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Measuring Tailor-made Service as a Form of Service Quality; The Service Individualization Level of the Hungarian Hospitality Industry.

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Abstract

Tailor-made services are widely used to create a higher-quality guest experience. This process requires a strategic approach but is essential to remain competitive in a crowded and increasingly technology intensive market. The dissertation focuses on how tailor-made service affects companies and their relationships. The research aimed to investigate the current Hungarian hospitality industry's ability to provide tailor-made service then discussed different approaches to tailor-made services. It also analysed how tailor-made service appears in the Hungarian hospitality industry by creating a measurement system to measure the tailor-made service the level of hotels. Part of this process was exploring current measurement systems in depth. The current state of the hospitality industry in post-covid Hungary was mapped; hotels were grouped into clusters according to their capability to provide personalised service, while the tailor-made service indicators were categorised based on how well hotels performed in them. The results of the scores were compared based on the hotel's characteristics and their importance to the General Managers. Finally, the tailor-made service scores were compared based on the phases and stages conceptualised in the customer journey model. This research provides a fresh perspective into important aspects of understanding tailor-made service in the hotel industry. The dissertation is providing a new customer journey model and a new, gap-filling, tailor-made service quality measurement system for hotels. In addition, further research confirmed that Hungarian hotels perform significantly better in functional stage quality, which is manifested in terms of being polite, paying attention to guests, and offering personal service, than in technical stage quality, which is characterised by having a hotel application, employing Search Engine Optimization techniques, having an adaptive website.

Based on the findings, the technical stage quality improvement is the most vital managerial objective. The research adds to current academic and managerial literature by introducing a customer journey model and measurement system. The model can identify growth opportunities in hotel services, while it is also suitable tool to group, cluster hotels based on service ability metrics.

Kivonat

A személyre szabott szolgáltatásokat széles körben használják a magasabb színvonalú vendégélmény megteremtése érdekében. Ez a folyamat stratégiai megközelítést igényel, azonban elengedhetetlen a versenyképesség megőrzése is a zsúfolt és egyre inkább technológia-intenzív piacon. A disszertáció arra összpontosít, hogy a személyre szabott szolgáltatás hogyan hat a vállalatokra és azok kapcsolataira. A kutatás célja az volt, hogy megvizsgálja a jelenlegi magyar vendéglátóipar személyre szabott szolgáltatási képességét, majd áttekintette a személyre szabott szolgáltatások különböző megközelítéseit. Azt is elemezte, hogy a testre szabott szolgáltatás hogyan jelenik meg a magyar vendéglátóiparban azáltal, hogy egy mérőrendszert hozott létre a szállodák testre szabott szolgáltatási szintjének mérésére. Ennek a folyamatnak része volt a jelenlegi mérési rendszerek alapos feltárása. Feltérképezésre került a vendéglátóipar jelenlegi helyzete a covid utáni Magyarországon; a szállodákat klaszterekbe sorolták aszerint, hogy mennyire képesek személyre szabott szolgáltatást nyújtani, míg a személyre szabott szolgáltatási mutatókat aszerint kategorizálták, hogy a szállodák mennyire teljesítenek ezekben. A kapott eredményeket a szállodák jellemzői és a szállodaigazgatók szempontjából meghatározott fontosságuk alapján hasonlították össze. Végül a személyre szabott szolgáltatási pontszámokat az ügyfélút modellben megfogalmazott fázisok és színterek alapján hasonlították össze. Ez a kutatás új nézőpontot nyújt a szállodaiparban a személyre szabott szolgáltatás megértésének fontos aspektusaihoz. A disszertáció egy új ügyfélút-modellt és egy új, hiánypótló, személyre szabott szolgáltatásminőség-mérési rendszert kínál a szállodák és az akadémia számára. Emellett a további kutatás megerősítette, hogy a magyar szállodák szignifikánsan jobban teljesítenek a funkcionális színtéren, ami az udvariasságban, a vendégekre való odafigyelésben és a személyes kiszolgálásban nyilvánul meg, mint a technikai színtéren, amit a szállodai alkalmazás megléte, a keresőoptimalizálási technikák alkalmazása, és egy adaptív weboldal megléte jellemez.

Az eredmények alapján a technikai színtér minőségének javítása a legfontosabb vezetői célkitűzés. A kutatás a jelenlegi tudományos és menedzseri szakirodalomhoz járul hozzá egy ügyfélút modell és mérési rendszer bevezetésével. A modell képes azonosítani a szállodai szolgáltatások növekedési lehetőségeit, miközben egy jól illeszthető eszköz a szállodák csoportosítására, klaszterezésére is a szolgáltatási képesség mérőszámai alapján.

Auszug

Massgeschneiderte Dienstleistungen werden häufig eingesetzt, um ein qualitative hochwertigeres Gästeerlebnis zu ermöglichen. Dieser Prozess erfordert einen strategischen Ansatz, ist aber unerlässlich um in einem überfüllten und zunehmend technologieintensiven Markt wettbewerbsfähig bleiben zu können. Die Dissertation fokussiert darauf, wie sich massgeschneiderte Dienstleistung auf Unternehmen und ihre Beziehungen auswirkt. Die Forschung zielte darauf ab, die Fähigkeit des derzeitigen ungarischen Gastgewerbes zu untersuchen, massgeschneiderte Dienstleistungen anzubieten, und diskutierte dann verschiedene Ansätze für massgeschneiderte Dienstleistungen. Es wurde auch analyisiert, wie massgeschneiderte Dienstleistung in dem ungarischen Hotel- und Gastgewerbe erscheint, indem ein Messsystem geschaffen wurde um die massgeschneiderte Dienstleistung auf dem Niveau von Hotels zu messen. Ein Teil dieses Prozesses war die eingehende Untersuchung aktueller Messsysteme. Der aktuelle Stand des Gastgewerbes im Post-Covid Ungarn wurde abgebildet, Hotels wurden entsprechend ihrer Fähigkeit, personalisierte Dienstleistung anzubieten in Clustern aufgeteilt, während die massgeschneiderte Dienstleistungsindikatoren danach kategorisiert wurden, wie gut die Hotels in ihnen abgeschnitten haben. Die Ergebnisse der Bewertungen wurden anhand der Eigenschaften des Hotels und ihrer Bedeutung für die Hotelmanager verglichen. Anschliessend wurden die massgeschneiderten Dienstleistungspunkte basierend auf den im Customer-Journey Modell konzipierten Phasen und Etappen verglichen. Diese Forschung bietet eine aktuelle Perspektive auf wichtige Aspekte des Verständnisses von massgeschneiderten Dienstleistungen im Hotel- und Gastgewerbe. Die Dissertation stellt ein neues Customer-Journey-Modell und ein neues, lückenfüllendes, massgeschneidertes Messsystem für Dienstleistungsqualität für Hotels bereit. Darüber hinaus bestätigten weitere Untersuchungen, dass ungarische Hotels in der funktionalen Phasenqualität, die sich in Höflichkeit, Aufmerksamkeit für die Gäste und persönliche Dienstleistung manifestiert, deutlich besser abschneiden als in der technischen Phasenqualität. Diese zeichnet sich durch Hotelanwendung, Einsatz von Techniken zur Suchmaschinenoptimierung und eine anpassungsfähige Webseite aus.

Basierend auf den Erkenntnissen ist die Verbesserung der Qualität in der technischen Phase das wichtigste Managementziel. Die Forschung ergänzt die aktuelle akademische und geschäftsführende Literatur durch die Einführung eines Customer-Journey Modells und eines Messsystems. Das Modell kann Wachstumschancen bei Hoteldienstleistungen identifizieren, während es auch ein geeignetes Instrument ist, um Hotels auf die Grundlage von Dienstleistungfähigkeitsmassen in Gruppen und Clustern aufzuteilen.

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[1] Ahlgrim, C. (2018) Snoop Dogg thanked himself for his star on the Hollywood Walk of Fame, and fans are loving it, Insider. Insider. Available at: https://www.insider.com/snoop-dogg-hollywood-walk-of-fame-speech-photos-2018-11 .

Köszönetnyilvánítás

“Egy gyermek felneveléséhez egy egész falura van szükség” tartja az angol mondás, de úgy gondolom, hogy egy doktorjelölt felneveléséhez is legalább egy falu szükségeltetik.

2009-ben találkoztam először a témavezetőmmel, Dr. Gyurácz-Németh Petrával, aki igazi inspiráció volt, hogy elmerüljek a szállodák és a vendéglátás világában. Számtalan élményt és barátot szereztem ezen a rögös úton, amelyre Petra nélkül soha nem léptem volna, és hálás vagyok az inspirációért, amit kaptam. Már az egyetemi tanulmányaim alatt szerencsém volt témavezetőmnek, ami még fontosabb, mentoromnak nevezni, és kulcs szerepe volt abban, hogy továbbtanultam. Petra már megtapasztalata, milyen nehézkes tudok lenni, ha kihívásokkal teli feladatokról van szó, ennek ellenére fontosnak tartotta, hogy meggyőzőn arról, hogy a PhD megszerzése lenne a tökéletes következő kihívás számomra; és bár fájdalmas volt, visszatértem, hogy újabb általa ihletet kihívásoknak nézzek elébe. Hiszem, hogy képes kihozni a legmagasabb potenciált az emberekből, ha hagyják neki. A képessége, hogy egyszerre több szerepben is megállja a helyét, igazán inspiráló lehet bárki számára. Életem nélkülözhetetlen részévé vált, és igazán hálás vagyok, hogy időt szakított arra, hogy mentoráljon az elmúlt évtizedben. Biztos vagyok benne, hogy utunknak még sok állomása van.

Szeretnék köszönetet mondani azoknak, akik lektorálták vagy segítették a dolgozat szó szerinti elkészülését. Nélkülük még tovább tartott volna eljutni odáig, hogy megírjam ezeket a sorokat. Szeretnék köszönetet mondani Szabó Ádámnak, Horváth Gizellának, Orosz Milánnak, Pitjeng Margueritte Mokgaetjinek, Slapšinskaitė Ringailėnak, Sárdi Ritának, Selmeczi Juditnak, Sadh Sathawatteynek, Kandó Katának és Dr. Tóth-Nagy Georginának a lektorálásban és a hibáim kijavításában. És persze a témavezetőmek, akinek többször is meg kellett ezt tennie.

Ezúton is szeretnék köszönetet mondani mindazon szállodaipari szakembereknek, akik időt szakítottak rám, és a jelenlegi gazdasági kihívásokkal teli időszak ellenére, válaszoltak kérdéseimre és megosztották velem szakértelmüket, vagy segítettek kérdőívem népszerűsítésében.

Ezúton is szeretnék köszönetet mondani a Minőségfejlesztési Központban dolgozó kollégáimnak, akik támogattak és biztattak, miközben igyekeztek tehermentesíteni a munkában, hogy a kutatásomra koncentrálhassak, és elviseltek a viharos időkben. Töretlen támogatásukért hálás vagyok.

Meg kell említenem a "falum" többi tagját, akik nélkül nagy valószínűséggel már rég feladtam volna. Szeretnék köszönetet mondani minden csodálatos barátomnak, akik állandó (online vagy valós) jelenlétükkel és bátorításukkal támogattak, vagy eltűrték életükből való távolmaradásomat, és szemrehányás helyett támogató, kedves emlékeztetőket küldtek. Csodálatos barátok vagytok, és kiváltság, hogy ismerhetlek titeket. Szeretném kiemelni Dr. Tomej Kristófot, Dr. Tóth-Nagy Georgināt, Horváth Gizellát, Kandó Katát, Boros Viktort, Bosnyák-Simon Nikolettnek, Sztudova Zoltánt és Tóth Biankát, hogy mindig meghallgatták gondolataimat, és szeretetükről és támogatásukról biztosítottak (illetve az esetenkénti koffein adagot szolgáltatták, ami nagyban hozzájárult a kutatás elkészüléséhez). Külön szeretném megköszönni Georginának, hogy segített eleget tenni a munkán kívüli kötelezettségeimnek.

Hálás vagyok a sorsnak is, amiért csodálatos háziállatokat adott nekem, akik mindig jelen voltak, és pelyhes szeretetet és endorfint adtak nekem az írás során.

Szeretnék köszönetet mondani szüleimnek is, akik mindig támogattak abban, amit csinálni szerettem volna, és akik a védőhálót jelentik az életemben és lehetővé teszik számomra, hogy kiteljesítsem önmagam. Édesapám egész életében értünk dolgozott, így soha nem kellett igazán aggódnom a döntéseim miatt, és (bár él néha a kritikus megfigyelések lehetőségével) olyan szabadságot biztosít számomra, amelyet csak néhányan élhetnek meg. A tudat, hogy amennyiben elbukom ott vannak, hogy elkapjanak, lehetővé tette, hogy nekivágjak ennek az új kihívásnak, és a fiskális növekedés helyett a tudományos növekedésre koncentráljak.

Ezt a munkát édesanyámnak ajánlom, kősziklámnak az életemben, aki támogatott, szeretett, ápolt, nevelt és bátorított, hogy olyan legyek, amilyen ma vagyok, és aki biztos vagyok benne, ha lehetőséget kap rá, rövidebb időn belül képes lett volna elvégezni ezeket a tanulmányokat, miközben gondoskodik a családjáról is. Ő az a személy, aki mindig ott van, amikor szükségem van rá. Minden lépésnél ott volt, és "ismeri" az összes professzoromat és az összes tárgyam tartalmát. Édesanyámnak mindig van türelme, hogy részletesen meghallgassa a problémáimat, zseniális elméje, hogy megértse azokat az összetett témákat, amiket feldobok neki, és bölcsessége, hogy olyan megoldásokat kínáljon, amelyekre még nem gondoltam.

Végezetül szeretném idézni Cordozar Calvin Broadust, Jr.-t és "Szeretném megköszönni magamnak, hogy hittem bennem, szeretném megköszönni, hogy elvégeztem ezt a sok kemény munkát, szeretném megköszönni, hogy ha nem is volt szabadnapom, soha nem adtam fel." (Ahlgrim, 2018)[2]

[2] Ahlgrim, C. (2018) Snoop Dogg thanked himself for his star on the Hollywood Walk of Fame, and fans are loving it, Insider. Insider. Available at: https://www.insider.com/snoop-dogg-hollywood-walk-of-fame-speech-photos-2018-11 .

1. Introduction

The focus of the dissertation is to introduce how tailor-made service, in other words, how providing customer experiences tailored to the consumer's individual needs and preferences (Chellappa and Sin, 2005; Kokko and Moilanen, 1997; Peppers et al., 1999; Roberts, 2003; Tam and Ho, 2006), affects customers, companies, and their relationships. The goal is to analyse the capability of the current Hungarian hospitality industry to providing tailor-made service. The dissertation details the different approaches of tailor-made service and what interaction it requires between customer and company. The dissertation will then analyse how tailor-made service appears (if it exist) in the Hungarian hospitality industry.

In the increasingly competitive marketplace businesses face today, delivering contextual customer experiences is no longer an added value but an expectation. Market professionals (such as SalesForce, Gartner, Sitecore, Forbes (Gartner Research, 2022; Pandey, 2020; Salesforce, 2018; Shep, 2020) etc.) focusing on coaching or selling tailor-made services and offering customers tailored experiences that keep them engaged. This process requires a far more robust and strategic approach than before and is essential to remain competitive in a crowded and increasingly technology savvy marketplace.

Using tailor-made service (such as personalization and customization) is a wildly used technique to create a higher quality guest experience (Imhoff et al., 2001; Kokko and Moilanen, 1997; Solomon et al., 1985). With technological innovations collecting big data become easier and more common. A tailor-made service is created by the service provider's adaptive behaviour and the customer's participation ((Blom, 2000; Roberts, 2003; Surprenant and Solomon, 1987a; Vargo and Lusch, 2004). It is important to tighten the relationship with the guest and create revenue opportunities by giving the guests experiences that they want, which can be more personalized and customized. According to market professionals, for example Forbes magazine, (Shep, 2020) customers today gravitate toward brands that feel like they listen to them, understand them, and pay attention to their specific wants and needs. Personalized customer service improves ROI significantly if implemented appropriately, since delivering a customized experience to the customers make them feel appreciated and valued.

Even though big data collection has become easily available, tailor-made service only works if the customer participates in the process; therefore, the customer and the service provider create the service experience together (Campos et al., 2018; Grönroos, 2011; Luo et al., 2019; Vargo et al., 2008; Vargo and Lusch, 2004). Tailor-made service is directed towards the person; and this will make tailor-made services different but hence difficult. In marketing and sales, the company will not be communicating with a large group of customers but with the individuals (Zhou et al., 2013). On the other hand, as each individual has a different level of willingness to share personal information with companies, a tailor-made service created from big data-based information can have a negative effect on the customer (Chellappa and Sin, 2005; Schoenbachler and Gordon, 2002). Other than that, because of miscommunication or misinformation, even if the customer participates in the service process, the tailor-made service can negatively affect the customer's satisfaction (Chellappa and Sin, 2005; Culnan and Armstrong, 1999; Goodwin, 1991).

Regardless, according to the market players, it pays to do this right. Customers will "go out of their way" to spend more money to get a great experience (Nidhi et al., 2021; Shep, 2020). The value a company can provide their customer, in the form of a personalized experience, can help make the price less important than other benefits. In today's economic situation, this could become a success factor for hotels. Personalization is about building customer loyalty by building meaningful one-to-one relationships, (Riecken, 2000) and by satisfying the individual guest needs, companies can increase loyalty and reduced-price elasticity. In addition, as customers share their experiences, high customer satisfaction should reduce the cost of attracting new customers and enhance the firm's reputation (Fornell, 1992). For instance Zeithaml et al. (1990) reported a positive relationship between service quality and the willingness to pay a higher price and the intention to remain loyal in case of a price increase. In strategic decision making the characteristics of the hotel industry must be considered. The hotel industry is resistant to change due to high investment cost, the cost of change and financial difficulties. In hotel firms the pressure of other priorities are also part of the main barriers to change (Dow and Perotti, 2013; Okumus and Hemmington, 1998a), and change being a slow but constant development (Okumus and Hemmington, 1998b), the topic of tailor-made service can be a key performance indicator for hotels, as changing the behaviour of the employee has lower cost than renovations.

Although research proved that satisfaction leads to loyalty (for instance; (Coelho and Henseler, 2012; de Ruyter et al., 1998; Dick and Basu, 1994; Fornell, 1992; Kuo et al., 2013; Ladhari et al., 2011; Oliver, 1999; Prentice et al., 2020; Santos Roldán et al., 2021), quality service leads to satisfaction, (Berry et al., 1988; Grönroos, 2001, 1984; Gustafsson et al., 2005; Oliver, 1997) and that quality service is judged by the customer (Gummesson, 1995; Parasuraman et al., 1988; Vargo and Lusch, 2004) there are only a few tailor-made quality measurement models. Therefore, developing such model to analyse the Hungarian hotel industry is beneficial for both from an academic and management perspective.

As the dissertation aims to create a measurement system with which the level of the tailor-made service can be measured, it must explore current measurement systems in depth. With the help of this newly created measurement system, the current state of the hospitality industry in post-covid Hungary will be mapped, hotels will be grouped according to their capability to provide personalized service and development areas of the Hungarian hotel service will be identified.

1.1.The goal of the dissertation

As the dissertation will detail later, providing tailor-made service is a difficult task, given that it has big data need, the cooperation of guest and employee is necessary and is time-consuming. However, it can highly improve loyalty and satisfaction.

Developing measurement systems and attempting to measure service quality (SQ) was already a well-researched topic; however, measuring the level of individualization of service through the company's capabilities and willingness rather than the guests' is more difficult as the quality in the eye of the service receiver. Therefore, one of the goals of this dissertation is to research and establish if it is possible to create a system that measures the tailor-made service level of the hotels. For that, it is essential to prove that quality service should be considered as tailor-made service, and to prove that the currently available measurement systems are not satisfactory

to measure the complex hospitality service. If we assume that creating such a measurement system is possible, it can be used to map the Hungarian hospitality industry and their current level of service individualization. A managerial implication goal of the dissertation is to identify the key improvement areas in service personalization and customization.

Therefore, the dissertation will have the following objectives:

1. to create a new measurement system to define tailor-made service level in the Hungarian hotels.
2. to measure the tailor-made level of the hotel service in Hungary.
3. to identify what the common characteristics are in the case of hotels that score high on the tailor-made service scale.
4. to identify what the common characteristics are in the case of hotels that score low on the tailor-made service scale.
5. to identify what phase of the guest encounter is most frequently tailor-made.
6. to identify development opportunities for the Hungarian hotel market.

1.2.The structure of the dissertation

The first part of this dissertation will be a collection and presentation of the theoretical background. The chapter will collect and synthesize previous research theories, models and show all the different aspects and research focus on the field.

The literature review research (Snyder, 2019) differentiates methodologies such as systematic, semi-systematic, integrative and narrative approaches (Toronto and Remington, 2020). Depending on the purpose of the literature review different techniques will be preferable based on the importance of the topic, how mature the topic is, or the paragraph's aim.

The first part of the literature review introduces service and service quality (SQ) definitions, research, and measurement systems throughout the past decades. It will demonstrate how SQ measurement models were created and conducted. After introducing and establishing the importance of SQ in hospitality service, the dissertation will detail the different approaches of tailor-made services, such as personalization, customization, and co-creation. It is important to stress that tailor-made service and tailor-made advertisement and marketing, such as personalized marketing or mass personalized marketing, can be viewed as two separate fields of research; however, due to the nature of hospitality service and guest interaction, hotel marketing activities will be part of the hotel service concept and will not be analysed separately, as the goal of this dissertation is to create a complex measurement system.

In order to create a new scoring system, firstly, the existing guest journey models need to be presented and compared. With the help of customer journey models, the development of a model that integrates the practicality of the field and the theoretical background of research are taking place. It is a necessary step to create a scoring model that can be understood and implemented by hotel professionals as they are an essential part of the measurement.

After establishing the theoretical background, the dissertation will present the research questions and hypotheses.

To create a tailor-made service measurement system firstly, the items used for measuring personalization in previous research must be synthesized, merged, and installed to the appropriate part of the guest journey model. After adding the synthesized items to the guest journey model, secondly, expert interviews take place to validate the importance of the selected items from the literature and to see if there would be any additional items required for the given phase of customer-company interaction to be as tailor-made as possible.

Thirdly, following the introduction and analyses of the expert interviews, a second round of expert interviews will take place to validate the scoring model. After the final validation and creation of the scoring model, the dissertation presents the data collecting methods.

Following the qualitative research of model building, quantitative analyses will be used to answer the hypotheses.

Finally, the dissertation will be finished with a chapter of summery, including a discussion, summary of thesis and conclusion.

2. Theoretical Background

2.1.Service Quality

The following paragraphs will be detailing the important definitions, concepts, and research on the topic of service quality (SQ). Initially introducing the background of SQ research followed by a brief definition of service and service quality. The aim of this chapter is to introduce the various measurement systems implemented to measure SQ and to show how tailor-made services, such as personalisation and customization, emerged from SQ research.

2.1.1. Service

To be able to talk about service quality (SQ) it is essential to define what service is. The goal is to introduce how research within the SQ field has progressed over time (Snyder, 2019).

In (1966)' Rathmell defined service as a 'verb' because it is an act, whereas ‘good’ is a thing or object, therefore a noun. Later, Solomon et al., (1985), defined service marketing as "the marketing of activities and processes rather than objects" (Solomon et al., 1985, p. 106) as they built on Rathmell’s definition. When defining services Lovelock, (1991) and Zeithaml et al., (2017) both used words like "process", "deeds"' and "performance". This means the researchers all agreed that **service is something that is done and not a thing that is**. The shift in focus to services management from goods management in the 90s’ meant that the producer perspective shifted to a customer perspective (Gummesson, 1995). Grönroos, (2001) and, Vargo and Lusch, (2004) also used the word "process", but by this time the definition of service evolved beyond a one-word description. Grönroos said that goods are products, existing even before consumption would start, while services are more unique in the sense that they are processes – meaning that they are being "produced" simultaneously the participation of the consumer. The definition of service evolved from it being a single word to the realization that it is not only what the service provider performs, but an act where the consumer also participates (Edvardsson, 2005; Grönroos, 2001; Gustafsson et al., 2005). During the time when the process of defining service was taking place, descriptions that a good service means something ‘tailor made’ emerged. In 2005, Edvardsson et al., defined service as value co-creation. It meant that the value creation happens through the eyes of the customer. It is a key concept because of the interactive, processual, experiential nature of service (Edvardsson, 2005). Later Grönroos added to the definition that the "consumption and production of services are (…) partly simultaneous processes, and (…) the service provider at least partly enters the consumption sphere." (Grönroos, 2006, p. 319). This means that not only the consumer takes part in the creation of the service, but the provider takes part in the consumption of the service as well. The resources are interacting with each other and with the consumer in the value-creating processes (Grönroos, 2006), creating an open system not only for the consumer but also for the service provider (Grönroos, 1984; Gummesson, 1979) because as the customer participates as a co-producer and can be influenced by the process it means that services are ‘open' processes while physical goods are closed processes (Grönroos, 2006).

On the other hand, Lusch and Vargo (2004) expanded the early definitions in a direction where customer perceptions were not taken into consideration. They defined service "as the application of specialized competencies (knowledge and skills) through deeds, processes, and performances for the benefit of another entity or the entity itself." (Vargo and Lusch, 2004, p.

2). So, while Grönroos (2001) put emphasis on consumer participation, in this approach the highlight is on the tools and means to perform the deed.

Before measuring SQ, it is important to define if we think of service as an individual phenomenon occurring on its own or as part of a complex offering or package. Sometimes, the satisfaction of the consumer depends on the object itself like in the case of an art piece' while for instance consulting about a legal process is pure service as there are no goods involved. However, Rathmell (1966) points out that there are very few pure products and services as most goods need supporting services and most services need supporting goods. For instance, for a receptionist to provide a service, a hotel room is needed. Gummesson (1995)also said that customers do not buy goods or services because "activities render services, things render services" (Gummesson, 1995, p. 43) but they buy offerings which provide services and that will create value. Similarly, Grönroos (2001) concluded that “a service firm has no products, only interactive processes.” (Grönroos, 2001, p. 150).

1. Table - Service definitions and keywords

Scholar	**Year**	**Keywords to define service**
Rathmell	1966	act, verb,
Solomon et al.	1985	activities and processes
Lovelock	1991	process, deed and performance
Zeithalm et al.	2000	process, deed and performance
Grönroos	2001	Unique process, producing with customer participation
Vargo and Lush	2004	application of specialized competencies, deeds, processes, and performances
Edvardsson et al.	2005	interactive, processual, experiential nature, value co-creation

(Source: Own Edit.)

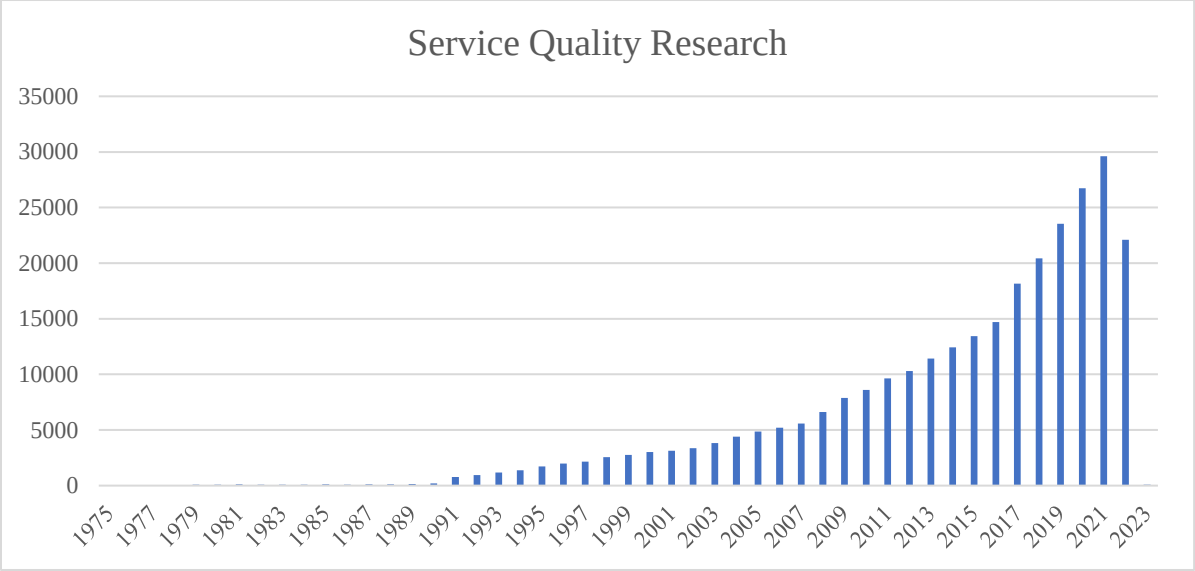
Conclusion:

Defining service itself is difficult. When we talk about a service that can be personalized it is even more of a challenge. In **1. Table**, we can see the different key- words researchers used throughout the years. We can see emphasis on customer participation and to be able to talk about service quality, we must consider if quality service could exist without tailoring. Although countless research has tried to define service, the purpose of this dissertation is not to find the true meaning of service but to discuss tailor-made services such as personalization. The description of service gradually grew and became more complex, describing service in more and more detail. For a good hospitality service to be performed, a competent employee is needed with the right skills and knowledge for the tasks. A customer's willingness to participate in the value creation is also essential as the service provider needs to find the real needs of the customer. In case of hotel products, we cannot use Grönroos' definition (2001, p.150) on its own as, in the hotel service the physical property takes an important role. Without tools, infrastructure and proper competences, the hotel service providers would be unable to invite the guests in the service process let alone in the co-creating process. In case of tailor-made services, be it through personalization, customization or co-creation we need to use skills, knowledge and experience (Vargo and Lusch, 2004) but we also need the participation of the guest (Edvardsson, 2005; Grönroos, 2001), therefore, we can state that services that can be personalized are interactive processes where the service provider uses specialized competencies and resources so that with the participation of the guest they are able to create value, which can either be the final product or the addition to a physical good.

2.1.2. History of Service Quality research

Defining service quality (SQ) is a challenging task. Quality research was a popular topic in the end of the 70s through the 90s (Crosby, 1979; Garvin, 1983; Grönroos, 1984; Parasuraman et al., 1988; Takeuchi and Quelch, 1983; Zeithaml, 1988). SQ has become a great differentiator and powerful weapon for service companies to use (Berry et al., 1988). Publications in the topic date back to 1975 based on the Web of Science database, the popularity of the topic has grown exponentially since the early 2000s (**1. Figure**). In this paragraph Bibliometric methods will be used to analyse articles.

1. Figure - Service Quality Research by year



(Source: Own Edit)

2.1.3. The growth of SQ topic

Searching for the key word 'service quality', there are 344,771 hits (2022. 11. 03.) using the code ALL = (service AND quality). This means that all the records that contains both words in their title, keywords or abstract will be found. The search was narrowed down to only include English language publications (326,924 records) and included only peer reviewed articles which resulted in 286,110 hits.

As the purpose of this chapter is to introduce the pillars and origin of SQ research, and to have an understanding on how the focus of the topics have changed over time, old publications will not be excluded. The aim of the paragraph is to present the most popular topics of service quality, considering that the dissertation is being written on the theme of business and economics, the next step is to select the relevant research areas.

2. Figure - Service Quality Research by Field

(Source: Web of Science)

The most publications with these keywords can be found in Engineering (35,156) and also Health Care Sciences Services (34,590) (2. Figure). Business Economics is only the 7th biggest topic in SQ. As the focus of this dissertation is tourism, specifically in hospitality, only SQ research done in the field of Business Economics (21,819) Social sciences (5,850), and Operations Research/Management Science (4,771) were considered. This means that there were 29,478 articles found on Web of Science Core Collection with the keywords 'Service Quality' within the focal research spectrum.

This chapter uses a bibliometric method, which is the "application of mathematical and statistical methods to books, articles, and other media of communications" (Pritchard, 1969). In the following paragraphs VOSviewer software program will be used as an analytic tool, firstly to identify the key terms used in the articles collected, secondly to further create co-citation maps (van Eck and Waltman, 2020; Waltman and van Eck, 2013). The program is free access and takes a distance-based approach to construct a network/density visualisation map based on occurrence and co-occurrence data. Co-occurrence means the number of times a key term occurs with another key term in the same article title or keyword in the database (van Eck and Waltman, 2020), therefore it can give an accurate picture of what the focus of topics were throughout the decades.

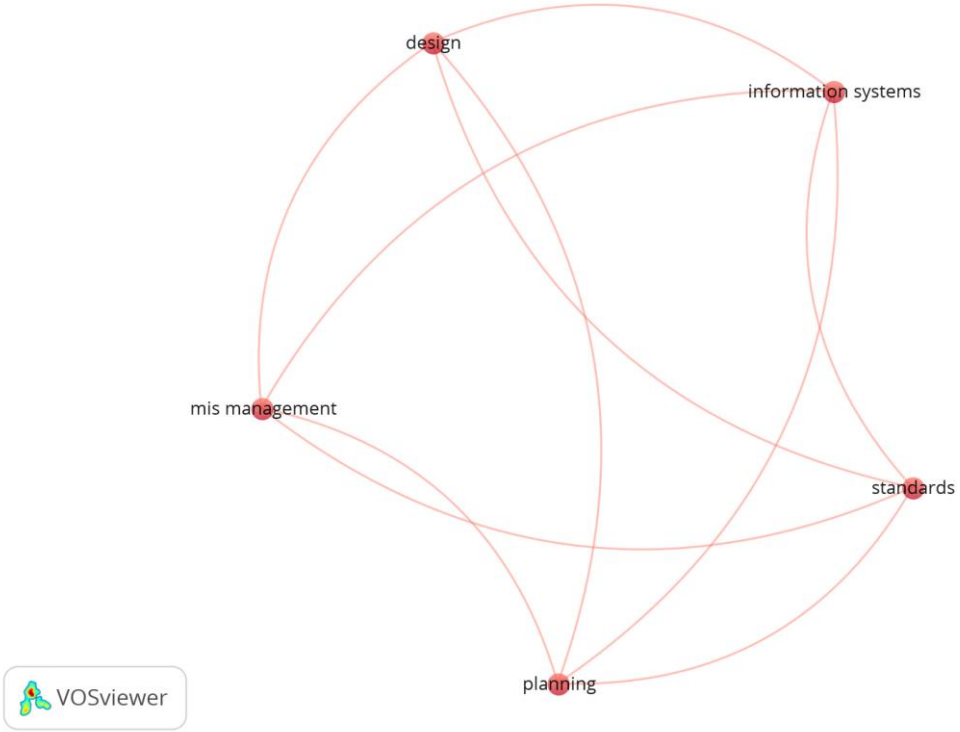
Data preparation has been done with the help of Web of Science. The article titles, their publication year, and full citation report were exported. A sum of 29,478 articles were collected and separated into different decades.

The second stage was the extraction of key terms, for this the VOSviewer program was used. The program follows a natural-language-processing algorithm to include terms in the analysis with a minimum occurrence chosen by the user (van Eck and Waltman, 2020).

2.1.3.1.SQ in the 1970s

After refining the dataset, concentrating on the 1970s only 17 articles were found on the Web of Science database focusing on SQ. Looking at the figure, the five common keywords, being "miss management", "design", "information system ", "planning" and "standard" can be found. (**3. Figure**) Although quality was associated with words like goodness, luxury, luster, or weight, it is not the correct description of the concept (Crosby, 1979). As we can see from the figure SQ is associated with "standard" and "design", which also corresponds with Crosby (1979) whom SQ meant zero defect or in other words doing it right the first time and making no mistakes.

3. Figure - Co-occurrence map of Service Quality keywords of the '70s



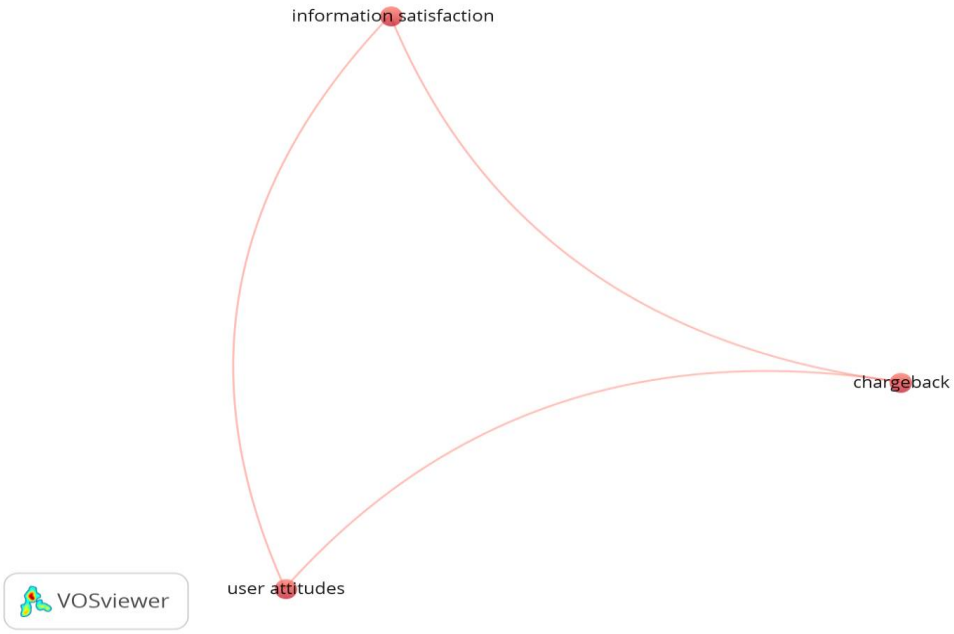
(Source: VOSviewer)

2.1.3.2.SQ in the 1980s

In the 1980s the interest grew, and 85 articles were found in our dataset. Using the same method, the co-occurrence map of these articles can be created. There are three key terms, "information satisfaction", "chargeback" and "user attitude" (**4. Figure**).

We can see these topics occurring in this decade as the two schools; the North American (Parasuraman et al., 1988) and the Nordic European (Grönroos, 1984) also emerged from this time period where they started to focus on the consumers expectations, reaction and satisfaction.

4. Figure - Co-occurrence map of Service Quality keywords of the '80s



(Source: VOSviewer)

In the 1980s the definitions still contained the importance of conformance; however, they shifted from the idea of strictly tangible terms when describing quality. One of the underlying themes of the research is the fact that SQ is more difficult for the consumer to evaluate than goods quality. Garvin (1983) defined quality as "conformance to requirements". He already differentiated between internal and external failures, where internal failure is something that happened before the product left the factory and external failure is what happened after the installation of the product. When the customer purchases a good, there are many tangible characteristics they can use to judge the quality, but with services the tangible evidence is limited to the physical appearance of the surroundings of the service provider (Parasuraman et al., 1988).

The comparison of consumer expectation with actual service performance was also a re-occurring topic (Churchill and Surprenant, 1982; Grönroos, 1984; Parasuraman et al., 1985; Smith and Houston, 1982). Hence, hereon quality is defined as **conformance to customer specifications** (Parasuraman et al., 1988) or, in other words, superiority or excellence. The perceived quality is defined by the product's overall excellence judged by the consumer (Grönroos, 1984; Parasuraman et al., 1988). The consumer evaluates the quality of the outcome of a given service, "the consumer compares his expectations with the service he perceives he has received" (Grönroos, 1984, p. 37). The result of this process will be the perceived quality of the service, therefore, "it is the customer's definition of quality, not managements, that counts." (Berry et al., 1988, p. 35). It makes providing and measuring quality difficult, as every individual has a different level of expectation.

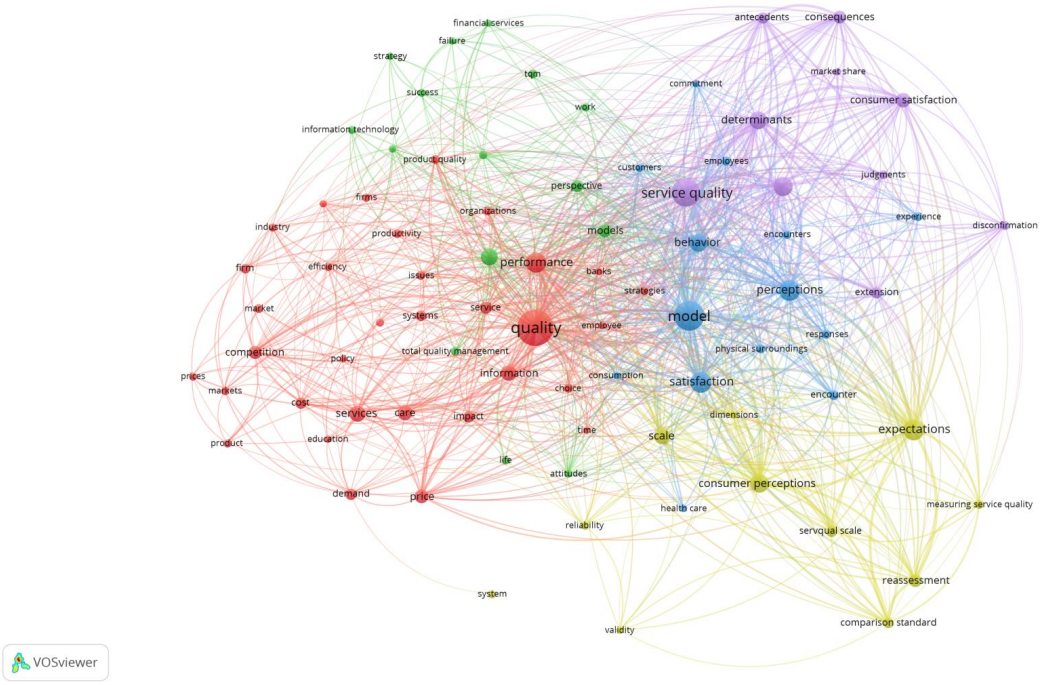
2.1.3.3.SQ in the 1990s

The research interest continued to grow and from the next decade (from 1990 to 1999) 1,432 articles are available, considerably more than the previous two decades combined. As with a

bigger dataset there are more possible keywords, in this case a higher (than 2) threshold had to be selected. With 10 chosen as threshold, 86 keywords remained, and the software excluded those with less occurrence. General terms that provide little information, such as “empirical research,” “study,” “US,” and so on were excluded.

Two separate key terms’ relationship when it comes to link strength is demonstrated by their distance in the visualisation map; the stronger the relationship, the closer the terms’ proximity (van Eck and Waltman, 2020; Waltman and van Eck, 2013).

5. Figure - Co-occurrence map of Service Quality keywords of the '90s

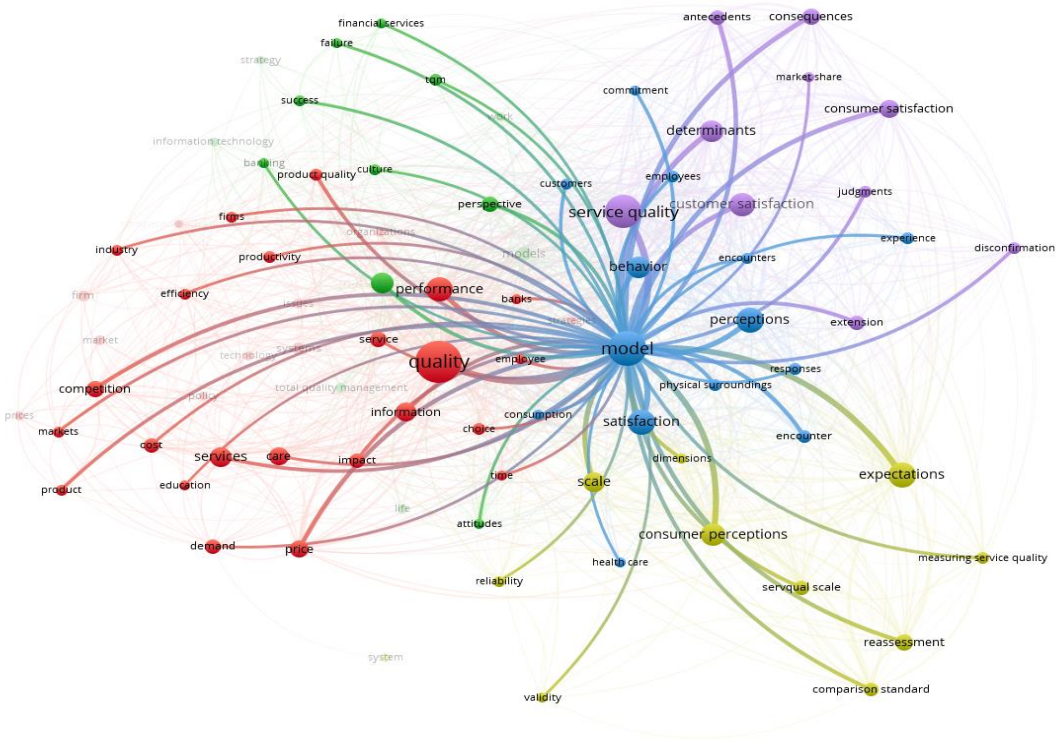


(Source: VOSviewer)

One of the two strongest terms - “quality”, with 232 occurrences and a link strength (the total number of links connecting a specific key term to its linked key terms) of 613, is close to “performance” which has a total link strength of 267, indicating that many of the researches of this decade have been focusing on performance quality. The second strongest term “model” has a link strength of 579. Based on the key terms’ relation, SQ models were an important topic in the 1990s. Models were created not only for the sake of service quality, but for “consumer perception”, “consumer satisfaction” and “performance” (**5. Figure** full size in **1. Appendix**).

The links show the connection between “model” and “scale”, implying that most models used “scales” for “measuring service quality” and for “reassessment”. Specific models like the “SERVQUAL scale” are also mentioned 22 times (**6. Figure** full size in **2. Appendix**).

6. Figure - Co-occurrence map of Service Quality keywords of the '90s - model



(Source: VOSviewer)

As seen on the co-occurrence map, SQ was studied from multiple angles in the 1990s.

Firstly, how SQ and consumer satisfaction will relate in different service settings. According to Oliver (1993, p. 76), "Satisfaction judgments can result from any dimension, quality-related or not but regardless if the negative experience was caused by a non-quality-related dimension, will still lower customer satisfaction. Later Oliver expanded the definition and stated that satisfaction could be defined as the consumer's fulfilment response". It is a judgement that "a product or service feature, or the product or service itself, provided (or is providing) a pleasurable level of consumption-related fulfilment, including levels of under- or over-fulfilment" (Oliver, 1997, pp. 13–14). Therefore, **satisfaction is the consumer's sense of the consumption outcomes**.

"Customer satisfaction" has at least two different conceptualizations: transaction-specific and cumulative (Boulding et al., 1993).

- Transaction-specific perspective;

Customer satisfaction is viewed as a post-choice evaluation and judgment of a specific purchase occasion (Oliver, 1999, 1997, 1996, 1993, 1980). Therefore, it can show specific information about a particular product or service encounter.

- Cumulative satisfaction;

Cumulative or overall satisfaction is "based on the total purchase and consumption experience with a good or service over time" (Anderson et al., 1994, p. 54). It can indicate the firm's past,

current and future performance (Fornell, 1992; Johnson and Fornell, 1991) and should motivate a firm's investment in customer satisfaction.

Fornell (1992) highlights the most important benefits of high customer satisfaction, increased loyalty and reduced-price elasticity. Customer satisfaction should make it hard for competitors to affect the customers, and as a company, reduce both the failure costs and future transaction costs. In addition, as customers share their experiences, high customer satisfaction should reduce the cost of attracting new customers and enhance the firm's reputation. As SQ has a positive impact on customer satisfaction, it also has a positive effect on profitability which means there is an economic benefit to increasing customer satisfaction (Anderson et al., 1994), however, the relationship between service quality and profits is complex (Greising, 1994; Zahorik and Rust, 1992). According to Anderson et al., (1994) increasing market share could lead to lower customer satisfaction. The reason behind it is that overall market expectations of the quality of a firm will change. Nevertheless, overall positive output positively affects customers' overall satisfaction with the firm.

The impact of SQ could indicate that customers will remain with a company (Zeithaml et al., 1996). Consumer loyalty and satisfaction are linked but have asymmetric relations. Loyal consumers are usually more satisfied, but satisfaction may seldom lead to loyalty (Oliver, 1999). Oliver (1997, p. 392) states that the consumer who "fervently desires to rebuy a product or service and will have no other" is considered loyal and has "a deeply held commitment to rebuy or re-patronize a preferred product/service consistently in the future, thereby causing repetitive same-brand or same brand set purchasing, despite situational influences and marketing efforts having the potential to cause switching behaviour" (Oliver, 1997, p. 392). Jones and Sasser (1995, p. 92) state that customer loyalty is "a feeling of attachment to or affection for a company's people, products, or services".

Most studies looked at the SQ - service loyalty relationship solely focusing on one specific industry (Oliver, 1999; Zahorik and Rust, 1992), creating a limitation that the results are not generalizable. However, Cronin and Taylor (1992) and (Zeithaml et al., (1996) reported differences between various service providers. Dick and Basu (1994) suggest that changes in costs in a given industry could influence customers' attitudes towards different services.

Cronin and Taylor (1992) focused solely on repurchase intentions, whereas Boulding et al. (1993) focused on repurchasing and willingness to recommend. While Cronin and Taylor (1992) did not find a significant effect of SQ on repurchase intentions, Boulding et al. (1993) found that SQ will affect repurchase intentions and willingness to recommend. Similarly, Dabholkar and Thorpe (1994) report that customer satisfaction with a store positively influences intentions to recommend the store to others.

Satisfaction is a necessary element of loyalty formation, however, it will gradually become less significant when loyalty is cemented through other mechanisms like personal determinism and social bonding at the institutional and personal levels (Oliver, 1999).

In the case of price-indifferent loyalty, Zeithaml et al. (1990) reported a positive relationship between SQ and the willingness to pay a higher price and the intention to remain loyal in case

of a price increase because with Cronin and Taylor (1992) together with Fornell (1992), it can be noted that there is a different level of elasticity in different service industries.

In industries characterized by relatively low switching costs, customers will be less loyal, (de Ruyter et al., 1998) therefore loyalty cannot be achieved by many service providers because some services and products will disinterest customers (Oliver, 1999).

Zeithaml et al., (1996) found that a long-term relationship between the customer and the company will affect profitability because loyal customers are more likely to buy additional services than short-term customers, in addition to spreading positive word-of-mouth communication. Ultimate loyalty combines perceived product superiority, personal fortitude, social bonding, and synergistic effects (Oliver, 1999). It is also possible for the firm to charge a higher price because these customers value maintaining the relationship (Zeithaml et al., 1996).

The physical surroundings also impact the behaviours of both customers and employees (Bitner, 1992) where services are purchased and consumed simultaneously while simultaneously requiring direct human contact. This will lead to customers and employees interacting with each other. Schneider (1990) highlighted the importance of distinguishing climate. Instead of physical sight, he defined it as "the shared perceptions of employees concerning the practices, procedures, and behaviours that get rewarded and supported in a particular setting" (Schneider, 1990, p. 384). It is not only important to think about how the physical environment affects customers, but it is also important to examine the effect of SQ on internal customers including how the physical environment will affect the internal customer. Research into organizational networks indicated that the environmental and atmospheric factors will affect the employee-consumer exchange activities (Auty and Long, 1999).

Researchers also began to test and further develop measurement models from the '80s,whereby the measurement of perceived SQ has attracted academic attention (Brown et al., 1993; Cronin and Taylor, 1992; Parasuraman et al., 1991, 1988; Teas, 1993). Measurement tools and procedures have been developed to measure SQ but mostly from the consumers' perspective (SERVQUAL (Parasuraman et al., 1988) and SERVPERF (Cronin and Taylor, 1992) and personalization started to appear in the dimensions of the measurement system.

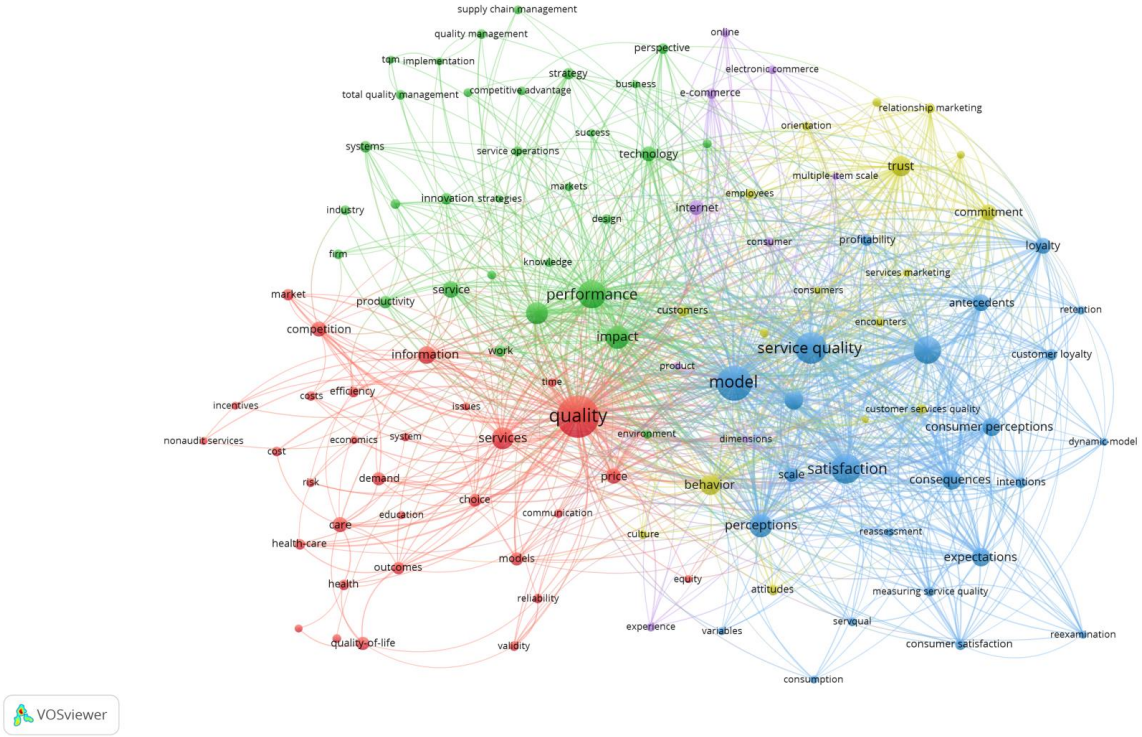
As customers may change their expectations on the whole service experience following a service encounter, therefore dynamic approaches had been proposed (Bolton and Drew, 1991; Boulding et al., 1993) to satisfy customers and gain perceived SQ.

Perception is a strong predictor of the SQ concept (Cronin and Taylor, 1992; Oliver, 1993; Teas, 1993). Hence, SQ is viewed as a performance concept as it depends on performance criteria (Zeithaml et al., 1993), which is determined primarily by the customer.

2.1.3.4. SQ in the 2000s

From the 2000s, there are a total of 3,810 articles, as the topic further grew exponentially. From the year 2015 there are more than 1000 articles found on the website under the said topic per year. With 30 chosen as a threshold, and excluding general terms, 112 items remained. The goal was to get approximately a similar map in size as was created for the 90s.

7. Figure - Co-occurrence map of Service Quality keywords of the '00s

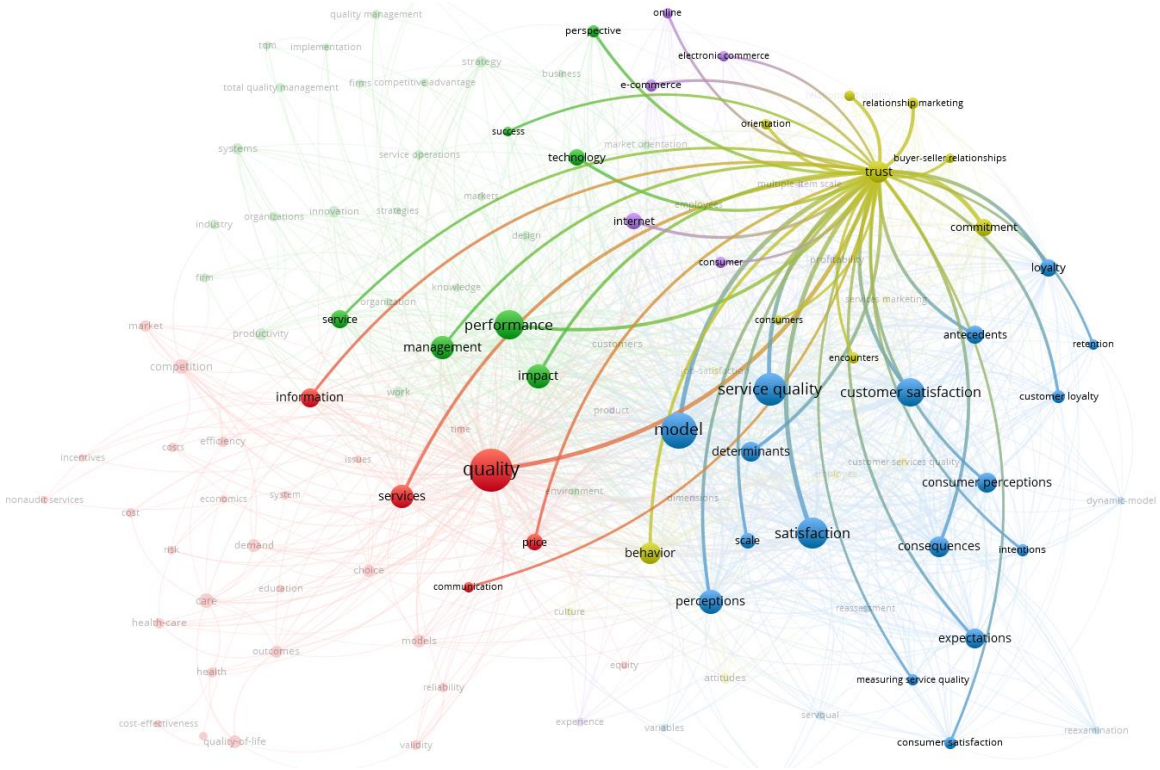


(Source: VOSviewer)

In the network visualisation map presented from the 2000s we can see many of the same keywords; “model” (occurrences 616, link strength 2800), “satisfaction”, “perception”, but there are keywords that were not present or were not as significant in the previous decade. Keywords like “trust” (occurrence 201, strength 1112) and “internet” (occurrence 116, total link strength 470) or “e-commerce” show a shift in focus (**7. Figure** full size in **3. Appendix**).

When focusing on the relationship and link origination from “trust”, we can see how the topics of “buyer-seller relationship”, “commitment”, “loyalty” and “internet” is linked, showing the new research perspectives of the decade (**8. Figure** full size in **4. Appendix**).

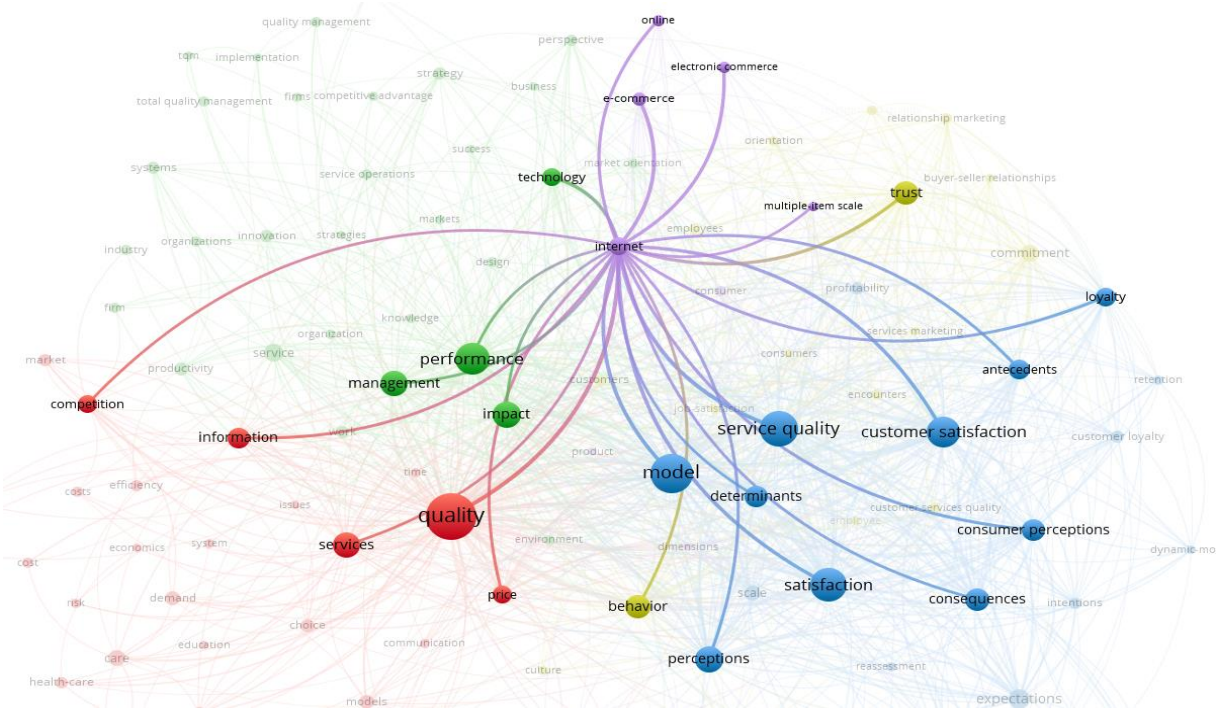
8. Figure - Co-occurrence map of Service Quality keywords of the '00s - trust



(Source: VOSviewer)

Because the terms' distance in the visualisation map indicates how strong the relationship is (van Eck and Waltman, 2020; Waltman and van Eck, 2013), it is evident that "trust" and "e-commerce" (commercial transactions conducted electronically on the internet) similarly "trust" and "commitment" have become closely related topics.

9. Figure - Co-occurrence map of Service Quality keywords of the '00 - internet



(Source: VOSviewer)

Putting the term “internet” in the focus it can be assumed that some researchers in this decade started to investigate the quality of service through the internet and started to focus on measuring this way of service. (**9. Figure** full size in **5. Appendix**)

Therefore, one of the focuses of the 2000s were the association between customer satisfaction and service attributes which were a complex research problem. The reason behind it is due to the intangible nature of services (Hong and Goo, 2004; Nguyen and Leblanc, 2002). However, it was concluded that the quality level of the service affects customer satisfaction (Eskildsen et al., 2004).

Boshoff and Gray (2004) underlined that satisfaction is not inherent in the product or the service itself; in their conceptualization, satisfaction mainly consists of the consumer's perceptions of the attributes regardless of whether it is a product or service as it depends on the individual. Thus, **every consumer will express different levels of satisfaction when faced with the same service encounter or experience** (Ueltschy et al., 2007). Torres and Kline (2006) argued that customer satisfaction means that customers are at ease but not excited by the company. Delighted customers are likely to give a positive word-of-mouth referral to others. In addition, delight has been once again linked to other positive outcomes, including customer retention and higher profitability and may create a competitive advantage that is difficult to imitate (Torres and Kline, 2006).

The perception of quality does not just occur cognitively but has an emotional aspect (Ladhari, 2000). **Quality service is a moving target; the guest's intentions will be impacted by their emotional satisfaction based on their perceived service quality**; therefore, hotels should pay attention to the emotional aspect of satisfaction (Cameran et al., 2010).

Gilmore and Pine (2002) turned from an employee-interaction focus and put emphasis on the infrastructure needed to create the experience. Of course, employees play an important part in bringing these experiences to life by **identifying the needs and preferences of different customers and providing creative responses.**

The other main area of the decade came with the rise of information technologies. IT advances made human-human interactions in some service delivery redundant (Bitner et al., 2000; Li et al., 2003). For example, technology-based services like e-retail and online gaming replaced human interactions during the 2000s with technology.

The 2000s were also when some of the services changed to hybrid services (Ganguli and Roy, 2010), particularly when information technology tools were used to increase the efficiency of service delivery, however, human interactions are still part of most service aspects (Aldrich, 2000).

This led to the awakening of a new type of service dimension, the E-service. Based on Parasuraman et al., (2005, p. 217), E-SQ is the extent "to which a website facilitates efficient and effective shopping, purchasing and delivery." Many researchers have used SERVQUAL (Parasuraman et al., 1988) and SERVPERF (Cronin and Taylor, 1992) as a base to develop a measure for E-service quality. In addition, thanks to the rise of technology-enabled services, research has also evolved and identified technology-related SQ dimensions (Collier and Bienstock, 2006; Joseph and Stone, 2003; Parasuraman et al., 2005). E-S-QUAL (electronic service quality) and E-RecS-QUAL (electronic service recovery quality) are some of many examples of technology-related scales (Parasuraman et al., 2005) created in this decade.

The four dimensions of E-S-QUAL are efficiency, fulfilment, system availability, and privacy, while E-RecS-QUAL has three dimensions - responsiveness, compensation and contact.

Other dimensions of e-quality can be website appearance/user interface, ease of use, linkage, layout and content, reliability, recovery quality, efficiency, supplementary services/support, communication, security, incentives, performance, feature, storage capability, serviceability, trust, responsiveness, customization, web store policies, reputation, assurance and empathy (Collier and Bienstock, 2006; Madu and Madu, 2002; Santos, 2003; van Riel et al., 2001).

Self-service technology has also become more popular in the service delivery context, and its impact on customer perceptions on the overall SQ has become more apparent (Curran and Meuter, 2005; Dean, 2002). Consumer perceptions of SQ will differ based on the self-service type (Curran and Meuter, 2005) as it could be telephone, internet, or interactive kiosks (Curran and Meuter, 2005). The SQ requirements will be different as there is no human interaction. Ease of use and fun will be more important. The research found that in the 2000s, avoiding service persons was an important factor; on the other hand, technology anxiety was also considered (Dabholkar and Bagozzi, 2002; Meuter et al., 2003, 2000). In the case of technology-enabled services, measures of SQ focus mostly on consumer interactions with the technology, and only in hybrid cases are employee-customer interactions considered.

Ladhari (2008) found a wide variation in the SQ dimensions as he examined 18 different service settings, commenting that "the number and nature of the dimensions varied, depending on the service context; indeed, they varied even within the same service industry. Apparently, “the criteria used to evaluate service quality differ among customer groups and circumstances." (Ladhari, 2008, p. 78). Consumers' perception of technology related SQ turned the attention towards the willingness to use and adapt the new technologies; therefore, scales like Technology Readiness Index (Parasuraman, 2000) were introduced.

A multi-industry study by Brady and Cronin (2001) shows that SQ consists of three dimensions.

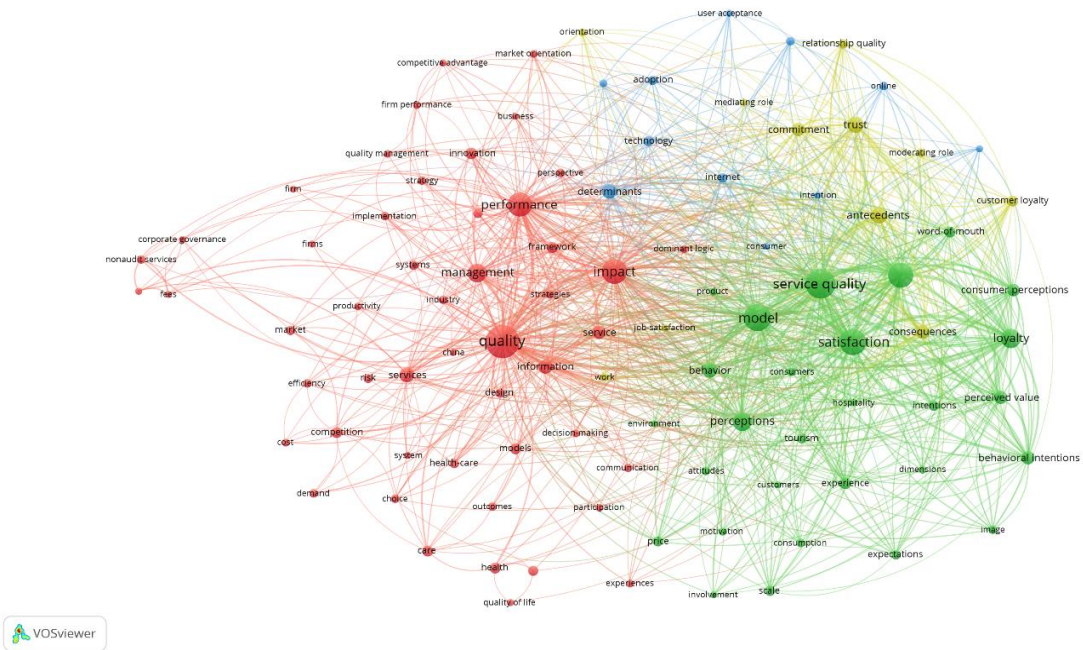
- Outcome (waiting time and tangibles),
- Employee interactions and,
- Environmental quality (ambient and social conditions and facility design).

With the rise of E-SQ, customer trust has become more important because trust is key for service providers. The trust element first appeared in the 1980s with Parasuraman et al., (1988, 1985), but it became more substantial with the appearance of e-service. When the company pays attention to enhancing customers knowledge of how the service delivery works and what kind of behind-the-scenes aspects the service has, it will strengthen and enhance the customers trust in the company, therefore it can be an important differentiator (Eisingerich and Bell, 2008).

2.1.3.5.SQ in the 2010s

SQ research produced 13,321 research in the field from 2010 – 2019. With 150 chosen as a threshold, and excluding general terms, such as “study,” “US,” and “framework”, 100 items remained. The goal remained to get approximately similar map in size.

10. Figure - Co-occurrence map of Service Quality keywords of the '10

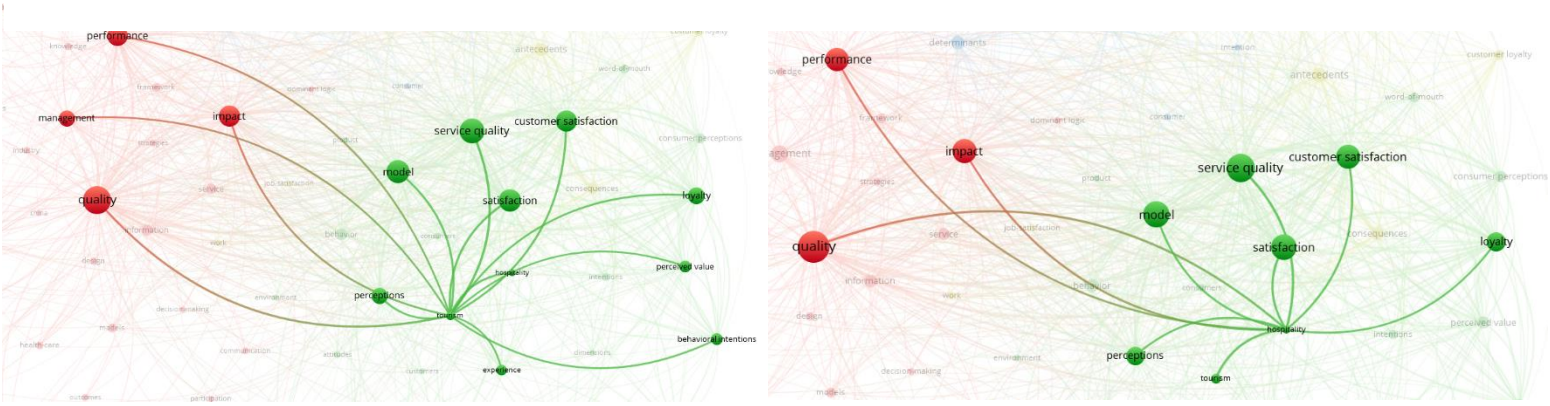


(Source: VOSviewer)

Keywords such as “quality”, “service quality”, “model” or “satisfaction” remained the central points of the co-occurrence map, but the size (and the importance) of ‘trust’ and ‘internet’ grew. There are more keywords that refer to technology, ‘internet’, ‘online’, ‘user acceptance’, ‘technology’ and they are all connected to the ‘customer satisfaction’ keyword. (**10. Figure** full size in **6. Appendix**)

Keywords such as ‘tourism’ (occurrence 281, total link strength 1179) and ‘hospitality’ (occurrence 151, total link strength 712) appear for the first time on the co-occurrence map and while both ‘tourism’ and ‘hospitality” are connected to keywords with greater occurrence, they are not connected to “trust” or any of the IT keywords (**11. Figure** full size in **7. and 8. Appendix**).

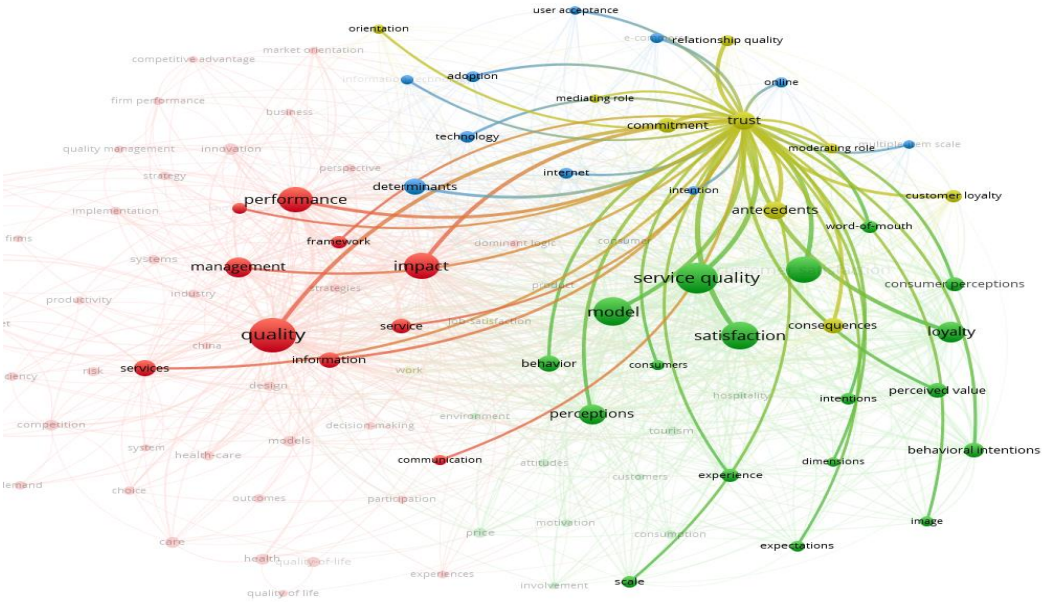
11. Figure - Co-occurrence map of Service Quality keywords of the 10' - tourism and hospitality



(Source: VOSviewer)

‘Trust’ (occurrence 801, total link strength 4350) continues to have a growing significance and sows a tight relationship with IT related keywords (**12. Figure** full size in **9. Appendix**).

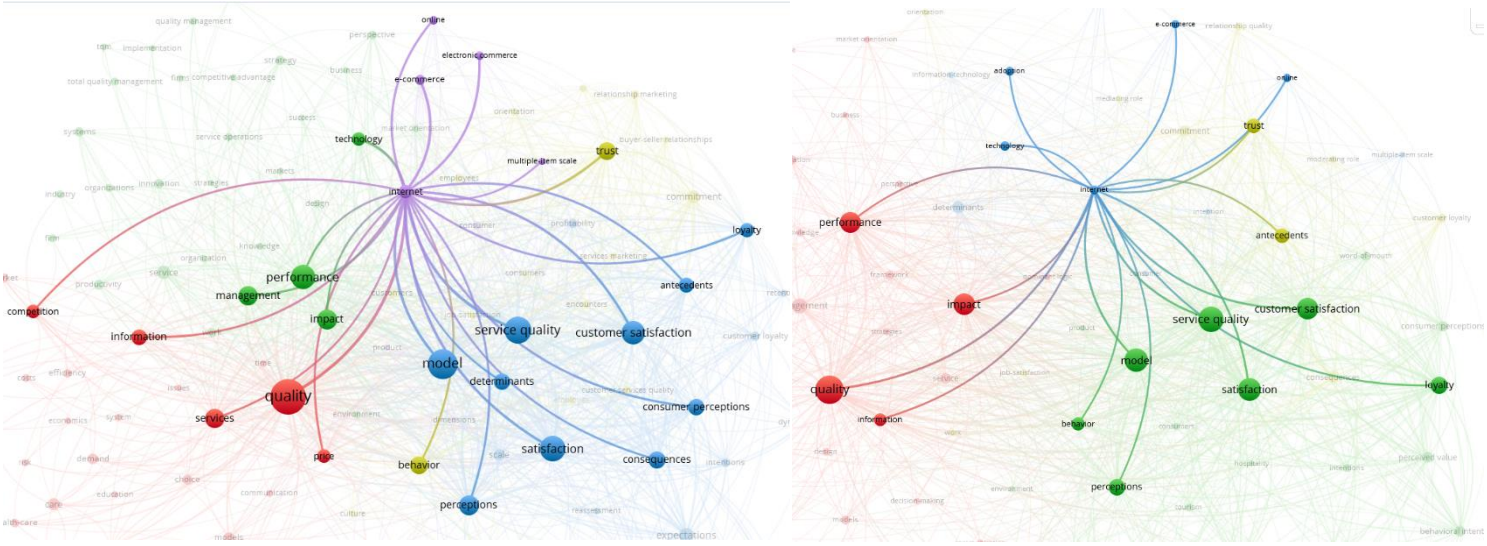
12. Figure - Co-occurrence map of Service Quality keywords of the '10 - trust



(Source: VOSviewer)

'Internet' (occurrence 258, total link strength 1161) became less interconnected, as from the 2010s the keyword 'technology' gained more attention. (**13. Figure** full size in **10. and 11. Appendix**).

13. Figure - Co-occurrence map of Service Quality keywords of the 00' (left) and 10' (right)



(Source: VOSviewer)

Building on the previous decades, in the 2010s further research on SQ shifted from traditional service encounters, with direct face-to-face customer-employee interactions due to the technological advances and the growth of social networks (Chung et al., 2020). Service providers found new opportunities to satisfy customers through digital services and digital marketing channels (Calantone et al., 2018; Perrey and Spillecke, 2011). Customers who use both online and offline services started to find effective and accessible online services that are both time and cost-saving (Escobar, 2016).

One of these technology-based service concepts is chatbots. Customers perceive that information is credible when there is a good relationship with the service provider (Edwards et al., 2014; Yuan et al., 2016). Therefore, for the information provided by the chatbots to be credible, customers must perceive that the computer/AI accurately identifies their problem and capable of providing the necessary information (Clokie and Fourie, 2016). Even in traditional service encounters, information quality plays an important role in building customers overall positive attitude towards the company (Jaiswal et al., 2010). High information quality and website support levels will lead to better-perceived SQ. Still, introducing these technologies also meant a growing concern regarding safety and ethical behaviour in e-commerce (Limbu et al., 2011).

Stromback (2013) conceptualized the service encounter as an unfolding service drama, where service personnel (actors) perform for customers (an audience) in the service space (service stage). With the introduction of chatbots this dynamic is changing.

Due to the nature of Internet services, protecting customers' privacy and security is a more important factor than before, compared with other telecommunication services (Thaichon et al.,

2014). Internet SQ and customers' attitudes toward Internet purchases significantly influence consumer satisfaction (Zarei et al., 2019). The traditional definition of SQ dimensions has been revised for online services and with the rise of technology-based services, the attention has shifted to measurement and operationalization issues in IT - SQ (Carlson and O'Cass, 2011; Ganguli and Roy, 2010).

However, it does not matter how good the technological service is if the in-person service does not reach the level and vice versa. The sequence of service encounters also matter because "**in-person service quality perception has a much stronger effect than e-service quality on customer metrics"** (Wang et al., 2016). During each encounter, the consumer will have a perceived SQ and use different reference points in time to evaluate. Ultimately, the cumulative quality perceptions will influence perceived value and overall customer satisfaction (Strombeck and Shu, 2014). Therefore, it is important to identify the SQ dimensions in hybrid contexts to improve customer satisfaction, loyalty, and commitment towards the company (Ganguli and Roy, 2010).

Of course, the end of the 2010s focused on COVID-19 and how the pandemic crisis expanded the roles of robots and their perceived usefulness. Smart robots have been used in some hotels, retail stores, airports, meal delivery, etc. (Grewal et al., 2018; Palvia and Vemuri, 2016). The application of robots is in the early stages in service (Lechevalier et al., 2014) although they were developed and implied rapidly.

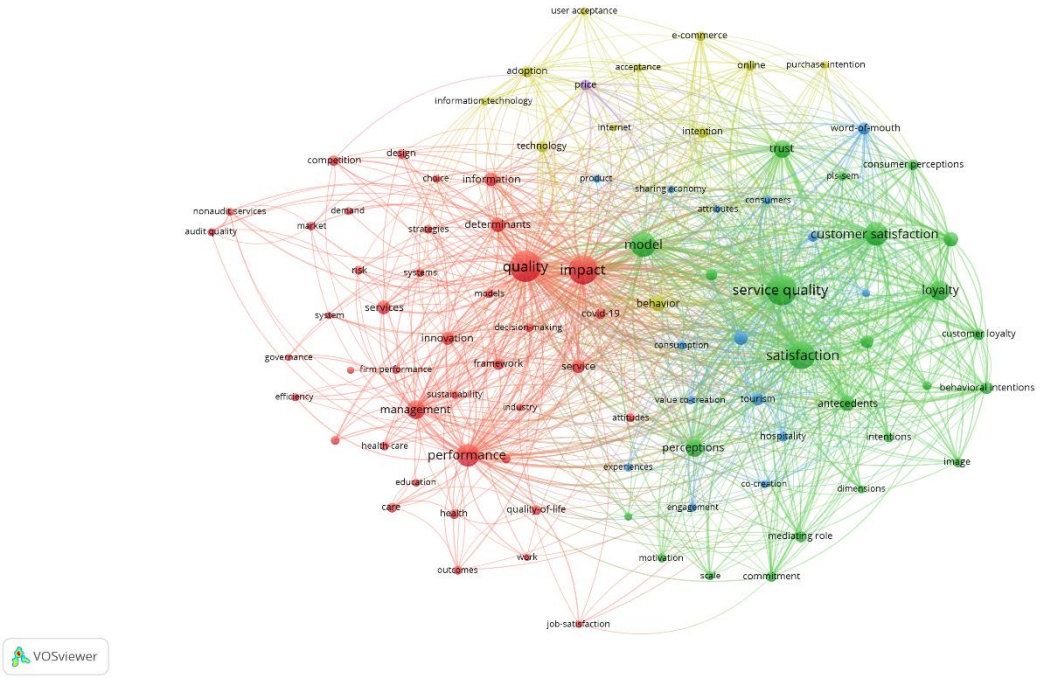
By the end of the decade artificial intelligence (A.I.) technology became one of the relevant topics in SQ research. The use of A.I. service agents in service should increase efficiency and personalization (Huang and Rust, 2018), therefore, they should improve the customers perceptions of the SQ delivered by AISA. However, research shows mixed findings from consumers. The AI usefulness is positive in credence service but negative in experience service where customers prefer human employees (Elliott, 2022; Wirtz et al., 2018).

SQ and scale development research mostly focused on the high human touch – the low-tech and low human touch – high-tech paradigms (Verhagen et al., 2014) and tried to find the different applicable combinations of SQ dimensions. Some can be considered universal, at least from the consumers' perspective, like responsiveness is a key dimension for both human (Brady and Cronin, 2001; Mittal and Lassar, 1996) and technology-based service agents (Ladhari, 2010). However, dimensions such as security and privacy are more evident for technology-based service agents (Huang et al., 2015; Lin and Hsieh, 2011).

2.1.3.6.SQ now

SQ research produced from 2020 – 2023 grew to 7887 research, in the field just over these 2 years (and early availability). With 100 chosen as threshold, and excluding general terms, such as "study," "US," and "framework", 92 items remained.

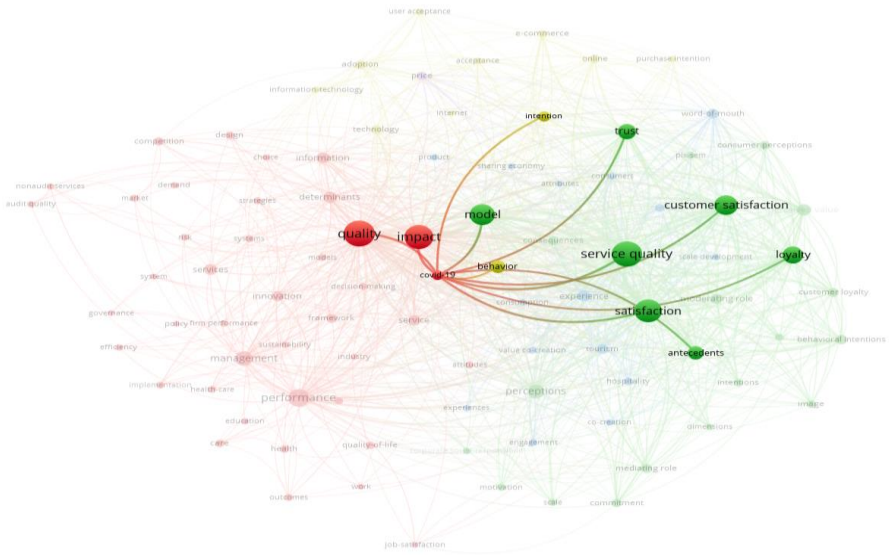
14. Figure - Co-occurrence map of Service Quality keywords after 2020



(Source: VOSviewer)

Keywords such as “quality”, “service quality”, “model” or “satisfaction” of course remained the central points (**14. Figure** full size in **12. Appendix**). “Tourism” and “hospitality” one again appeared on the map, but the most recognisable change is the keyword “covid-19” (**15. Figure** full size in **13. Appendix**).

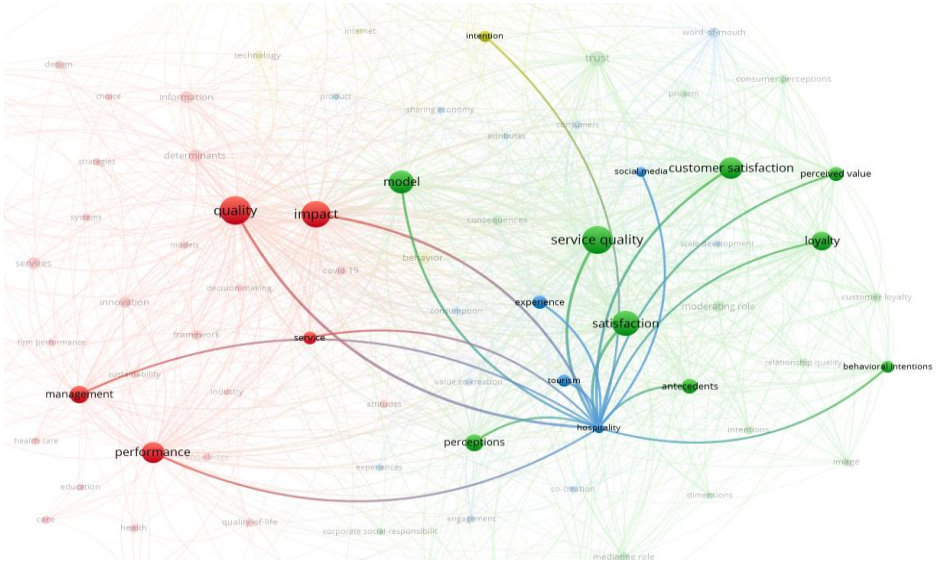
15. Figure - Co-occurrence map of Service Quality keywords after 2020 - Covid 19



(Source: VOSviewer)

"Covid-19" appears in connection with "behaviour", "intention", "trust" and "loyalty", which seems to be the main research focus when it comes to the pandemic (**15. Figure** full size in **13. Appendix**). "Hospitality" research regarding SQ became more connected throughout the map. (**16. Figure** full size in **14. Appendix**).

16. Figure - Co-occurrence map of Service Quality keywords after 2020 - Hospitality



(Source: VOSviewer)

At the beginning of the 2020s, most research focused on the COVID-19 pandemic (which created a higher purpose of contactless service), the technological advances in AI, big data analytics, and robotics, and the relationship of technology to SQ became more apparent.

The pandemic has increased robot usage in the service sector, and robots are now trusted and accepted as lifesavers (Chiu et al., 2014; Lew, 2022; Matthews, 2020; O'Neill, 2020)

Although service providers and consumers adopted artificial intelligence service agents (AISA) for service, measurement of AISA-SQ only recently gained popularity (Noor et al., 2022). Noor et al., (2022) refines and validates a multidimensional AISAQUAL scale that provides a tool to examine the relationship between AISA-SQ and satisfaction, perceived value, and loyalty popularity (Noor et al., 2022). **If AISA is capable of higher efficiency and personalization of service, it will be accepted** (Huang and Rust, 2021).

However, in the service context like hotel service, although an AI provided service can be related to customer satisfaction, when AISA is combined with human employees, AI has a negative effect on the overall satisfaction (Noor et al., 2022; Prentice et al., 2020). Noor, Rao Hill and Troshani, (2022) there is a gap between customers' AISA service needs and expectations.

2.1.4.1. Service Quality Conclusion

SQ and SQ measurement has expanded throughout the past five decades, with definitions growing from zero defect (Crosby, 1979) to compliance with guest expectations and reaching the customers' perception of SQ (Grönroos, 1984; Berry et al., 1988; Parasuraman et al., 1988; Zeithaml et al., 1993; Anderson et al., 1994; Oliver, 1997).

Suppose quality is conformance to customer specifications (Parasuraman et al.,1988) because it will be judged by the consumer (Grönroos, 1984) regardless if it is the quality of a product or a service. In that case, the guest will decide if their experiences were pleasurable (Oliver, 1997) which means that only tailor-made services can provide high level perceived SQ.

As customers will judge the services based on the sum of all service encounter experiences (Bolton and Drew, 1991; Boulding et al., 1993) and the performance of the company is determined by the customer (Zeithaml et al., 1993), each costumers' needs have to be fulfilled. Satisfaction is based on the consumer's perceptions of service attributes, therefore, depending on the individual guest (Boshoff and Gray, 2004). Every consumer will express different levels of satisfaction even when faced with the same service (Ueltschy et al., 2007). Therefore, the service provided has to match the guest's needs and perceptions. The criteria used to evaluate SQ differ even among customer groups and circumstances (Ladhari, 2008) so companies have to have a strategy to tailor their service. Companies must identify the needs and preferences of different customers and provide creative responses (Gilmore and Pine, 2002). Consumers' perception of technology-related SQ is also important as IT-SQ is essential to 21st-century service.

It may be that "in-person service quality perception has a much stronger effect than e-service quality on customer metrics" (Strombeck and Shu, 2014; Wang et al., 2016) but nowadays, all services include multiple stages of service (Strombeck and Shu, 2014) and can consist of separate phases of; technology only, hybrid and human encounters. If AISA is capable of higher efficiency and personalization of service, it will be accepted (Huang and Rust, 2021); therefore, the technological gadgets must be useful for the guests.

Therefore, in this paper high level SQ will be viewed as a tailor-made service.

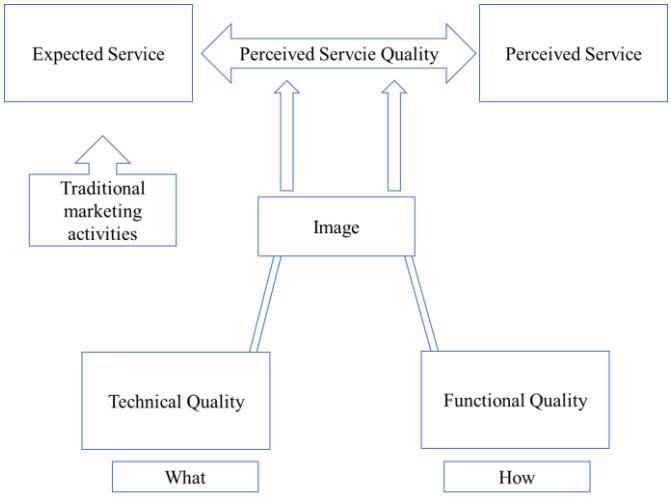
2.2.Service Quality Models

After defining service quality (SQ), the next step is to evaluate how to measure it. Sasser et al., (1978). Grönroos (1982), Lehtinen and Lethinen (1982) and Parasuraman et al., (1985) have all come to the same conclusion; SQ must be measured on multiple levels. The most common differentiation is between the service or good the customer receives and how they receive it. These variables are based on the idea that the consumer is not only interested in what they receive as an outcome of the production process but in the process itself (Grönroos, 1982).

An early conceptualization of the SQ model was created by Grönroos (1984, 1982)(**17.Figure**). His approach: if a firm wants to be successful, the business operator needs to understand the

customers' perception of the service; therefore, it is essential to match the perceived quality with the expected quality and keep this distance as small as possible to reach customers' satisfaction. He measured perceived SQ based on qualitative methods.

17. Figure - Grönroos Service Quality Model



(Source: Grönroos, 1982, Own Edit)

Three SQ components were identified here:

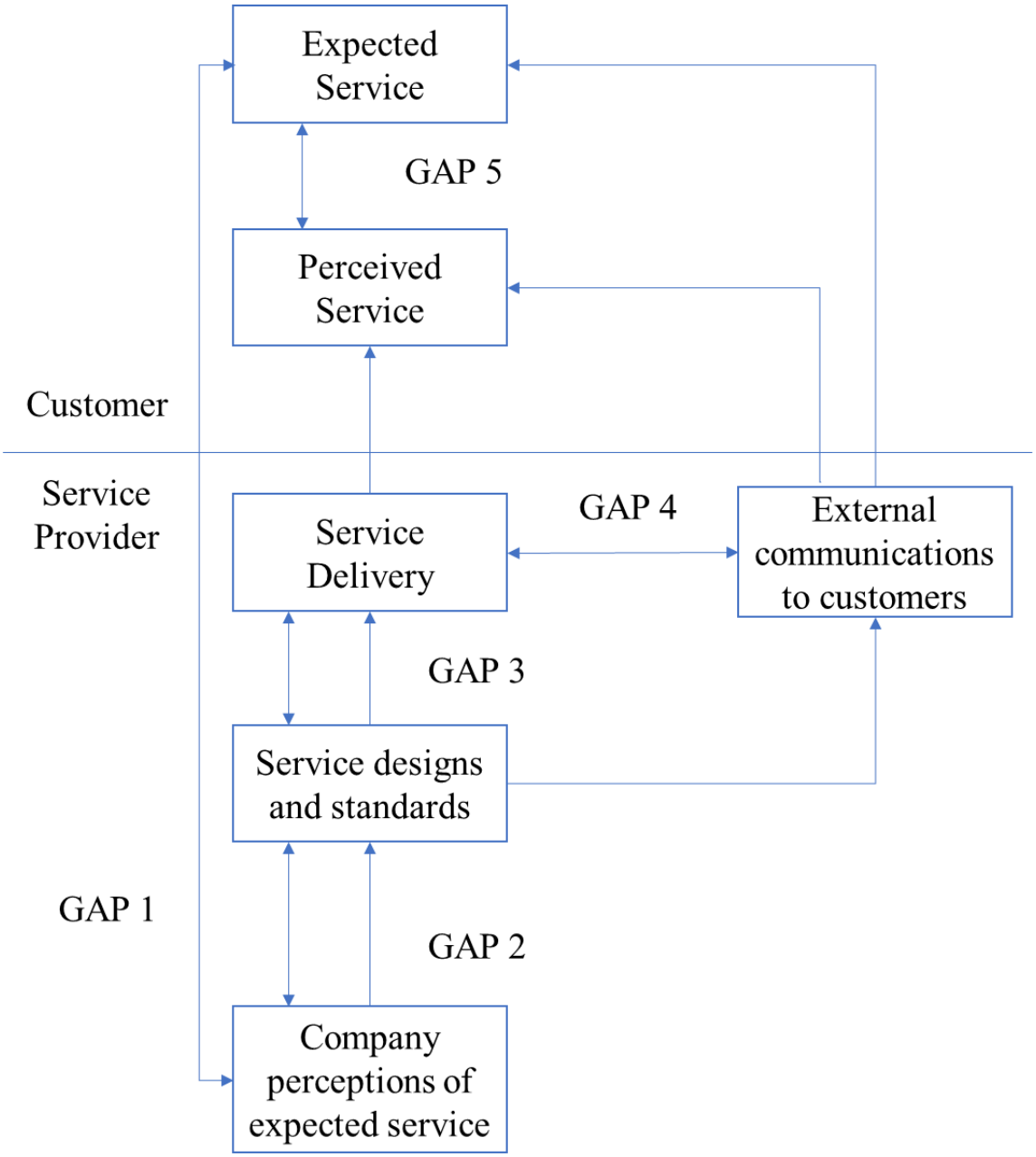
- technical quality,
- functional quality, and
- image.

The first factor, technical quality, is what customers receive from interaction with a service firm. The second component, functional quality, is how the consumer receives the technical outcome of the service - way this process will affect the customers' evaluation of SQ. The third SQ factor in this model is the corporate image: the customers' view of the corporation or brand. Their view of the firm influences the customers' expectations, resulting from how customers perceive firm services. Grönroos (1982) model is based on disconfirmation from product quality literature that puts perceived service against expected service.

Following the idea of disconfirmation, Parasuraman et al., (1985) developed the GAP SQ model (**18. Figure**). The model is based on the differences between expectation and performance dimensions. It shows the critical insights gained from executive and focus group interviews about the SQ concept. The model differentiates the marketers' side (from GAP 1 to 4) and the costumers' side (GAP 5).

- GAP 1: Customer expectation-management perceptions gap, The Knowledge Gap.
- GAP 2: Management perception-service quality specifications gap, The Policy Gap.
- GAP 3: Service quality specifications-service delivery gap, The Delivery Gap.
- GAP 4: Service delivery-external communications gap, The Communications Gap.
- GAP 5: Expected service-perceived service gap, The Service Quality Gap.

18. Figure - GAP model



(Source: Parasuraman et al., 1985, Own Edit)

After the gap modelling, SQ determinants were identified. When interpreting the quality, the consumers use these determinants that fall into ten key categories labelled "SQ determinants". This research was later refined, including the SERVQUAL model created in 1988 (Parasuraman et al., 1988). Consequently, the original ten SQ dimensions were merged into five dimensions: reliability, responsiveness, tangibles, assurance (communication, competence, credibility, courtesy, and security), and empathy (understanding and knowing the customer).

Later the SERVQUAL model was once again revised by Parasuraman et al., (1991). They replaced the word "should" with "would," and although they kept the five dimensions, they

reduced the total number of items to 21. The authors also characterized and further identified the four gaps in their research of 1985, which created an extended SQ model. According to this extended model, most factors involve communication and control processes implemented in organizations to manage employees. They used the SERVQUAL model and later used it to create the E-S-QUAL model (Parasuraman, 2000). They were not the only ones who had built on the SERVQUAL model. Most SQ models are built on the Grönroos (1984) and the Parasuraman, Zeithaml and Berry (1988) models and add to these concepts or attempt to merge them. For example, Cronin and Tailor (1992) built on the SERQVAL model, created the SERVPERF model and inspired researchers to continue in the performance-based measure direction, creating a new branch of SQ models.

The athor collected some of the past decades' SQ models and highlighted their most useful aspects in correlation to present research which can in detail be found in **15. Appendix – 18. Appendix.**

SQ models created before the 2000s were mostly built on three main models (**15. Appendix**). Grönrooos SQ model, Parasuraman et al. GAP model, and the SERVQUAL model as mentioned above. The focus is to identify a way to measure SQ through its dimensions and factors. Performance evaluation, customer expectations, and perceived experience are key. Adapting SQ measurement to hotels started in the 1990s, but there will be a separate table detailing SQ models for hospitality. Grönroos's idea of technical and functional quality was transcendent till the end of the 1999s. Differentiating the physical attributes of the service and the employees providing it, appear in one way or another in many SQ models. Therefore, while creating a SQ measurement model, separating the technical and functional elements of SQ will be key. Considering the effects of the tangible aspects of service and how it is delivered will need to get the focus. Looking at SQ in regard to phases, (Oh, 1999) should also be considered for a more detailed evaluation.

When looking at the models after 2000s (**16. Appendix**), there are mostly concerns regarding technology, however some SQ models were still focusing on non-technological aspects of SQ. These models concentrate more on intangible attributes and combine multiple models from the 80s and 90s. There is also examples of different focals in SQ; for instance, Frost and Kumar (2000) look at internal customer satisfaction, Soteriou and Stavrinides (2000) looked at under performers, whereas Luk and Layton (2002) suggest that not only management but employees too have to be involved in the GAP model as they will have different perceptions. The takeaway from these models is that they try to find a way to measure the intangibles, consider the employees and combine multiple models to create a measurement system.

In **17. Appendix**, some of the SQ measurement models that were modified for hospitality or hotel SQ measures in the past decades are presented. These models used the SERVQUAL model in a hotel setting, however some (Akan, 1995; Wong Ooi Mei et al., 1999) created additional dimensions. Employee behaviour, the hotel's physical appearance and product quality were added which are key elements of the hotel industry.

Most SQ models after the 2000s focused on technology (**18. Appendix**), although the first model concerning internet technology was Berkley and Gupta (1994) and Dabholkar(1996).

These SQ models address the fact that SQ will be different online or through technological agents compared to the in-person experience. Therefore, they need separate measurement systems. The design and usability of websites or mobile technology-supported channels are essential to satisfaction.

Based on the examples presented above, the approach to create a good measurement model will;

- rely on multiple previous research,
- use items that can be measured on the Likert scale,
- consider the technical and functional aspects of service,
- differentiate phases of the service,
- tailored to the hospitality industry,
- consider both the technological and human aspects of the overall service.

2.3.The Base of SQ in Hospitality

The next step in introducing SQ in hospitality co-citation analysis. Co-citation will be performed to find the common most important articles SQ in hospitality is currently based on. To make sure that only the relevant articles stay in the database the search term was now complemented to only include papers related to hotels and hospitality. With this method there are 3,063 peer reviewed articles. By starting the search terms ‘service’ and ‘quality’ and ‘hotel’ or ‘hospitality’ then exclude findings based on the same criteria as before we get the exact same result, therefore:

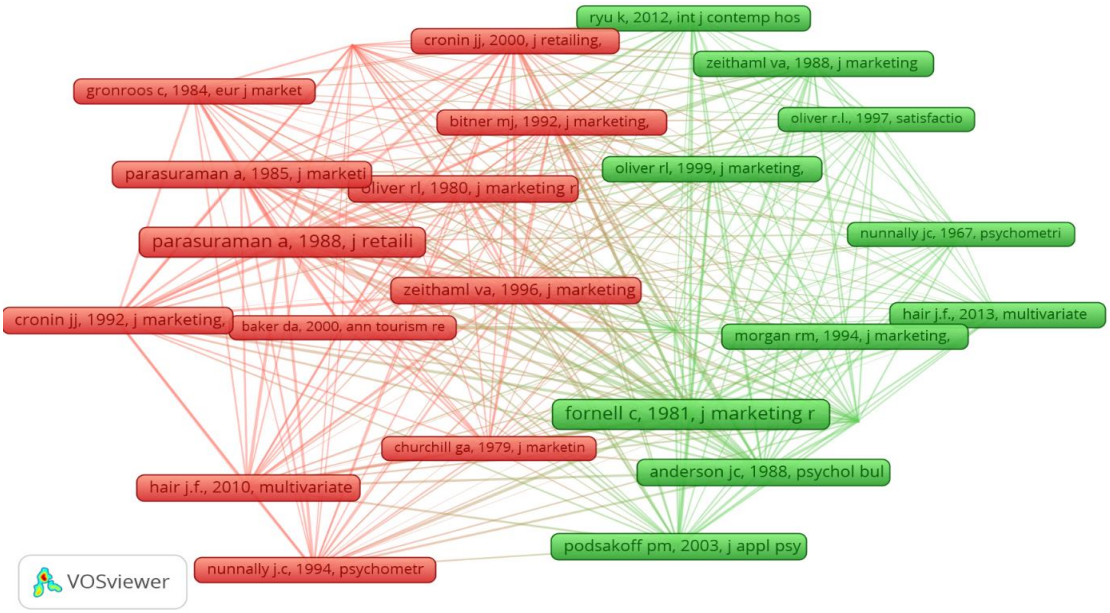
ALL = ((Service) AND (Quality) AND (hotel OR hospitality)) Refined by: DOCUMENT TYPES: (ARTICLE) AND LANGUAGES: (ENGLISH) AND RESEARCH AREAS: (SOCIAL SCIENCES OTHER TOPICS OR BUSINESS ECONOMICS OR OPERATIONS RESEARCH MANAGEMENT SCIENCE)

equals to

ALL=(Service AND Quality) Refined by: LANGUAGES: (ENGLISH) AND DOCUMENT TYPES: (ARTICLE) AND RESEARCH AREAS: (BUSINESS ECONOMICS OR SOCIAL SCIENCES OTHER TOPICS OR OPERATIONS RESEARCH MANAGEMENT SCIENCE) AND TOPIC: (hotel OR hospitality).

After downloading the database of the 3,063 peer reviewed articles in txt format, VOSviewer was used to create a co-citation map. Co-citation is the frequency with which two documents are cited together by other documents or in other words the aim is to identify pairs of highly cited papers (Small, 1973). With the help of VOSviewer, the minimum number citation criteria to be 150 was chosen, this way the 25 most co-cited articles could be identify. These articles **19. Figure** are what hotel service quality themed peer reviewed articles are based on.

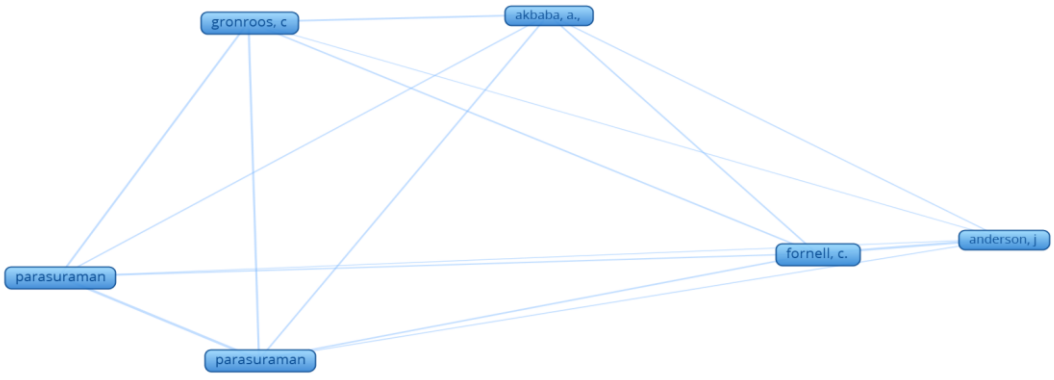
19. Figure - Co-citation map based on Web of Science



(Source: Own Edit)

For further analyses Elsevier and Science Direct were also scanned for other articles on the topic of 'service' and 'quality' and 'hotel' or 'hospitality' and the same elimination criteria was used to narrow down the search. TITLE-ABS- KEY (service AND quality AND (hotel OR hospitality)) AND (LIMIT-TO (DOCTYPE, "ar")) AND (LIMIT-TO (LANGUAGE, "English")) AND (LIMIT-TO (SUBJAREA, "BUSI") OR LIMIT- TO (SUBJAREA, "SOCI") OR LIMIT-TO (SUBJAREA, "ECON")) This resulted in 2,932 articles. (2022. 11.03.) To make sure that the co-citation that used only the web of science articles gave an appropriate background, the articles from Elsevier were also tested separately with VOS-viewer. Here, **20. Figure** the program found less couples as with minimum number citation criteria being on 100 as there were only 6 matches. Fornel and Larcker (1981), Grönroos (1984), Parasuraman et al., (1985), Anderson (1988), Parasuraman et al., (1988) and Akbaba (2006), from which Akbaba (2006) was not covered in the previous co-citation map.

20. Figure - Co-citation map based on Science Direct



(Source: VOSviewer)

On Science Direct with the coding; Title, abstract, keywords: Service AND quality AND (hotel OR hospitality) and the limitations research article, there are 343 results covered by the previously mentioned database. Most of these articles were already included through different measures but these are the basis of hospitality SQ researchers. The key articles found are detailed in **20. Appendix**.

While most of the literature presented (9) was methodological, the focus of SQ in hospitality research followed the trend of generic SQ research of the 80s and 90s, with Grönroos (1984) and Parasuraman et al., (1985, 1988) being one of the most cited papers. Evaluations of the SERVQUAL method are truly the backbone of SQ literature. The conceptualization of quality and the connection between loyalty and satisfaction are essential to talk about SQ in hospitality.

2.4. Conclusion of the Chapter

The first chapter introduced service and service quality definitions and detailed how the research focus had changed throughout the past decades. The research also concluded its own stance on these definitions.

In this paper, service in hospitality is considered as an interactive process that can be personalized and where the service provider uses specialized competencies and resources so that with the participation of the guest, they are able to create value, which can either be the final product or an addition to a physical good.

Quality is conformance to customer specifications and can be only judged by the consumer. As the guest will decide based on their perceptions, quality service will be tailor-made. This means that when looking for a measurement system to measure the Hungarian hotel SQ, theoretically, the tailor-made SQ should be measured as that is how the guest's needs and perceptions are matched.

The first chapter also introduced many SQ models and highlighted key elements, to consider, when creating a measurement system.

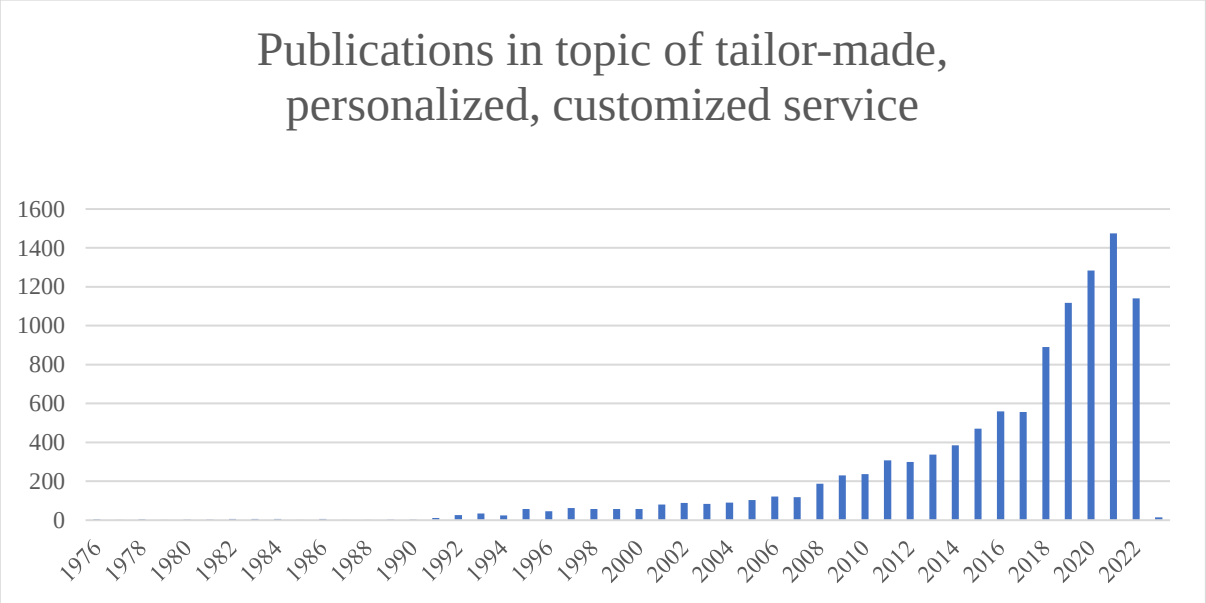
While creating an SQ measurement model, firstly separating the technical and functional elements will lay the foundation, followed by guest encounter phases which will be considered to give a more nuanced result. The intangible aspects of service and employees both play a key role in SQ. In the 21st century, technological SQ cannot be omitted.

After introducing service and service quality, the next chapter will concentrate on the different types of tailor-made services.

2.5. Tailor Made Service

More than 106,953 articles can be found in the database in service research where the authors focused on tailor made, personalized, customized, or co-created services. (ALL= ((((tailor) AND (made)) OR (personal*) OR (co-creation) OR (customi*)) AND (service))) Refining the dataset to Business Economics (8,186) and Social Science (3,069) we note that the topic had already appeared in the 1970s, but it only become significant after the 1990s. The topic grew exponentially from the 2000s (**21.Figure**).

21. Figure - Publications in topic of tailor-made, personalized, customized service

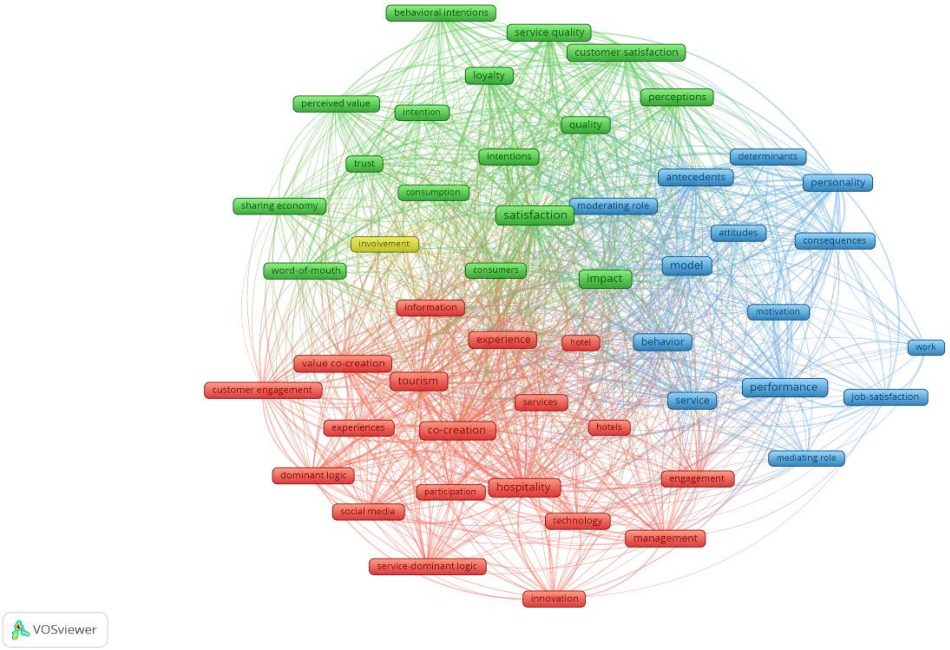


(Source: Own Edit)

Out of these papers 1,881 were also written in the theme of hotel or hospitality research. As with a bigger dataset there are more possible keywords, in this case a higher (than 2) threshold had to be selected. With 40 chosen as the threshold, 50 keywords remained.

Based on keyword co-occurrence analyses (**22. Figure**), the research focused on 3 main topics, value co- creation with guests (red), the mediating role and performance of employees (blue), and the effect on sharing, loyalty and return intentions (**19. Appendix**).

22. Figure - Co-occurrence analyses of Service Quality in Hospitality research



(Source: VOSviewer)

In the following chapter, the dissertation will introduce the definitions of tailor-made services, personalization, customization, and co-creation focusing on their role in hospitality, including the differences and similarities between these definitions.

2.5.1. Personalization

Personalization can be defined in various ways, but one of the most basic concepts is providing a "good service" (Surprenant and Solomon, 1987b). Researchers used terms like individualization (Totz and Riemer, 2001), segmentation (Smith, 1956), targeting, profiling, and one-to-one marketing (Peppers and Rogers, 1997). Smith (1956) defined market segmentation as viewing a heterogeneous market as several smaller homogeneous markets based on preferences, attributes, and desires while Peppers and Rogers (1997), said that one-to-one marketing is personalized marketing, where an enterprise knows its customers and treats them differently. Therefore, the roots of personalization are in relationship marketing and management (Crosby et al., 1990; Dwyer et al., 1987). Personalization can be anything from personal encounters where the service provider develops a deeper relationship with the customer (Kokko and Moilanen, 1997; Surprenant and Solomon, 1987) (to the above-mentioned personalized marketing.

Personalization can use technology and customer information to create tailor-made advertising or open communication between businesses and individual customers. Both in human-to-human and human-technology interactions, the customer is greeted by name, and the service provider remembers what they purchased or browsed and suggests products accordingly (Lin et al., 2010).

Service providers can use either previously provided information or information given in real time to fit the offers or advertisements according to the customers need (Vesanen, 2007)

There are two main ways of defining personalization.

One, when it is something done by the company (Allen et al., 2001; Cöner, 2003; Imhoff et al., 2001) while the second is when it is initiated by the customer (Roberts, 2003; Wind and Rangaswamy, 2001). In both cases the goal is to create a product or service that will fit the expectation of the guest better (Berry et al., 1988; Crosby, 1979; Grönroos, 1984; Parasuraman et al., 1988), lowers the cost or has some benefits, (Peppers et al., 1999) and creates an individual experience (Allen et al., 2001).

2.5.2. Types of Personalization

As individuals have different quality expectations, the service providers must differentiate the provided services; therefore, when talking about personalization, it can be any behaviour occurring in the interaction intended to contribute to the customer's individuation (Surprenant and Solomon, 1987).

Surprenant and Solomon (1987) propose two kinds of personalization in the service market - option personalization and process personalization.

Option personalization (emphasizes the outcomes of service):

Allows the customer to choose from a set of service possibilities. Firms can create several service outcomes by providing a menu of alternatives from which the customer can choose the option best suited for his/her needs. Later this will also fit the definition of customization. (Anderson et al., 1997; Bettencourt and Gwinner, 1996; Peppers et al., 1999)

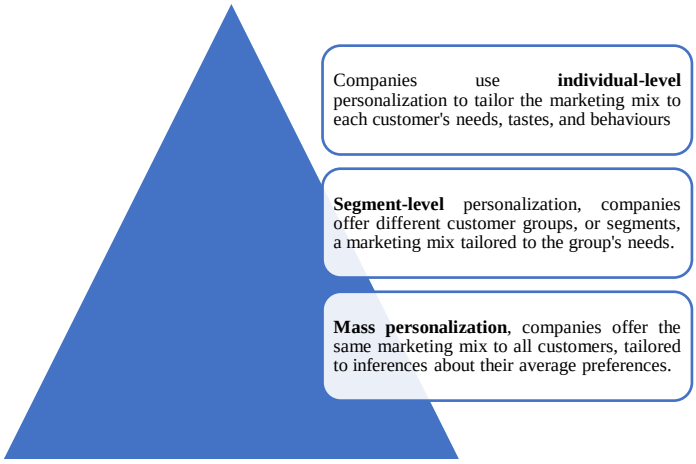
Process personalization (process personalization focuses on service procedures):

It can be divided into programmed personalization, and customized personalization.

- Programmed personalization: "Accomplished by the embellishment of routinized actions with personal referents" (Surprenant and Solomon, 1987a, p. 89) such as small talks, using the customer's name, etc.
- Customized personalization: Helps customers with the best possible form of service offering (Surprenant and Solomon, 1987).

There are three main levels of personalization according to Zhang and Wedel, (2009); mass, segment, and individual-level personalization.

23. Figure - Levels of Personalization



(Source: Zhang and Wedel, 2009)

Tam and Ho (2006) also differentiates three types of personalization in a technological setting.

- User-driven personalization; when the user specifies in advance the desired web layout and content that matches their interests and preferences with the tools and options provided.
- In transaction-driven personalization, an online merchant generates the personalized layout and content, and thus personalization is driven by previous transactions.
- Context-driven personalization employs an adaptive mechanism to personalize content and layout for each individual user based on the context and inference of users' processing objectives in real-time (e.g., product inspection versus random browsing).

Consumers will compare their expectations with the received service and as in the 80s the concept that quality service can be achieved by satisfying the needs of the individual customer (Berry et al., 1988; Crosby, 1979; Grönroos, 1984; Parasuraman et al., 1988), researchers tried to define personalization since. Collection of personalization definitions are in **21. Appendix**.

Personalization in general has high information demand regardless of it being initiated by the company or the consumer. Personalization could be the part of technology-based service, personal encounter, or marketing. The common dominator is that personalization will use information to provide the right service or product to the right person. In many cases the adaptation is initiated by the company. Some only apply personalization to services, while other definitions include products too. The definitions on personalization also morphed from "tailored behaviour" during service to personalization in technology. In personalization the company uses information based on what they know about the consumer and create a tailored service or product.

Personalization is time and resource consuming. This however did not stop researchers in trying to conceptualize the concept of mass-personalization. According to Zhou et al (2013) mass personalization views each customer as an individual, and concentrates on implicit need, therefore putting emphasis on value over cost.

2.5.3. Customization, Consumerization

Consumer desire for customized products led to market segmentation (Smith, 1956); meaning that customers with similar preferences were put into the same market segment, and in this way, companies could offer a customized product based on the average need of the segment.

From this, "two distinct strategies emerged:

> (1) being a cost-efficient mass producer with limited or no variety, or
>
> (2) offering highly customized and often expensive products resulting from a craftsmanship-like approach (Kaplan and Haenlein, 2006).

Later, Davis (1987, p. 169) introduced the term mass customization to describe "mass producing customized products". While traditional mass customization "is a strategy that creates value by some form of company-customer interaction at the design stage of the operations level to create customized products, following a hybrid strategy combining cost leadership and differentiation" (Kaplan and Haenlein, 2006, pp. 116–117), with digitalization, the concept of e-mass customization had also emerged. Kotler (1989) predicted that advancing technologies (Web 2.0) will enable customer integration into product design and configuration inexpensively and rapidly. Hence, e-mass customization is "a strategy that creates value by some form of company–customer interaction at the fabrication/assembly stage of the operations level to create customized products with production cost and monetary price similar to those of mass-produced products, where at least one of the three market dimensions—player, product, and process—is digital" (Kaplan and Haenlein, 2006, p. 178). Collection of mass customization definitions can be found in **22. Appendix**.

While personalization fits a specific customer and tailors the product or service to that specific customer, a key element in mass – customization is that although, similarly, personalization is based on individual specifications and one – of – a - kind results, it has a manufacturing aspect with a high emphasis on scalability and costs.

Kotler (1989), among others, regards customization as an answer to the shifting nature of customer demand, for greater variety, more features, and higher quality in products as well as services. Service customization may be viewed as a tailor-made solution for the customer's benefit (Lovelock, 1983). Customization allows customers to (partly) adapt the marketing mix to their individual preferences (2008), and it aims to satisfy as many needs as possible for each customer (Fiore et al., 2004; Shostack, 1987; Simonson, 2005), thereby enhancing the consumer experience (Wang et al., 2010). This way, customization increases perceived SQ, customer satisfaction, customer trust, and ultimately customer loyalty toward a service provider (Coelho and Henseler, 2012). In addition, a high level of customization will delight the customer because of the individualized attention and specifically tailored solutions (Wang et al., 2010). Customization definitions can be found in **23. Appendix**.

The difference from personalization is that customization occurs within predetermined boundaries; customers are presented with a specific set of options, and they can adjust to their preferences (Valenzuela et al., 2009) but be a result of employees' proactive contributions, such as offering helpful information and suggestions (Keh et al., 2013). The number of options

determines the flexibility customers have to tailor their own marketing mix (Bleier et al., 2018; Valenzuela et al., 2009). Some examples of service customization in hospitality include allowing guests to have flexible check-in/out times, personalizing room decor, or having childcare options available. Customized options adapt the hotel's service offering to each individual guest's preferences (van Riel et al., 2001).

However, customization is challenging to implement due to the firm's operational capabilities. For example, a flexible check-in/out policy could lead to labour scheduling problems Victorino et al., (2005). Meeting customer needs involves designing customized attributes, features, and unique service delivery methods. The dual nature of quality requires both standardization and customization of the service design and delivery process (Anderson et al., 1997; Gyurácz-Németh, 2014). Customization means higher cost, longer waiting time, and higher customer involvement in the service delivery process (compered to standardization), which are sacrifices for a better-fitting product (Wang et al., 2010).

In - e service personalization and customization of service influence customers' behavioural intention (intention to return (Zo, 2003)) The technological enhancements provide firms with capabilities to identify customers' needs and tailor their services to meet customers' requirements (Zo, 2003). Not only the skill of the employee but the use of technological tools are important when it comes to customizing service. Effective guest history systems make it possible to customize guest service (Bowen, 1997).

Based on specific information, the customer has the chance to select from provided offers or specifically given information about their needs. Customization will more likely be initiated by the customer, and will have a higher emphasis on needs, while personalization use information to offer based on preference.

2.5.4. Personalization vs. Customization

Researchers have yet to reach a consensus on the personalisation and customisation concept (Wind and Rangaswamy, 2001). According to some researchers, the concepts are different for instance, (Arora et al., 2008; Gilmore and Pine, 1997; Kumar and Stecke, 2007; Montgomery and Smith, 2008), while some use the two terms interchangeably (Miceli et al., 2007; Peppers and Rogers, 1997). Based on Peppers and Rogers (1997), personalisation is customising some feature of a product or service so that the customer enjoys more convenience, lower cost or some other benefit. Their definition washes together the two constructs, while Hanson (1999) and Imhofe et al., (2001) said that customisation is part of the personalisation concept.

Totz and Riemer (2001) said that personalisation could be initiated by the customer or by the firm, while Allen (2001), and Valenzuela et al. (2009), along with others, said that customisation is customer initiated.

Personalisation is a process where a system's functionality, content information, interface, or uniqueness increases, making it more relevant to the individual (Chellappa and Sin, 2005). Personalisation refers to tailoring a product or experience to match the individual consumer based on personal information. Therefore, personalisation depends on vendors' ability to acquire and process consumer information and on consumers' willingness to share information and use personalisation services. As Arora et al. (2008) differentiated, personalisation is a firm's

decision on the marketing mix suitable for the individual based on previously collected customer data. On the other hand, customisation occurs when a customer proactively specifies one or more elements of their marketing mix.

Personalisation in a technology-based environment according to Zo (2003) does not require users' explicit preferences. Instead, it employs data mining techniques to automatically discover users' behavioural patterns. This concept is similar to that of process personalisation by Surprenant and Solomon (1987). In case of customisation, a website provides choices for the users to modify a website's look and feel. On the other hand, personalisation is providing relevant content based on individual user preferences, and personalised websites implicitly obtain preference information by tracking customer purchases or usage habits Ho (2006).

Bleier et al. (2018) compared customisation and personalisation opportunities. (figure) They differentiate customisation as something the consumer decides based on a predetermined marketing mix. The autonomy that companies give the customers shapes the form of each specific product. At the same time, personalisation is decided by the company's impression on what a personalised marketing mix would be. This dissertation supports the differentiation of the concept that personalisation is the company's choice of the marketing mix for the consumer and customisation is when the consumer chooses from specific marketing mix elements.

Bleier et al. (2018) compared customised price pay-what-you-want (customers can pay any price they deem fit) and name-your-own-price (a bid which is acceptable if it surpasses a threshold price set by the company and unknown to customers in advance) with price personalisation (at a segment level, it is common practice, for example, in early-bird pricing while individual pricing is more car insurance based on customers' driving behaviour).

Sunikka and Bragge (2012) also distinguished customization from personalization based on who initiated the process and the framework founded on user involvement. They say that when it is strictly in a web context, if the system initiates the tailoring, it will be personalization. However, when it comes to tangible products, it is all mass customization.

2. Table - Customization vs. Personalization

	Intangibles (web context, service)		**Tangibles (products)**
	Individual	Group	Individual and group
System initiated	One-to-one personalization	Mass personalization	Mass customization
User initiate	(Web) customization	Customization	

(Source: Sunikka and Bragge, 2012

2.5.5.1. Conclusion of Personalization and Customization

Although definitions of customization and personalization overlap, this dissertation argues that the distinction between personalization and customization can also be made regarding tangible products.

For instance, in restaurants like pad Thai wok-bar, or Burger King, there is a set of options to choose from and with the customers' lead, a specific mix of ingredients will create a tangible product. While at the same time, a designer or tattoo artist can tailor a dress (or tattoo) with the individual customer in mind. Therefore, as many of the definitions pointed out, it is possible to distinguish if there is a set of options the customer can choose from, or if it will be the service provider who will use the information, they had gathered from the customer to create something fitting for that customer. Hence, while in the case of technology-based tailor-made functions, this dissertation agrees with Sunikka and Bragge (2012), tangible products or in-person encounters will build on Bleier et al. 2018's differentiation. Applying ethical theories to personalization and customization has led to conflicting conclusions. However, they are in line with Treiblmaier et al.,'s (2004) findings that customization is ethically less questionable than personalization, as it does not impose features on users but is entirely controlled by users. Customization allows website users to specify their own preferences explicitly (Nunes and Kambil, 2001) whereas in technology personalization, customers' needs and preferences and information are collected for user modelling (Sunikka and Bragge, 2012).

2.5.6. Co- Creation

Researchers have emphasized the role of customers in co-creating innovative services (Cooper and Edgett, 1996) while tourism preferences for destination activities have evolved towards a more participative behaviour (Campos et al., 2018). Values are co-created through customization and personalisation (Zine et al., 2014). Firms can enhance the value of consumer-generated ideas by facilitating the exchange of relevant information during co-creation (Kim and Slotegraaf, 2016). According to Zine et al., (2014), value creation happens through customisation, and a service execution plan offers opportunities for value co-creation through co-design, co-production, and co-delivery, leading to personalisation. However, this conceptualization would mean that customization is a type of personalization. this would mean that while customising the service due to the active participation or both, customer and company personalization is reached, although the previous sub–chapter defined customization and personalization to be separate constructs.

In the ‘co-creation’ concept, the company and its customers are both key participants in creating a unique service, and the customer plays the role of a co-creator in this process (Vargo and Lusch, 2008). Therefore, there is a high value on consumer co-creation, especially in the new product development process. Results show that a higher degree of dynamic interaction and personalisation, in other words "co-creation" creates more constructive product ideas (Kim and Slotegraaf, 2016). “Service is a labour-intensive activity, a process where the aim is to provide benefit for the customer to satisfy their needs by involving them in the service process itself." (Gyurácz-Németh, 2014, p. 31). Opposed to Lusch and Vargo (2006; Vargo et al., 2008; Vargo

and Lusch, 2016), Grönroos, (2011, 2008) concludes that co-creation is not when the customer is actively participating in the value creation, but when the service provider gets opportunities to co-create value together with its customers. Grönroos (2011) emphasizes the background processes that are needed to offer a service or product, and co-creation can only happen after delivery. Value-in use is created only by the consumer, therefore there is no co-creation. Collection of co-creation definitions can be found in **24. Appendix**.

Campos et al. (2018) proved the importance of recognising active participation and interaction in co-creation experiences. The framework is built on the experience environment, or the experience scape, which integrates dimensions, such as physical aspects of the environment, social actors and participants, and organisational dynamics and features of service delivery. These dimensions will influence the way the tourist experiences the interaction. The on-site co-creation experience has the tourist at its centre; thus the behaviours and psychological state of the customer will affect the outcome.

The co-creation process is a circular encounter, and this interaction is affected by many outside influences. Therefore, even the same guest with the same employee would not be able to create the same experience.

2.5.6.1. Conclusion of Co-creation

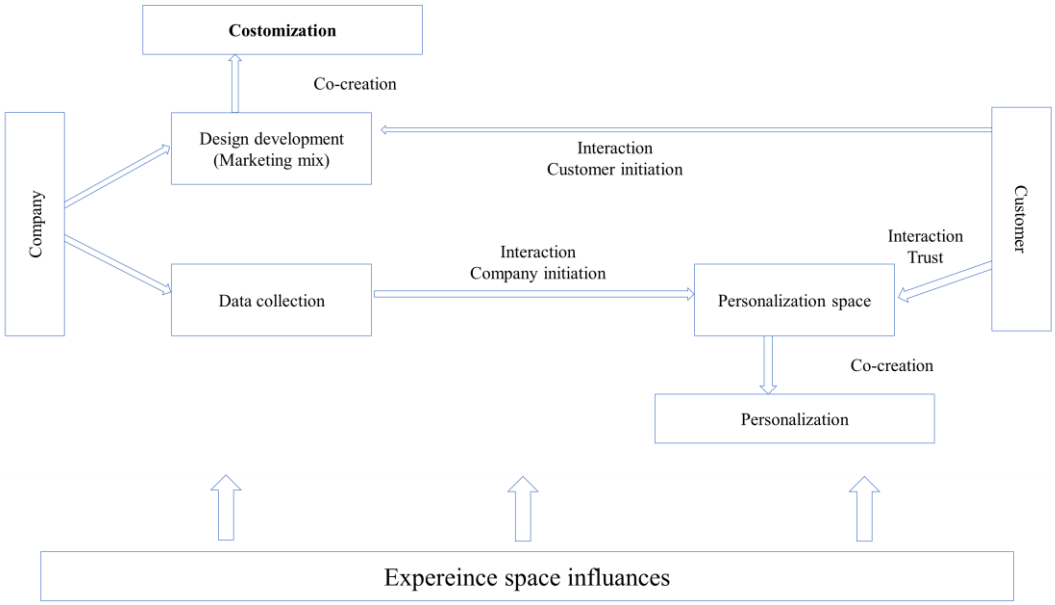
Co-creation is an essential part of creating tailor-made services and can be part of both the customization and the personalization process. Tailor-made services are impossible without co-creation. Although the author agrees with Grönroos (2011)that not the entire process can be co-created with the guest as there are many supportive functions and back-office phases that are needed to reach delivery, however the author argues that from the delivery process, co-creation (based on (Campos et al., 2018; Lusch and Vargo, 2006; Vargo and Lusch, 2016, 2008)) is not only possible but preferred.

2.6. Conclusion of the Chapter

The first chapter addressed the fact the SQ will be judged by the perception and satisfaction of the customer, hence concluding that quality service is a tailor-made service. The second chapter showed different forms of service tailoring.

In personalization, the main initiator is the company. The company will collect data, (from a conversation though big data analysis) and will create the opportunity and space for personalization. The guest is important too in this process, as their trust and interaction is needed for the company to be able to offer an individualized service or product. Customization is also the tailoring of service, but here the hotel had already pre-determined variations of their offer. However, this is part of the back-office development process. Here the customer has a bigger role as they will have to choose from the presented options. Considering there are pre-determined options, the originality of co-creation is smaller compared to personalization, but, depending on the variety of the marketing mix, they can create their unique mix of offers (**24. Figure**).

24. Figure - Personalization and Customization Concept



(Source: Own Edit)

Further comparing the two (**3. Table**), customization will need more investment prior to delivery, but will need less information about the individual guest than in the case of personalization.

3. Table - Personalization vs. Customization Characteristics

	Customization	Personalization
Provider sphere investment	high	medium
Information collection	medium	high
Main initiator	customer	company
New value Co-creation	medium	high

(Source: Own Edit)

Co-creation will be part of both processes on different levels. In practice, customization is when a company prepares different options to choose from that they can offer to many customers, but personalization does not necessarily mean that it is not possible to have developed options in the provider spere. In this instance personalization will be when a company has many options to offer but will only offer a specific one to the customer that they predict would be most suitable for the individual.

3. Research Environment and Model Building

The first chapter introduced service and service quality (SQ) concepts and definitions to conceptualise why a tailor-made service is a quality service. Those services that can be personalised are interactive processes where the service provider uses specialised competencies and resources (such as data collection) so that with the participation of both guests and service providers, co-creation will be possible. Those services that can be customised use knowledge of the overall target group to create a proper marketing mix offer, and with the guest's cooperation, co-creates value. Providing and measuring quality service is difficult, as every individual has a different level of expectation. Therefore, separating the technical and functional elements of SQ will be vital in creating an SQ measurement model. Both the effects of the tangible part of the service and how the service is delivered will need to be focalised. Service processes can be viewed as chain activities; therefore, to create a measurement system, I have to consider the elements of such a service chain.

3.1. Customer Experience as a Chain of Service Encounters

Understanding how customers evaluate the service process and how those judgments evolve is critical (Bitner et al., 2008). Some research suggests that customers assess not only the individual interactions with service providers but the totality of all the steps or service encounters within a service process that matters (Danaher and Mattsson, 1994). Therefore, the different events (service encounters) associated with a service provider must be examined and evaluated individually along unique attribute dimensions (Singh, 1991). Brown and Swartz (1989) proposed that it is not the actual outcome but the character of the process itself that has a more significant role in determining the customers' overall evaluation (Brown and Swartz, 1989). From a service research perspective, companies build relationships from a series of encounters with the customer (Voorhees et al., 2017) therefore, they create strategies to design and then later manage the entire process the customer goes through to have a good experience (Lemon and Verhoef, 2016). Consumer judgment about the firm's quality will be made during these encounters, and each encounter contributes to the overall satisfaction and loyalty (Bitner, 1990; Bitner and Wang, 2014; Bolton and Drew, 1991). These evaluations will be affected by the customer experience.

Another conceptualization of service experience is "the cognitive, affective, and behavioural reactions associated with a specific service event" (Padgett and Allen, 1997). According to Carbone and Haeckel (1994), customers cannot avoid having an experience, and all service encounters will create an experience. Therefore, each of the separate steps will become a small experience that will add up to the full-service experience. The total customer experience will create perceptions of service quality and value. At the same time, it will create perceptions of the overall brand itself, consequently influencing preferences and loyalty (Haeckel et al., 2003). Delivering customer value through separable and memorable service experiences requires that all parts of the organization are working for the common goal of creating an integrated, memorable, and good customer experience.

3.2. Customer Journey

Not only in market research, but the concept of the customer journey has appeared in many fields, for instance, in the design field by Parker and Heapy (2006). They have presented

journeys as a lens for "seeing services as people do" (p. 19), arguing for this perspective's usefulness. Other than the field of design, customer journeys appear in service management Voss and Zomerdijk (2007), and Zomerdijk and Voss (2011, 2010), service, communication (Segelström and Holmlid, 2009), management and design of public sector services (Parker and Heapy, 2006), and for service innovation in consumer markets (Edelman and Singer, 2015).

In service management, the works of Zomerdijk and Voss (2011, 2010) have shown how the customer journey perspective has emerged. After conducting case studies with consulting firms, service providers, and design agencies, they concluded that services are often designed through a customer blueprinting or customer journey approach strengthening the customer experience throughout the service process. The cases indicated that design and consultancy firms, together with experiential service providers, shared a common perspective or metaphor - that of the customer journey. As opposed to a single transaction or purchase experience involving a service product and a service process, the service is seen as a journey that spans a longer period and consists of multiple components and touchpoints.

3.2.1. Customer Journey Mapping

Customer journey mapping is a market research technique that emerged in the 1960s and 1970s in response to the emerging "consumer society" and the marketing philosophy of customer orientation (Crosier and Handford, 2012). The interest began in the 1960s with the buying process (Howard and Sheth, 1969), where the customer journey is described as customers moving from need recognition to purchase and evaluation of the purchased product. Today, the government sector and non-governmental service providers increasingly recognize customer journey mapping as a vital research tool.

3.2.2. Customer Journey Model

The customer journey model originated from service blueprinting and service mapping by Shostack (1987), Kingman-Brundage (1989), Bitner (1993) and Bitner et al. (2008). Companies have developed techniques for mapping customer journeys, such as ‘Moment Mapping ®’ (Shaw and Ivens, 2002), the ‘Brand Touchpoint Wheel’ (Davis and Dunn, 2002), and many others. We have to distinguish the various parts of the guest journey and how creating tailor-made services through personalization or customization can play a role.

Services are more than products (service is not a physical object and therefore cannot be owned) and good manners. In the case of service, we take nothing with us but the experience itself (Shostack,1987), therefore, contrary to physical goods, services are dynamic. The service event unfolds over time through a sequence or constellation of events and steps, as such, the service process can be viewed as a chain or constellation of activities that allow the service to function effectively (Johne and Storey, 1998).

Customer journey analysis is an important topic in service management and design. Identifying the customer journey in the hospitality setting is essential in creating a „good service”. There are companies (https://www2.deloitte.com, www.theydo.io, www.delighted.com, and www.guesttouch.com) focusing on helping hotels identify their consumer journey steps in order to improve service quality (Reichheld and Jennings, 2022).

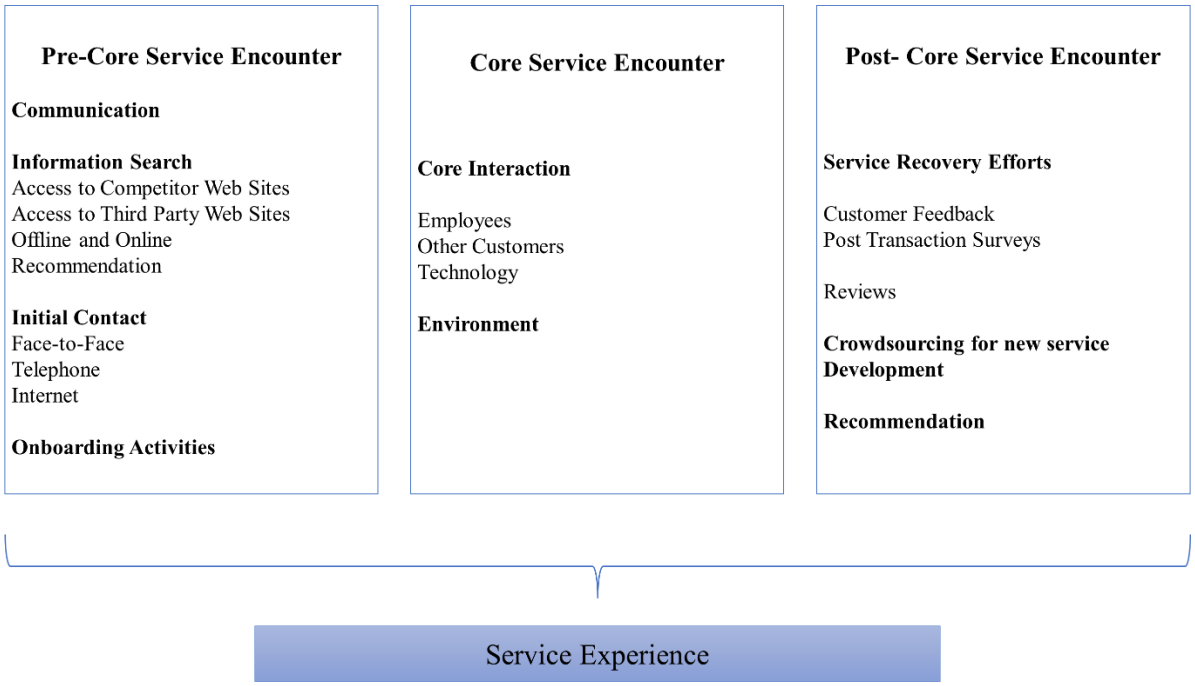
3.2.3. Service Encounter Phases

Voorhees et al. (2017) defined service encounter as "any interaction between the customer and the service provider relevant to a core service offering, including the interaction involving the provision of the core service offering itself." (p. 2). This definition is built on Bitner and Wang (2014) therefore, it includes the concept of pre-, post-, and core encounters or "moments of truth" that influence the overall customer outcomes. Encounters can happen face-to-face, online, telephonically, or through the mail (Bitner et al., 2000). Moments of truth are those critical encounters between customers and the company that impact the customers' impressions of the company (Beaujean et al., 2006; Bitner and Wang, 2014; Löfgren, 2005). When designing moments of truth, it is crucial to decide which service elements should be provided to the customer and which elements should be performed behind the scenes (Bitner et al., 2008; Chiu et al., 2014). Each service encounter is a specific element of customer impressions and satisfaction, but at the same time, these encounters have a cumulative effect, therefore, earlier service encounters will influence later encounters and the view of the overall service experience (Voorhees et al., 2017).

- Alderson (1965) differentiates "sort" and "transformation" service encounters. The sort phase involves bringing resources to a place, while the transformation phase creates form a transaction.
- Grönroos (1998) argues that service consumption is a process, and consumers perceive that the service production process is part of the service consumption itself.
- Moeller (2008), similarly to Alderson (1965), uses the transformation phase but considers service consumption, distinguishing the following phases: facilities, transformations and usage.
- Edvardsson and Olson (1996) also divide the service into three dimensions: prerequisites for the service, which is the infrastructure in which the service happens (servicescape (Bitner, 1992)), and process and outcome.
- Court et al. (2009) divided it into awareness, familiarity, consideration, purchase, and loyalty.
- Lemon and Verhoef, (2016) talk about the pre-purchase, purchase, and post-purchase phases.

25. Figure from Voorhees et al. (2017) provides a graphical overview of the relationships between various service encounters and the service experience. They define and distinguish pre-core, core, and post-core service encounters within a service experience.

25. Figure - Service Phases



(Source: Voorhees et al., 2017)

Voorhees et al. (2017) argued that a narrowed focus on the "core service delivery" hinders the possibility of fully recognizing evolving customer needs. Therefore, a holistic service experience will span all potential service encounters (or touchpoints). "By taking a holistic view of the customer experience (pre-core-post), firms may be able to strengthen relationships with their most valuable customers and, in turn, increase customer retention, positive word-of-mouth and profitability." (Voorhees et al., 2017, p. 3).

Godovykh and Tasci (2020) aimed to suggest the use of a combination of several measures to capture the totality of the tourism experience at pre-visit, onsite, and post-visit stages.

They define experience “as the totality of cognitive, affective, sensory, and conative responses, on a spectrum of negative to positive, evoked by all stimuli encountered in pre, during, and post phases of consumption affected by situational and brand-related factors filtered through personal differences of consumers, eventually resulting in differential outcomes related to consumers and brands.” (p. 8). Experience in all phases can be affected by several antecedents sourcing from brand-related stimuli, consumer-related factors filtering the stimuli, and situational factors such as consumption context and macro-environmental factors. This definition explains the importance of measuring hospitality experiences as reactions at the pre-visit, on-site, and post-visit stages of the trip.

The function or the purpose of the pre-core and post-core service encounters is to support the core service. Voorhees et al. (2017) define the pre-core service encounter as a period that focuses on encouraging the customers to engage with the company in a core-service encounter and can include multiple service encounters. This is the first of three service experience stages, and it takes place when customers begin to review information about a company and its service

and makes their first contact with the company. The pre-core encounter period is vital for customer loyalty (Bitner, 1995).

3.2.3.1.Pre-encounter

A pre-core encounter can be;

- seeking information from online reviews,
- addressing questions to frontline employees
- onboarding processes
- reviewing information on review sites.

Most prior to purchase decision-making, research had a product focus (Moorthy et al., 1997; Punj and Staelin, 1983). Johnson et al. (2012)stress the importance of interdependency between companies and customers in decision-making. They suggest examples of various strategies to influence decision-making in the pre-core process. Consumers' choices are made using some form of information technology (Murray et al., 2010). The pre-core encounter stage ends when the delivery of the primary service offer begins.

3.2.3.2.Core Service Encounter

The core service encounter period is the time interval where the foundational needs of the customer are fulfilled in the primary service offering. This period is when the customer is in the company or using the core service of the company. The core interactions between customers and employees, customers and technologies (Bitner et al., 2000), and the service environment (Bitner, 1992) has been researched.

Service firms have used personalization techniques during face-to-face service encounters even before the term personalization was introduced (Gwinner et al., 2005; Mittal and Lassar, 1996). The service providers' actions and behaviour during service encounters determines customer satisfaction (Bitner and Hubbert, 1994) and the perception on the level of quality (Parasuraman et al., 1991, 1988). Thanks to the adaptative skill of service representatives, tailoring the services to an individual customer is achievable. Two distinct dimensions can be differentiated: interpersonal adaptive behaviour and service-offering adaptive behaviour (Surprenant and Solomon, 1987; Gwinner et al., 2005).

In the case of interpersonal adaptive behaviour, the service provider can adjust their verbal and nonverbal behaviour to the interpersonal context of the service interaction. This would be, for example, addressing customers by first name, engaging in small talk, displaying personal attention and warmth, and demonstrating a genuine desire to assist the customer (Goodwin, 1996; Surprenant and Solomon, 1987; Mittal and Lassar, 1996) - in other words, displaying hospitality. In the case of service-offering adaptive behaviour, employees tailor or customize the service offering to a specific customer by providing options (Surprenant and Solomon, 1987).

3.2.3.3.Post-core Service

The post-core service encounter period is the interval following the core service encounter where consumers assess their experience. During this period, the companies' goal is to keep customers and turn them into returning loyal customers and improve future service experiences (Voss and Zomerdijk, 2007).

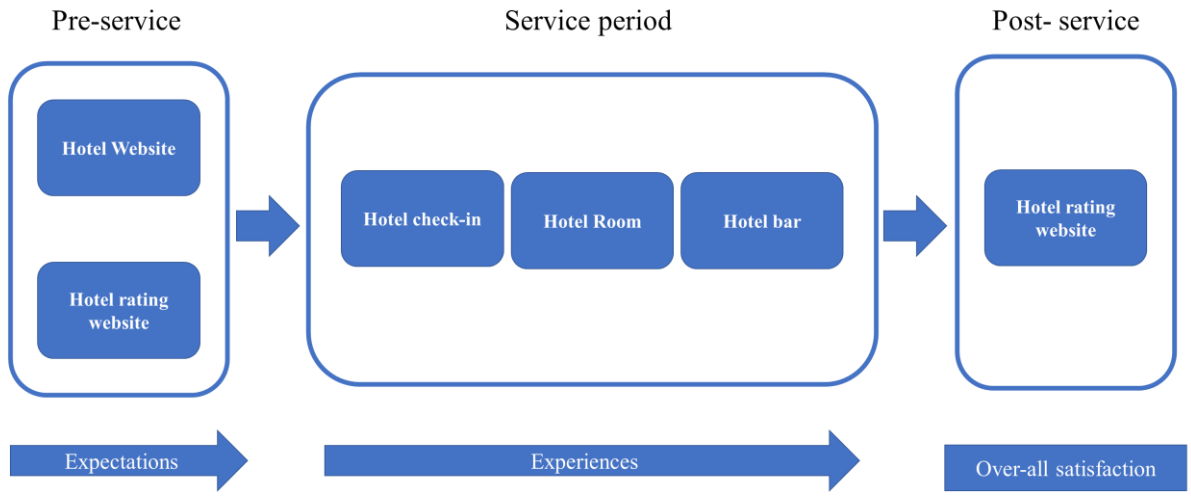
Post-core encounters includes the following;

- Proactive firm activities (e.g., the receipt of a survey, a request for social media posting, etc.) (Voss and Zomerdijk, 2007).
- Any situations involving a complaint (Voss and Zomerdijk, 2007).
- Service recovery efforts (Dong et al., 2008; Smith and Bolton, 2002).
- A firm's actions to sustain a relationship with the customer over time (Voss and Zomerdijk, 2007).
- Relationship development (Morgan and Hunt, 1994).
- Customer provision of feedback (i.e., via post-transaction surveys) (Voss and Zomerdijk, 2007).
- Customer reviews and service recommendations (Voss and Zomerdijk, 2007).

If done properly and effectively, the actions of the post-core service period can cycle into future pre-core service encounters (Voss and Zomerdijk, 2007).

Stickhorn and Zehrer (2009) have also incorporated these three phases in their guest journey model (**26. Figure**), but they divided them into smaller segments based on the place of activity.

26. Figure - Customer Journey Model



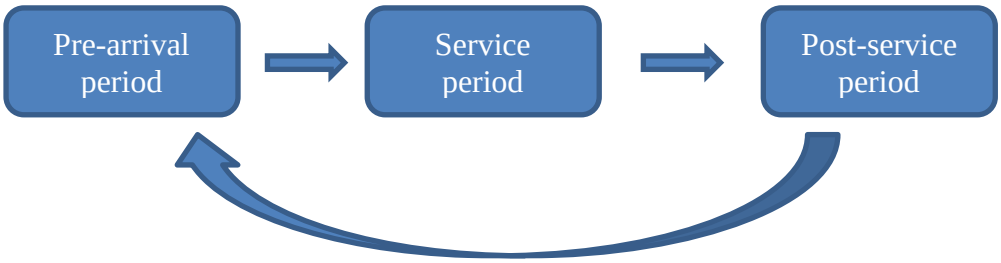
(Stickhorn and Zehrer, 2009)

The notion that customer experience is shaped during (as well as before and after) the interactions between the customer and the service provider (Berry et al., 2002, 2006) has spawned much research on the drivers of customer experience (Carreira et al., 2013; Verhoef et al., 2009) and how customer experience evolves throughout the service process (Baron and Harris, 2010; Walter et al., 2010).

Several frameworks and methods, such as service blueprinting (Bitner et al., 2008) and multi-level service design (Carreira et al., 2013) have been proposed to manage the processual and experiential factors as intertwined aspects of services. Nevertheless, how to enhance and manage customer experience across channels and customer interactions continues to be an

essential service research priority (Ostrom et al., 2015). In the model concept, this research will build mainly on the works of Whittle and Foster (1991), Lemon and Verhoef (2016), Voorhees et al. (2017), Godovykh and Tasci (2020), and will consider three main phases for service encounter. Considering the customer journey in a hotel, the customer or guest goes through a pre-arrival period, service period and post-service period (**27. Figure**).

27. Figure - Service Phases



(Source: Own Edit)

3.2.4. Service Blueprinting:

Service blueprinting is a flexible approach to developing a deeper understanding of customer experience and evaluating service processes. Service blueprinting can enable the detailed dissection of a single step in the customer journey and create a comprehensive, visual overview of an entire service process (Bitner, 2008). Service blueprinting was introduced by Schostack (1984) while Kingman-Brundage (1989) further developed the concept. As this technique concentrates on the entire service process, it will have a more detailed approach compared to the customer journey model.

It was initially introduced as a process control technique for services that offered several advantages:

- It was more precise than verbal definitions.
- It could help solve problems pre-emptively.
- It could identify failure points in a service operation.

A service blueprint can help a service developer to identify problems before they happen and to see other market opportunities. The blueprint can be used to develop new services and test the quality of services (Shostack, 1984).

Over time, service blueprinting evolved to be more customer-focused. Schostack's (1984) adaptation originally mapped the customer process stages through the service delivery and set it with the organizational structure, further developing the techniques. The Kingman-Brundage (1989) adaptation includes and distinguishes the concept of frontstage (onstage) and backstage activities, just like the addition of physical (tangible) and intangible evidence (quality) and the timing of each stage of the customer journey (Bitner et al., 2008; Lovelock et al., 2009; Palmer, 2008). This characteristic of service was more prominent in the case of service blueprinting methods than in the traditional customer journey method. In order to identify failure points, it is important to consider these stages separately.

The blueprint of a service can be created; however, very little of this service is visible to customers as they have no conception of the underlying processes (Shostack, 1984). After physical evidence was added as a key component of service blueprints, the idea of visual, photographic, and video blueprints was integrated (Bitner, 1993).

Although these components form the basis of the technique, the most important feature is identifying the customer's role in the service process (Gummesson and Kingman-Brundage, 1991) because if companies concentrate on the "genius of the product" even if they make sure the processes are most efficient and they codify the process in policies and procedures, they are still not counting for a greater phenomenon of service. Good and lasting service management requires better service design (Shostack, 1984).

As part of the mapping process, alternate means of execution must be identified. In addition to applying the service from a journey perspective, Bitner et al., 2008 introduces five components of a service blueprint based on Zeithaml et al., (2006) as an example of a one-night hotel stay.

There are five components of a typical service blueprint:

- Customer actions,
- Onstage/visible contact employee actions,
- Backstage/invisible contact employee actions,
- Support processes, and
- Physical evidence

The service blueprinting technique considers all steps and aspects of services; however as it has multiple stages and considers all touchpoints, it is more suitable to analyse one specific company’s service delivery and less suitable for a complex measurement system that can be used to compare multiple companies.

The concept blueprint that was introduced shows the actions of the hotel customers. The goal is to visualize and conceptualize the entire customer service experience from the customer’s point of view. Front desk employees who deliver room service, restaurants, etc., perform an onstage action. In addition, employees might engage in backstage activities such as preparing the food and arranging a tray. The reservation and registration systems are important support processes affecting customer experience. Hotels have a lot of physical evidence or tangible aspects that customers are exposed to, which can affect their quality perceptions (Bitner, 1993).

3.2.5. Stages of Service Based on Service Blueprint

In previous chapters, service stages were already mentioned; for instance, in the x chapter ‘Service Quality Models’, one of the early conceptualizations of the service quality models was introduced, for instance Grönroos (1982, 1984), who differentiated three service quality components; technical quality, functional quality, and image.

- Technical quality, is what customers receive from interaction with a service firm.
- Functional quality, is how the consumer receives the technical outcome of the service.
- Image is the customers' view of the company or brand.

Kingman-Brundage (1989) distinguishes the concept of frontstage (onstage) and backstage activities and the addition of physical (tangible) and intangible evidence.

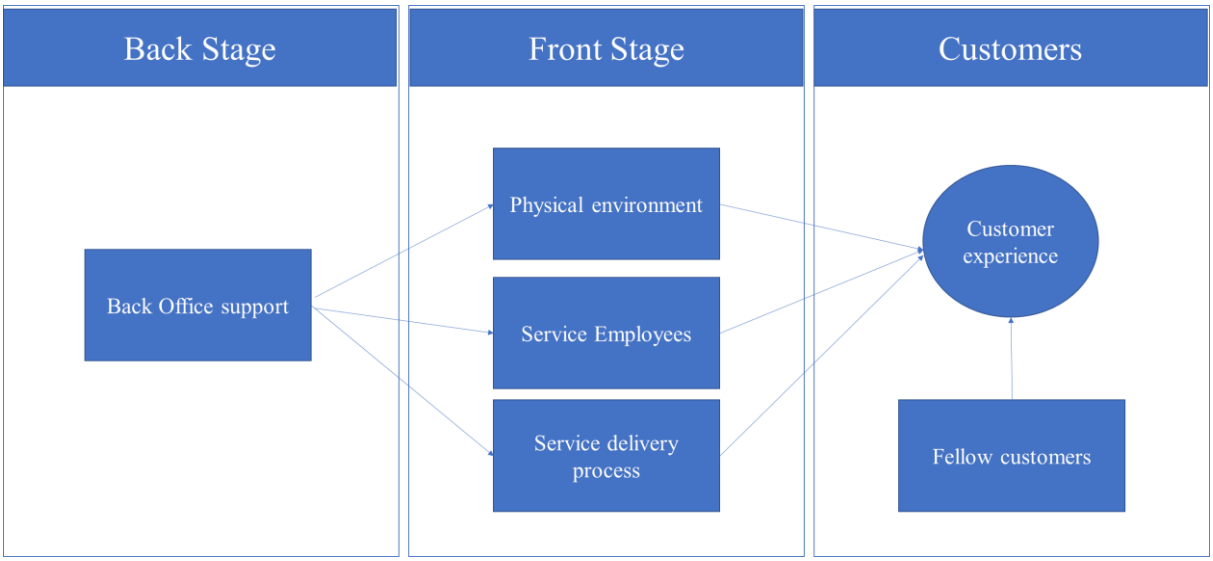
Edvardsson and Olson (2006) divided service into three dimensions where, besides process and outcome, they define prerequisites for the service phase, which is the infrastructure in which the service happens.

Biter (2008), based on (Zeithaml et al., 2006), distinguishes onstage/visible contact employee actions that are part of a "face-to-face" encounter between the frontline contact employees and customer.

Voss and Zomerdijk (2007) summarized design areas of service blueprinting (**28. Figure**). These areas show similarities to the concepts summarized in Bitner (2008) and Bitner et al. (2008) but also includes other aspects of the blueprint. They write: „In addition to applying the service as a journey perspective, experiential service providers and design agencies and consultancies in the field of experiential services innovated in five distinct design areas:

- Physical environment (‘stage’)
- Service employees (‘actors’)
- Service delivery process (‘script’)
- Fellow customers (‘audience’)
- Back office support (‘back stage’)” p.9.

28. Figure - Stages of Service by Voss and Zomerdijk



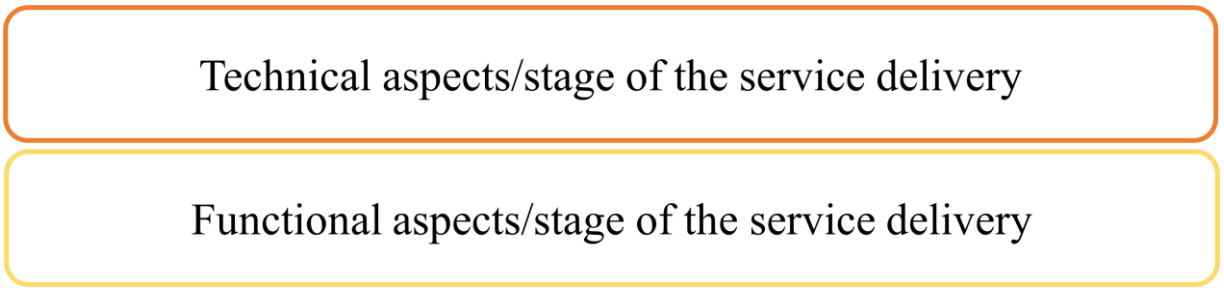
(Source: Voss and Zomerdijk, 2007)

Voss and Zomerdijk (2007) refer to the same process as the service delivery process or 'script', which is a series of actions or events to deliver the service. They also define the back-office support or 'back stage', which is an invisible contact employee action, where all the actions employees have to take for the service to be realized are but that the guest does not see. Similarly, to backstage processes, "support processes" are where activities are needed to have a service delivery without direct contact with the consumer (Bitner, 2008).

The environment has different roles, guides behavioural actions, and provides cues about the expected service type. The company must select and manage products with care. Although frequently the product is not present during service delivery, the consumer often deduces the nature of the service from circumstantial evidence. Therefore, a service's design must incorporate the coordination of tangible assets that the consumer uses to verify the service's effectiveness (Shostack, 1984). The physical environment is the setting in which a service is delivered or an experience is created. It can influence customer perceptions and behaviour and has been studied from the perspectives of environmental psychology (Mehrabian and Russell, 1974), retail atmospherics (Kotler, 1974; Turley and Milliman, 2000), and 'servicescapes' (Bitner, 1992). Voss and Zomerdijk (2007) call these aspects physical environment or the 'stage'. Considering the backstage and front stage concept and applying it to the hotel service, we can see that these stages are essential to consider in the service process, therefore, they must be incorporated into the model. The ambience and tangible aspects are also essential for hotel businesses; therefore, the tangible aspects and support processes must be integrated.

Based on Grönroos (1982, 1984) Kingman-Brundage (1989), Edvardsson and Olson (2006), together with Voss and Zomerdijk (2007), this model will also separate the tangible and functional aspects of the service. Tangible aspects consider all elements, processes, technologies, and tangible items that are either present in the service delivery process or are not used. Functional aspects are those service delivery processes that are part of the employees' behaviours and actions that are visible to the guest **(29. Figure**).

29. Figure - Stages of Service



(Source: Own Edit)

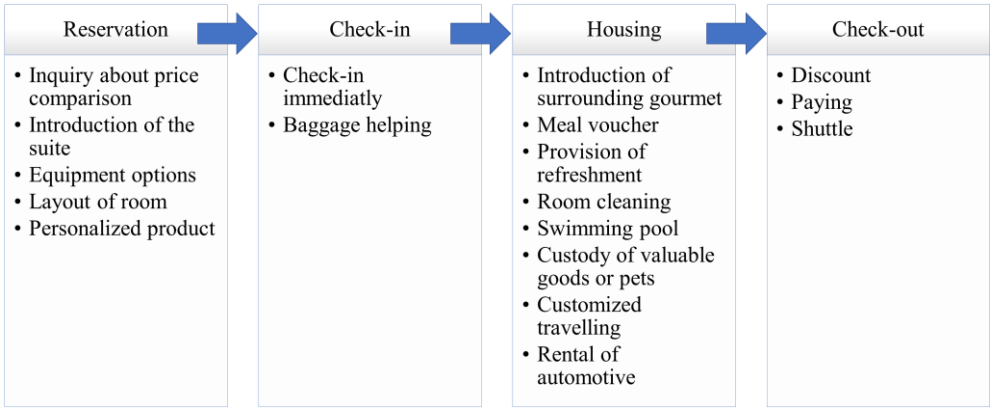
3.2.6. Customer journey touchpoints

Most consumer journeys are divided into at least three main parts; before, during, and after purchase/service phase (Følstad and Kvale, 2018); however, in the hospitality industry, the during service phase can further be divided by either basing on the activity itself (check-in, stay, participating in service, requiring help, check out, (Agarwal and Bajaj, 2021; Chiu et al., 2014; Reichheld and Jennings, 2022) or on the place of the activity (check-in, hotel room, hotel bar, in Stickdorn and Zehrer (2009, p. 8) in Følstad & Kvale, 2018)).

There can be differences based on how the substages are grouped, for instance, if pre-arrival and check-in are part of the same group or if check-out and feedback stages should be placed in the same phase (Agarwal and Bajaj, 2021). The most common separation by service companies recognizes both the booking phase and the importance of complaint handling, but it is missing the post-service part of the guest journey.

Chiu et al. (2014) have also considered the guest encounters starting with booing/ reservation and identified specific services that can be provided (**30. Figure**). They considered the booking phase and the personal encounters during in-house but did not look before or beyond that.

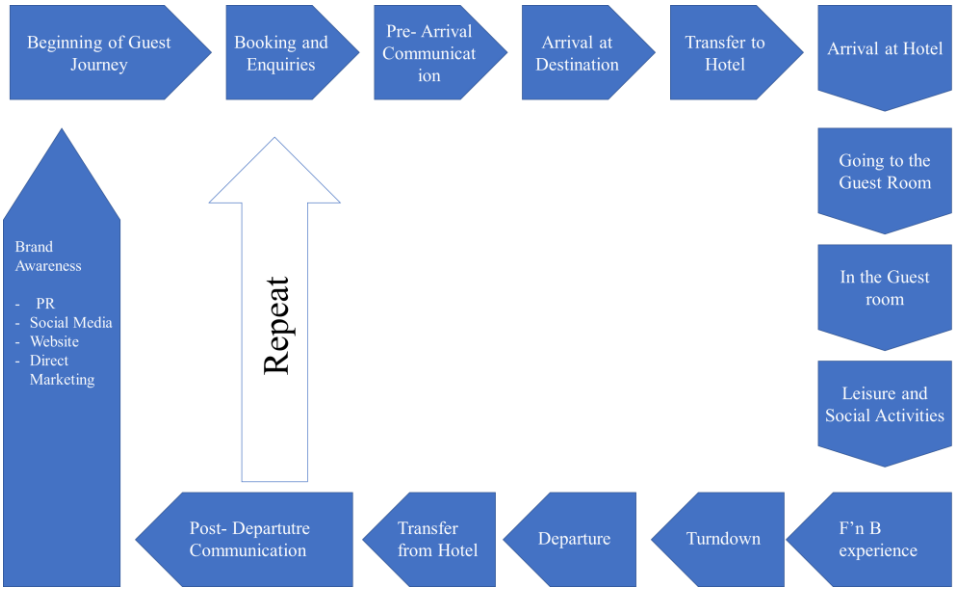
30. Figure - Touchpoints of Service Chiu et al.



(Source: Chiu et al., 2014)

The idea that customer experience is shaped during the interactions between the service provider and the customer (Berry et al., 2002, 2006) has inspired research on how customer experience changes and evolves during the service process (Baron and Harris, 2010; Walter et al., 2010) including what drives customer experience (Carreira et al., 2013; Verhoef et al., 2009). A customer journey starts before the actual transaction and ends after the transaction is completed, aiming for the service to be recommended to others (Følstad and Kvale, 2018). "Journeys are often cyclical, with the end of one cycle leading to another." and "the total customer experience is the result of every element in this journey." (Voss and Zomerdijk, 2007, p.7). **31. Figure**, where a customer journeys pre-booking phase is considered, is a typical example of a marketing agency using customer journey mapping (Medyasepti, 2020).

31. Figure - Customer Journey by Medyasepti



(Source: Medyasepti, 2020)

The interaction between customers and the people delivering the service is crucial for customer experience. For example, in the SERVQUAL model (in chapter x), three of the five dimensions are specifically related to employee behaviour, responsiveness, or the willingness to help customers and provide prompt service (Parasuraman et al., 1988). Employees are inseparable parts of services rendered to customers, but the presence of people in the service process brings a higher risk service quality level (Shostack, 1984).

Numerous things backstage will influence the front-stage performance. For example, most service organisations have many back-office employees that are vital to the customer experience yet generally do not interact with customers.

Another way researchers refer to service encounters is touchpoints, but touchpoints are a service provider's opportunity to facilitate the service encounter and create interactions with customers. (Voorhees et al., 2017)

Most customer journeys are divided into at least three main parts; before, during, and after the purchase/service phase Chiu et al. (2014)and Stickhorn & Zehrer (2009)). However, in the hospitality industry, the service phases can be further divided either based on the activity itself (check-in, stay, participating in service, requiring help, check out, (Reichheld and Jennings, 2022)) or the place of the activity (check-in, hotel room, hotel bar, in Stickdorn and Zehrer (2009, p. 8).

For each touchpoint (**4. Table**), the channel of the service can be identified and later, similar to Chiu et al. (2014), the potential customization and personalization strategies can be created. Medyasepti (2020) is also a great example from paragraph xxx. as they have also used detailed touchpoints to measure guest satisfaction with the ambience.

Based on the literature presented, customer journey touchpoints in a Hotel could be divided as follows.

4. Table - Service Touchpoint in Hospitality

Pre-Arrival/ Inspiration	Pre-Arrival/ Research	Pre-Arrival/ Booking	On property/ Check in	On property/ Stay	On property/ Check out	Post Stay/ Feedback	Post Stay/ Keeping in touch
PR WOM Radio TV Print Online Display Search Engine Newsletter	Website landing Meta Search Reviews Social media	Direct Mail Travel agency Call center Mobil App Website Chatbot	App Reception Hotel Staff	App Hotel Staff Face-to-face encounter Hotel devices	App Reception Hotel Staff	Social media Reviews	Loyalty Program Newsletter

(Source:Hahn, 2018; Ansari and Mela, 2003; Shen and Dwayne Ball, 2009)

Inspiration to travel: The basis for every hotel booking is the wish or the need to travel. A variety of impulses can create this. The potential customer has access to various online and offline channels to provide inspiration (Hahn, 2018). Compelling content marketing, PR, social media, and influencer marketing can capture the guests' imagination and motivate them to choose a certain property (StayNtouch, 2019).

Research hotels: When the guest is searching for hotels or making reservations, information technology applications can be used to provide tailored service (Ansari and Mela, 2003; Shen and Dwayne Ball, 2009) to develop longer-term, more personal relationships with their valuable customers.

With a few hotels selected, the potential customer will research hotel reviews and evaluations – friends, Google, Facebook and OTAs offer popular channels for studying previous guests' experiences and providing crucial information that can assist in deciding for or against a booking (Hahn, 2018). Here the hotels have to react to the guest reviews (Evergreen). Often, potential guests "check out" what a hotel has to offer on its website, only to turn around and book on the OTA if the hotel website is not working sufficiently (StayNtouch, 2019).

Booking: The Booking can happen on the hotel website (or corporate site), an OTA or via email/telephone. In each case, the booking process must be set up to be as easy as possible: a quality user experience and a responsive website, well-summarised content, and a simple, intuitive and quickest-possible process flow. And most important of all transparent and user-friendly price communication (Hahn, 2018; Chiu et al.,2014).

Check-in: After a guest arrives at the hotel, the front desk agent should complete the guest registration process. This is the first time for an actual face-to-face encounter. A service representative's behaviour during service encounters critically affects customer satisfaction and the perceived quality (Bitner, 1990; Bitner and Hubbert, 1994; Chiu et al., 2014; Parasuraman et al., 1991, 1988).

Stay: This is where the decisions are made as to whether the guest returns and whether they recommend the hotel to friends and acquaintances. In addition to the obvious factors such as the cleanliness of the rooms or good service, this phase is critical in determining whether positive or negative reviews are given – the handling of complaints is also an important aspect (Hahn, 2018). The goal is to secure the guest's loyalty to the hotel and, where applicable, to the brand. Employees may adjust their verbal and nonverbal behaviour to the interpersonal context of the service interaction. It could be things like addressing customers by first name, engaging in small talk, displaying personal attention and warmth, and demonstrating a genuine desire to assist the customer (Bettencourt and Gwinner, 1996; Goodwin, 1996; Mittal and Lassar, 1996; Surprenant and Solomon, 1987c). Most of the hospitability gestures mentioned in xxx. happen during this phase.

Check out: It is crucial to persistently motivate the client to re-book and thank them for their loyalty or a possible next booking (Hahn, 2018).

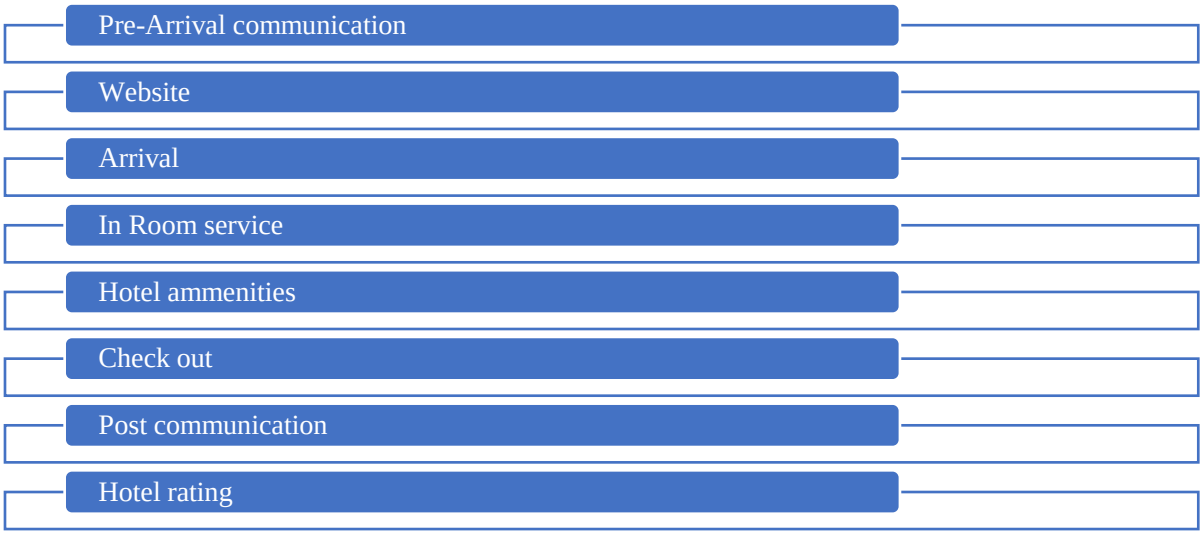
Feedback: After the stay, guests are often encouraged to share their experience online (WoM). The results from fixed effects regression models show that online ratings from user-generated

reviews on TripAdvisor have positive effects on hotel revenue growth (Neirotti et al., 2019). The way hotels react to this feedback can be used as a marketing tool for future guests researching booking opportunities.

Keeping in touch: The possible channels are first and foremost a newsletter and the brand's respective loyalty schemes; this is how the journey ends and starts again (Hahn, 2018).

Therefore, hotel touchpoints can be divided into the following categories in **32. Figure**.

32. Figure - Hotel Service Touchpoints



(Source: Own Edit)

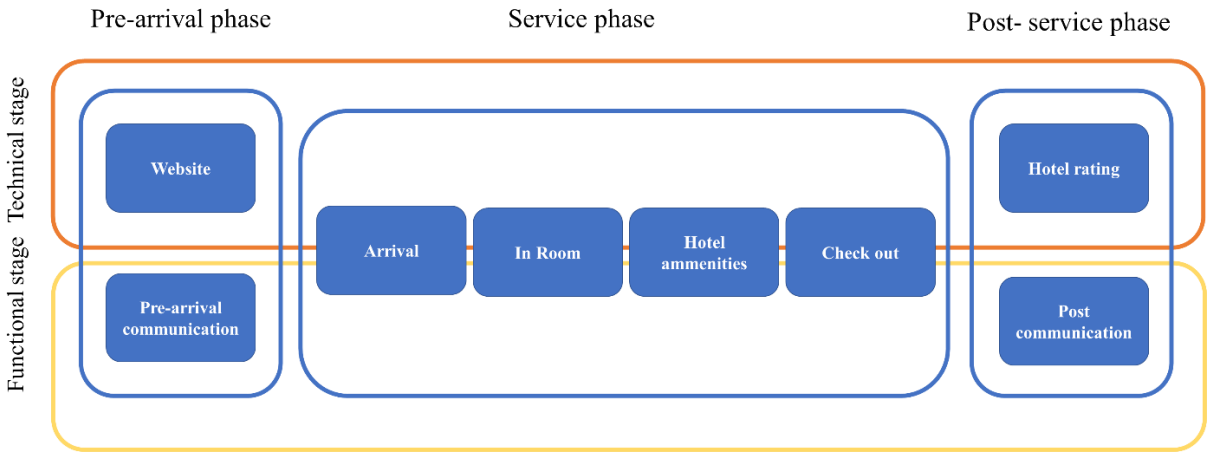
3.3.Conclusion of the Chapter:

As the chapter introduced, there are many ways to dive into the guest's journey in the hospitality service experience, and they all have their own value to showcase the different stages, phases, and touchpoints that the customer encounters. Based on the reviewed literature, the combination of the different concepts was deemed important.

First of all, the customer experience starts when the customer decides to purchase a certain service and become aware of the company. Everything that takes place from awareness to arrival will be considered the pre-arrival phase. All encounters that happen after the customer arrives at the company will be considered the service period phase. After the customer has left the company and the service encounter stops, (the guest paid, left the hotel, and the service purchase interaction has ended) will be the post-service phase. The customer journey touchpoints can be placed into phases inspired by Stickhorn and Zehrer (2009). However, as was discussed in 3.3x, the tangible parts of service can be just as important as the gestures, acts of kindness or classical service elements. In the hotel environment, the state of the room or the surroundings have a massive effect on the customer. Therefore, within the phases, we must differentiate the technical and functional stages. A hotel either has a website, or not. This will therefore represent a technical aspect. Websites can be used throughout the customer journey; however, they are most important before and during the booking process. This touchpoint will be present in the pre-arrival phase and on the technical stage. During

the service period, most touchpoints have a functional and technical aspect; therefore these will be in the middle of the model.

33. Figure - Customer Journey Model for Scoring Model



(Source: Own Edit)

At further points of this research, the newly built customer journey model will be the base of the research logic.

3.4.Hospitality and Hotel Service

The word "hospitality" is often used to describe a complex field within the tourism scape, incorporating attraction, lodging, food service, leisure, and travel (Ottenbacher et al., 2009). Hospitality dates back thousands of years and can be described as a dynamic, constantly changing and transforming activity. It always adapts to the expectations, fashion and needs of consumers of a given age. Its economic importance has undergone spectacular development in recent decades (Nagy, 2021).

Hospitality can also be viewed as how one person behaves toward another (crick and spencer). Satisfying one's needs and striving for the near impossible, for instance, the ideal luxury hospitality experience should require the service level of an "idealized mother" (Sherman, 2007). Hospitality demands a lot from the employee. It could mean anything from helping guests have a good time (proactively engaging them in small talk) (Constanti and Gibbs, 2005; Guerrier and Adib, 2000) to making the guest feel at home by assuring safety and comfort (King, 1995). Hospitality work, in summary, is complex, but even the demanding aspects could be turned into opportunities to create memorable experiences for customers (Pizam and Shani, 2009). The service delivery process determines the customer journey through the organization (Voss and Zomerdijk, 2007). Every encounter between the consumer and service provider must be considered at the design stage. Manners and attentiveness toward customers that will be associated with good personal service have to be part of the company's hiring, training, and performance standards (Shostack, 1984).Finding the best employees to carry out these demanding jobs can be a challenge, and high hotel employee turnover continues to be a problem in many parts of the world (Chalkiti and Sigala, 2010; Formádi and Gyurácz-Németh, 2021;

Kovács et al., 2021; Nagy, 2021; OGYOSZ, 2018; Ráti, 2022; Rodek and Fehérvári, 2022; Sectoral Policies Departmen, 2022; tourismhr.ca, 2022; turizmus.com, 2022), especially after COVID-19.

While hospitality organizations were studied in the scope of SQ research, Crick and Spencer argue that treating them like other service-providing organizations is a mistake as hospitality services require different approaches. Hospitality is multidimensional, therefore, it should be studied separately; however, it is important to distinguish that hotel work and hospitality are different. Hospitality creates a home away from home (Crick and Spencer, 2011). According to Crick and Spencer (2011), hotel work is longer than the average hospitality experience but misses the desired behaviour of the host.

Hotel work is not only complex but also challenging as employees must display emotional, aesthetic and other types of labour sustainably. Hotel employees interact with customers of different cultures. The difference in power distance (Hofstede) can affect the customers' quality perception, hence the need to be more multicultural (Crick and Spencer, 2011). SQ within the hospitality sector is hard to define, given its multidimensional nature (Pizam et al., 2016; Pizam and Shani, 2009).

It was stated that guests are the ultimate judges of the quality of service delivered (2.1.4.1.). This will create an ever more complex system as part of the hotel service scape where individual stays must be considered just as much as events (such as weddings and business conferences). Kandampully and Hu (2007) states that "the service environment (buildings, tourist attractions, décor, and so on) plays such an important part in the delivery of service products in this industry (p. 90)." Within the hospitality industry, guest satisfaction may be considered the 'degree to which a product or service meets the customer's expectations (Pizam, 2008, p. 66).

Much research has been devoted to the mechanics of matching guest expectations with experiences of quality and linking expectations to guest satisfaction (Crick and Spencer, 2011; Hu et al., 2009; Huang and Rust, 2021; Lai and Hitchcock, 2017; Saut and Bie, 2022), but when measuring SQ in hospitality, most measurements built on SERVQUAL (**15.-18. Appendix**). However, reading the characteristics of hospitality and good hotel experience, there are many similarities to that of tailor-made service. Therefore, to correctly measure the hospitality aspect of a hotel's service quality, we must measure the level to which the service is tailor-made.

Victorino et al., (2005) found that service innovation matters when guests select a hotel. Service innovation is found to have a larger influence on choices when guests are staying at economy hotels; also, leisure travellers were found to be more influenced by innovative amenities such as childcare programs and in-room kitchenettes than business travellers.

3.4.1. Hotels in Hungary

The number of accommodations in Hungary fluctuates throughout the year, but there are around 2100 – 2900 commercial accommodation businesses (including seasonal establishments) (ksh.hu, 2023).

In Hungary, a hotel is a type of accommodation established solely to continue accommodation services. In addition to accommodation and breakfast, other services are also provided as part

of the accommodation service, where the number of utilized rooms is at least eleven (based on 239/2009. (X. 20.) Korm. rendelet 14. (ksh.hu, 2005; Wolters Kluwer Hungary kft, 2009). January 1, 2013, the KSH published the data of the members qualified to be accommodations according to the trademark system. The total hotel data, based on the KSH website (**5. Table**), includes those units that operated without an assigned star rating. Therefore, based on the KSH (ksh.hu, 2023; https://www.ksh.hu/stadat_files/tur/hu/tur0071.html), there are approximately 855 – 955 hotels in Hungary.

5. Table - Commercial Accommodation Hungary

Year	Month	Number of operating units					
		Hotel	Pension	Community accommodation	Holiday home	Camping	Total
2022.	January	855	979	182	71	42	2 129
	February	848	960	184	73	38	2 103
	March	865	1 032	198	89	51	2 235
	April	893	1 114	219	115	109	2 450
	May	928	1 146	268	141	167	2 650
	June	945	1 183	307	193	216	2 844
	July	946	1 201	318	199	242	2 906
	August	948	1 192	320	205	235	2 900
	September	922	1 118	261	169	187	2 657
	October	885	1 042	208	119	93	2 347
	November	842	928	165	86	54	2 075
	December	826	884	155	79	47	1 991

(Source:ksh.hu)

There are no openly available databases of all “hotel” type accommodations. The only reliable source is the Hungarian Hotel and Restaurant Association (HHRA). Not all “hotel” type accommodations are part of the HHRA. To be able to understand star rating, the clarification of the star quality system used in Hungary is necessary. The HotelStars Union is the hotel rating system applied uniformly in a significant part of the European Union's member states https://www.hotelstars.eu/, and used to be the star rating system used in Hungary; however, from 2022, a new national system will be implemented. Also, in previous years the star rating system (Hotel Stars) was not mandatory; therefore there are still hotels without an assigned star rating. From the 1st January 2022, the Hungarian Tourism Quality Certification Body (https://szallashelyminosites.hu/) started the process where all Hungarian hotel establishments get a new star rating based on a uniform (national) quality system to represent the 21st century.

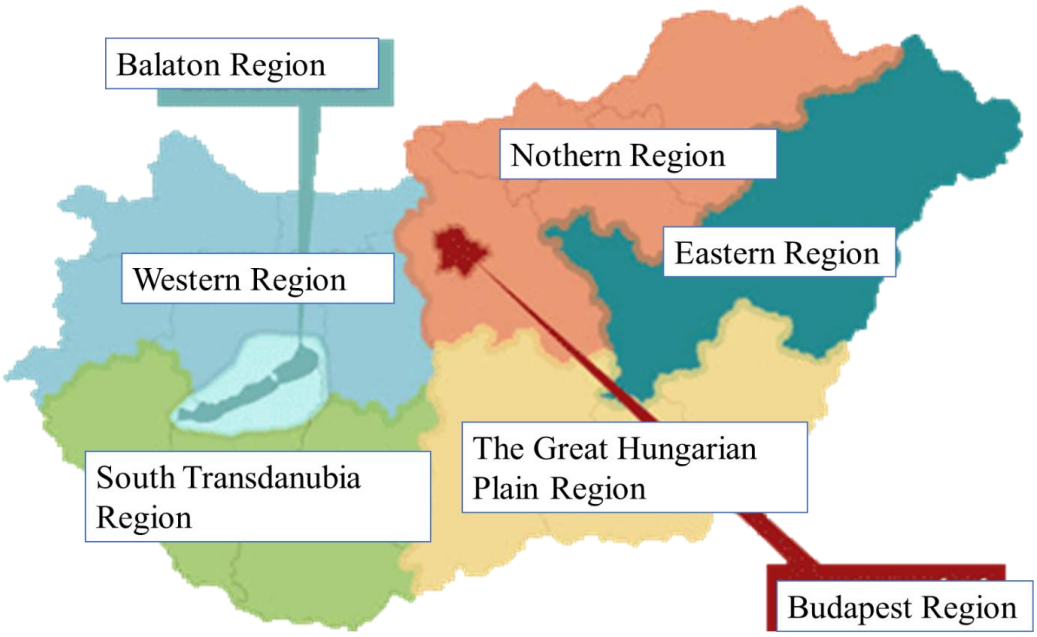
As this process was not finished by the end of 2022, there is no data regarding the specific number of hotels on each star rating category.

3.4.2. Hungarian Hotel and Restaurant Association

The Association founded in 1968, has been one of the determining professional organizations in Hungarian tourism and the hospitality industry. The current membership exceeds 500 and includes more than 400 hotels with 36,000 hotel rooms – representing about 60% of the entire hotel capacity of the country – seven hotel chains, 30 independent restaurants, 20 middle and high-level educational institutions and more than 100 associate members, according to their website. The HHRA is divided into seven regions, covering the entire country, representing the interest of all types and categories of hotels and other hospitality businesses nationwide.

The seven regions (**34. Figure**) are the Northern Region, the Eastern Region, the Great Hungarian region, Budapest, Western Region, South Transdanubia Region and the Balaton Region. The HHRA had 458 members on the 8th of May 2022 (and 468 hotel partners on the 8 January 2023).

34. Figure - Hungarian Hotel and Restaurant Association



(Source:Own Edit)

Most hotels are located in the Budapest region, where (other than the un-assigned) 4-stars is the most common star category. The least hotels are located in the South Transdanubia region, where most hotels are also 4 stars, and this is also the highest-rated category **6. Table**.

6. Table - Hotels within the Regions

	Not Assigned	2	2 sup.	3	3 sup.	4	4 sup.	5	5 sup.	All
West Region	19	2	1	7	4	19	4	0	1	**57**
South Transdanubia Region	9	1	0	6	1	11	0	0	0	**29**
Balaton Region	18	1	0	18	9	21	10	2	0	**80**
Budapest Region	79	0	0	18	8	40	8	5	1	**159**
Northern Region	13	1	0	11	1	16	6	1	0	**49**
Eastern Region	18	3	0	14	2	7	2	1	0	**47**
The Great Hungarian Plain	17	0	0	4	1	11	3	0	0	**37**
All	**173**	**8**	**1**	**78**	**26**	**125**	**33**	**9**	**2**	**458**

(Source:Own Edit)

4. Research Objectives and Hypotheses

Following the literature review, this chapter introduces the research objectives and the hypotheses determined based on the literature, followed by the research methodology and methods adopted in the analysis.

4.1.Research Objectives

According to the previously discussed literature research, real service quality can be reached only by a tailor-made service.

Personalized services are interactive processes where the service provider uses specialized competencies and resources. With the guests' participation, value is created, which can either be the final product or the addition to a physical good. Quality is conformance to customer specifications and will be judged by the consumer. As the guest will decide if their experiences are pleasurable or not, therefore tailor-made services can provide a high level of perceived service quality.

Based on the previously drawn conclusions, the purpose of the study is:

1. to create a new measurement system to measure the level of tailor-made service in hotels.
2. to measure the degree to which hotel service is tailor-made in Hungary.
3. to identify what the common characteristics are in the case of hotels that score high on the tailor-made service scale.
4. to identify what the common characteristics are in the case of hotels that score low on the tailor-made service scale.
5. to identify what phase of the guest encounter is most often tailor-made.
6. to identify development opportunities for the Hungarian hotel market.

4.2.Research Questions

After reviewing the conceptual background and theoretical literature, the author formulated the following research questions.

Q1. Is it possible to create a measurement system that fits the ideal hotel guest journey model?

Q2. What indicators should be involved in creating a measurement system to determine/identify how tailor-made hotel services are to reach SQ?

Q3. How tailored (personalized, customized) are the Hungarian hotel services?

Q4. Can the hotels be assigned to groups based on the tailored service scale scores?

Q5. What are the common characteristics of those hotels that got into the same cluster?

Q6. Can the tailored service scale indicators be groped based on which indicators hotels perform well and poorly?

Q7. What are the common characteristics of those hotels that score high on the tailor-made service scale?

Q8. What is the importance of providing tailored service for hotel managers?

Q9. Is there a relationship between the value of the score on the tailored service scale and the importance of providing tailor-made service determined by the Hotel Manager?

Q10. Is there a difference in the level to which guest encounter phases are tailor-made?

Q11. Is there a difference in the level to which guest encounter stages are tailor-made?

4.3.Hypotheses

The hypotheses are built on the research questions.

Hypothesis 1. - It is possible to create a system that measures the tailor-made service level of the hotels.

Previous service quality measurements applied in the hospitality industry have mostly built on the SERVQUAL model (Akan, 1995; Akbaba, 2006; Getty and Thompson, 1995; Knutson et al., 1990; Webster and Hung, 1994; Wilkins et al., 2007) and, often, measured service quality from the guest's point of view (Akan, 1995; Akbaba. 2006; Albacete-Saez et al. 2007). On the other hand, the star rating systems (the national quality system, HotelStars) use service quality indicators and self-administered surveys, measuring quality from the hotel's perspective and looks at industry standards (HotelStars, 2023; SzallashelyMinosites, 2023).

Personalization and customization measurements were either just small additions to an existing model (Zeithaml et al., 2000) or only concentrated on one aspect of the customer's journey (Ariffin and Maghzi, 2012; Bettencourt and Gwinner, 1996; Blom and Monk, 2003; Xu et al., 2014). In-person service quality perception has a stronger effect than e-service quality (Stromback et al., 2013; Wang et al., 2016). Therefore, it is important to measure the in-person aspects too. Nowadays, all services include multiple stages of service (Stromback et al., 2013) and can consist of separate phases of; technology only, hybrid and human encounters. Therefore, it is important to explore the possibility of building a complex and comprehensive measurement system that can be used without the guests' involvement.

Hypothesis 2 - Hungarian hotels can be grouped in different clusters according to the tailor-made service.

Tailor-made service has both human and financial recourse needs (Wang et al., 2010), but both customization and personalization can have elements that can be implied relatively low cost. Also, based on the stages of service and the phases of guest encounters, some hotels may emphasize certain aspects of personalization more than others. Therefore, the goal is to determine if hotels can be grouped based on personalization and customization indicators rather than star rating or type.

Hypothesis 3 - Tailor made service indicators can be grouped into different clusters based on the performance of the hotel.

While personalization has high information demand, it could be part of technology-based service, personal encounters, or marketing. The common dominator is that personalization will use the information to provide the right service or product to the right person. In the case of customization, the hotel already had pre-determined variations of its offer. Both personalization and customization can be part of any of the touchpoint's phases. By clustering the tailor-made service indicators, a clear picture could be seen of the overall strength and weaknesses of the Hungarian hotels.

Hypothesis 4 - There is a relationship between the different characteristics of a hotel and its tailor-made service level.

H4a. There is a relationship between the size and the tailor-made service level of a hotel.
H4b. There is a relationship between the hotel type and the tailor-made service level of a hotel.
H4c. There is a relationship between the type of the hotel guest and the tailor-made service level.
H4d. There is relationship between the star rating of the hotel and tailor-made service level.
H4e. There is relationship between chain affiliation and the tailor-made service level of the hotel.

Personalisation and customization both have a high information, time and human resources demand (Wang et al., 2010) in order to adapt the hotel's service offering to each guest's preferences (Valenzuela et al., 2009; van Riel et al., 2001). It can be the result of employees' proactive contributions, such as offering helpful information and suggestions (Keh et al., 2013).

For tailor-made service to happen, the employee and the guest need to meet, and the employees must have the opportunity to create individualised service. Depending on the hotel and the customer characteristics, the guest will spend different lengths of time in the hotel; therefore, in some cases, there will be more opportunities for personal encounters to occur. Resorts typically have longer stays, and guests spend more time in resorts and wellness hotels than in city hotels, where the guests stay for a shorter period and explore the city; therefore, there might be fewer encounter opportunities. (Győrffy, 2004; Jávor, 2009; Crick and Spencer, 2011)

Consumers' desire for customised products led to market segmentation (Smith, 1956); meaning that customers with similar preferences were put into the same market segment, therefore depending on the market segment the hotel targets as the primary target group, there could be differences in the need or desire for tailor-made service. Ladhari (2008, p. 78) commented that "the number and nature of the dimensions varied, depending on the service context; indeed, they varied even within the same service industry. Apparently, the criteria used to evaluate service quality differ among customer groups and circumstances."

Hospitality demands a lot from the employee (Constanti and Gibbs, 2005; Guerrier and Adib, 2000) to make the guest feel at home by assuring safety and comfort (King, 1995) will highly depend on the employee.

Five and 5-star superior hotels usually have concierge and guest relation representatives, which means that depending on the star rating, there might be more human and financial resources available to be able to offer personalized service.

According to Lin et al. (2010), both in human-to-human interaction and human-technology interaction, the customer is greeted by name, and the service provider remembers what they purchased and suggests products accordingly. However, it might be more challenging to do so in a hotel with a big capacity.

Hypothesis 5 - There is a relationship between the level of tailor-made services and the importance of the tailor-made services determined by the hotel manager.

General Manager decides on the hotel's strategy (Hayes et al., 2016; Jávor, 2009); therefore, if tailor-made service is important to the hotel manager, they should be able to influence the overall strategies of the hotel.

Hypothesis 6 - There is a difference in the tailor-made service level of the guest encounter phases.

As it was detailed before, individualization of the service demands interaction between the hotel and the customer. The different stages have a varying amount of opportunities for encounters. Also, depending on the phase, it will need more strategic planning (marketing) or technological investment (website, data gathering) compared to others that mainly have human resource demands (hotel reception, small talks, acts of kindness). There should be a higher chance for value cocreation during the service phase than the pre-arrival or post-service phases.

Hypothesis 7 - There is a difference in the tailor-made service level of the guest encounter stages.

The functional aspects of service delivery have a higher human resource demand, while the technological aspects have more financial demand. both need investments, but the return time is different when buying a new website or application compared to training employees to provide better service. However, to be able to provide good tailor-made service on the functional level, the hotel needs good technical support (technical being marketing mix offerings available, pieces of training available, budget to offer something unique to the guest, etc.); personalization is mainly initiated by the company by collecting data. If this technological stage indicator is missing, the functional stage will have a harder job. But given the fact that it is hard to directly see the advantages of the technical stage aspects, there will be differences between the stages.

4.4. Research Concept

Research is one of the most important tasks: the large-scale structuring and analysis of formations and the appropriate presentation of the results (Mitev, 2019).

In the dissertation, both secondary and primary data were collected for preparation. In addition, the research has quantitative (questionnaires, cluster analysis, relationship studies) and qualitative (structured interview) aspects.

4.4.1. Secondary Research

Secondary data collection, during which different materials were processed, and new research results were achieved (Majoros, 2011; Tomcsányi, 2000) started with the analysis of data related to:

- service quality
- service quality models
- tailor-made service
- guest journey
- encounters
- and the building of the new guest journey model.

Websites like the web of science, science direct, and google scholar were used. Furthermore, as part of building the scoring model, secondary data was used to collect and identify potential items to use in the tailor-made service measurement.

To identify the hotel pool, or in other words, the population that can be included in the research, the HHRA database was used.

4.4.2. Primary research

After reviewing the literature, the primary research and preparing the indicator list on which the scoring system will be based, interviews will be conducted with experts. First, based on the customer journey model created in the literature, the indicators are going to be grouped, and each group will be presented to experts of that touchpoint. During the interview, we focus on the most important factors of tailor-made service and how they appear in theory and practice. This can help to extend the questionnaire based on the hotel professional's recommendation. After the elimination of indicators and the addition of indicators proposed by the experts, a second round of interviews will take place with general managers to measure if the indicators are, on the one hand, understandable for the general manager and, on the other hand, if the interviews find it important. The goal is to make sure that there is a clear understanding of concepts. Then, based on the literature and the preliminary interviews, the specific scoring model can be presented which serves as a starting point for the final questionnaire. The questionnaire will be filled out by the hotel managers who are members of the HHRA.

7. Table - Research questions, Hypotheses and Methods

Research question	Hypotheses	Methods
Q1. Is it possible to create a measurement system that fits the ideal hotel guest journey model? Q2. What indicators should be involved in the process of creating a measurement system to determine/ identify how tailor-made hotel services are in order to reach SQ?	H1. It is possible to create a system that measures the tailor-made service level of the hotels.	Interview
Q3. How tailored-made (personalized, customized) are the Hungarian hotel services?		GAP
Q4. Can the hotels be assigned to groups based on the tailored service scale scores? Q5. What are the common characteristics of those hotels who got into the same cluster?	H2. Hungarian hotels can be grouped in different clusters according to the tailor-made service.	Bi-cluster
Q6. Can the tailored service scale indicators be groped based on which indicators hotels perform well and poorly?	H3. Tailor made service indicators can be grouped into different clusters based on the performance of the hotel.	Bi-cluster
Q7. What are the common characteristics of those hotels that score high on the tailor-made service measurement? Q8. What are the common characteristics of those hotels that score low on the tailor-made service measurement?	H4. There is a relationship between the different characteristics of a hotel and its tailor-made service level. H4a. There is a relationship between the size and the tailor-made service level of a hotel. H4b. There is a relationship between the hotel type and the tailor-made service level of a hotel. H4c. There is a relationship between the type of the hotel	ANOVA

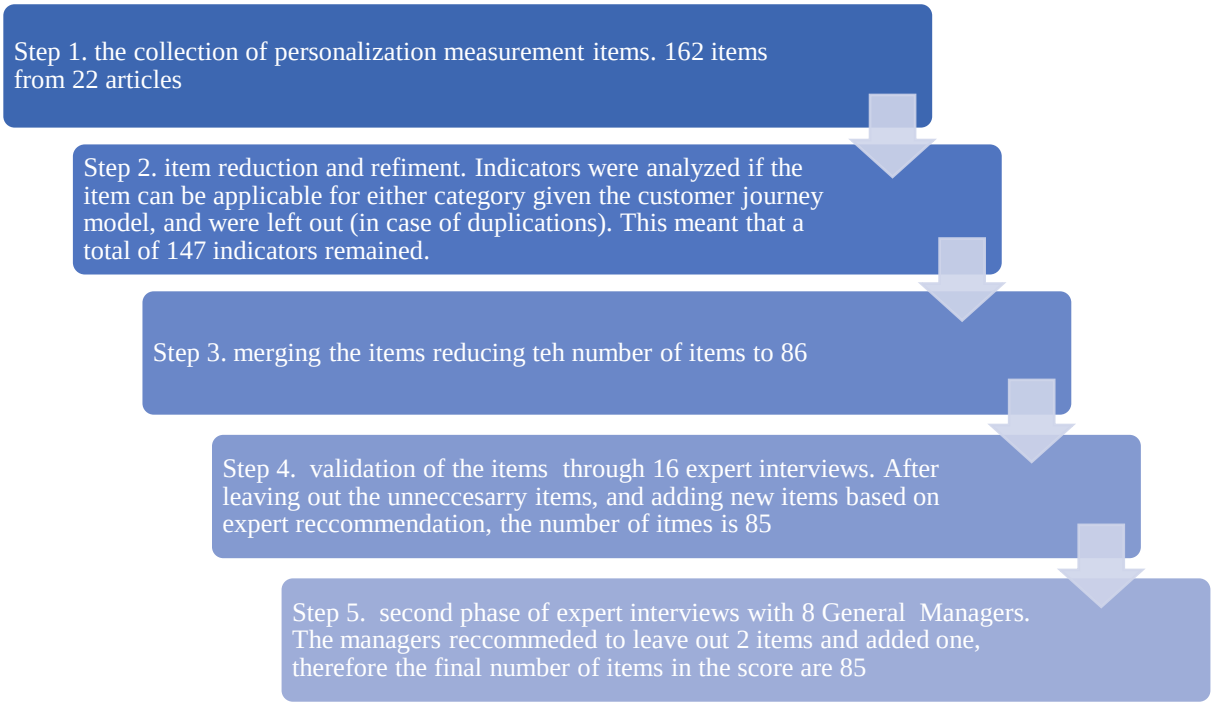
	and the tailor-made service level. H4d. There is relationship between the star rating of the hotel and tailor-made service level. H4e. There is relationship between chain affiliation and the tailor-made service level of the hotel.	
Q9. What is the importance of providing tailored service for hotel managers? Q10. Is there a relationship between the value of score on the tailored service scale and the importance of providing tailor-made service determined by the Hotel Manager?	H5. There is a relationship between the level of tailor-made services and the importance of the tailor-made services determined by the hotel manager.	Spearman
Q11. Is there a difference in the level to which guest encounter phase are tailor-made?	H6. There is a difference in the tailor-made service level of the guest encounter phases.	Paired t-test
Q11. Is there a difference in the level to which guest encounter stages are tailor-made?	H7. There is a difference in the tailor-made service level of the guest encounter stages.	Paired t-test

(Sourve:Own Edit)

5. Building the Scoring Model.

This study aimed to conceptualize the measurement of tailor-made service. For this process, the scale development procedures developed and employed by, among others, Churchill, (1979) Parasuraman et al., (1985), Chi et al., (2020), Elgaraihy (2013)were used to create the hotel tailor-made service measurement model (**35. Figure**).

35. Figure - Building the Scoring Model



(Source:Own Edit)

The rigorous scale development procedures entailed both qualitative and quantitative research.

5.1.First Step of Building the Scoring Model

The first step was the collection of personalization measurement items. Following the literature review, 162 items were collected from 22 articles. The full list of items can be found in detail in **25. Appendix**. 22 articles were focusing on various sectors, but 10 of them were concluded in a hotel environment (8. Table).

8. Table - Literature of Score Building Items

Autor	Research focus	Research Context
(Parasuraman et al., 1988)	"A Multiple-Item Scale for Measuring Consumer Perceptions of Service Quality"	Retail
(Mittal and Lassar, 1996)	SERQUAL-P (has a personalization scale, encounter	Retail
(Bettencourt and Gwinner, 1996)	Personal encounter	Fortune 500 company front line employee
(Blom, 2000)	Interface personalization	Mobile phone and e-commers webpage

(Blom and Monk, 2003)	System personalization	Web portal
(Chellappa and Sin, 2005)	Web personalization	Online Vendors
(Gwinner et al., 2005)	Personal Encounter	Hotel employee
(Ball et al., 2006)	Personal encounter	Bank
(Tam and Ho, 2006)	Ability	Display of the offers on website
(Ekinci et al., 2008)	Service quality and overall attitude toward the firm	Hotel
(Pijls and Groen, 2012)	Personal Encounter	Hotel
(Ariffin and Maghzi, 2012)	Personal encounter	Hotel
(Elgaraihy, 2013)	Personal Encounter	Hospitality
(Ariffin, 2013)	Personal encounters	Hotel
(van der Heijden, 2004 in Ho et al., 2014)	Perceived Usefulness -	using the personalization agent, Books and Song
(Bhattacherjee and Premkumar 2004 Ho et al., 2014)	Attitude Valence - The direction and extremity of an attitude	using the personalization agent, Books and Song
(Berger and Mitchell 1989 in Ho et al., 2014)	Attitude Confidence	confidence in the offer made personalization agent
(Xu et al., 2014)	Website personalization	Recommendation agent
(Nyheim et al., 2015)	Perceived personalization - smartphone advertising	Restaurant
(Mody et al., 2017)	Hotel/Airbnb communication and recommendation system	Hotel / Airbnb
(Ozturk et al., 2017)	Online recommendation	Online booking system
(Aydin, 2018)	Advertisement	Social Media
(Morosan and DeFranco, 2019)	Hotel application personalization level	Hotel
(Kapeš et al., 2022)	Personal encounter – problem handling	Hotel

(Source:Own Edit)

5.2. Second Step of building the scoring model

The second step contains item reduction and refinement. Indicators were divided based on touchpoints, phases, and stages. First, they were analysed if the item could be applicable for either category (based on the customer journey model) and were left out in case of duplications (as some researchers used the same article as a reference, some of their items were identical (Mody et al., 2017; Nyheim et al., 2015)). This meant that a total of 147 indicators remained. Some of the items can be assigned to a specific touchpoint, however, certain behaviour and service offerings can happen during the entire stay, or during the whole guest journey. If the item describes a key “moment of truth” but it could fit the entire customer journey, it was

assigned either to the technical or the functional stage. Of course, if an item is assigned to a touchpoint it will also be assigned to a phase and a stage. If an item is assigned to a phase but not a touchpoint it will still be part of a stage. The items were always placed in the most specific possible part of the model.

5.3.Third step of building the scoring model

The next step focused on scale purification. After assigning the 147 items they were checked for similarity and got merged. The merging process can be found in **26. – 36. Appendix**.

9. Table - Indicator Number after Step Three

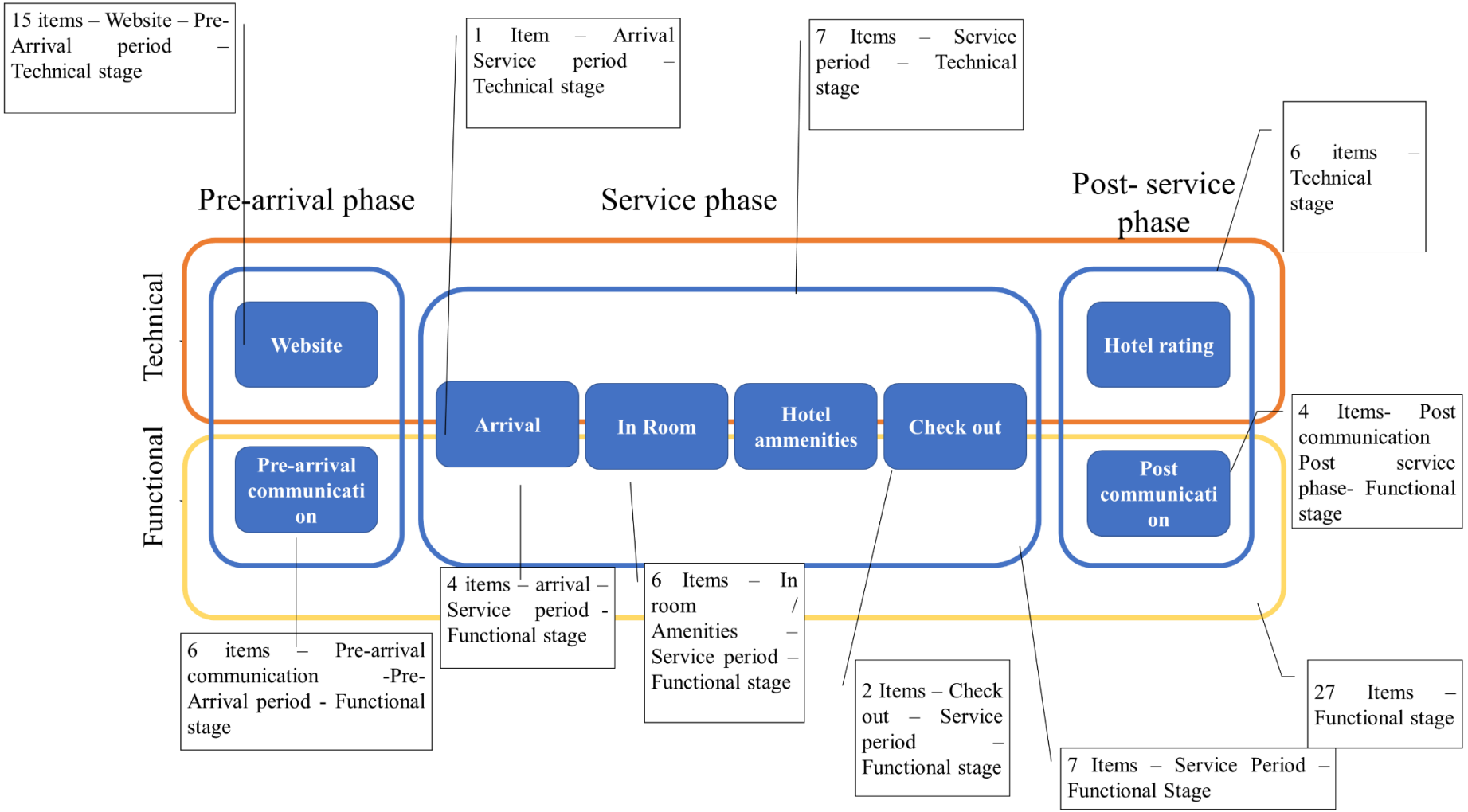
Touchpoint	**Original number of Items**	**After purification**
Website	25	15
Pre-arrival communication	11	6
Arrival	7	5
In-room service and hotel amenities	10	6
Check out	3	2
Post communication	5	4
Stay period	22	14
Functional stage	53	28
Technical stage	11	6
Sum:	147	86

(Source: Own Edit)

The Pre-arrival phase has 21 Items in total, the Service-period has 27 Items in total, and the post-service phase has 10 items (9.Table).

The Functional stage has 56 items in total while the technical stage has got 29 items. So, although not all items belong to a touchpoint, but all items belong to one of the stages as shown by the **36. Figure**. The specific items can be found in Appending **37. – 47. Appendix**.

36. Figure - Distribution of Items



(Source: Own Edit)

5.4.Fourth Step of Building the Scoring Model

The 4th step in creating my scale was the validation of the items through expert interviews. Since the 1990s, expert interviews (a qualitative method, specifically empirical research) have been used in political and social research (Döringer, 2021; Van Audenhove and Donders, 2019). The goal is to explore or collect data about a specific topic. It focuses on the expert's knowledge, broadly characterised as specific knowledge in a certain field of action (Meuser and Nagel, 2009). According to Wheeler (2019) expert interview is a great way of learning and developing new strategies. The most important thing about qualitative interviewing is investigating experiences and perspectives to develop a better understanding (Edwards and Holland, 2013).

Three main features characterize the expert interview:

- „Respondents must be experts in a specific subject area,
- the focus is on the knowledge of the respondent, there is less interest in the person and their biography,
- a high degree of pragmatism in interviewing using guidelines and selective data evaluation (Monke, 2021).

There is a thematic difference between expert interviews. The expert and the expert knowledge, according to Meuser and Nagel (2009). Experts are representatives of implicit knowledge. They do not act as experts from outside, but they are part of the field they are an expert in and have privileged access to information. Their knowledge was acquired in an institutional context. This knowledge will be used in the expert interview from the perspective of a specific problem. According to Meuser and Nagel (2009), we can differentiate between Operational knowledge and contextual knowledge experts.

> Experts with operational knowledge are responsible and implement innovations. They form the top management of politics, business, science, justice and associations (Hönke et al., 2008).
>
> The contextual knowledge of experts is mainly used when it comes to problem structuring, e.g. living conditions of certain populations. Their knowledge is about evaluating and assessing certain contexts and not exploring the expert's actions (Hönke et al., 2008). In this research, experts with operational knowledge are needed.

The items were grouped based on service touchpoints, periods, and stages, and they got divided into five different interview outlines.

Two groups were divided based on the service stages where the first group includes all items regarding the technical stage of service (29 items), and the second includes all items regarding the functional parts (57 items). Therefore, these two interview outlines have no overlap in their items. (As seen in **36. Figure**)

The items in the other four interview outlines were assigned based on the service periods: Pre-arrival phase, Service phase and Post-service phase.

The third interview outlines joined the Pre-arrival and Post-service phase items as both of these phases are often overseen by marketing professionals. – This meant 25 items because the technical stage items were omitted.

The service-period interview outline included all the items that belong to the service period or one of the touchpoints within this period, which meant 27 items. This interview outline included both the technical and functional stages within the period but had no overlapping items with the other interview outlines based on the phases.

The final interview outline version was one only for the post-stay period, with 7 items, which is a specialized field. The specific content of the interview outlines included the item is **37. – 47. Appendix**. The author conducted the interviews both in person and online, using Zoom and Google Meet. Following the principle of purposive sampling, the author have contacted individuals with experience in the specified stage or phase of the customer journey, firstly with whom the author already had professional contact with, secondly, the interviewees were also contacted via cold calling or based on the recommendation of other interviews.

The interviews took four weeks to conclude, from the 27th to the 17th of June 2022. As the interviewees were asked based on the three periods or the two stages of service and included items from 7 to 57 the length of the questionnaire was different. The length of the interview hence took from 15 minutes to 59 minutes (**10. Table**).

10. Table - Participants of the first Interview

Name	Position	Background	Phase	Duration
Ákos Gyenes	RESnWEB/Everguest – Hospitality Consultant and Trainer	10 years in Accor, Ramada. Since 2011 RESnWEB net hotel booking Ltd. for independent hotels.	Technical stage	59:20
Gergely Csernák	Senior Account manager at Bit Soft	20 years of experience in hotel Front Office in various positions in Hungary and in abroad (mainly Australia). 2 years in hotel software developing company.	Technical stage	53:11
Gábor Dencs	Co-founder and CEO at Bonomi	History of working in the marketing and advertising industry (approx. 20 years) Skilled in Digital Strategy, Digital Production, Marketing Management and Media Communication	Technical stage	27:36
Dorottya Bánfi	Senior Customer Coach at SabeeApp	International Economics studies with a focus on hotels for research partners Four Seasons	Technical stage	29:43

		and Hilton. Works for SabeeApp (hotel property management software) for 2 years.		
Alexandra Balázs	Lobby Ambassador at Matild Palace, a Luxury Collection Hotel	6 years in hospitality. Budapest Marriott – Internship at reception. Small hotels by the Lake Balaton and Veszprém Abacus Wellness and Business. 1 year at reception. Ritz Carlton Budapest Guest Relations. 2017 - Now	Functional stage	53:45
Anonym	Front Office Manager in a small luxury hotel in urban settings	Student work in 3 and 5-star hotels (1 year) 2 years in tourism Destination management office 4 years in 5-star hotel reception followed by work as a sales manager in a 4-star hotel. Currently been a hotel manager for 2 and a half years.	Functional stage	45:30
Jelger Schotten	Facility coordination by HEYDAY, Facility Management	20 years of service experience, bartender in clubs in Amsterdam, Opera, Airport Hotels Receptionist, Australia and Indonesia Reception and then concierge. Art'otel Amsterdam and W Amsterdam Concierge till 2019. Since then Facility Manager.	Functional stage	55:47
Lilla Balassa	Online Marketing Manager - Aquilo Hotel Panorama, Tihany	Social Media Manager from 2014 Entrepreneur, Trainer Social media manager since 2018.	Pre-arrival period and Post-service period	34:54
Dr. Fanny Liska	Marketing Manager, Electrostatics, Adjunct Professor, University of Pannonia, Marketing	Working in Marketing since 2016, has worked with restaurants, hotels and other accommodations. Specialized in	Pre-arrival period and	36:55

	Specialist, Love Szalon Budapest.	Service marketing and mass personalization.	Post-service period	
Ádám Nagy	Manager Csesznek, Ferráta Vendégház	From 2013 Front Office and Marketing functions.	Pre-arrival period and Post-service period	38:51
Eszter Tüttő	Hotel Manager at Hotel Historia**** and Hotel Historia Malomkert	Reception 2010 – 2014 General manager 2014 - 2016 Sales and marketing manager - 2022	Pre-arrival period and Post-service period	15:05
Hajnalka Bújna	Quality Officer, Quality Centre, University of Pannonia	Receptionist from 2006 Front desk manager from 2009 Front office manager from 2010 – 2011 July	Stay period	41:40
Enikő Kutai	Reception Manager, Montague on the Gardens Hotel	Reception Villa Medici Hotel and Restaurant from 2010 In London since 2016, Receptionist – Team Leader – Night Manager -Duty Manager – Reception manager. In Management position since 2018 (The Cavendish London and Montague on the Gardens Hotel)	Stay period	43:52
Kitti Molich	Flight attendant WizzAir	From 2015. Receptionist at Hungest Hotel Sun Resort, Montenegro till 2016. In 2018 In the USA in F&B and Housekeeping. From 2019 Parizsi Udvar 5-star from receptionist to Front office Supervisor till 2022 May	Stay period	35:43
Frigyes Vörös	Reception Manager, Villa Medici Hotel and Restaurant	From 2016 in Dual Education reception intern From 2020 receptionist 2021 – Front Office Manager.	Stay period	31:32
Kitti Gondos	Reputation Manager at Everguest	10 – 12 years in the hospitality industry. From Reception to	Post-service period	18:52

		Rooms Division Manager. In Everguest for 1.5 years		

(Source: Own Edit)

From the total of 86 items, the interviewees were asked to either take out, comment or add tailor – made service measuring characteristics. The Full list of items can be seen in 11. Table.

11. Table - List of all Items before the first Interview

Item ID	Statement	Placement
I1	Our website has features that are personalized for the users' preferences	Pre-arrival. Website
I2	Control panel style can be customized by user.	
I3	Exterior colour can be customized by user.	
I4	The website has a Chat service	
I5	The website has features for the visually impaired.	
I6	Our website automorphically fits the e.g. computer, mobile phone etc.), browser (e.g. Netscape, Internet explorer) and operating system (e.g. Windows, Unix) that the guest uses.	
I7	We have a hotel App.	
I8	The hotel app can provide the guest with personalized services, products, or information tailored to their preferences or personal interests.	
I9	The website acquires the specific needs of the guest and shows service recommendations based on their personal needs.	
I10	The Web site acquires the guests' personal preferences and offers services and products that are tailor-made for the guest.	
I11	Our website automatically collects data (such as IP address, pages viewed, access time) but cannot identify the guest as an individual and offers goods or services based on that.	
I12	Our hotel uses Search engine optimization to appear for searching accommodation nearby.	
I13	Our hotel makes sure that we appear as a personalized search result through search engine optimization.	
I14	Our hotel makes sure that we provide information and products according to our guests' preferences.	
I15	We aim to advertise our hotel in a way that feels personalized for our potential guests, even based on previous searches or interests.	

I16	We place a greeting card with a hand-written message and the guest's name in the room.	Arrival – technical
I17	It is possible for the guest to ask for minor changes regarding the room during their stay.	Service Period – Technical Stage
I18	The guest can choose a specific temperature they want their room to be.	
I19	The guest can choose what kind of bed/Matras they want in their room.	
I20	The guest can choose the style and the type of the bedding.	
I21	The guest can choose what kind of pillow they want.	
I22	The guest can choose to have no alcohol in their minibar.	
I23	We put the favourite drink of the guest in the room even if that is not the brand the hotel normally works with.	
I24	Our hotel offers personalized products and services that our customers could not find in another hotel.	Technical
I25	There is an opportunity for the guest to reflect their identity and belonging on the service and products we provide them.	
I26	When a guest is fed up with the appearance of the product or system, we provide them with the option that they can re-personalize it.	
I27	Our hotel application is similar to what most customers use in their everyday lives.	
I28	The system/ product is created in a way that is fun for the guest to use.	
I29	The hotel app can provide the guest with personalized services, products, or information tailored to their specific hotel stay.	
I30	Communication by our hotel brand provides our customers with product and service recommendations that are tailormade for them.	Pre-arrival communication
I31	We recommend products and services that are personalized to our customer's interest based on our communication with that customer.	
I32	We recommend products and services that are personalized to our customer's interest based on of the basis of preferences of similar-minded consumers.	
I33	We aim to use personalized communication so our brand can make the guest feel that they are a unique customer.	
I34	We aim to give personalized recommendation in a timely way.	

I35	We aim to adjust our communication style (either on phone on in written channels) based on the guest type and characteristics (age, gender, interest, etc).	
I36	Our hotel adjusts the response to the specific.	Post communication – Post-stay
I37	The guest is invited to interact with us.	
I38	Our hotel / employee knows exactly to whose review it responds.	
I39	Our hotel / employee gives an individual response to all guest reviews and comments.	
I40	We aim to provide an authentic warm welcome to the guest.	- Arrival Service phase
I41	Guests are walked to the guestroom after check -in.	
I42	We place different welcome gifts in the guestroom (to all guest).	
I43	We place different welcome gifts in the guestroom (of VIP guest).	
I44	The hotel operates working hours to be appropriate to all its customers.	In - room
I45	We pay attention to the special requirements of our guests while staying in a hotel.	
I46	We respond immediately to all guest requests.	
I47	We make sure, that there are appropriate meals for all guest (religion, allergies, dietary restrictions).	
I48	We make sure that the chosen room is comfortable for the guest.	
I49	We make sure that all aspects of the room is in good condition and suitable for the guest.	
I50	We give a warm “good bye” after checking out at the counter.	Checkout
I51	Based on previous conversation with the guest we are recommending them with activities for the last day.	
I52	The hotel staff helps with the luggage.	Service Perioud – Functional Stage
I53	Our staff gives authentic smiles all the time.	
I54	We encourage the employees to display personal warmth in their behaviour.	
I55	We encourage the employees to be approachable.	
I56	We encourage the employees to make eye contact with the guest during conversation.	
I57	We are doing everything to understand the special requirements of the guest while staying at the hotel.	

I58	The employee has to know the name and / or nationality of the guest.	
I59	Our employee changes their behaviour to suit the needs of the guest.	Functional
I60	Our employee changes their behaviour to suit the needs of the situation.	
I61	The employee is empathetic towards the guest when they have a problem.	
I62	The employee responds immediately to guest requests.	
I63	When our employee promise to do something by a certain time, they do so.	
I64	We make sure that our information is accurate and update our records frequently.	
I65	Our employee is talented and displays a natural expertise in case of all requests.	
I66	Our employee is efficient.	
I67	Our employee aims to exceed the guest's expectations.	
I68	Our employee / hotel personalizes goods and services that are based on information that the guest has voluntarily given out (such as age range, salary range, Zip Code) but cannot identify them as an individual.	
I69	Our employee personalizes goods and services that based on information that the guest gave voluntarily and can identify them as an individual (such as name, shipping address, and card information).	
I70	Our employee can customize the service offering to the needs of the customer. (example: food allergies etc)	
I71	Our employee / hotel makes sure to take the time and understand the specific demands.	
I72	Our employee / hotel offers customers products and services that satisfy their specific needs.	
I73	Our employee / hotel anticipates what the guest wants before they ask.	
I74	Our employee / hotel recommends products on the basis of the preferences of similar-minded consumers.	
I75	We make sure that the hospitable behaviour from our employees seems to be motivated by genuine needs to please and care for their guests as an extension of their characteristics.	
I76	Our hotel / employee considers the best interest of the guest our / their top priority.	

I77	Our hotel / our employee aims to make the guest feel like an important person.	
I78	Our employee always tries to help solve guests' problems, even coming up with unique solutions.	
I79	Our employee aims to give guests individual attention.	
I80	Our employee takes time (and has time) to get to know the guest personally.	
I81	The hotel employee treats guest with full respect.	
I82	Our employees are polite with all guests.	
I83	Our employee aims to treat the guest as a friend rather than a customer.	
I84	Our employee is friendly with all guests.	
I85	It is important that the guest feels that building a good relationship rather than making money seemed to be the most important drive of the hotel.	
I86	We allow / encourage our employee to move to a familiar (informal) talk with the guest who needs that.	

(Source: Own Edit)

Interviewees were asked to remove items from the list if it is not necessary to measure the level to which service is tailor-made, based on their experience. In **13. Table** we can see that some items were asked from multiple perspectives either from the phase or stage points of view. Any item that was deemed unnecessary by more than one interview will be automatically removed from the list unless one interviewee highlighted it as extremely important. On these occasions further elaboration will be done to analyse the importance of the item.

As it is clear from the table the following items can be left out, I2, I3, I12, I19, I25, I26, I28, I41, I42, I48, and I52. The list of items is automatically got reduced to 75. The other Items are either removed by one interviewee or were marked as important by and another interviewee, therefore, the detailed elaboration on the exclusion process will be discussed in the next sub-chapters.

The experts were asked to mention any additional "items" / suggestions that are needed to measure personalization.

12. Table - Interviewee Suggestions

Interviewee	Suggestion
Technology 1.	Micro segmented news-letter with different content
	Post – small present for children
	Can the app do different functions from the website

	Language knowledge if the guest circle
	Chat bot
Technology 2.	Are there enough employees to provide personalized services?
	Language knowledge
	Micro segmented newsletter.
Technology 3.	Did not add anything.
Pre-arrival period and Post-service period 1.	Is the storage of guest data present in the hotel and is it updated?
Pre-arrival period and Post-service period 2.	Does the hotel provide training to the employee so they can provide good service?
	Is there an employee or outside company who is looking at the statistics?
Pre-arrival period and Post-service period 3.	Is there a person to teach the chatbot?
	Guest satisfaction survey after stay.
Pre-arrival period and Post-service period 4.	Is there a team to analyse big data?
	Option to give preferences.
	Newsletters for micro-segment.
	Supporting content.
Post – Service period	Hotel being proactive and sending out “Medalia etc” review.
	As arrival should be personalized, guests should have a personalized checkout, to encourage to give feedback.
	Email after check-out.
	Asking for review.
	Answering to review.
	Personalized answers.
Functional 1.	Is there a financial frame for personalization?
	Are there some small merch items that can be placed in the room or can be given to guests when needed?
Functional 2.	Listening to the guest, as sometimes complaints are not what they are really about.
	Training employees to the standards of service.

	Knowledge of the city/ area given by the hotel.
Functional 3.	Is there any hotel training for the employees?
	Is it also a commitment for the managers?
	Are good-performing employees rewarded?
Stay- period 1.	Is there employee training.
	Is there a reward system for the employee?
	Is there a chance to ask for a completely empty minibar?
	Does the employee take the initiative and be proactive in getting to know the guest?
	Language knowledge of the sum of the employee.
	Is there a function on the TV that writes a welcome message with the guest's name?
	Knowledge of the city/ area given by the hotel.
Stay- period 2.	Important to hire staff that are interested in service.
	How is the work environment?
	Is there encouragement from the hotel?
	Is the management open to supporting (financially, time for time etc.) the staff when they are doing an exemplary job?
	Is there a training for service?
	Knowledge of the city/ area given by the hotel.
Stay- period 3.	Recognizing when guest needs more personal communication.
Stay- period 4.	Guest can request/choose to have his/her favourite newspaper delivered in the room.
	Guest will see their names on the television automatically with a welcome message once they get to the room
	Guest Preferences and relevant Guest Experience Management info's are collected and updated continuously in an internal system (with different methods) to have an up-to-date list about any guests' preferences -> easier to prepare for the arrival and make the stay more personalized
	Fast/express check-in is enabled for multiple returning guests (no need to show ID/passport again, only if those data changed since the last stay) as well as express check-out

(Source: Own Edit)

The suggestions that were mentioned most often were about employee training, employee encouragement, newsletters and proactiveness.

The results were compared, in a table below (**13. Table**). Green colouring in the table indicates that the interviewee found that indicator very important, while red indicates that the interviewee suggested that it should be removed. Brown shows those indicators, where the interviewee was uncertain if they would like to remove it or leave it in the scoring system.

13. Table - Result of the First Interviews

Interviewee ID	Technical 1	Technical 2	Technical 3	Technical 4	Pre-Arrival/ Post-Stay 1	Pre-Arrival/ Post-Stay 2	Pre-Arrival/ Post-Stay 3	Pre-Arrival/ Post-Stay 4	Post - Stay	Functional 1	Functional 2	Functional 3	Stay-Period 1	Stay Period 2	Stay Period 3	Stay Period 4
I1	I1	I1	I1	I1	I1	I1	I1	I1								
I2	I2	I2	I2	I2	I2	I2	I2	I2								
I3	I3	I3	I3	I3	I3	I3	I3	I3								
I4	I4	I4	I4	I4	I4	I4	I4	I4								
I5	I5	I5	I5	I5	I5	I5	I5	I5								
I6	I6	I6	I6	I6	I6	I6	I6	I6								
I7	I7	I7	I7	I7	I7	I7	I7	I7								
I8	I8	I8	I8	I8	I8	I8	I8	I8								
I9	I9	I9	I9	I9	I9	I9	I9	I9								
I10	I10	I10	I10	I10	I10	I10	I10	I10								
I11	I11	I11	I11	I11	I11	I11	I11	I11								
I12	I12	I12	I12	I12	I12	I12	I12	I12								
I13	I13	I13	I13	I13	I13	I13	I13	I13								
I14	I14	I14	I14	I14	I14	I14	I14	I14								
I15	I15	I15	I15	I15	I15	I15	I15	I15								

Original	Technical 1	Technical 2	Technical 3	Technical 4	Pre-Arrival/ Post-Stay 1	Pre-Arrival/ Post-Stay 2	Pre-Arrival/ Post-Stay 3	Pre-Arrival/ Post-Stay 4	Post - Stay	Functional 1	Functional 2	Functional 3	Stay-Period 1	Stay Period 2	Stay Period 3	Stay Period 4
I16	I16	I16	I16	I16									I16	I16	I16	I16
I17	I17	I17	I17	I17									I17	I17	I17	I17
I18	I18	I18	I18	I18									I18	I18	I18	I18
I19	I19	I19	I19	I19									I19	I19	I19	I19
I20	I20	I20	I20	I20									I20	I20	I20	I20
I21	I21	I21	I21	I21									I21	I21	I21	I21
I22	I22	I22	I22	I22									I22	I22	I22	I22
I23	I23	I23	I23	I23									I23	I23	I23	I23
I24	I24	I24	I24	I24												
I25	I25	I25	I25	I25												
I26	I26	I26	I26	I26												
I27	I27	I27	I27	I27												
I28	I28	I28	I28	I28												
I29	I29	I29	I29	I29												
I30					I30	I30	I30	I30		I30	I30	I30				

Original	Technical 1	Technical 2	Technical 3	Technical 4	Pre-Arrival/ Post-Stay 1	Pre-Arrival/ Post-Stay 2	Pre-Arrival/ Post-Stay 3	Pre-Arrival/ Post-Stay 4	Post - Stay	Functional 1	Functional 2	Functional 3	Stay-Period 1	Stay Period 2	Stay Period 3	Stay Period 4
I31					I31	I31	I31	I31		I31	I31	I31				
I32					I32	I32	I32	I32		I32	I32	I32				
I33					I33	I33	I33	I33	I33	I33	I33	I33				
I34					I34	I34	I34	I34	I34	I34	I34	I34				
I35					I35	I35	I35	I35	I35	I35	I35	I35				
I36					I36	I36	I36	I36	I36	I36	I36	I36				
I37					I37	I37	I37	I37	I37	I37	I37	I37				
I38					I38	I38	I38	I38	I38	I38	I38	I38				
I39					I39	I39	I39	I39	I39	I39	I39	I39				
I40										I40	I40	I40	I40	I40	I40	I40
I41										I41	I41	I41	I41	I41	I41	I41
I42										I42	I42	I42	I42	I42	I42	I42
I43										I43	I43	I43	I43	I43	I43	I43
I44										I44	I44	I44	I44	I44	I44	I44
I45										I45	I45	I45	I45	I45	I45	I45

Original	Technical 1	Technical 2	Technical 3	Technical 4	Pre-Arrival/ Post-Stay 1	Pre-Arrival/ Post-Stay 2	Pre-Arrival/ Post-Stay 3	Pre-Arrival/ Post-Stay 4	Post - Stay	Functional 1	Functional 2	Functional 3	Stay-Period 1	Stay Period 2	Stay Period 3	Stay Period 4
I46										I46	I46	I46	I46	I46	I46	I46
I47										I47	I47	I47	I47	I47	I47	I47
I48										I48	I48	I48	I48	I48	I48	I48
I49										I49	I49	I49	I49	I49	I49	I49
I50										I50	I50	I50	I50	I50	I50	I50
I51										I51	I51	I51	I51	I51	I51	I51
I52										I52	I52	I52	I52	I52	I52	I52
I53										I53	I53	I53	I53	I53	I53	I53
I54										I54	I54	I54	I54	I54	I54	I54
I55										I55	I55	I55	I55	I55	I55	I55
I56										I56	I56	I56	I56	I56	I56	I56
I57										I57	I57	I57	I57	I57	I57	I57
I58										I58	I58	I58	I58	I58	I58	I58
I59										I59	I59	I59				
I60										I60	I60	I60				

Original	Technical 1	Technical 2	Technical 3	Technical 4	Pre-Arrival/ Post-Stay 1	Pre-Arrival/ Post-Stay 2	Pre-Arrival/ Post-Stay 3	Pre-Arrival/ Post-Stay 4	Post - Stay	Functional 1	Functional 2	Functional 3	Stay-Period 1	Stay Period 2	Stay Period 3	Stay Period 4
I61										I61	I61	I61				
I62										I62	I62	I62				
I63										I63	I63	I63				
I64										I64	I64	I64				
I65										I65	I65	I65				
I66										I66	I66	I66				
I67										I67	I67	I67				
I68										I68	I68	I68				
I69										I69	I69	I69				
I70										I70	I70	I70				
I71										I71	I71	I71				
I72										I72	I72	I72				
I73										I73	I73	I73				
I74										I74	I74	I74				
I75										I75	I75	I75				

Original	Technical 1	Technical 2	Technical 3	Technical 4	Pre-Arrival/ Post-Stay 1	Pre-Arrival/ Post-Stay 2	Pre-Arrival/ Post-Stay 3	Pre-Arrival/ Post-Stay 4	Post - Stay	Functional 1	Functional 2	Functional 3	Stay-Period 1	Stay Period 2	Stay Period 3	Stay Period 4
I76										I76	I76	I76				
I77										I77	I77	I77				
I78										I78	I78	I78				
I79										I79	I79	I79				
I80										I80	I80	I80				
I81										I81	I81	I81				
I82										I82	I82	I82				
I83										I83	I83	I83				
I84										I84	I84	I84				
I85										I85	I85	I85				
I86										I86	I86	I86				

(Source: Own Edit)

If two or more interviewees suggested that an indicator is not important, the indicator got excluded. After comparing the results and 11 indicators were omitted. In the following part, the items will be looked at by stage and phase, and those items that were suggested to be removed by only one expert will be examined.

5.4.1. Technological stage:

There were 4 experts included in the purification of the items regarding the technological stage of service and included items from I1 – I 29 (**48. Appendix**). Experts agreed to remove I2 (Control panel style can be customized by user.), I3 (Exterior colour can be customized by user.), I12 (Our hotel uses Search engine optimization to appear for searching accommodation nearby.), I19 (The guest can choose what kind of bed/Matras they want in their room.), I25 (There is an opportunity for the guest to reflect their identity and belonging on the service and products we provide them.), I26 (When a guest is fed up with the appearance of the product or system, we provide them with the option that they can re-personalize it.) and I28 (The system/ product is created in a way that is fun for the guest to use.).

The Experts had some comments regarding the items, which will be considered going further in the research.

- I1, (Our website has features that is personalised for the users' preferences.) –One interviewee suggested that it is only good if the hotel considers the segment, and the website is personalized based on the segments they are catering for as it is impossible to personalize it for each individual. Expert 2 also suggests box- solutions. Therefore, this item will have some additional explanation added.
- I7, (We have a hotel App.) –The experts had commented that it is usually not something the guest likes to download so it has to give something extra, these are also box solutions most of the time, not individually developed. It will depend on the segment if it is useful for the hotel. If it can give some extra features (like it is your keycard) it's okay, otherwise guests don't like it.
- I10, (The Web site acquires the guests' personal preferences and offers services and products that are tailor-made for the guest.) – The Web site acquires the guests' personal preferences and offers services and products that are tailor-made for the guest according to one expert this should be based on previous stays and based on that database newsletters can be sent out. It can also be part of the Pre-arrival or Post-service phase. As questions about newsletters and database were suggested to be added to the item list, this Item can be left out.
- I14, (Our hotel makes sure that we provide information and products according to our guests' preferences.) was deemed removable by Expert 4 but another interviewee found it to be important. This question also appears in the Pre-arrival phase questionnaire, therefore, will not be removed.
- I15, (We aim to advertise our hotel in a way that it feels personalized for our potential guests, even based on previous searches or interests.) is important for remarketing according to one expert.

- I16, (We place a greeting card with a hand-written message and the guest's name in the room.) We place an introduction greeting card with a hand-written message and the guest's name in the room was deemed removable by expert 4 but this item appears in the Service phase questionnaire too where it was not eliminated but had comments detailed in a later paragraph. As this item's techniques are more related to the front office (on stage) work the item will not be removed.
- I17, (It is possible for the guest to ask for minor changes regarding the room during their stay.) based on Expert 2s opinion it is only valid if it is a function mistake, otherwise not applicable.
- I19, (The guest can choose what kind of bed/Matras they want in their room.) and I21, (The guest can choose what kind of pillow they want.) were both deemed removable by expert 4 however these items appear in the Service phase questionnaire and these "items' are more related to the front office (on stage) work. Therefore, the item will not be removed as none of the Stay-phase experts have removed it.
- I24, (Our hotel offers personalized products and services that our customers could not find in another hotel.) Expert one said that if it is similar to what they use we are not reaching the point with it, which should be to have a different effect or a different tool from what the guests are already using. Expert four has also removed it, therefore this item will be removed from the list.
- I27, (Our hotel application is similar to what most customers use in their everyday lives.) was removed by Expert four but not the other three Experts therefore this will stay on the list.

After consulting with these four experts, 9 items were removed from the 29 items (**49. Appendix**). The following suggestions were made by the interviewees during the interview in **14. Table**.

14. Table - Technology Interviews - Suggestions

Interviewee	Suggestion
Technology 1.	Micro segmented news-letter with different content.
	Post – small present for children.
	Can the app do different functions from the website.
	Language knowledge if the guest circle.
	Chat bot.
Technology 2.	Are there enough employees to provide personalized services?
	Language knowledge.
	Micro segmented newsletter.
	Considering the suggestions, the following Item will be added to the list:

(Source: Own Edit)

Based on the suggestions, the following indicators can be included.

- I87 The hotel does micro-segmentation.
- I88 The hotel sends out segment-based newsletters.

Furthermore, based on the suggestions of the interviewees; I4 can be divided into I4a and I4b.

- I4a The website has a Chat service operated by a chatbot.
- I4b The website has a Chat service operated by an employee.

5.4.2. Functional stage

There were 3 experts included in the purification of the items regarding the functional stage of service. This stage included items from I30-86. (**50. Appendix**) With 57 items, this category had the most items to consider.

I41(Guests are walked to the guestroom after check-in.), I42 (We place different welcome gifts in the guestroom (to all guest).), I48 (We make sure that the chosen room is comfortable for the guest.) and I53 (Our staff gives authentic smiles all the time.) were automatically disqualified based on the criteria mentioned in 3.3.4 those items deleted by at least two experts will automatically be deleted.

Based on Expert three I41 should be deleted however Expert one stated that in a luxury hotel, every guest has to be escorted to the room. As Expert one has more experience in the luxury industry and Expert two did agree to leave this item in, I41 would not be deleted yet. However, these items are included in the Stay phase questionnaire too where one expert also deleted it. Hence, the item will be removed from the list.

I38, (Our hotel / employee gives an individual response to all guest reviews and comments.) - Expert 2 said that the employees can only aim to give "an individual response to all guest reviews and comments", and suggested to remove the items, however the other experts did not remove it, therefore at this point this will not be removed.

I49, (We make sure that all aspects of the room is in good condition and suitable for the guest.) - was marked by Expert one as removable with the suggestions that it should be the basic service, however at this stage it will not be removed yet.

In the case of I58, (The employee has to know the name and / or nationality of the guest.) Expert two deleted it while the other two mentioned it could be useful to know, but more than the nationality it is more about the guest needs that have to be important, therefore this item will be removed.

I74, (Our employee / hotel recommends products on the basis of preferences of similar-minded consumers.) Expert one marked as very important while expert 3 suggested to remove it. Expert two suggested adding "aim to" therefore this item will be kept with minor revision.

I82, (Our employees are polite with all guests.) and I83, (Our employee aims to treat the guest as a friend rather than a customer.) were marked to be deleted by expert 2 but they have not reached the minimum mark to be deleted.

Considering the revisions and suggestions 5 items have been deleted from the list, shrinking it to 52. (**51. Appendix**)

15. Table - Functional Interviewee - Suggestions

Interviewee	Suggestion
Functional 1.	Is there a financial frame for personalization?
	Are there some small merch items that can be placed in the room or can be given to guests when needed?
Functional 2.	Listening to the guest, as sometimes complaints are not what they are really about.
	Training employees to the standards of service
	Knowledge of the city/ area given by the hotel
Functional 3.	Is there any hotel training for the employees?
	Is it also commitment for the managers?
	Are good performing employees rewarded?

(Source: Own Edit)

Considering the suggestions (**15 Table**) of the experts the following items will be added:

- I89-The hotel has specific gifts or budget to use when the employee finds a guest should get a gift (birthday, honeymoon special occasion, etc.)
- I90 There are employee trainings for the employee so they can provide the level of quality service the hotel aims to provide.
- I91 Providing personalized service is encouraged by reward.

5.4.3. Pre-Arrival and Post-Stay phases

In case of the Pre-Arrival and Post-Stay phases 4 experts were included in the. These phases included items from I1-I15 and I30 to I39 including 24 items in this questionnaire (**52. Appendix**).

During the previous purification chapters I2 (Control panel style can be customized by the user.), I3 (Exterior colour can be customized by the user.), I10 (The Web site acquires the guests' personal preferences and offers services and products that are tailor-made for the guest.) and I12 (Our hotel uses Search engine optimization to appear for searching accommodation nearby.) have already been removed.

Experts suggested to add to I13 which focuses on "appearance as a personalized search result through search engine optimization " that it means the usage of google Ads, as it might not be obvious to some users, while I14 to "provide information and products according to our guests' preferences" means content marketing. It is important in the case of I30 that "product and service recommendations that are tailor-made for the guest" is considered when designing the communication site.

As 4 items were already removed the list contains 21 items (**53. Appendix**)

16. Table - Pre-arrival and Post-service Interviewees - Suggestions

Interviewee	Suggestion
Pre-arrival period and Post-service period 1.	Is the storage of guest data present in the hotel and is it updated?
Pre-arrival period and Post-service period 2.	Does the hotel provide training to the employee so they can provide good service?
	Is there an employee or outside company who is looking at the statistics?
Pre-arrival period and Post-service period 3.	Is there a person to teach the chatbot?
	Guest satisfaction survey after stay.
Pre-arrival period and Post-service period 4.	Is there a team to big data?
	Option to give preferences.
	Newsletters for micro-segments.
	Supporting content.

(Source: Own Edit)

Based on the suggestions (**16 Table**), the following items can be added;

- I92 We store and update guest data frequently.
- I93 We have an employee or an outsider company to analyse our guest data and previous statistics.
- I94 We send out a guest satisfaction survey after the guest checks out.

5.4.4. Post-service phases

One expert was asked in detail about the post-service phase as a specialized area of the customer journey. From I33 to I39 included 7 items. (**17. Table**) None of the indicators were removed, however, some additional indicators were suggested. The expert had the following suggestions and remarks.

17. Table - Post- Service Interviewee - Suggestion

Interviewee	Suggestion
Post – Service period	Hotel being proactive and sending out "Medallia etc" reviews.
	As arrival should be personalized guests should have a personalized checkout, to encourage feedback.
	Email after checking out.

	Asking for review.
	Answering to review.
	Personalized answers.

(Source: Own Edit)

I37 was rephrased as We are proactive in encouraging feedback, the guest is invited to interact with us.

Based on the suggestions of this expert, for I94 We send out a guest satisfaction survey after the guest checked out, was completed with the following comment: for instance Medallia.

5.4.5. Service Phase

In the case of Stay phase 4 experts were asked about the items. These phases included items from I16-I23 and I40 to I58 including 27 items in this questionnaire (**55. Appendix**).

I19 (The guest can choose what kind of bed/Matras they want in their room), I41 Guests are walked to the guestroom after check -in), I42 (We place different welcome gifts in the guestroom (to all guest)), I48 (We make sure that the chosen room is comfortable for the guest), I52 (The hotel staff helps with the luggage) and I53 (Our staff gives authentic smiles all the time) have previously been excluded.

For I16, (We place an greeting card with a hand-written message and the guest's name in the room) - two of the experts have highlighted that they only put cards to the VIP rooms, therefore this indicator will be modified accordingly.

In the case of I45, (We pay attention to the special requirements of our guests while staying in a hotel.) it was an important additional question if the behaviour is encouraged by management or not.

For I46, (We respond immediately to all guest requests.) one expert mentioned that responding to all guest requests can only happen within reason, while another deleted it. However as deleting the indicator was suggested by only one expert, it did not receive the needed threshold and was not deleted.

The other items have not reached the threshold to be deleted as there was only one expert who wanted to delete them. The final list includes 21 items (**56. Appendix**). Recommendation to add items are in **18. Table**.

18. Table - Service Period Interviewee - Suggestion

Interviewee	Suggestion
Service-period 1.	Is there employee training?
	Is there a reward system for the employee?
	Is there a chance to ask for a completely empty minibar?
	Do the employee take the initiative and be proactive in getting to know the guest?
	Language knowledge of the sum of the employee.

	Is there a function on the TV that writes a welcome message with the guest's name?
	Knowledge of the city/ area given by the hotel.
Service -period 2.	Important to hire staff that are interested in service.
	How is the work environment?
	Is there encouragement from the hotel?
	Is the management open to supporting (financially, time for time etc.) the staff when they are doing an exemplary job?
	Is there service training?
	Knowledge of the city/ area given by the hotel.
Service -period 3.	Recognizing when a guest needs more personal communication.
Service -period 4.	Guest can request/choose to have his/her favourite newspaper delivered in the room.
	Guest will see their names on the television automatically with a welcome message once they get to the room.
	Guest Preferences and relevant Guest Experience Management information are collected and updated continuously in an internal system (with different methods) to have an up-to-date list about any guests' preferences -> easier to prepare for the arrival and make the stay more personalized.
	Fast/express check-in is enabled for multiple returning guests (no need to show ID/passport again, only if those data changed since the last stay) as well as express check-out.

(Source: Own Edit)

As training and reward systems were mentioned additionally both in the functional interviews and here I54, I55 and I56 got the additional comment, that the behaviour encouraged and rewarded.

Employee training and rewarding, just like data collection were already added previously.

- I95 our employees are proactive and take the initiative to get to know the guest better.
- I96 We have and use the function on the TV to display the guest's name and welcome the guest into the room.
- I97 We aim to choose an employee who is motivated in guest service.
- I98 Fast check-out and check-in are granted for regulars.

After removing items from the list, the list shrank however with the additional suggested Items we have 88 items in total (**57. Appendix**).

5.5. Fifth Step of building the scoring model Second Interviews

In this second phase of interviews the selection criteria of the interviewees included either at least 10 years of hospitality experience or that they are currently working as a general manager. General Managers have a great overview of the entire hotel process. The author asked two

interviewees from the first round to be part of the second phase of the expert interview given their diverse and long experience with hotels (**19. Table**). One was Ákos Gyenes, who has worked 10 years in Accor, Ramada in a managerial position and as a founder of RESnWEB net hotel booking kft. he is in touch with hotels and working with them as a coach. The second one was Kitti Gondos (29:12), as she has also 10 – 12 years' experience with the hospitality industry and worked as a Rooms Division Manager. The other interviewees are currently working as General managers.

19. Table - Participants of the first Interview

Name	Position	Background	Duration
Horváth Tibor	Park Inn Zalakaros**** General Manager	He started in the hospitality industry in 1995. Was part of the opening of a new hotel and has worked for a short time in a travel agency. Since 2001 he has worked strictly in hotels as a restaurant manager, spa manager, and sales and marketing manager pre-opening to a Ramada in Balatonalmádi. He was the sales manager in a Hungest hotel in Austria and then he become a hotel manager in the chain. he is in Park Inn Zalakaros since 2017 as General manager.	54:36
Sívó Roland	Aquaworld Resort Budapest**** General Manager	While studying as an agricultural economist in Gödöllő, while he was working at the housekeeping department followed by the F&B FnB department. He had studied at the Budapest Business School tourism studies during which he worked in Guest houses He spent one year abroad as an intern working as a bell boy, waiter and a cleaner. He then worked first as a night receptionist and then a receptionist at an Accor hotel. After that, he went to a five-star golf hotel in Gödöllő, where he moved from receptionist to assistant front office manager to front office manager. (3 years) Velence resort and spa (180 rooms) front office manager, since its pre-opening phase. He then went to an online hotel booking system company where he was the sales and marketing manager for 3 years. Then he started to work as a sales and marketing manager for a newly opening hotel, but then he became General Manager of Hotel Castello Siklós. Then he went back to Velence Resort & Spa as	42:45

		general manager. He stayed for 5 years. He works in Aquaworld Resort Budapest since 2018. He is also a lecturer at Kodolányi János University.	
Juhász Gábor	Tihany Aquilo Hotel Panoráma*** General Manager	He worked in 2006 in London in the hospitality industry and he has been the General manager of Tihany Aquilo Hotel Panoráma for 16 years.	01:07:19
Csere András	Caramell Premium Resort Superior**** General Manager	Ha had worked in restaurants since he was 14 till 2001. He went to college in 2004 where he studied hospitality, and he worked as a hotel manager since 2011. Since 2016 he is working in Caramell Premium Resort Superior.	53:38
Németh Marietta	Lotus Therme Hotel & Spa***** Operation Manager	Started her traineeship in 2009. She has a master's in tourism management. In the past 10 years she has worked in 2 hotels as General manager assistant and operational manager. She has worked in the past 5 years in Lotus Therme Hotel & Spa***** as Operational Manager.	37:38
Parádi Ádám	Danubius Hotel Marina and Danubius Hotel Annabella General Manager	In 2007 he had worked in the Hilton Vienna as a trainee, and then he worked in Housekeeping and FnB. In the following years, he worked in the training program of the Danubius Hotel group and gained experience in every department. He then returned to the Hilton chain in FnB. He changed to marketing and then worked in Danubius Hotel Gellért as an operational, marketing and project manager. Since 2011 he has worked in Danubius Hotel Marina as General manager and since 2019 ha is also the General manager of Danubius Hotel Annabella.	43:35
Fazekas Eufrozina	Keszthely Hotel Helikon****superior General Manager	During high school she had worked in FnB bar and kitchen and as a housemaid. After studying at university, she started to work at the reception, 10 years ago. She became a front office manager in 2015, she worked 5 years in the ETO hotel **** Győr, and she started working in 2021 in Keszthely Hotel Helikon****superior as general manager.	45:58

Kovács Krisztina	Bonvital Wellness & Gastro Hotel****superior General Manager	She had worked in Bükk Radisson SAS from 2007. Before that, she had worked in tourism but not in hospitality. After Radison SAS in 2014 she worked in Spirit Hotel Thermal Spa*****superior in Sárvár as Sales and Marketing manager. Currently, she is working in Hévíz Bon Vitál **** as General Manager, since 2018.	41:16

(Source: Own Edit)

In the second round of interviews, all indicators in 22. Table were presented. The interviewees were conducted both in person and online, using Zoom and Google Meet, using purposive sampling. The participating General Managers were either whom I already had an established relationship with, or they were also contacted via cold calling or based on the recommendation of other interviews. The second round of expert interviews had multiple purposes.

- Firstly, the General Managers, who oversee the entire hotel processes, needed to give feedback if they understood the items the same way they were intended based on the literature.
- Secondly, they could recommend leaving out or adding additional items.
- Thirdly, they could recommend a question order more suitable for the managers' practical mindset than the scientific survey structure.

The criteria to leave out an indicator remained the same. If two or more experts agreed that the indicator is not important to measure the tailor-made service level,

Twelve indicators were mentioned during the interviews, but I5, I16a, I16b, I40, I49, I53, I59, I73, I75 and I85 were only suggested once, therefore these indicators were not removed. I80 was mentioned by two experts and I83 was suggested by three experts to be left out. Hence, I80 and I83 were left out.

- I80 - Our employee takes time (and has time) to get to know the guest personally.
- I83 - Our employee aims to treat the guest as a friend rather than a customer.

The interviews suggested adding a final indicator regarding the booking engine's capability to enable customers to customize their booking. Therefore, the final item had been added to the scale. They were also asked if they agree on which stage certain items belong to, meaning if they would also assign the indicator to the functional or the technical stage.

Indicators on the technical stage either exist in the hotel or not. These are the tangible elements, like a website, a hotel application etc. that the hotel either uses or not. Therefore, these indicators will have a biometric measurement. 0-1

Indicators on the functional phase are things that are done for the guest, therefore there is a degree of it. If a hotel does not use the service technique the indicator suggests, it is a 0 and if they are performing it to the highest degree (according to their self-evaluation, it is a 5).

I99- The booking engine has functions that allow users to customize their bookings (according to their preferences) when booking a room. (For example, what kind of pillow do you want, what kind of massage do you want, other services.)]

20. Table - Indicator Number after Step Five

Touchpoint	Original number of Items based on Literature	After purification	After the two rounds of expert interviews
Technical stage – Pre-Arrival phase - Website	25	15	11
Functional Stage - Pre-Arrival phase - prearrival communication	11	6	8
Arrival	7	3	4
In Room service and Hotel amenities	17	15	15
Check out	3	2	2
Functional Stage – Post-Service phase - Post communication	5	4	5
Stay period	15	7	4
Functional stage only	53	28	30
Technical stage only	11	6	8
Total	147	86	85

(Source: Own Edit)

In the final scale 19 items are specifically Pre-Arrival phase, 22 Service phase, 5 post- service phases (**20. Table**) while looking at the stages, 26 items focus on the technical stage of service, while 59 focuses on the functional part of service (**21. Table**).

21. Table - Final Indicator List

Place of Item	Indicator ID	Indicator
Technical, Pre-Arrival, Website	I1	Our website has features that personalized for the users' preferences (for instance based on segments they can choose to browse between offers to their specific needs or interests.)
Technical, Pre-Arrival, Website	I11	Our website automatically collects data (such as IP address, pages viewed, access time) but cannot identify the guest as an individual and offers goods or services based on that.

Technical, Pre-Arrival, Website	I13	Our hotel makes sure that we appear as a personalized search result through search engine optimization.
Technical, Pre-Arrival, Website	I4a	The website has a Chat service operated by a chatbot.
Technical, Pre-Arrival, Website	I4b	The website has a Chat service operated by an employee.
Technical, Pre-Arrival, Website	I5	The website has features for the visually impaired.
Technical, Pre-Arrival, Website	I6	Our website automorphically fits the device (e.g. computer, mobile phone etc.), browser (e.g. Netscape, Internet explorer) and operating system (e.g. Windows, Unix) that the guest uses.
Technical, Pre-Arrival, Website	I7	We have a hotel App
Technical, Pre-Arrival, Website	I8	The hotel app can provide the guest with personalized services, products, or information tailored to their preferences or personal interests.
Technical, Pre-Arrival, Website	I9	The website acquires the specific needs of the guest and shows service recommendations based on their personal needs.
Technical, Pre-Arrival, Website	I99	The booking engine has functions that allow users to customize their bookings (according to their preferences) when booking a room. (For example, what kind of pillow do you want, what kind of massage do you want, other services.)
Technical, Arrival	I96	We have and use the function on the TV to display the guest's name and welcome the guest into the room.
Technical Stage - Service Period	I17	It is possible for the guest to ask for minor changes regarding the room during their stay.
Technical Stage - Service Period	I18	The guest can choose a specific temperature they want their room to be. (And the hotel will even set the room to that temperature)
Technical Stage - Service Period	I20	The guest can choose the style and the type of the bedding
Technical Stage - Service Period	I21	The guest can choose what kind of pillow they want.
Technical Stage - Service Period	I22	The guest can choose to have no alcohol in their minibar
Technical Stage - Service Period	I23	We put the favourite drink of the guest in the room even if that is not the brand the hotel normally works with

Technical	I27	Our hotel application is similar to what most customers use in their everyday lives.
Technical	I29	The hotel app can provide the guest with personalized services, products, or information tailored to their specific hotel stay
Technical	I87	The hotel does micro-segmentation.
Technical	I88	We have an employee or an outsider company to analyze our guest data and previous statistics.
Technical	I89	The hotel has specific gifts or budget to use when the employee thinks a guest should get a gift (birthday, honeymoon special occasion, etc.)
Technical	I91	Providing personalized service is encouraged and rewarded.
Technical	I92	The hotel sends out segment-based newsletters.
Technical	I93	We store and update guest data frequently (even before the check-in or after the check-out) that we use during re-marketing campaigns.
Service Perioud – Functional Stage	I52	The hotel staff helps with the luggage
Service Perioud – Functional Stage	I54	We encourage the employees to display personal warmth in their behaviour.
Service Perioud – Functional Stage	I55	We encourage the employees to be approachable.
Service Perioud – Functional Stage	I56	We encourage the employees to make eye contact with the guest during a conversation.
Service Perioud – Functional Stage	I57	We are doing everything to understand the special requirements of the guest while staying at the hotel.
Functional, Pre-arrival, communication	I14	Our hotel makes sure that we provide information and products according to our guests' preferences.
Functional, Pre-arrival, communication	I15	We aim to advertise our hotel in a way that feels personalized for our potential guests, even based on previous searches or interests.

Functional, Pre-arrival, communication	I30	Communication by our hotel brand provides our customers with product and service recommendations that are tailor-made for them.
Functional, Pre-arrival, communication	I31	We recommend products and services that are personalized to our customer's interests based on our communication with that customer. (Before their arrival at the hotel).
Functional, Pre-arrival, communication	I32	We recommend products and services that are personalized to our customer's interests based on the basis of preferences of similar-minded consumers. (Before their arrival at the hotel).
Functional, Pre-arrival, communication	I33	We aim to use personalized communication so our brand can make the guest feel that they are a unique customer.
Functional, Pre-arrival, communication	I34	We aim to give personalized recommendations in a timely way.
Functional, Pre-arrival, communication	I35	We aim to adjust our communication style (either on phone on in written channels) based on the guest type and characteristics (age, gender, interest, etc).
Functional, Arrival	I16a	We place introduction greeting card with a printed message and guests name in the room.
Functional, Arrival	I16b	We place introduction greeting card with a hand-written message and guests name in the room.
Functional, Service phase,checkout	I50	We give a warm "goodbye" after checking out at the counter.
Functional, Service phase,checkout	I51	Based on a previous conversation with the guest we are recommending them with activities for the last day.
Functional, Service phase, In - room	I43	We place different welcome gifts in the guestroom (of VIP guest).
Functional, Service phase, In - room	I44	The hotel operates working hours to be appropriate to all its customers.
Functional, Service phase, In - room	I45	We pay attention to the special requirements of our guests while staying in a hotel.

Functional, Service phase, In - room	I46	We respond immediately to all guest requests.
Functional, Service phase, In - room	I47	We make sure, that there are appropriate meals for all guest (religion, allergies, dietary restrictions).
Functional, Service phase, In - room	I49	We make sure that all aspects of the room are in good condition and suitable for the guest.
Functional, Service phase, Arrival	I40	We aim to provide an authentic warm welcome to the guest
Functional, Post-service, Post communication	I36	Our hotel adjusts the response to the specific problem of the guest.
Functional, Post-service, Post communication	I37	We are proactive in encouraging feedback, the guest is invited to interact with us.
Functional, Post-service, Post communication	I38	Our hotel / employee knows or aims to find exactly to whose review it responds
Functional, Post-service, Post communication	I39	Our hotel / employee gives an individual response to all guest reviews and comments.
Functional, Post-service, Post communication	I94	We send out guest satisfaction surveys after the guest checked out. For instance, Medallia.
Functional	I59	Our employee changes their behaviour to suit the needs of the guest.
Functional	I60	Our employee changes their behaviour to suit the needs of the situation.
Functional	I61	The employee is empathetic towards the guest when they have a problem.
Functional	I62	The employee responds immediately to guest requests.

Functional	I63	When our employee promise to do something by a certain time, they do so.
Functional	I64	We make sure that our information is accurate and update our records frequently. (During the stay)
Functional	I65	Our employee is talented and displays a natural expertise in case of all requests.
Functional	I66	Our employee is efficient.
Functional	I67	Our employee aims to exceed guest expectations
Functional	I68	Our employee / hotel personalizes goods and services that are based on information that the guest has voluntarily given out (such as age range, salary range, Zip Code) but cannot identify them as an individual.
Functional	I69	Our employee / hotel personalizes goods and services that are based on information that the guest gave voluntarily and can identify them as an individual (such as name, shipping address, card information).
Functional	I70	Our employee can customize the service offering to the needs of the customer. (Example: food allergies etc)
Functional	I71	Our employee / hotel makes sure to take the time and understand the specific demands
Functional	I72	During the stay Our employee / hotel offers customers products and services that satisfy their specific needs
Functional	I73	Our employee / hotel anticipates what the guest wants before they ask.
Functional	I74	Our employee / hotel recommends products on the basis of the preferences of similar-minded consumers.
Functional	I75	We make sure that the hospitable behaviour from our employees seems to be motivated by genuine needs to please and care for their guests as an extension of their characteristics.
Functional	I76	Our hotel / employee considers the best interest of the guest our / their top priority.
Functional	I77	Our hotel / our employee aims to make the guest feel like an important person.
Functional	I78	Our employee always tries to be helpful in solving guests' problems, even coming up with unique solutions.
Functional	I79	Our employee aims to give guests individual attention while they are in the hotel.

Functional	I81	The hotel employee treats guests with full respect.
Functional	I82	Our employees are polite with all guests.
Functional	I84	Our employee is friendly with all guests.
Functional	I85	It is important that the guest feels that building a good relationship rather than making money seemed to be the most important drive of the hotel.
Functional	I86	We allow / encourage our employee to move to a familiar (informal) talk with the guest who needs that
Functional	I90	There are employee trainings for the employee so they can provide the level of quality service the hotel aims to provide
Functional	I95	Our employees are proactive and take the initiative to get to know the guest better.
Functional	I97	We aim to choose employees who are motivated in guest service.
Functional	I98	Fast check-out and check-in are granted for regulars.

(Source: Own Edit)

The CV for the individual indicators are mostly heterogenous, but when merged into stages and phases, the importance of the indicators were within the 10% homogenous marker. The Pre-arrival and the Post-Service phases are around 10% and while the median of the Pre-arrival phase is 8, the Modus is 10 in both cases, which also shows that more than not they have agreed (**22. Table**).

22. Table - CV of the Phases

	CV%	Median	Modus
Pre-arrival phase	11,05	8	10
Service-phase	8,14	9,5	10
Post-service phase	11,76	10	10

(Source: Own Edit)

When looking at the stages, both the technological and functional stage (**23. Table**), are below 10%.

23. Table - CV of Stages

	CV%	Median	Modus
Technological stage	8,4	8	10
Functional stage	9,67	9,5	10

(Source: Own Edit)

These results suggest that all together the experts agreed in the importance of concepts, such as focusing on technological stage items, or focusing on the service phase, but they disagreed in the in specific scores.

5.6. Value of the scale

The tailor-made service scale has two types of values. The technical stage items have binary value as the indicators included on this stage are either present in the hotel or not. Therefore, these will be measured on a 0-1 scale. There are 26 items on the technical sale which means that the total value of the technical scale items is 26.

The functional stage items can be measured on an ordinal scale. A five point Likert-type scale was used, as it is often used in measurement regarding service quality (Bouranta et al., 2009) and hotel research, (for example: (Ariffin, 2013; Babakus and Mangold, 1992; Hayes, 1992; Lalicic and Weismayer, 2017; Yadegaridehkordi et al., 2018)) The five-point scale could be clearer (Babakus and Mangold, 1992; Hayes, 1992), and according to Prentice et al., (1998), it is more appropriate scale for European surveys. A five point Likert-type scale was used in Babakus and Mangold (1992) to increase the response rate while reducing respondents' "frustration level". According to Krosnick 1996 Courtenay 89, a mid-point Likert scale can increase scale reliability, while Roberts et al. 201 suggest that a midpoint should be used when respondents are familiar with the topic. As General managers are experts of hotel service evaluation, a five point scale is appropriate, however as it is possible that certain indicators are not present in the hotel even in the case of functional stage, the sale starts at 0 – 'we do not do it at all' till 5 – 'we do it in every situation'. As there are 59 indicators on this stage, the hotels could reach a maximum of 295 points on the functional stage.

Therefore, a hotels' tailor-made service score can be anywhere from 0 – 321.

5.7. Conclusion

In this subsection the entire process of scale development was presented. After the introduction of the scale development and thorough refining, the professional interviewees and their suggestions were introduced. Using the self-developed customer journey model, a tailor-made service scale has been developed, that, in agreement with the hotel and service professionals, is adequate to measure not only the overall level of individualization of service, but it is also sufficient to measure the service stages and phases separately.

Thesis 1.

Based on the research it is possible to create a system that measures the tailor-made service level of the hotels.

6. Quantitative research

This chapter introduces the process of collecting the data and its analyses. First, the population will be defined, and then the questionnaire structure will be introduced.

Quantitative research, in contrast to qualitative research, deals with numerical data or can be converted into numbers (Sheard, 2018). After creating the measurement scale, the next step is distributing it among hotels. First, the scale was added to a questionnaire with questions about the hotels' characteristics and then sent to the HHRA hotel members. With the questionnaire, the General Managers' self-analysis about their service was collected in a structured and standardised way (Majoros, 2011; Mitev, 2019).

6.1.Data collection

To be able to distribute the questionnaire, it was essential to determine a group of hotels which could be analysed. As presented in Chapter 3.4.2., the Hungarian Hotels and Restaurant association consisted of 458 hotel members in the summer and autumn of 2022.The HHRA was used as the database and population of Hungarion hotels because based on the Ksh data, it is uncertain how many hotels there are exactly in Hungary, and there is no database available to the public which would contain all hotel establishments. The HHRA however have hotel members, that beseem the definition of hotel, and have an openly available database. As mentioned in the hotels and hospitality subsection, Hungarian Tourism Quality Certification Body (https://szallashelyminosites.hu/) started the process where all Hungarian hotel establishment get a new star rating based on a uniform (national) quality system at 1. January 2022 and this process was not finished by the end of 2022. Therefore, some hotels were still un-assigned during the data collection period of this research.

The questionnaire was converted into an online survey with the help of LimeSurvey and was sent out via email. First, through the help of two of the interviewees, the president of the HHRA agreed to help in the distribution of the survey. After inspecting the survey the HHRA sent out the survey on the 3rd of October, 2022, endorsing the research. After that, using the HHRA database, a reminder email was sent out weekly. The region presidents or vice presidents were connected directly via email and/or phone. The East HHRA region, the Great Hungarian Plain region, the South Transdanubia region and the Budapest region presidents and vice-presidents personally forwarded the survey to the regional members.
The *MORGENS* Design Kft, the TouchgameTable and the Previo kft hotel software have shared the survey with their HHRA member clients. In addition, the regional president of the West-Hungarian Hotel and Restaurant Association and the regio president of the Balaton region association granted an invitation to the regional meetings, where hotel General Managers could be approached in person to get familiar with the research goals. The director of the Danubius hotel group and Accent hotels was also connected.
All hotel members of the North, East, West and South -Transdanubia region were called on the phone registered on the HHRA website.
The last survey was sent out on the 15th of November 2022.

6.2. Questionnaire:

The questionnaire can be divided into two main parts:
− General questions regarding the hotel characteristics: the size, the type, guest type and other hotel characteristics.

This part of the questionnaire includes closed questions that are either multiple choice or scale. There are 4 open questions regarding information about the corresponding hotel representative, the size of the hotel, and postcode number, as part of the general questions. Among the closed questions, simpler yes/no questions and ranking questions were the most common. There are three questions focusing on the importance of tailor-made service for the hotel or the hotel manager. There three questions were on a 7-point Likert scale. A 7 point scale was used as the original Likert scale, developed (1932) by Rensis Likert was a 7 point scale.

− Tailor-made service scale: this part of the questionnaire aims to measure the extent to which the guest journey touchpoints are tailor-made. The previously presented measurement system was imported into the survey.

The tailor-made service scale as presented in the previous subsection, has two measurement options a 0-1 and a 0-5 scale or implementing it into the, yes/no and a 0-5 scale. The demographic questions of the questionnaire survey can be seen in **58. Appendix**.

6.3.Results

After cleaning the data, 105 hotels remained in the sample, which, according to the HHRA feedback, is within the range of the "member hotels' willingness to respond" (90-120 fillings) to surveys done by the HHRA.
As the National Quality rating is under evaluation, the collected data can only be compared to the dataset from October 2022. Comparing the survey results to the population, I can state, that 22,93% of the HHRA members participated in the survey.

24. Table - Participants by HHRA Regions

	Not assigned	2	2 sup.	3	3 sup.	4	4 sup.	5	5 sup.	All	%
Western Region	**2**	**1**		**2**	**2**	**11**	**2**		**1**	**21**	**36,84**
South Transdanubia Region			1	2		1	1			**4**	**13,79**
Northern Region	**1**			5	4	13	5	1		**29**	**36,25**
Eastern Region				2		4	4	3	1	**14**	**8,81**
Great Hungarian plain		1		3	1	8	1			**14**	**28,57**
Balaton Region	**1**	3		6	1	1	1			**13**	**27,66**
Budapest Region				1	1	8				**10**	**27,03**
All	**4**	**5**	**1**	**21**	**9**	**46**	**14**	**4**	**2**	**105**	**22,93**
%	**2,31**	**62,50**	**100,0**	**26,92**	**34,62**	**36,80**	**42,42**	**44,44**	**100,0**	**22,93**	

(Source: Own Edit)

Most of the hotels in HHRA are located in the Budapest region which consists of the hotels of the city of Budapest (N=131) and surroundings (N=28). This region was the least responsive as 8,81% agreed to participate in the survey (**24. Table**).

When divided based on geographical location, the majority of hotels are located on the west side of Hungary (N=166). 32,53% filled out the survey from this area of the country, while 27,81% from the east side of Hungary (**25. Table**).

25. Table - Participants by Greater Regions

	All hotels	Participation hotels	% of participants
West region	166	54	32,53%
Budapest region	159	14	8,81%
East region	133	37	27,81%

(Source: Own Edit)

According to Finn et al. (2000), the response rate can be accepted between 10-40% in the case of surveys, and as the cumulative results (N=105) are close to 23% therefore, acceptable.

26. Table - Hotel Chain Membership

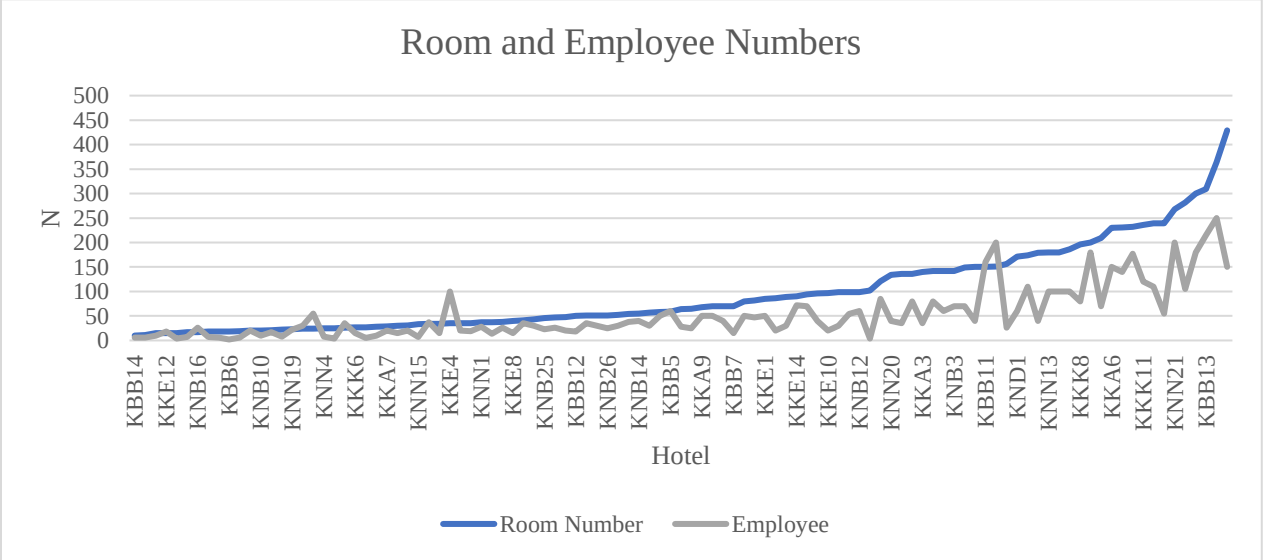
		Region							Total
		Great Hungarian Plain	Balaton	Budapest	South Transdanubia	North	East	West	
Hotel Chain Member	Yes	4	3	10	0	5	4	5	31
	No	6	26	4	4	9	9	16	74
Total		10	29	14	4	14	13	21	105

(Source: Own Edit)

Among the participants, 31 hotels are part of a hotel chain, most of them from the Budapest region, which has significantly more chain members then the other regions (**26. Table**; p=.003)

The hotel size is between 10 – 429 while the employees working in the establishments (in grey on **37. Figure**) are from 2- 250 persons.

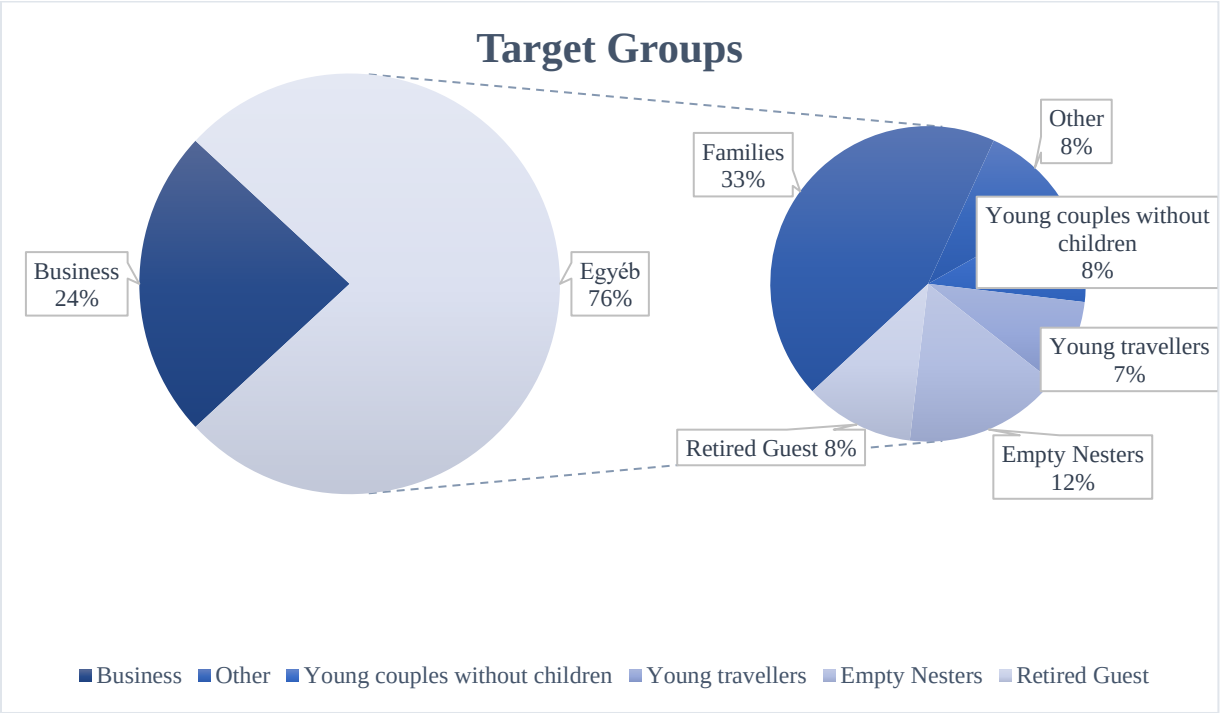
37. Figure - Room and Employee Numbers



(Source: Own Edit)

Most hotels target leisure guests (76%), and the most common leisure guests as primary target group are families. More hotels have families as their primary target group (33%) then business guests (24%). Young people 7%, young couples without children and retired guests are around 8-8%, and empty nesters representing 12% of all (**38. Figure**).

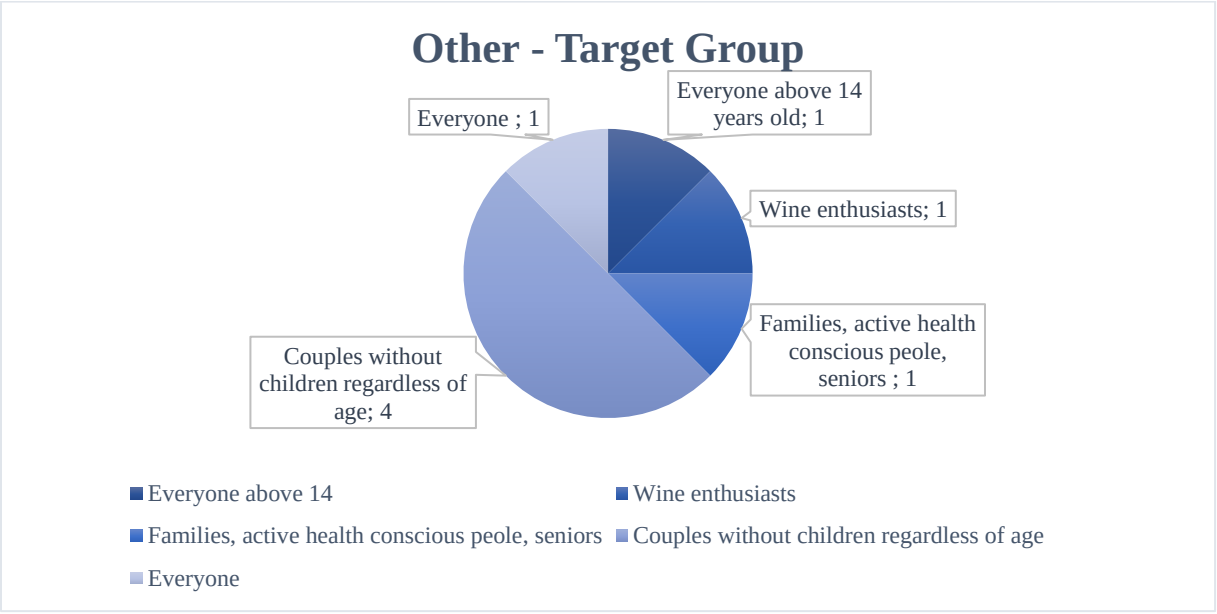
38. Figure - Target Groups



(Source: Own Edit)

From the participants 8% choose other and specified their target group as can be seen on **39. Figure**. The most common comment was couples, without children regardless the age. When cumulating all hotels with couples without children, they represent 24% or the population. Therefore, these three target groups are the most common, families, businesses and couples regardless the age.

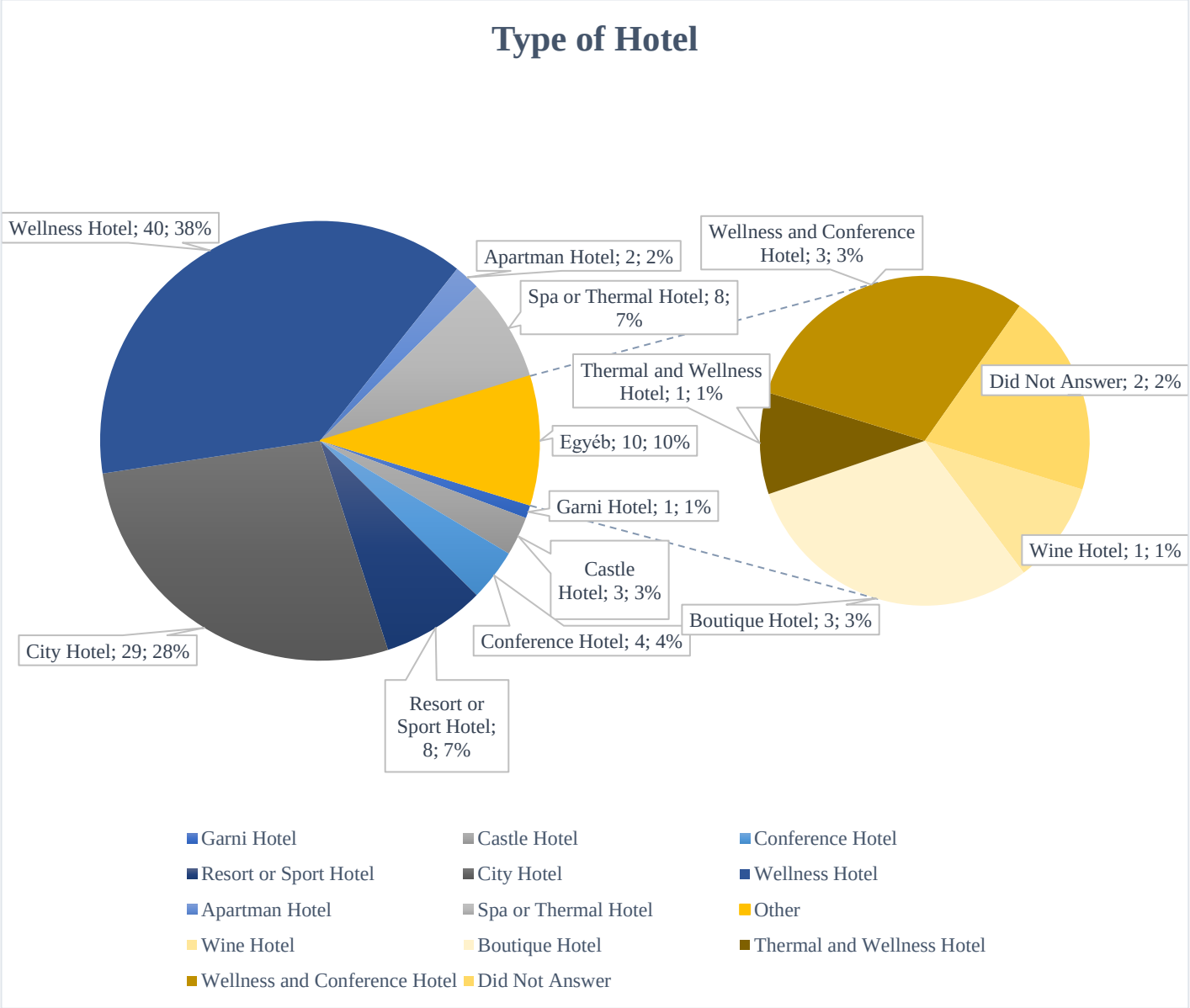
39. Figure - Other - Target Group



(Source: Own Edit)

Most of the participants are Wellness (38%) and City hotels (28%) (**40. Figure**).

40. Figure - Hotel Types

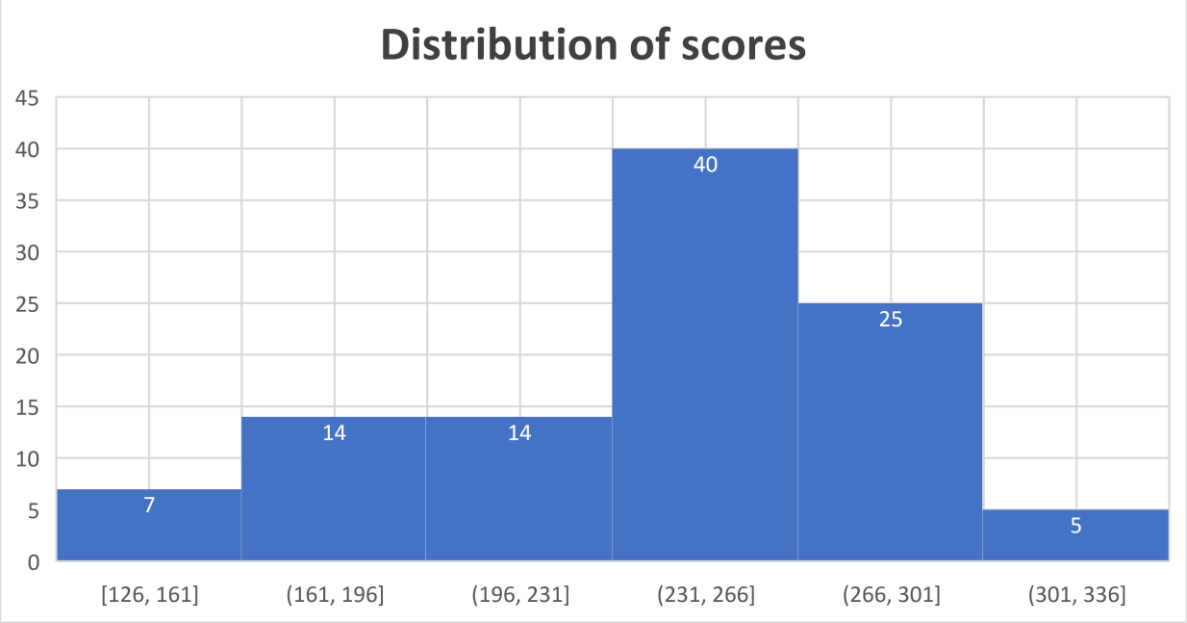


(Source: Own Edit)

The total score for the tailor-made survey is 321, and the hotels participating in the survey reached between 126 – 321. Only one hotel has reached the maximum possible score.

23 hotels scored under 200 and only 5 cored above 300 (**41. Figure**).

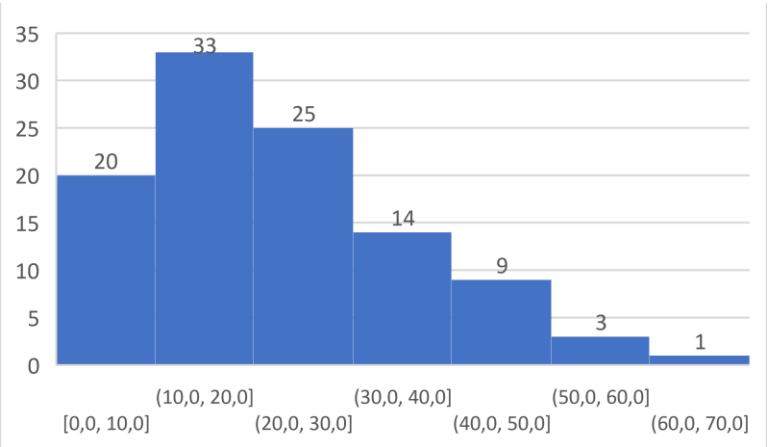
41. Figure - distribution of the Hotel Tailor-made Service Scores

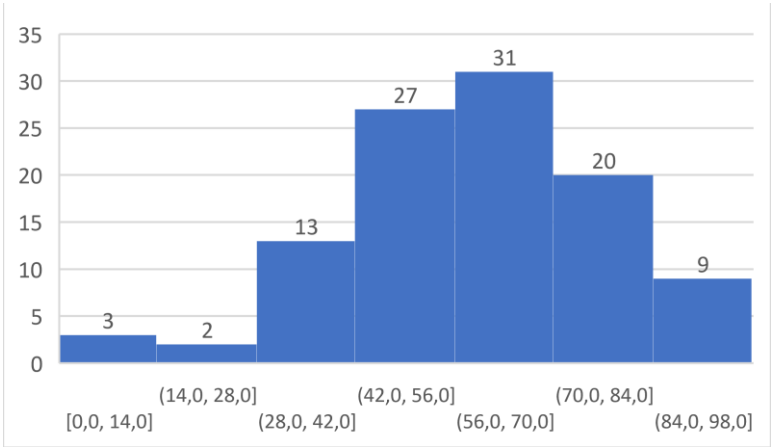


(Source: Own Edit)

Technical stage measures up to a maximum 26 points while the functional stage is 295. The size of the GAP expressed in percentage is smaller in case of the functional Items score that in the Technical Items score (**42. Figure**).

42. Figure - Functional and Technical GAP





(Source: Own Edit)

Therefore, most hotels scored higher in the functional sub-score that in the technical-sub score.

6.4. Hungarian hotels can be grouped in different clusters according to the tailor-made service. (Hypothesis 2) and Tailor-made service indicators can be grouped into different clusters based on the performance of the hotel. (Hypothesis 3)

6.4.1. Testing hypothesis 2 and 3

To test hypothesis 2 and hypothesis 3, Bi-cluster analyses was performed. Bi-clustering methods are new in the social sciences (Z. T. Kosztyán et al., 2019a), which is a data mining technique that makes the simultaneous clustering of the rows and columns possible. Few publications use bi-clustering algorithms in the social, business and economic (Banász et al., 2023; Kosztyán et al., 2019b) but a new measurement in hospitality and service quality research.

Bi-clustering is variance based; according to Kosztyán et al., (2019a), two types can be differentiated.

"BIC1: Bi-clusters with constant values (in rows and/or columns)
BIC2: Bi-clusters with similar values (on rows and/or columns)"

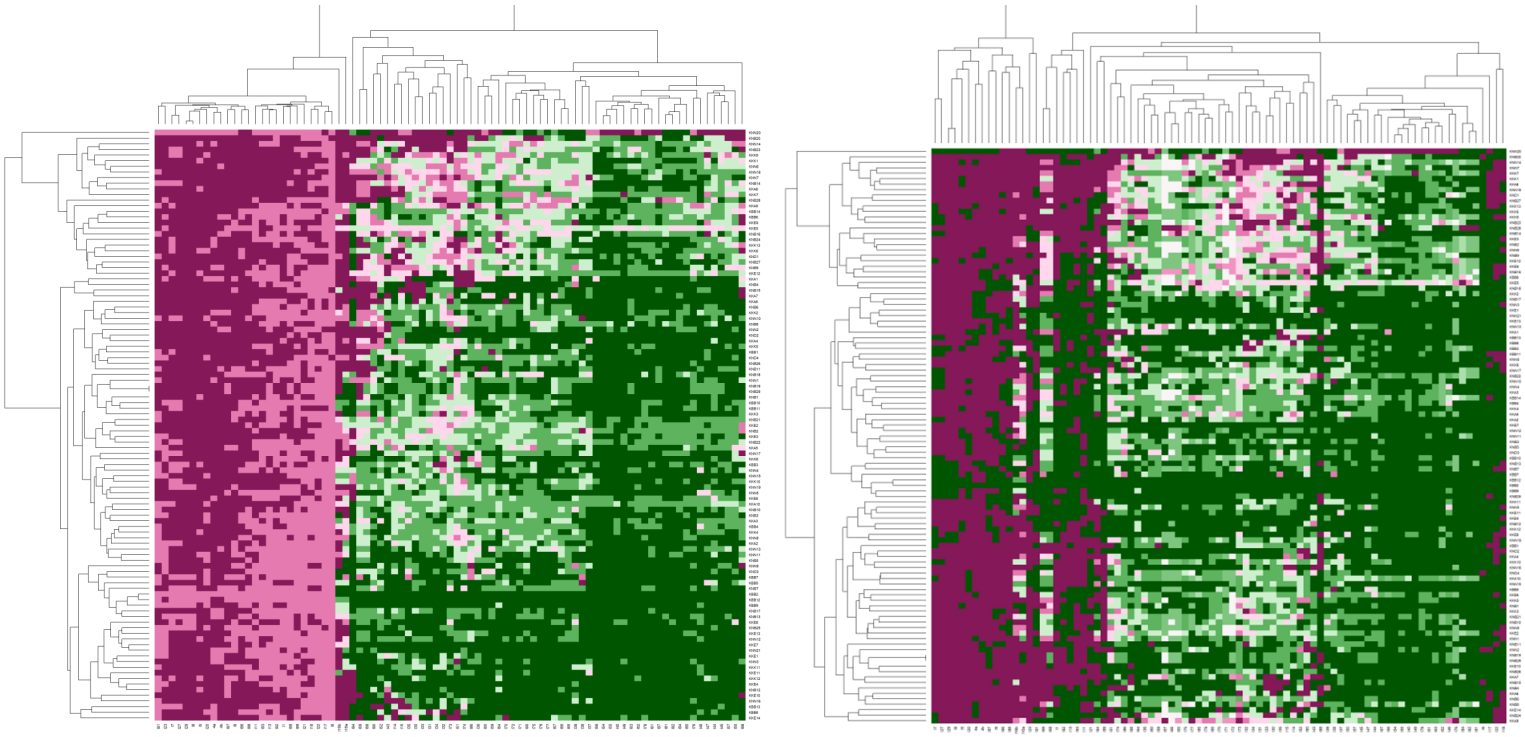
The BIC1-type bi-clustering algorithms simultaneously reorder the rows and columns of the matrix to place similar rows and columns as close together as possible, then find bi-clusters with similar (constant) values. BIC2-type algorithms seek bi-clusters with similar values in the rows and columns. Kosztyán et al., (2019a). Based on the research Kosztyán et al., (2019a.; 2019b.)and Banász et (2023), this research will identify leagues of hotels and tailor-made service indicators simultaneously.

The method will identify three leagues: upper league A, middle league B and lower league C.

For this purpose, two bi-clustering methods are necessary, the iterative Bi-clustering of Genes (iBBiG) (Kosztyán et al., 2019a.) where the algorithm produces bi-clusters, where the cells exceed the threshold (i.e., median) and, Bi-clustering Analysis and Results Exploration (BicARE) where a bi-cluster is created to identify a middle league of overlapping respondents.

For this analysis, R software environment and R Studio integrated development environment were used. The first task is to have an approximate picture of the possible bi-clusters, the seriation of the original data is done, and the plotting of the heat map of the original data (see **43. Figure**) can help to detect the possible bi-clusters. Green cells indicate a lower score for the tailor-made service indicators, and red cells mean higher scores for the tailor-made service indicators. However, as the indicators had two types of scale, 0-1 and 0-5, data had to be normalized. After normalization, the seriation of the data is done, but the heat map shows a similar grouping of indicators.

43. Figure - Bi-cluster Heat Map Before (left) and after (rigt) Normalizing.



(Source: R-Studio Output)

The **43. Figure** shows two bigger homogeneous blocks. The block of the green cells on the right indicates the top league (those hotels that scored high on the tailormade service scale and those indicators that hotels marked high), while the red block indicates the lower league.

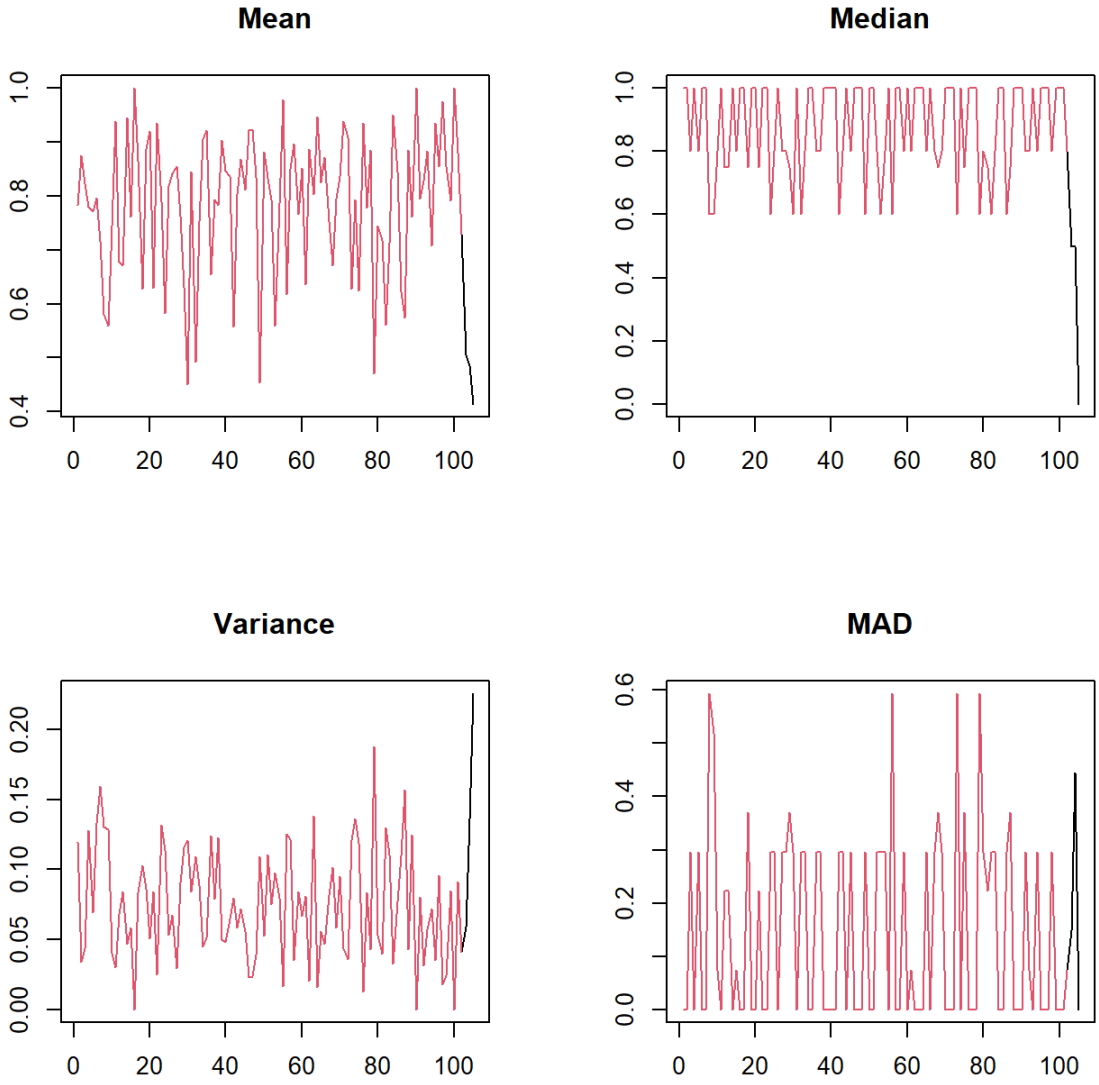
After concluding that there is a possibility to cluster the data, the top and the low leagues have to be analysed separately by applying the iBBiG method to the original normalized data.

6.4.2. Determining the top league – league A

The top leagues will contain those hotels and those indicators that the respondents scored high in. The iBBiG organises the data simultaneously. After determining that the top league has one bi-cluster with 102 rows (hotels) and 65 columns (tailor-made service indicators), an F-test is performed to determine if the cluster is significant. (The detailed results and coding can be found in **58. Appendix**. Both the row and column effects are significant, which means that both the hotels and the tailor-made service indicators are significant. The “cut of point” was 0.5, therefore all indicators above 0.5 (median) were selected into this league. The **44. Figure** shows the difference of the means, medians, variances, and median absolute deviations (MAD) for rows (respondents) between hotels included in the top league and those not. The tailor-made service indicators show the indicators' normalized (0-1) data. The red line indicates those hotels in the top league, while the black line shows the remaining hotels. The hotels in the top league have higher means and medians and have lower variances.

The **44. Figure** shows that most hotels belong to the top league. The same analyses can be performed for the tailor-made service indicators.

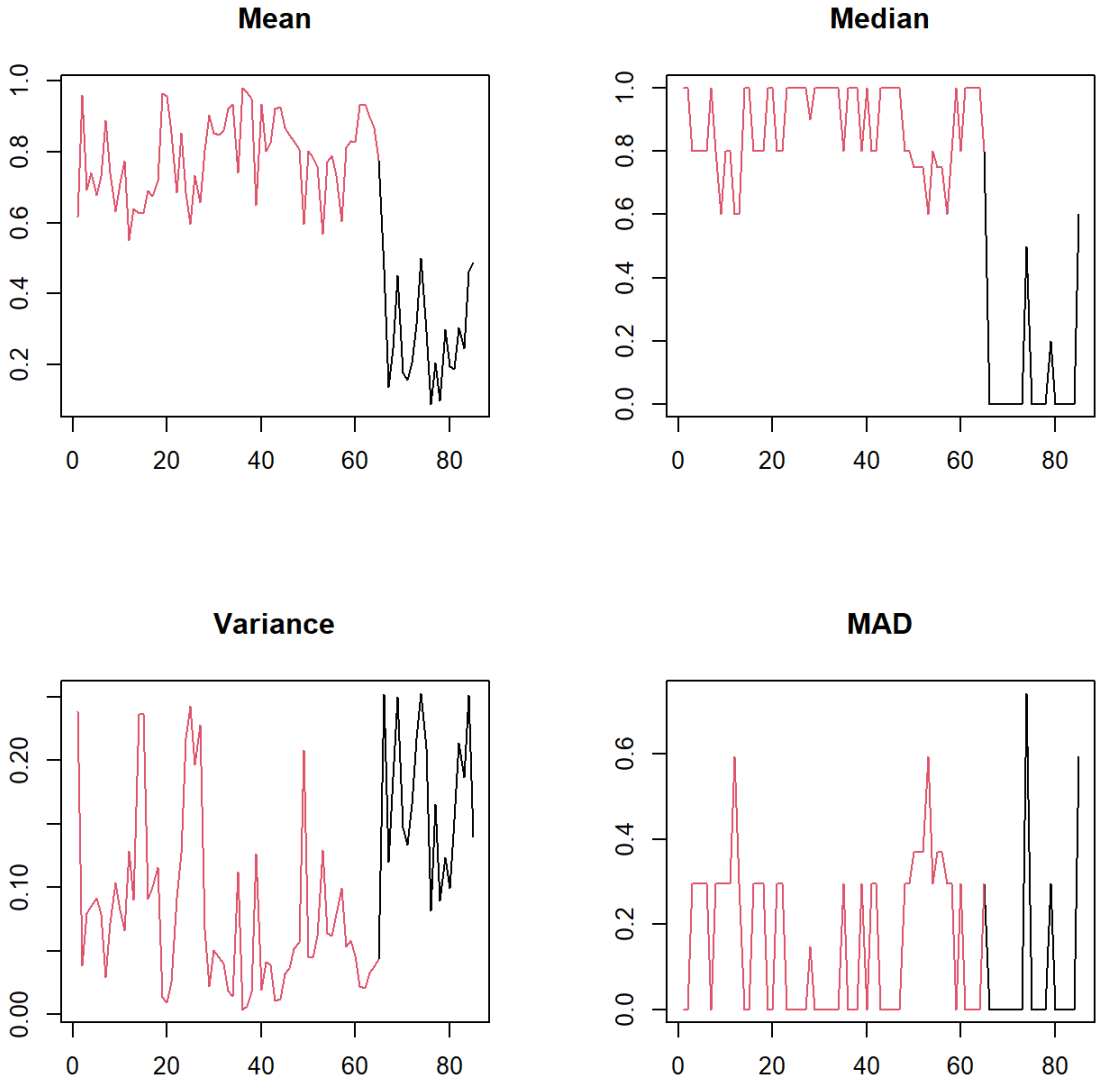
44. Figure - Top Leagues Hotels, Mean, Median, Variance, MAD on τ=0.5



(Source: R-Studio output)

The **45. Figure** shows the differences between the means, medians, variances, and median absolute deviations (MAD) for the tailor-made service indicators. (The horizontal axis shows the tailor-made service indicators, and the vertical axis shows the hotel (0-1) data.) Again, the red line indicates those indicators in the top league, while the black line shows the remaining ones.

45. Figure - Tailor-made Service Indicators Mean, Median, Variance, MAD on τ=0.5

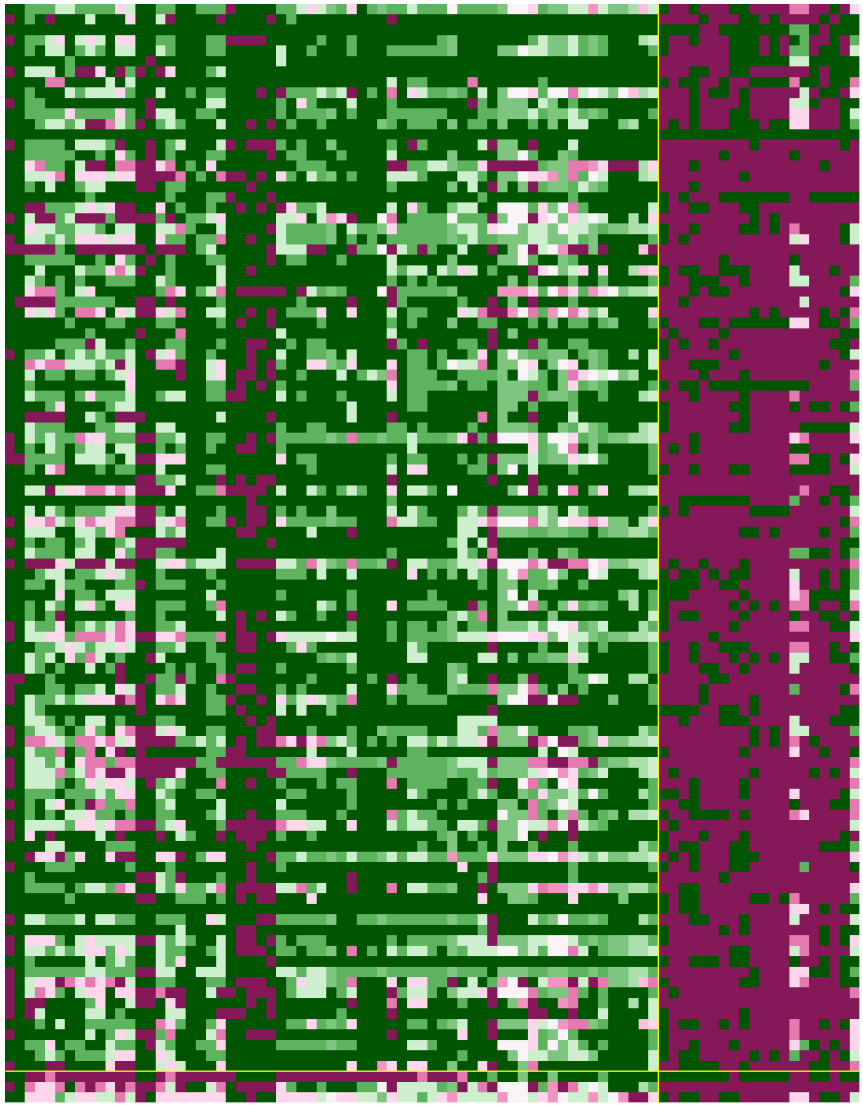


(Source: R-Studio output)

The majority of tailor-made service indicators are in the top league but there are a greater number of indicators that are outside of the top league.

The 46. Tigure shows the heat map of the results of iBBiG on normalized data for the top league of 102 hotels and 65 tailor-made service indicators. The top leagues can be seen in the upper left corner (with a yellow border). To check the stability of the top league, bi-cluster bootstrap is performed, and in all cases, the *bootstrapPvalueRow* and the *bootstrapPvalueCol* are lower than 0.01, therefore the bi-clusters are stable.

46. Figure - Heatmap of Normalized Data – Top League τ=0.5



(Source: R-Studio Output)

The next step is calculating and comparing the result of partial rankings based on the top league's tailor-made service indicators and hotels. Spearman's rank correlation results show a strong positive relationship between the two rankings.

Top league Hotel bi-cluster 0.5 threshold

P- value < 2.2e-16 rho = 0.9982842

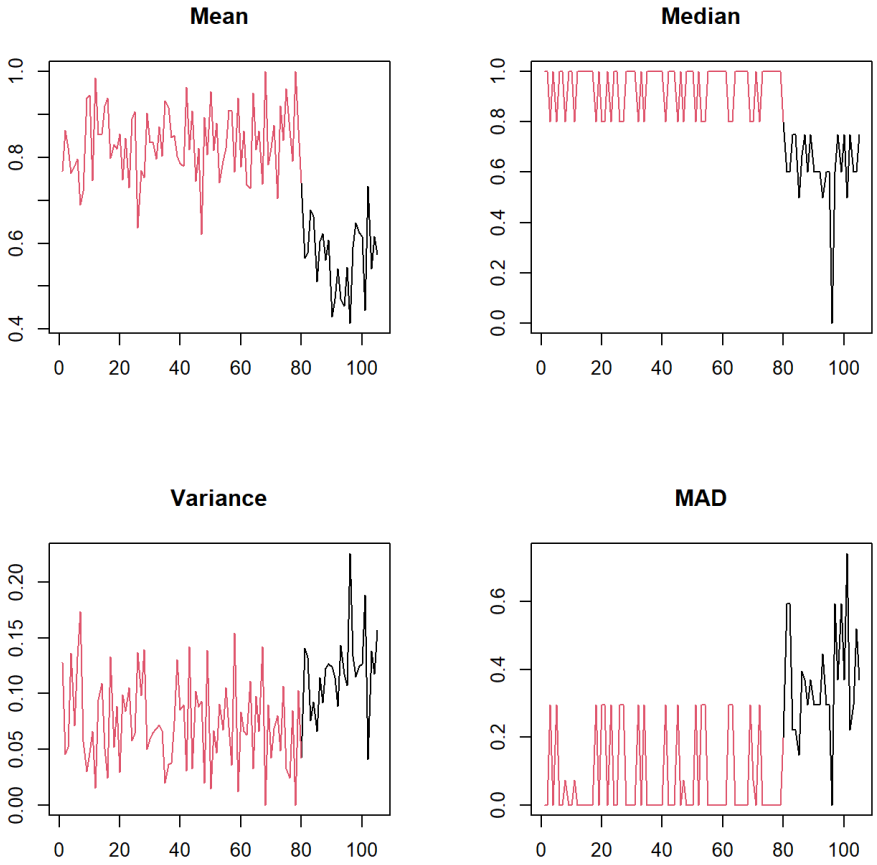
Top league tailor-Made service bi-cluster 0.5 threshold

P-value = 1.505e-15 rho = 0.9834092

Therefore, it can be concluded that the bi-cluster is relevant as there is a high correlation between the league and the original data.

As there are 102 hotels in the top league, applying the same method, the analysis was performed again with a τ=0.75 threshold. When applying stricter selection criteria, 80 Rows and 65 columns can be identified. (The detailed analyses can be found in **59. Appendix**)

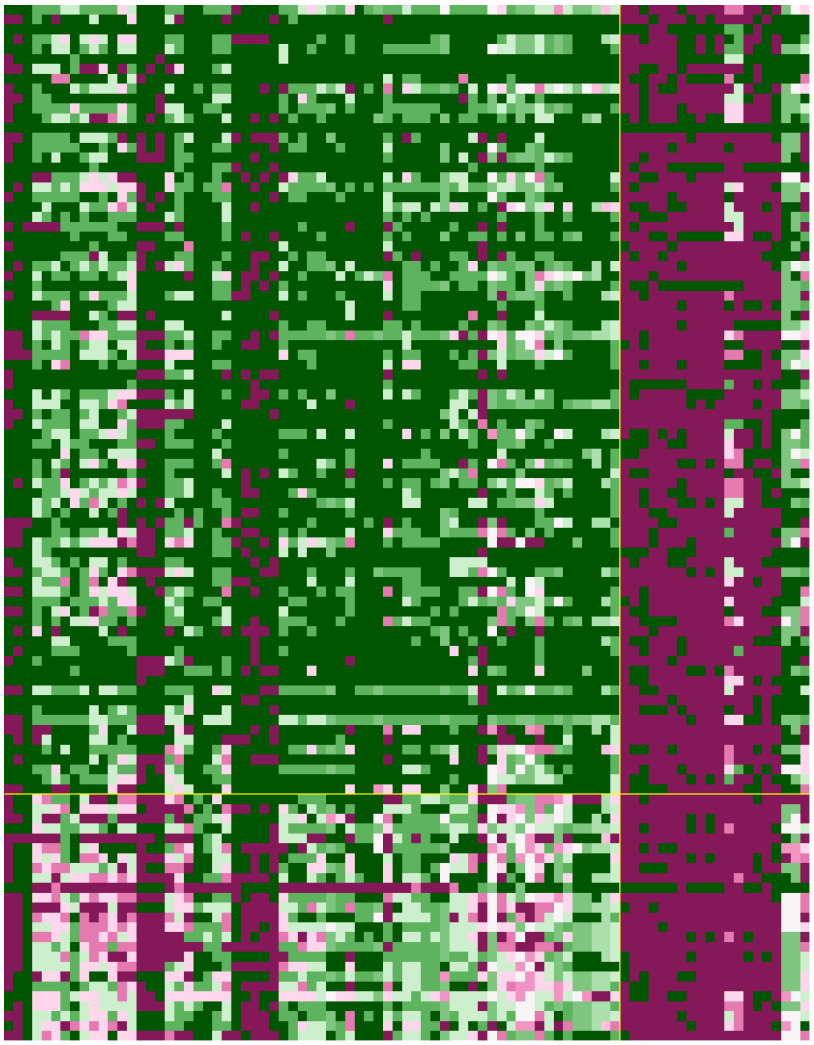
47. Figure - Top Leagues Hotels, Mean, Median, Variance, MAD on τ=0.75



(Source: R-Studio Output)

As can be seen in **47. Figure**, the means, medians, variances, and median absolute deviations (MAD) (horizontal axis of the hotels, the vertical axis of the tailor-made service indicators on normalized (0-1) data of indicators) when the cut-off point is higher there is a greater difference in the value of median and mode compared to **44. Figure**.

48. Figure - **Heatmap of Normalized Data – Top League τ=0.75**



(Source: R-Studio Output)

Comparing the heatmap of the top league when the criteria is τ=0,75 compared to τ=0,5, we can see a smaller cluster on the left corner. The bicluster is stable with the stricter criteria as the b*ootstrapPvalueRow* and the *bootstrapPvalueCol* are lower than 0.01. Spearman's rank correlation results show a strong positive relationship between the two rankings.

Therefore, it can be conclude that the bi-cluster on τ=0.75 threshold is relevant as there is a high correlation between the league and the original data.

6.4.3. Determining the lower league – league C

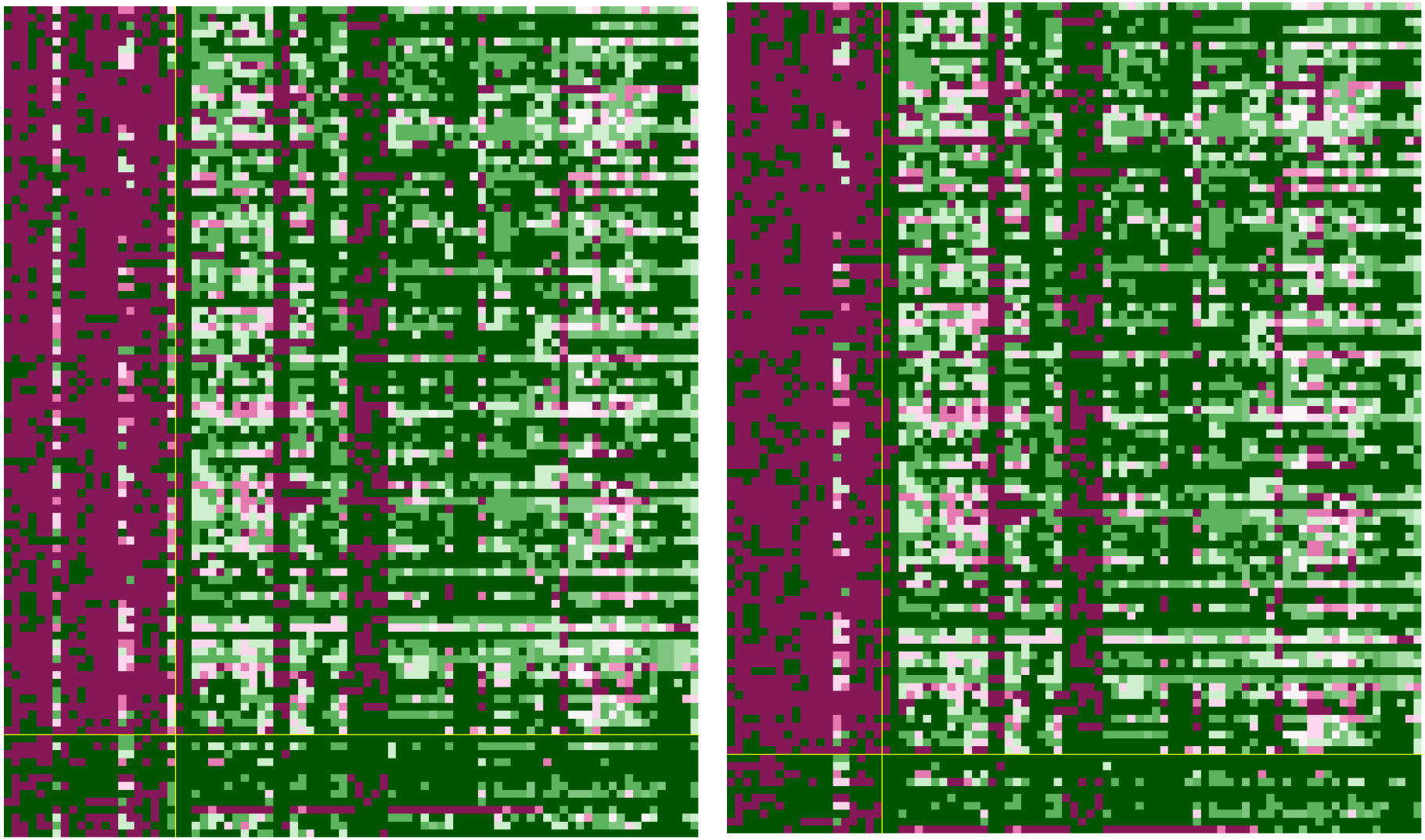
The process was repeated only with a reverse data matrix to identify the lower league. This league will contain all hotels that scored under the threshold on the indicators and all the tailor-made service indicators that scored low. Applying the iBBiG method on the reversed normalized data the lower league bi-clusters can be specified. 92 hotels and 21 tailor-made indicators were found with τ=0.5 thresholds, and 95 hotels and 19 tailor-made indicators with a τ=0.75 threshold.

In both cases, the F test shows that the row and column effects are significant; therefore, they can be part of the lower league. (in detail see **58. and 59. Appendix**)

The bi-cluster is stable with both thresholds as the b*ootstrapPvalueRow*, and the *bootstrapPvalueCol* are $p<0.01$ in both threshold levels. Spearman's rank correlation results show a strong positive relationship between the two rankings.

The **49. Figure** visually shows the difference between the results based on the two thresholds.

49. Figure - Heat Map of the Lower league on τ=0.5 (left) and τ=0.75 (right)



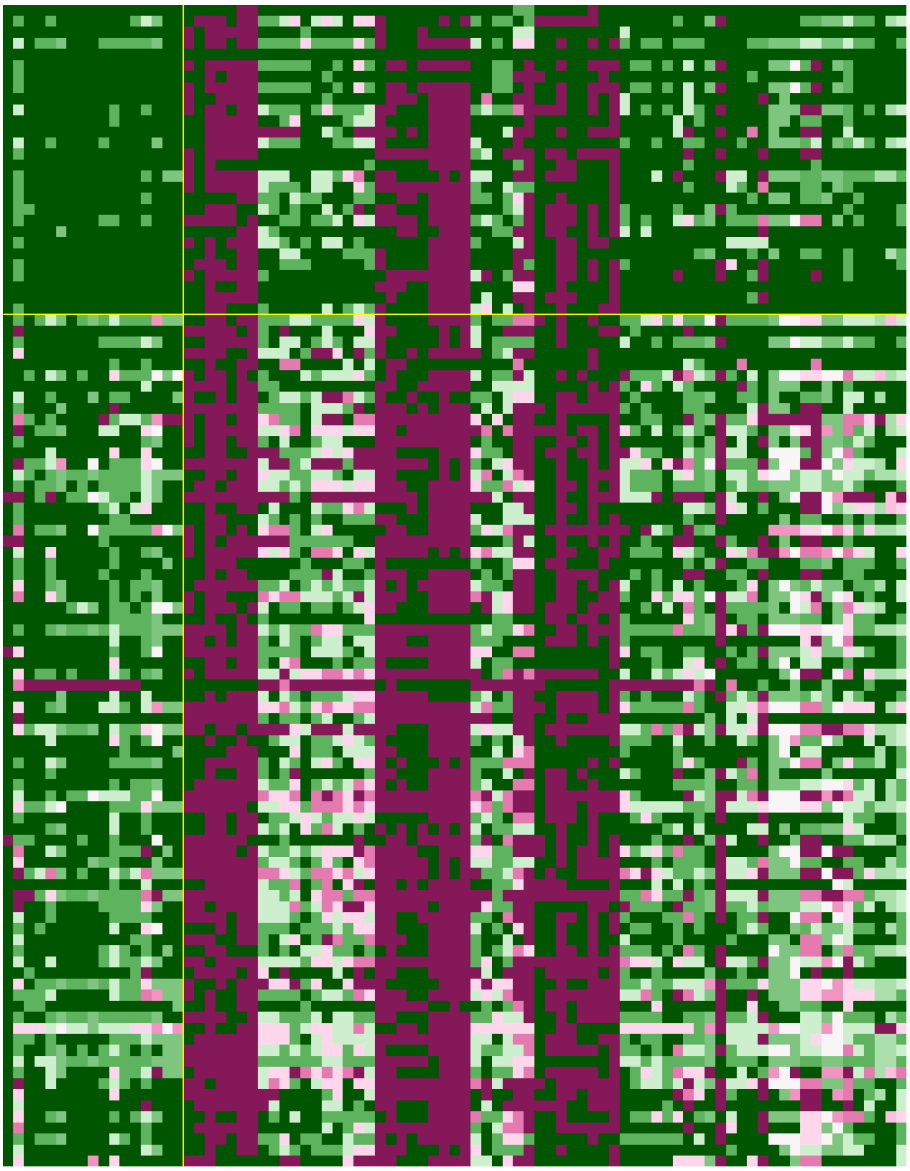
(Source: R-Studio Output)

Therefore, I can conclude that the bi-clusters on both thresholds (τ=0.5; τ=0.75) are relevant as there is a high correlation between the league and the original data.

6.4.4. Determining the middle league – league B

The final analysis is finding the middle league. The BiCARE method is capable of two things. One is identifying the middle field of hotels that do well according to certain indicators while do not perform well in others, or two, they perform moderately in all indicators. If it is the second case, BiCARE will find the hotels that perform similarly, therefore they all perform well and poorly in the same indicators. Regardless, the goal is to find the smallest, most homogenous cluster. The first bi-cluster that the BiCARE algorithm found is a completely homogenous group of 34 hotels and 13 tailor-made service indicators, but after performing the F-test, the rows and columns were not significantly correlating. Therefore, measurement was repeated till the smallest, most homogenous bi-clusters were found that are still significant. Therefore, the B league was identified to contain 28 hotels and 17 tailor-made service indicators (**50. Figure**).

50. Figure - Heat Map of the Middle League



(Source: R-Studio Output)

After performing the F test, both for the row and column effects are significant; therefore the B league bi-cluster is stable with the higher threshold (τ=0.75) as the b*ootstrapPvalueRow*, and the *bootstrapPvalueCol* are p<0.01 in both threshold levels. Spearman's rank correlation results show a strong positive relationship between the two rankings, the comparison of the languages can be considered.

6.4.5. Leagues and the overlap of the leagues.

After identifying and confirming that the three leagues (A, C, and B) are relevant, the next step is to find the overlaps.

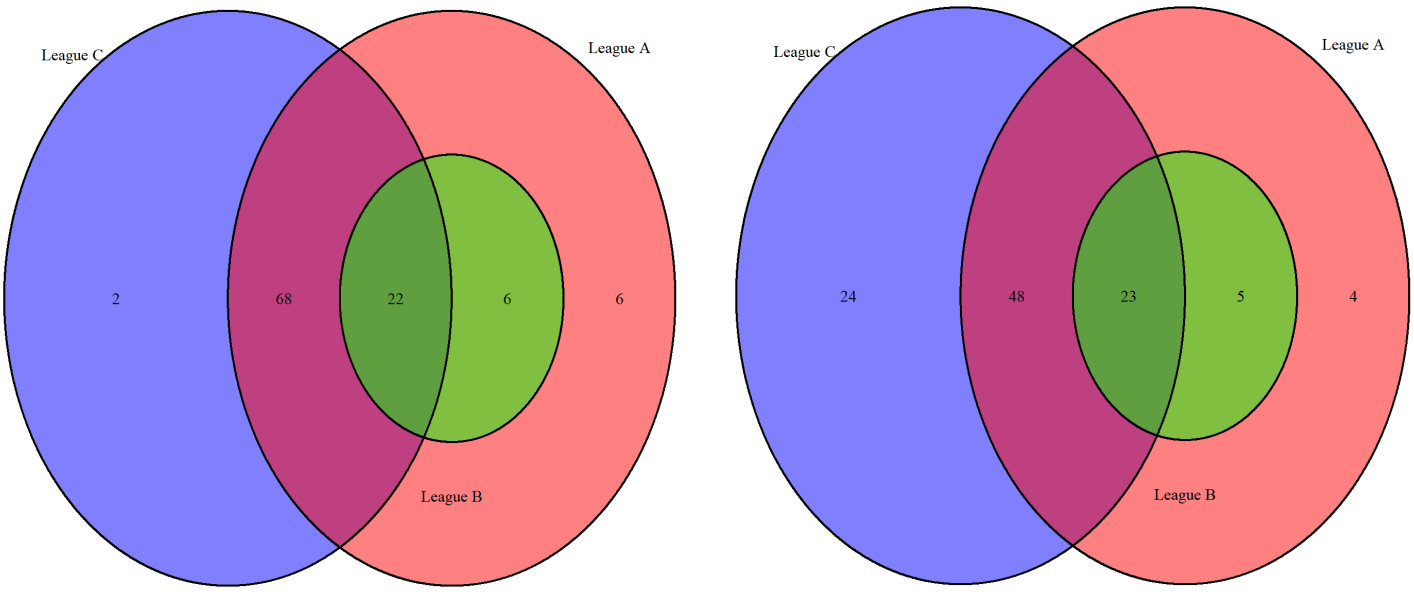
6.4.5.1.Cluster of Hotels

Depending on the chosen threshold (τ=0.5; τ=0.75), the overlapping areas are also different.

On **51. Figure** the red circle contains hotels in the upper league (League A), and the blue circle are those hotels in the lower league (League C). The green circle indicates the middle league's (League B) respondents. As it can be seen in **51. Figure** the middle league (B) is fully overlapping with the top league (A) and just partially with the lower league (C). The **51. Figure** show how the size of the submatrix changes as the threshold value gets higher.

Not all hotels assigned to top league perform well in all tailor-made service indicators as there are overlaps with the middle (B) and lower leagues (C). In the same way, it can be said that not all of the hotels in the lower league (C) fall short of the τ threshold of 0.5 or 0.75 in terms of all

51. Figure - Venn Diagram of Hotels on *τ*=0.5 (left) and *τ*=0.75 (right)



(Source: R-Studio Output)

their tailor-made service indicators. Bi-clustering procedures allow each submatrix to overlap each other. According to Kosztyán et al., (2019) increasing the threshold value τ or the α-value

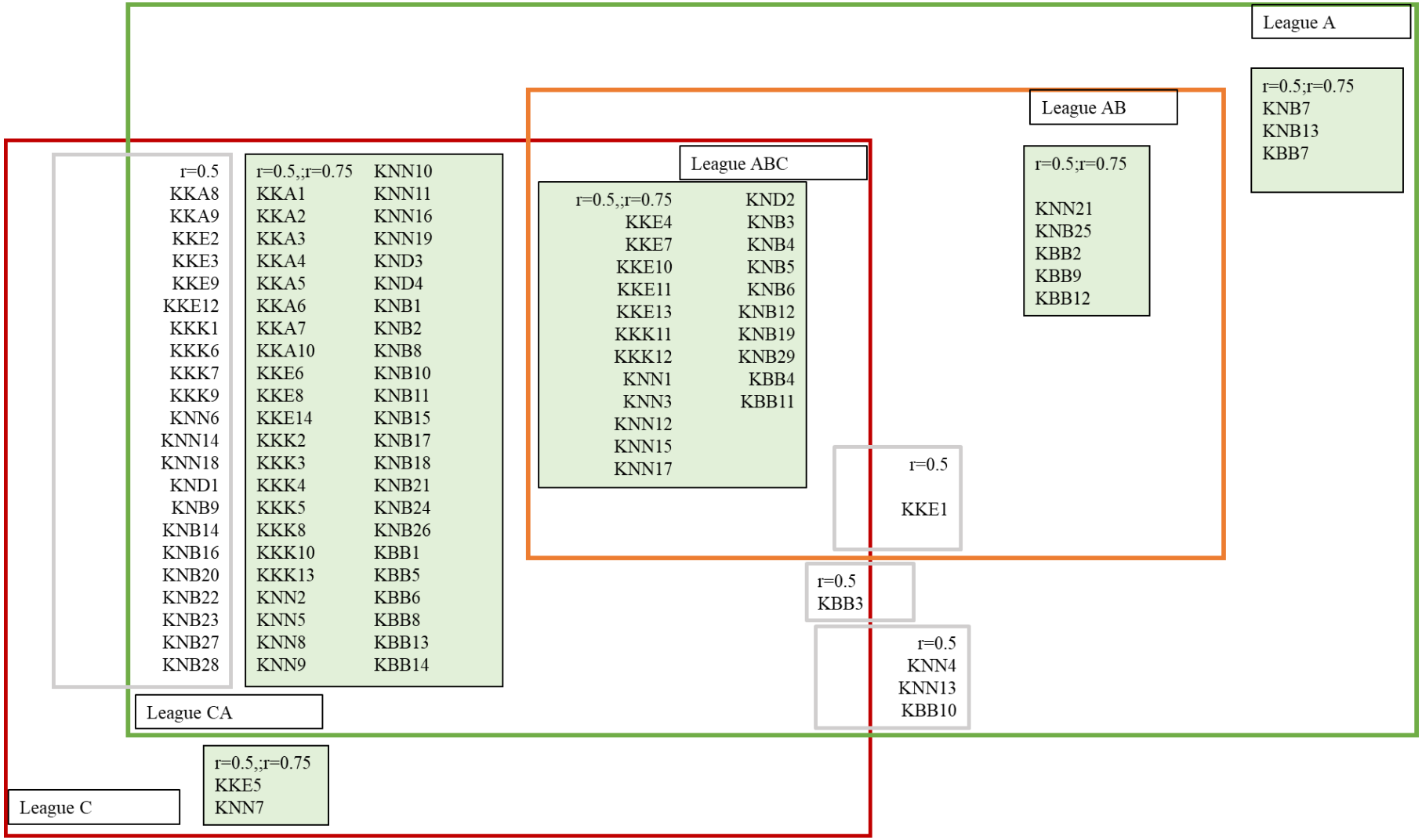
the overlap can be eliminated, but at the same time, the overlapping submatrices show how individual hotels perform in terms of certain tailor-made service indicators, and in which indicators they perform well.

In this case, when comparing the τ threshold of τ=0.5 and τ=0.75 we can see (Figure) that the overlaps were not eliminated, but the distribution of hotels changed. When using the τ=0.75 threshold, more of the participating hotels get assigned to the lower leagues or League C without overlapping qualities. If we look at **52. Figure** we can see that there are hotels that belong to the same bi-cluster, regardless of the threshold. However, hotels marked with grey frames would fall into another category if only the τ=0.75 threshold were considered.

3 hotels belong to the top league (A) considering both thresholds. These three are the absolute top. Two of these hotels' main target is leisure guest and in one case business. Two of them are in the Balaton region and one is in the Budapest region. The star categories are 5, 4 superior and 4.

There are 2 hotels which are in the lower league (C) with both thresholds. The main target is leisure guest, and business one of them is in the Western region and one is in the Eastern region. The star categories are 4 and 3.

52. Figure - Clusters of Indicators and Hotels Under Both Thresholds



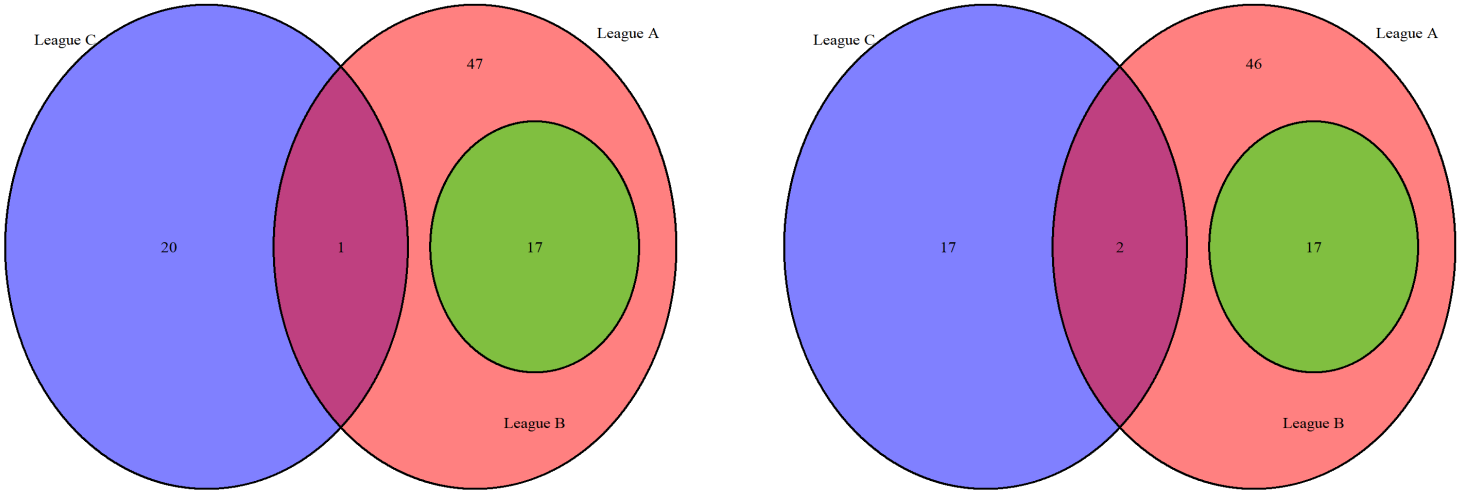
(Source: Own Edit)

6.4.5.2.The cluster of tailor-made service indicators

To see the similarities of tailor-made service the indicators also must be analysed.

The Venn diagram of the indicators (**53. Figure**) seems to be more consistent than the hotel Venn diagram at first. On the left, with τ threshold of 0.5, there are 47 tailor-made service indicators in the top league and 20 of them fall into the lower league with a threshold of 0.5 and 17 with τ = 0.75.

***53. Figure* - Venn Diagram of Tailor-made Service Indicators on τ=0.5 (left) and τ=0.75(right)**



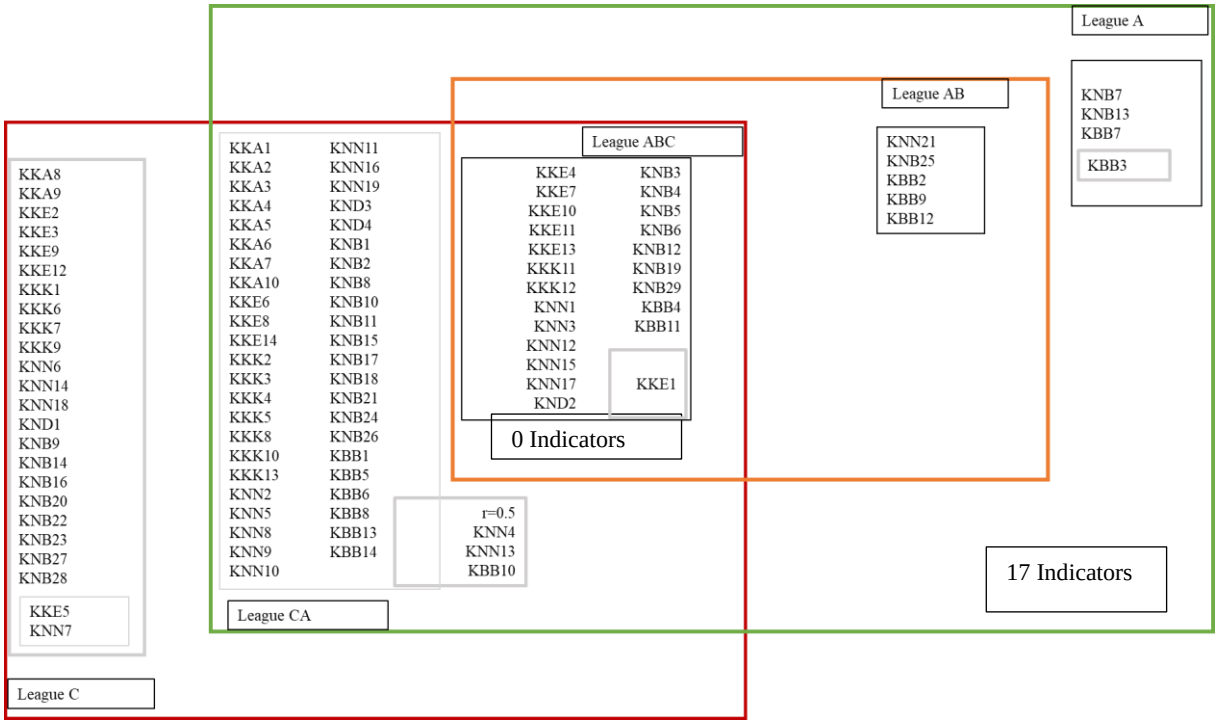
(Source: R-Studio Output)

Three indicators I65, I66 and I69 cannot be significantly assigned under the stricter threshold. The difference between the league members in the case of indicators is minor. Can be found in **60. Appendix**.

6.4.6. Members of the clusters

As the indicators placement relative to the leagues is extremely similar in both thresholds, in details I will introduce the members of the leagues based on the stricter τ = 0.75 threshold. Whit the tailor-made service indicators assigned; the cluster will look as follows in **54. Figure**.

54. Figure - Clusters of Indicators and Hotels τ = 0.75



(Source: Own Edit)

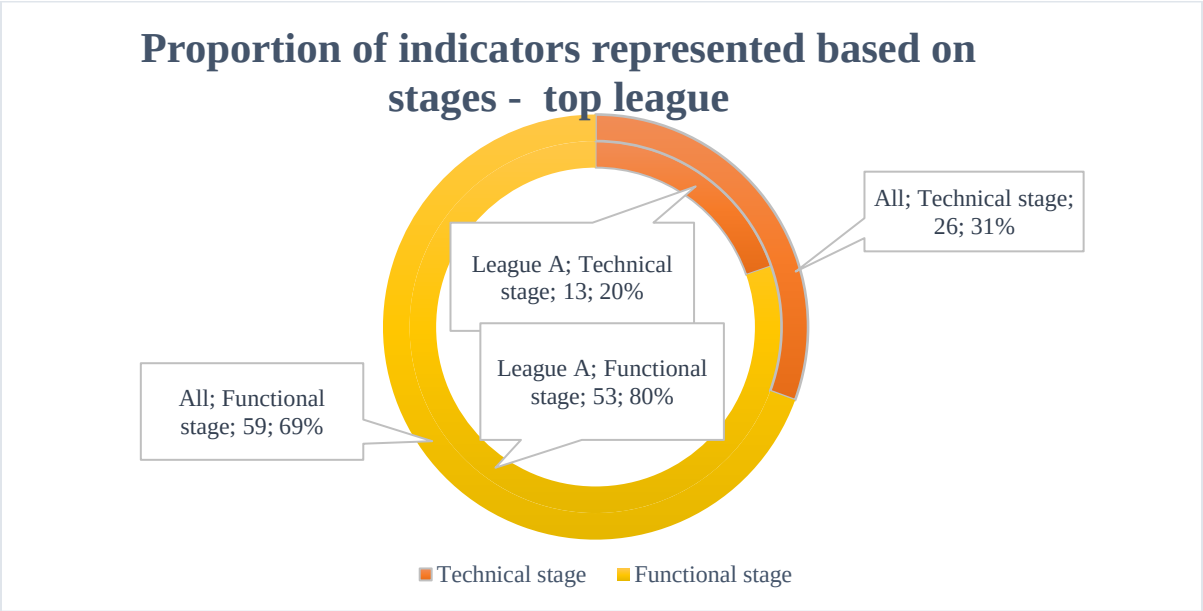
6.4.6.1. League A – the top league

There are 80 hotels and 65 indicators in this League represented by the green frame, but 76 hotels overlap with the middle (orange) and the lower league (red) which means that they perform well there in most indicators but there are certain indicators they perform poorly, similar to the members of lower league (C).

Indicators of League A – the top league

While 89.83% of the Functional stage indicators fall into this league, only 50% of the technical stage indicators (**55. Figure**) are in the A-League, showing that the technical conditions of tailor-made service are less present in the Hungarian Hotels.

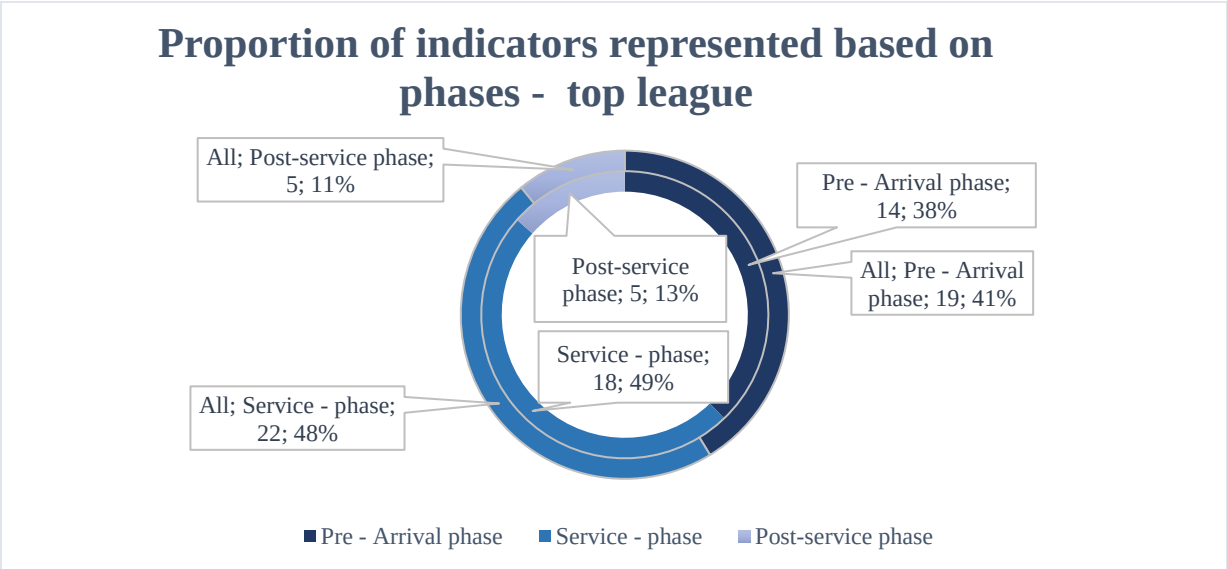
55. Figure - Proportion of Indicators Represented Based on Stages - Top League



(Source: Own Edit)

Those indicators that can be linked to a specific phase, (and are assigned to the top league) represent 73.68% of the Pre-arrival phase indicators, 81.81% of the Service phase indicators and 100% of post-service phase indicators (**56. Figure**). Those indicators, which were only assigned to stages as they could not be linked to a phase, were also present in the league. Functional stage indicators, which can be applied to the entire guest journey, appear with 83.33%, but technical indicators only present with 37.5%. Therefore, we can conclude that the indicators hotels perform well in are mostly functional indicators. (Detailed list can be found in the **60. Appendix.**) Also, the results of the bi-clustering show that all hotels perform well in communicating with the guest after the guest left the hotel.

56. Figure - Proportion of Indicators Represented Based on Phases



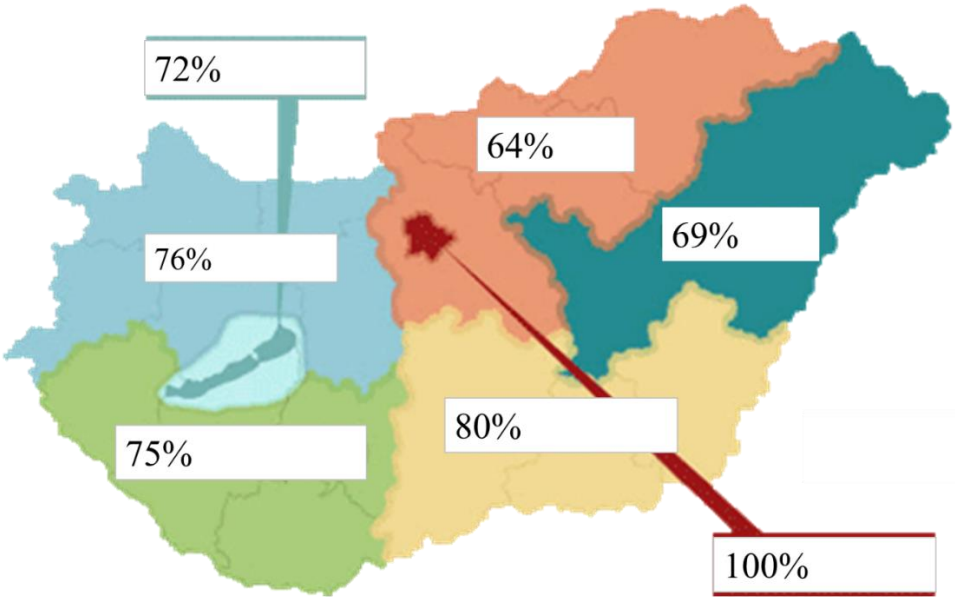
(Source: Own Edit)

The indicators are mostly focusing on the behaviours towards the guest and the acts of kindness, (politeness, warm goodbye, etc) regarding guest service, or supporting activities, (like having a budget to give small gifts, segment-based newsletters, pillow menu etc.) even encouragement of the employees on tailor-made guest service. The indicators of the top league also include indicators on the technological stage, that indicate technologically advanced guest services such as mobile apps, and data mining websites.

Hotels of League A - the top league

The League includes all participants from the Budapest region, 80% of the participants from the Great Hungarian Plain region (**57. Figure**). The least participants are from the Northern region with 64%. This means that all Hotels in Budapest perform above the threshold in these 60 indicators detailed above.

57. Figure - Percentage of Hotels by Region in Top League



(Source: Own Edit)

We can also conclude that 100% of the 4-star superior, 5-star and 5-star superior hotels are in this group, while only 76.08% of the 4-star hotels (**27. Table**). Hotels with a 3-star superior rating, are represented by 88.88%, therefore with a higher percentage than 4-star hotels.

27. Table - Number of Hotels by Region in Top League

Star rating	No rating	2	2 sup.	3	3 sup.	4	4 sup.	5	5 sup.
Sum of all participants	4	5	1	21	9	46	14	4	2
League A	0	3	0	11	8	35	14	4	2
% in League A	0	60,00	0	52,38	88,89	76,09	100,00	100,00	100,00

(Source: Own Edit)

The target group is leisure travellers in 58 cases which is 73% of all hotels with leisure guests and 88% is targeting business (22 hotels), out of which 16 have Leisure travellers, (*families as*

a secondary target group or couples without children, retired travellers) as the secondary target group shown on the **58. Figure**. The most common guest target is families.

58. Figure - Target Group - Top League

	All	Leagues A	
Business	25	25	8%
Families	35	35	66%
Other	8	8	75%
Young couples without children	8	8	75%
Young travelers	7	7	100%
Empty Nesters	13	13	77%
Retired Guest	9	9	67%

(Source: Own Edit)

Hotels with an international focus are more represented by proportion, as 91.42% of hotels with international guests are in the top league (32 hotels) and only 68.57% of the hotels with a domestic focus (48 hotels). Most of the hotels (72) have individual bookings which is 76.59% of all hotels with mostly individual bookings, and only 8 focuses mainly on groups (72.72% of all hotels who target groups). 6 out of these 8 hotels targets business travellers and the remaining two also has conference and even as their secondary focus. Most of the hotels (32) in this group which is the 80% of all Wellness hotels represented in the data. There are 26 city hotels which is the 89.65% of all city hotels. The **59. Figure** shows, the other hotel types represented in the top league. All hotels are open throughout the year.

59. Figure – Hotel Type – Top League

	All	League A	
Garni Hotel	1	0	0%
Castle Hotel	3	3	100 %
Conference Hotel	4	3	75%
Resort or Sport Hotel	8	5	62.5%
Apartment Hotel	2	2	100%
Spa or Thermal Hotel	8	7	87.5%
Other	10	9	90%

(Source: Own Edit)

The members of this League find tailor-made service important as 63 hotels manager gave an average of 6 or above importance to tailor-made service on a 1-7 scale.

Top league conclusion

This greater group is connected by the capability of performing well in functional indicators, communicating with their guests' pre and post-service and performing acts of kindness. There is an emphasis on supporting activities, and on the encouragement of the employees on tailor-made guest service. The indicators of the top league also include most indicators on the technological stage and indicate technologically advanced guest service. In proportion, the top league mostly contains hotels 4-star superior and above, targeting business guests and international guests. What is interesting about the proportion of hotel type is that long-stay hotels like resorts and spas where the guest spends more time, (other than the two Apartment hotels) did not represent 100% of the league.

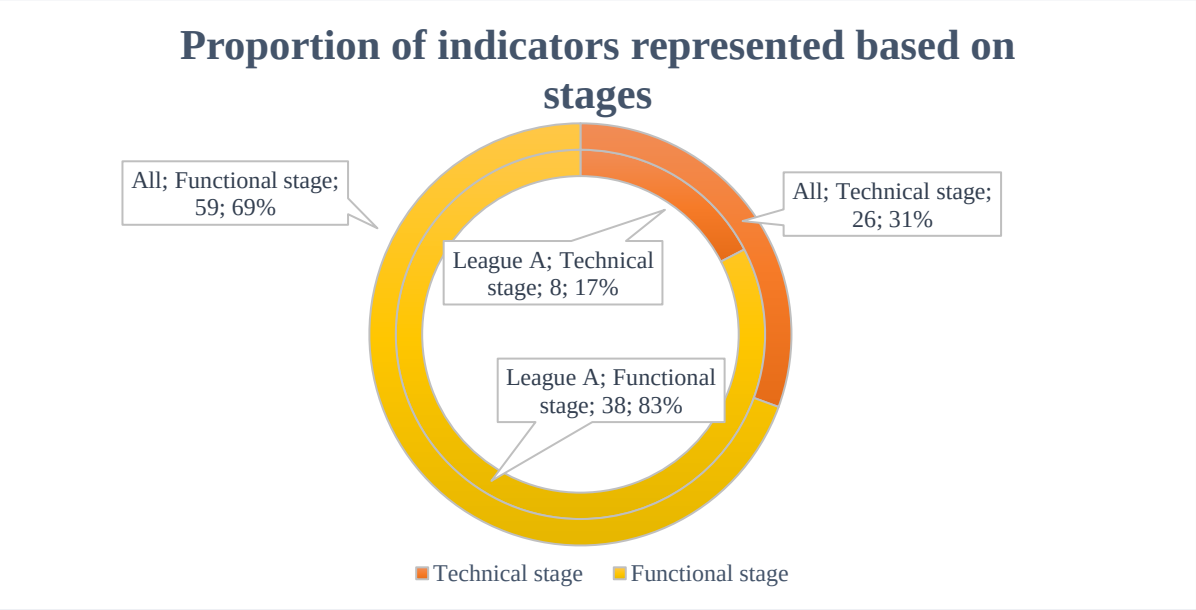
6.4.6.2. League A*****- Sub league

Only 4 hotel belongs to purely to League A without overlapping with the other major leagues (B and C), 3 of which was already introduced, as they fall into the A-League, based on both thresholds. Comparing the 4 hotels, leisure guest is the main target group for 3 of the hotels and the secondary target group for the fourth one. Even though international travellers are only the main guest target (based on origin) to 33.33% of the participating hotels, 3 league members have mostly international travellers. Three of them have mostly individual guests which is more common in the sample. Two of them are wellness and 2 of them are city hotels.

Regarding the star rating, they are 3, 4, 4 superior and 5-star hotels, 2 from Budapest and 2 from the Balaton region (**60. Figure**).

Although these 4 hotels are different, there are 46 indicators they scored high in. In proportion, most of the indicators are from the functional stage (83%).

60. Figure - Proportion of Indicators Represented Based on Stages



(Source: Own Edit)

They all scored high in the following 8 technical indicators shown in **28. Table**, all regarding the customization of the room; choosing from a pillow menu, specifications of the minibar, gifts that can be given to the guest so they can feel more special, and micro-segmentation during marketing.

28. Table - Indicators of the Top League

Indicator ID	Indicator	Placement of the Indicator
I17	It is possible for the guest to ask for minor changes regarding the room during their stay.	Technical Stage - Service Period – In Room
I18	The guest can choose a specific temperature they want their room to be. (And the hotel will even set the room to that temperature)	Technical Stage- Service Period - In Room
I21	The guest can choose what kind of pillow they want.	Technical Stage - Service Period - In Room
I22	The guest can choose to have no alcohol in their minibar	Technical Stage - Service Period - In Room
I89	The hotel has specific gifts or budget to use when the employee thinks a guest should get a gift (birthday, honeymoon special occasion, etc.)	Technical
I92	The hotel sends out segment-based newsletters.	Technical

I13	Our hotel makes sure that we appear as personalized search results through search engine optimalization.	Technical, Pre-Arrival, Website
I99	The booking engine has functions that allow users to customize their bookings (according to their preferences) when booking a room. (For example, what kind of pillow do you want, what kind of massage do you want, and other services.)	Technical, Pre-Arrival, Website

(Source: Own Edit)

The 38 functional indicators they all score high in, are mostly regarding the in-room touchpoint. 7 out of the 8 Pre-arrival communication indicators and 4 out of 5 post-service communication. Therefore, it can be stated, that the A***** League puts more emphasis on communication with the guest. They also score high on communication indicators regarding style and attitude towards the guest.

Similar to the technical indicators, 8 items concern room service and amenities, (therefore 14/15 in this category). They are similar in providing customized options for the room and using personalization to surprise the guest (I89- The hotel has specific gifts or budget to use when the employee thinks a guest should get a gift (birthday, honeymoon special occasion, etc.))

Full list can be found in the **61. Appendix**.

A*****- Sub league Conclusion

As these hotels have no overlapping indicators of the lower league they perform at least average and excellent in all 85 tailor-made service indicators, therefore these hotels are the Leaders of Customization – Communication – Personalization

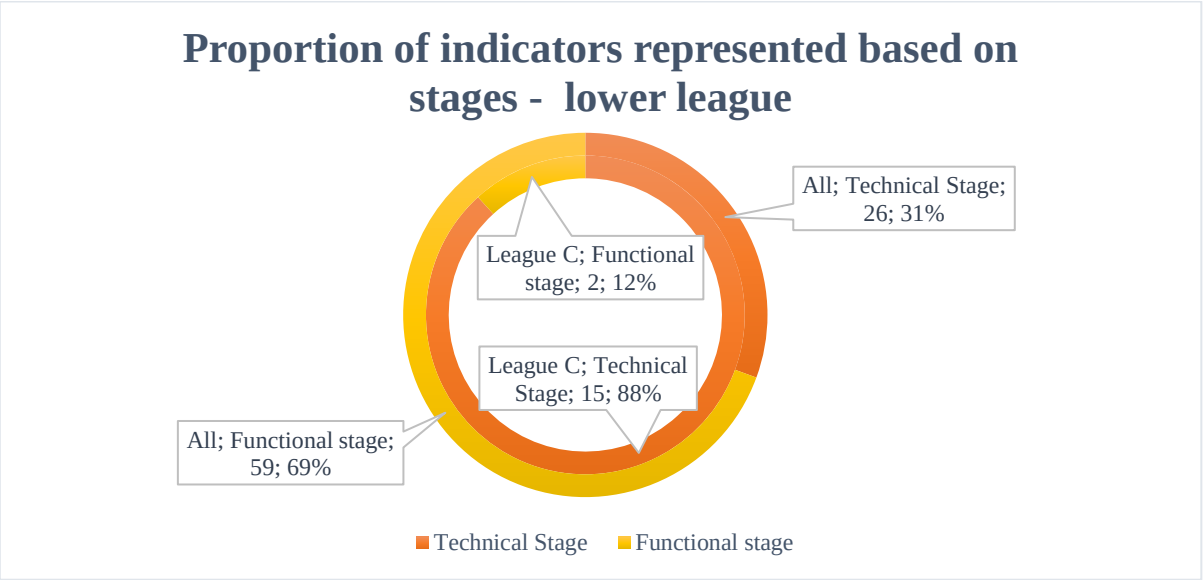
6.4.6.3.League C – lower league

95 hotels fall into the lower league or League C represented by the red frame on Figure_, and which is bigger that League A. This means that more hotels are performing under the given threshold than above it in these indicators. The lower league was created by a reverse data matrix which means that the members of this league perform poorly in the tailor-made service indicators in the league. This league also contains all the hotels that are not part of the A*****League_. There are 19 indicators and only 2 of them are shared with some of the members of the top league.

Indicators of League C

While 57.69% of the technical stage indicators fall into this league, only 3.38% of the functional stage indicators are in the lower league, showing that most hotels perform poorly in almost 60% of the technical stage of tailor-made service (**61. Figure**).

61. Figure - Proportion of Indicators Represented Based on Stages - Lower League



(Source: Own Edit)

Those indicators that can be linked to a specific phase can be identified in the C League, Pre-arrival phase 42.10%, and Service phase 22.72%. None of the Post- service phase indicators are in the lower League. Those indicators, that were only assigned to stages as they could not be linked to a phase, only the technical indicators were in the lower league (5%). This confirms the assumption the author partially concluded in the previous paragraph, that indicators hotels perform poorly in are mostly the technical indicators. **29. Table** results show that the hotels in this league perform poorly when it comes to website development and technological devices. They also do not emphasize the technical aspects of tailor-made service. They are also not scoring high on encouragement.

29. Table - Indicators of the Lower League

Indicator ID	Indicator	Placement of the Indicator
I16a	We place introduction greeting card with a printed message and guests name in the room	Functional, Arrival
I16b	We place introduction greeting card with a hand-written message and guests name in the room	Functional, Arrival
I87	The hotel does micro-segmentation.	Technical
I88	We have employee or outsider company to analyze our guest data and previous statistics.	Technical
I7	We have a hotel App	Technical
I27	Our hotel application is similar to what most customers use in their everyday lives.	Technical
I29	The hotel app can provide the guest with personalized services, products, or information tailored to their specific hotel stay	Technical

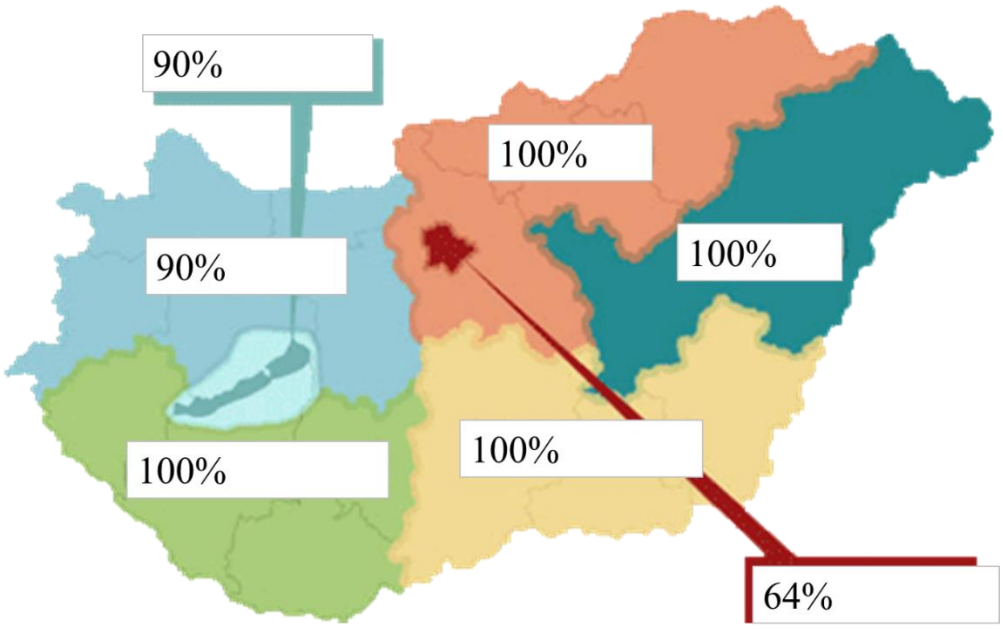
I93	We store and update guest data frequently (even before the check in or after the check-out) that we use during re-marketing campaigns.	Technical
I20	The guest can choose the style and the type of the bedding	Technical - Stage Service Period
I23	We put the favourite drink of the guest in the room even if that is not the brand the hotel normally works with	Technical - Stage Service Period
I96	We have and use the function on the TV to display guest name and welcome the guest in the room.	Technical, Arrival
I1	Our website has features that personalized for the users' preferences (for instance based on segments they can choose to brows between offers to their specific needs or interests.)	Technical, Pre-Arrival, Website
I5	The website has feature for the visually impaired.	Technical, Pre-Arrival, Website
I9	The website acquires the specific needs of the guest and shows service recommendations based on their personal needs.	Technical, Pre-Arrival, Website
I11	Our website automatically collects data (such as IP address, pages viewed, access time) but cannot identify the guest as an individual and offers goods or services based on that.	Technical, Pre-Arrival, Website
I4a	The website has a Chat service operated by chatbot.	Technical, Pre-Arrival, Website
I4b	The website has a Chat service operated by an employee.	Technical, Pre-Arrival, Website
I8	The hotel app can provide the guest with personalized services, products, or information tailored to their preferences or personal interests.	Technical, Pre-Arrival, Website
I91	Providing personalized service is encouraged and reward.	Technical, Pre-Arrival, Website

(Source: Own Edit)

Hotels of League C

The league includes all participants from the Northern, Eastern, Great Hungarian Plain, and South Transdanubia Region (**62. Figure**) which means that in the above-mentioned 19 indicators, the majority of these members perform poorly.

62. Figure - Percentage of Hotels by Region in Lower League



(Source: Own Edit)

We can also conclude that 100% of the unassigned, 2-star and 3-star superior, hotels are in this group, while only 25 and 50% of the 5- and 5-star superior participants seem to perform poorly in the case of League C indicators (**30. Table**). Hotels with a 3-star rating, are represented by 95.24%, therefore with a higher percentage than 4-star and 4-star superior hotels (93.48 and 85.71%).

30. Table - Number of Hotels by Region Lower League

Star rating	No rating	2	2 sup.	3	3 sup.	4	4 sup.	5	5 sup.
Sum of all participants	4	5	1	21	9	46	14	4	2
League C	4	5		20	9	43	12	1	1
% in League C	100,00	100,00	0,00	95,24	100,00	93,48	85,71	25,00	50,00

(Source: Own Edit)

There are members of this League mostly target families (34) which is 97% of all hotels with this target group or business (24) which is 96% or all hotels with business guests are the target group.10 of the hotels who have business guests as their main target group has families as a secondary target group (**63. Figure**).

63. Figure – Target Group Lower League

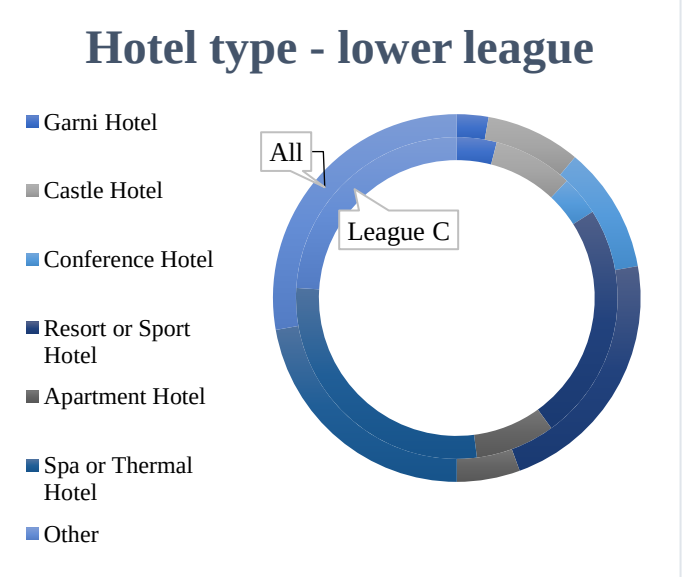
	All	Leagues C	
Business	25	24	6%
Families	35	33	94%
Other	8	8	100%
Young couples without children	8	6	75%
Young travelers	7	5	71%
Empty Nesters	13	11	85%
Retired Guest	9	8	89%

(Source: Own Edit)

Most guests are mainly domestic guests, 67 hotels which is 95.71% of all hotels with domestic guests. 85 are expecting individual guests which is 90,42% but 90.9% of the hotels with groups also fall into the lower league in these 19 indicators. All wellness hotels (40) and almost all (28 out of 29) city hotels are in this league (**64. Figure**).

64. Figure - Hotel Type Lower League

	All	League A	
Garni Hotel	1	1	100%
Castle Hotel	3	2	66.7 %
Conference Hotel	4	1	25%
Resort or Sport Hotel	8	6	75%
Apartment Hotel	2	2	100%
Spa or Thermal Hotel	8	7	87.5%
Other	10	6	60%



(Source: Own Edit)

Some members of this league find tailor-made service important as 59 hotels manager gave an average of 6 or above importance to tailor-made service on a 1-7 scale, but 9 hotels gave 4 or lower or in other words, reportedly do not find it important.

C league Conclusion

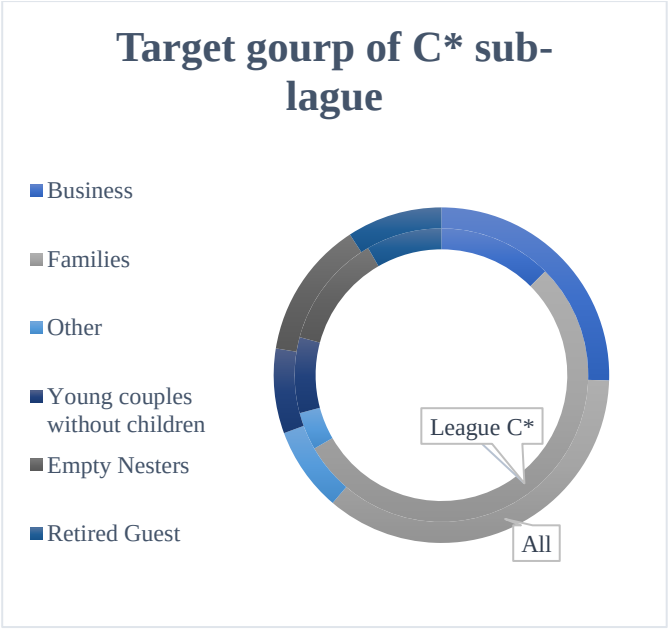
90.5% of the hotels in the research perform poorly in these technical indicators, which means that website development and technological devices are not a priority to most. They also do not emphasize the technical aspects most hotels won't offer customization of the room. These kinds of customization have high human resource requirements, which is a difficult issue in current Hungary. They are also not scoring high on encouragement and reward of individualized service.

6.4.6.4.League C* - Sub league

Only 24 hotel belongs to exclusively to League C, 2 of which were already introduced, as they fall into the lower league, based on both thresholds. Comparing the 24 hotels, leisure guest is the main target group for 21 of the hotels and for the 3 hotels (12% of all business hotel in the sample) the secondary target group is also families for one of the other 3 as seen on **65. Figure**.

65. Figure – Target Group of C* Sub-league

	All	Leagues C*	
Business	25	3	2%
Families	35	13	37%
Other	8	1	13%
Young couples without children	8	2	25%
Empty Nesters	13	3	23%
Retired Guests	9	2	22%

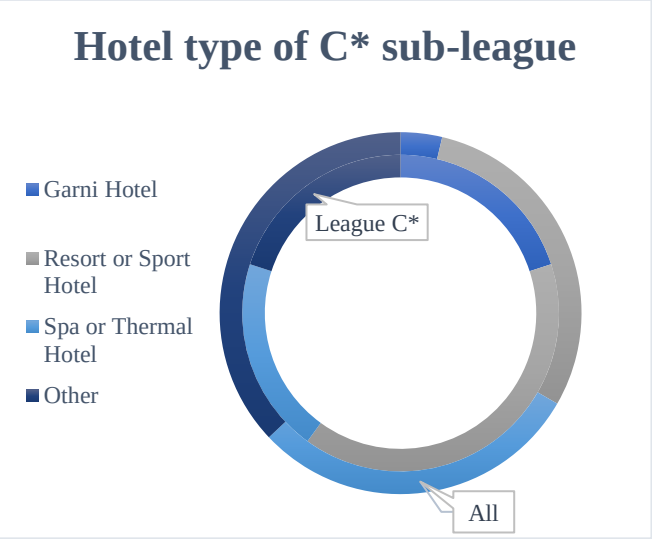


(Source: Own Edit)

Only 2 League members have international travellers, and 22 of them have individual guests. The league has 12 wellness hotels which is 30% of all wellness hotels in the sample (**66. Figure**) and 6 city hotels (20.6%).

66. Figure – Hotel Type of C* Sub-league

	All	League A	
Garni Hotel	1	1	100%
Resort or Sport Hotel	8	2	25 %
Spa or Thermal Hotel	8	1	12.5%
Other	10	1	10%



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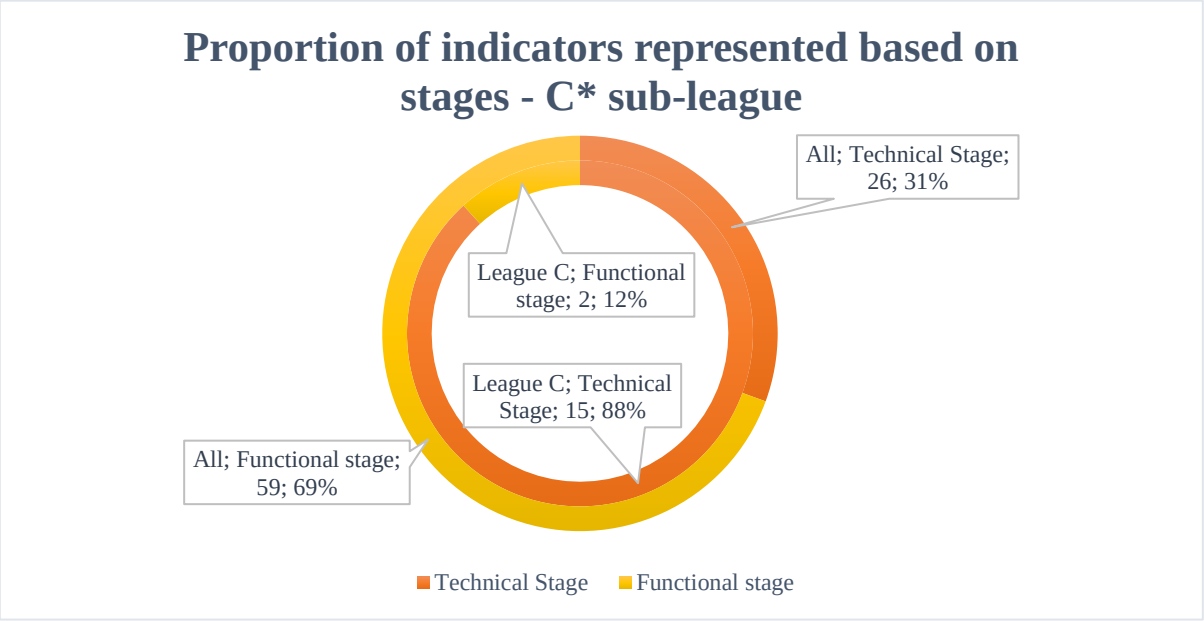
The 17 indicators they all scored low in are in the C league minus I1 and I93 (**60. Appendix**), in proportion there are more items from the technical stage also shown in **67. Figure**.

67. Figure - Proportion of Indicators Represented Based on Stages - C* Sub-league



(Source: Own Edit)

C* sub- league Conclusion

There are more hotels in this sub-league than in the league of Leaders (A *****), but fewer indicators are assigned. These hotels avoid most technical aspects of individualized service and offer no changes regarding the room. They are the true conservatives of service offering and based on the results are not collecting guest data for marketing purposes.

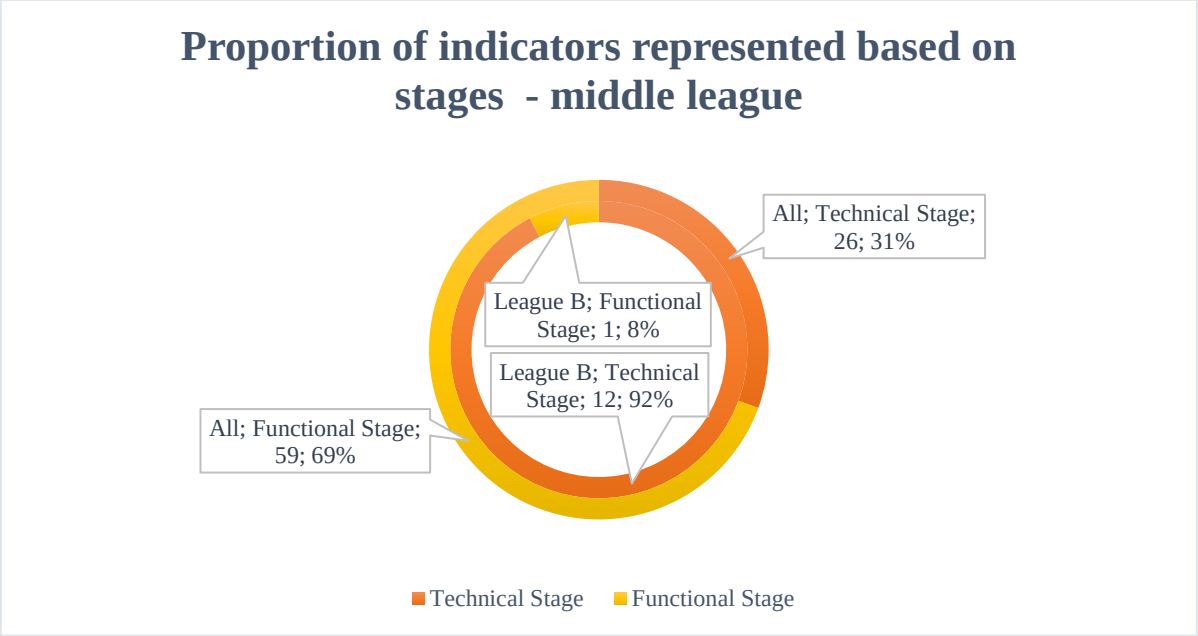
6.4.6.5.League B – middle league

The B league is called the middle league as usual in bi-clusters analyses this represents the responders that are transitioning between A and C leagues. This means that the hotels of the middle league are either performing high on certain indicators but low in others or performing overall the same in all indicators. In the case of the indicators, looking at **50. Figure**, League B is a homogenous group of highly performed tailor-made service indicators, as on the one hand all hotels and indicators are marked with green, and on the other hand as it can be seen on **52. Figure**, none of the tailor-made service indicators overlap with the lower league (C). The matrix of the league contains the fewest hotels from the three base leagues (A, C and B). This is the most heterogenous group with 28 hotels and 17 tailor-made service indicators and represented by orange frame on **52. Figure.**

Indicators of League B

Out of the 17 tailor-made service indicators, 16 is functional and only 1, I6 is technical. (Our website is automorphically fits to the device (e.g. computer, mobile phone etc.), browser (e.g. Netscape, Internet explorer) and operating system (e.g. Windows, Unix) that the guest uses.) (**68. Figure**). As the middle league completely overlaps the top league the tailor-made service indicators of the middle league are also part of the indicators of the AB section League.

68. Figure - Proportion of indicators represented based on stages - middle league



(Source: Own Edit)

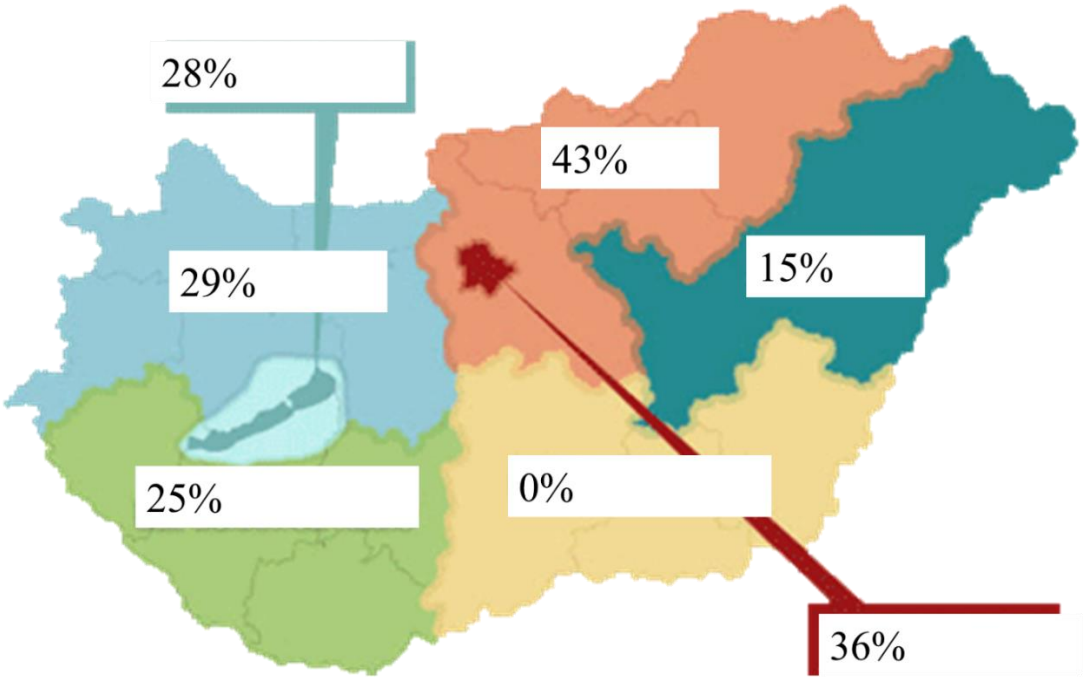
The functional stage indicators of the middle league are focusing on encouragement from the management towards the employee to perform a certain way (personal warmth, eye contact, be approachable) which is the core behaviours of hospitality and indicators of employee behaviour (being helpful, try to customize, be polite, treat guest with respect). As the indicators of this group are more about acts of kindness then tangible goods, or “things” hotels use to satisfy guests and create individualized experiences, they can be performed without big expenditure. Without these base behaviours, it is impossible to provide good service let alone tailor-made

service. These indicators are all regarding performing an encouraging hospitality. These can be found in **62. Appendix**.

Hotels of League B

No members of this league were from the South Great Plain region and although the top league had the least participants from the Northern region (**69. Figure**), they are proportionally represented the most in the middle league.

69. Figure - Percentage of Hotels by Region in the Middle League



(Source: Own Edit)

Most hotels of League B in proportion are 5 – star and 5 – star superior hotels. The hotels which have no rating assigned yet, reported to be on a 2 and 5 – star quality level (**31. Table**).

31. Table - Number of Hotels by Region - Middle League

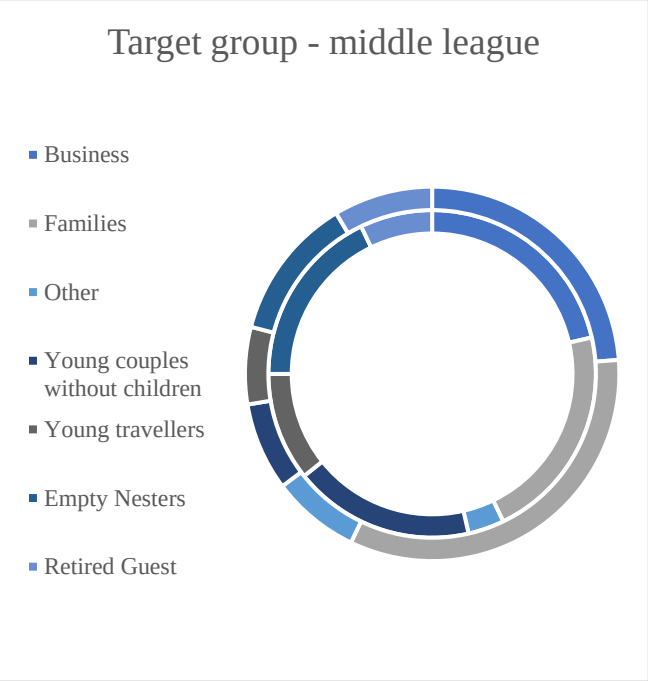
Star rating	**No rating**	**2**	**2 sup.**	**3**	**3 sup.**	**4**	**4 sup.**	**5**	**5 sup.**
Sum of all participants	**4**	**5**	**1**	**21**	**9**	**46**	**14**	**4**	**2**
League B	2	1		2	1	12	5	3	1
% in League B	50,00	20,00	0,00	9,52	11,11	26,09	35,71	75,00	50,00

(Source: Own Edit)

22 of the 28 hotels focuses on leisure guests (seen on **70. Figure**, in proportion mostly to young couples without children) and all 6 of the hotels with business as their primary target group has families as their secondary target group.

70. Figure - Target Group Middle League

	All	Leagues B	
Business	25	6	4%
Families	35	6	17%
Other	8	1	13%
Young couples without children	8	5	63%
Young travellers	7	3	43%
Empty Nesters	13	5	38%
Retired Guests	9	2	22%



(Source: Own Edit)

In proportion to the sample, 42.85% of all hotels with international guests (15) are in the middle league, and 13 of them focuses on domestic guest which is 18.57% of all hotels in the sample with this target audience (**71. Figure**). 26 is expecting individual guests and although most of the hotels are Wellness (12) or city hotels (10) in proportion it is important to mention, that all apartment hotels (2) are located in this league.

71. Figure - Type of Hotel Middle League

	All	League A	
Resort or Sport Hotel	8	1	12.5%
Apartment Hotel	2	2	100 %
Spa or Thermal Hotel	8	2	25%
City Hotel	29	10	34.5%
Wellness Hotel	40	12	30%

(Source: Own Edit)

B league Conclusion

This middle league embraces hotels that simultaneously perform well in indicators of the top league and poorly in the lower league. They are stronger in hospitality, and although they encourage the individualization of service, they perform average or poorly when it comes to customizing the room or technological gadgets like a hotel application.

6.4.6.6. League AB - Sub league

AB League only contains 5 hotels and 17 indicators (that are identical of the indicators of the middle league). Three of them are in Budapest while one in the Balaton and one in the Western region. These five hotels have the same strength and do not perform poorly (as they are not in overlap with league C) Three of them are targeting young couples, 1 family and 1 empty nesters. Two are for domestic (wellness hotels) and 3 is for international guests mainly (city hotels). All of these hotels are 4 star and above. (One 4-star, one 4-star superior, two 5-star and a 5-star superior). They all gave 7 to all the questions about the importance of tailor-made service.

These hotels are the stars of encouragement from the management towards the employee and indicators of employee behaviour detailed in League B. These indicators are all regarding performing an encouraging hospitality.

AB league Conclusion:

As the members of this league management encourage the employee to individualise service and be hospitable, they are the champions of hospitality.

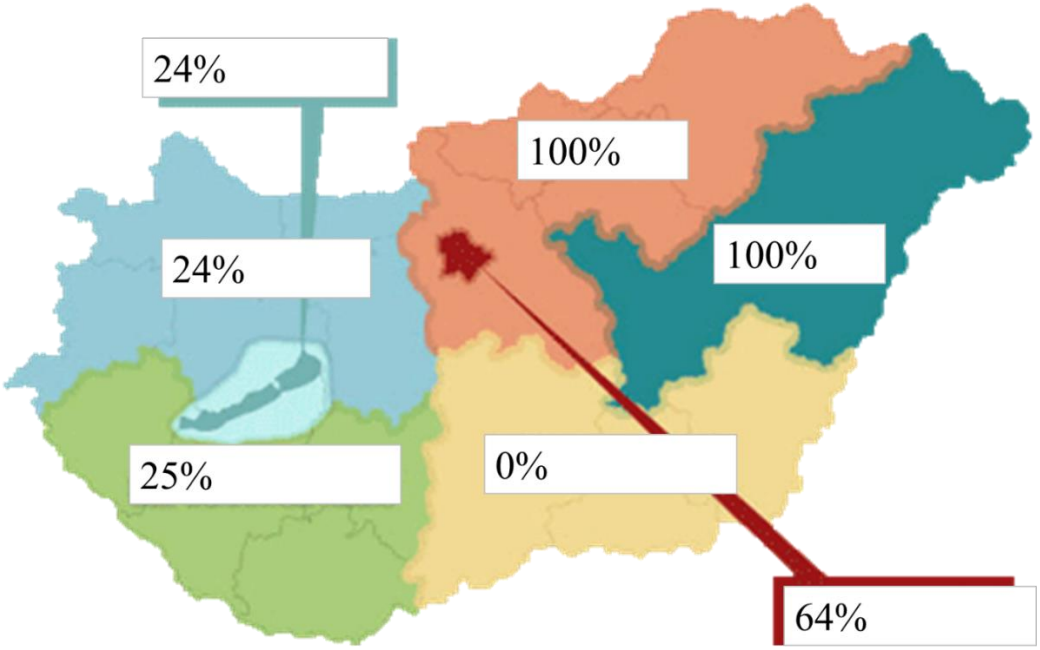
6.4.6.7. League ABC – Sub league

The ABC League is the intersection of A, C and B leagues. It contains 23 hotels, but no indicators dedicated specifically to this league. These hotels are present in all 3 Leagues therefore they are the true middle league. They perform well in respect of the top and middle league indicators and poorly in all the lower league indicators. This sub-league shows how big the gap is between the few outstanding performers and the underperformers (in view of tailor-made service).

Hotel of Sub-league ABC

All hotels from the Eastern and the Northern region fall into this sub-league, but no hotels from the Great Hungarian Plain are represented seen in **72. Figure**.

72. Figure - Percentage of Hotels by Region in ABC League



(Source: Own Edit)

Given the greater number of 4-star hotels in Hungary (**32. Table**), most members of the league are 4-star but in proportion, it is only 23.91% of all 4-star hotels are present in this sub-league.

32. Table - Number of Hotels by Region - ABC League

Star rating	**No rating**	**2**	2 sup.	**3**	3 sup.	**4**	4 sup.	**5**	5 sup.
Sum of all participants	4	5	1	21	9	46	14	4	2
League ABC	2	1		2	1	11	5	1	
% in League ABC	50,00	20,00	0,00	9,52	11,11	23,91	35,71	25,00	0,00

(Source: Own Edit)

Members of this League have mostly leisure guests, as **73. Figure** shows in proportion most of these hotels target young couples without children.

73. Figure - Target group - ABC League

	All	League ABC	
Business	25	6	4%
Families	35	5	14%
Other	8	2	25%
Young couples without children	8	3	38%
Young travelers	7	2	29%
Empty Nesters	13	3	23%
Retired Guest	9	2	22%

(Source: Own Edit)

Half of the hotels of this league is welcoming domestic guests (which is 17.14% of all domestic focused hotels) therefore in proportion, 31.24% of all hotels with international guest were assigned to this league, and 21 out of 23 hotels fucuses on individual guests. When looking at the type of hotels, five hotel types represented in this group (**74. Figure**)

74. Figure - Hotel Type - ABC League

	All	League ABC	
Castle Hotel	3	1	33.3%
Resort or Sport Hotel	8	1	12.5%
City Hotel	29	7	24.1%
Wellness Hotel	40	10	25%
Apartmen Hotel	2	2	100%
Spa or Thermal Hotel	8	2	25.5%

(Source: Own Edit)

ABC league Conclusion:

As the league has no indicators of its own, that they would be outstanding, they are the real Midfielders of Hungarian tailor-made hotel service.

6.4.6.8.League CA – Sub league

The CA sub-league has 48 hotel members and 2 indicators. This is the biggest sub-league and includes the most hotels. They perform poorly in the indicators of the lower leagues, perform well in the indicators of the top league and they perform average in the indicators of the middle league.

Indicators of sub-league CA

The two technical indicators of this sub-league are from the lower league indicators bi-cluster. These hotels are connected by the fact that they do better in these two indicators than the rest of the hotels in the lower league as it can be seen in **33. Table**.

33. Table - Indicators of CA Sub-league

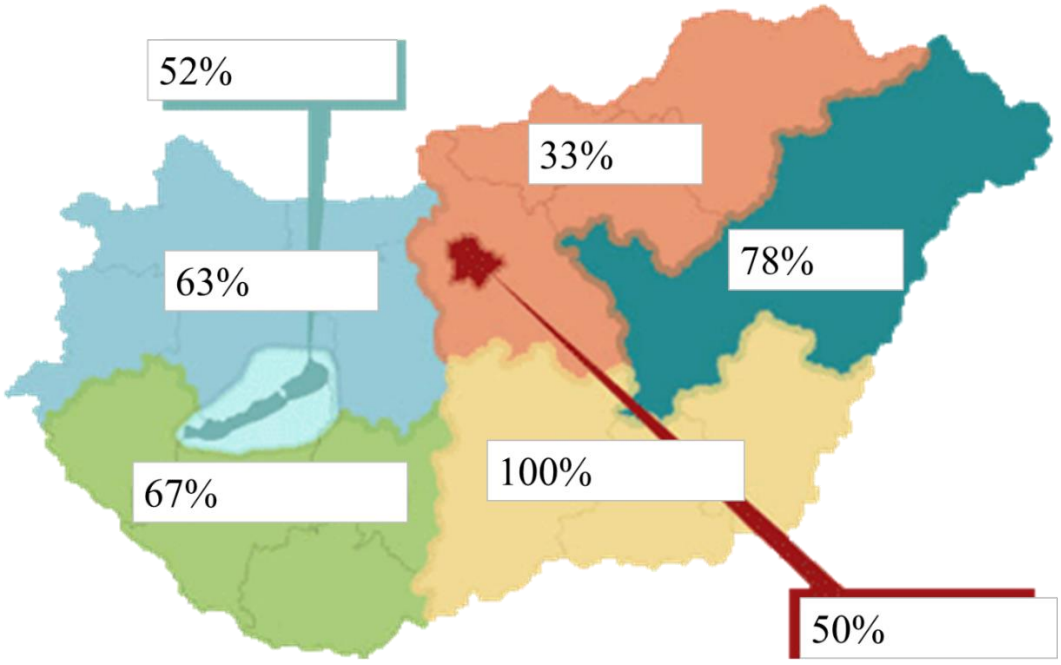
Indicator ID	Indicator	Indicator Placement
I1	Our website has features that are personalized for the users' preferences (for instance based on segments they can choose to browse between offers to their specific needs or interests.)	Technical stage – pre-arrival stage
I93	We store and update guest data frequently (even before the check-in or after the check-out) that we use during re-marketing campaigns.	Technical stage

(Source: Own Edit)

Hotels of these sub-league CA

All of the hotels from the Great Hungarian Plain region are in this sub-group, meaning that only 33% of the Northern region got into this league (**75. Figure**).

75. Figure - Percentage of Hotels by Region in CA League



(Source: Own Edit)

In proportion, most members of the sub-league are 3-star superior hotels, and mostly the middle categories 3-star, 3-star superior, 4-star and 4-star superior appears in the sub-league (**34. Table**).

34. Table - Number of Hotels by Region CA League

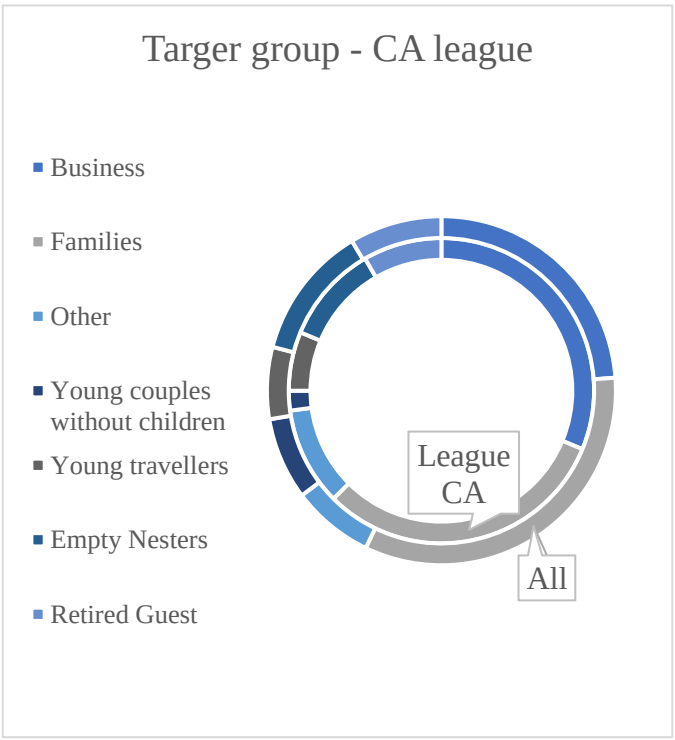
	No rating	2	2 sup.	3	3 sup.	4	4 sup.	5	5 sup.
Sum of all participants	4	5	1	21	9	46	14	4	2
League CA	1	2		8	7	22	7		1
% in League CA	25,00	40,00	0,00	38,10	77,78	47,83	50,00	0,00	50,00

(Source: Own Edit)

In proportion, and contrast with the other sub-leagues, many of the businesses guest focused hotels are in this CA sub-league, 33, or 47.14% of all focuses on domestic guests and 15 (which is 42.86% of all hotels with international guest) focuses on international travellers (**76. Figure**).

76. Figure - Target Group CA League

	All	Leagues CA	
Business	25	15	0%
Families	35	15	43%
Other	8	5	63%
Young couples without children	8	1	13%
Young travellers	7	3	43%
Empty Nesters	13	5	38%
Retired Guest	9	4	44%

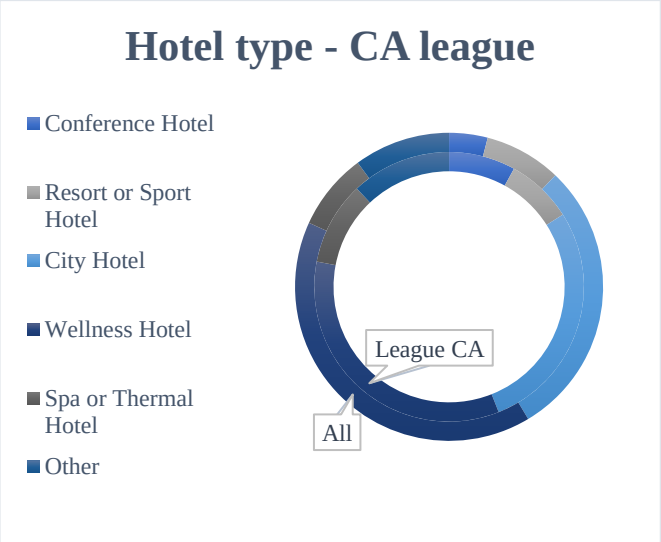


(Source: Own Edit)

All conference hotels and most spa and thermal hotels are in this sub-league but given the nature of the sample in case of number, most hotels are wellness and city hotels (**77. Figure**).

77. Figure - Hotel Type - CA League

	All	League CA	
Conference Hotel	4	4	100%
Resort or Sport Hotel	8	4	50 %
City Hotel	29	14	48.3%
Wellness Hotel	40	17	42.5%
Spa or Thermal Hotel	8	5	62.5%
Other	10	6	60%



(Source: Own Edit)

CA league Conclusion

Members of this league although perform poorly in the indicators of the lower leagues, they perform well in the indicators of the top league and perform average in the indicators of the middle league.

They are connected as they perform above average in data collection and re-marketing, and they have website features that enable them to collect data. This means that they do better in these indicators than the rest of the hotels in the lower league, in other words, they made steps to transition to the top league, hence they are the up-and-comers of the Hotel industry when it comes to tailor-made service.

6.4.7. Conclusion of Bi-cluster Analyses

In this subsection, I have used bi-cluster analyses to determine if it is possible to group Hungarian hotels into different clusters based on the level to which service is tailor-made (Hypothesis 2). Due to the nature of bi-clustering, I was also testing, simultaneously, if the tailor-made service indicators could be grouped in different clusters based on which indicators hotels perform well and poorly. (Hypothesis 3)

In the first half of this subsection, I have introduced bi-clustering and determined that it is possible to create statistically significant clusters of hotels and tailor-made service indicators.

The hotels and the tailor-made service indicators had been assigned to 3 greater leagues, marked as League A or top league, League C or lower league and League B or middle league.

The top league (League A) has 80 hotels and 65 indicators; almost 90% of functional stage indicators and 51% of technical stage indicators are here meaning, that 80 out of 105 hotels perform well above average when it comes to the post-service phase, and do well at the service-phase, especially in acts of kindness, guest service, and have supporting activities and infrastructure, that is necessary to offer personalized and customized service. All hotels in the Budapest region are positioned in the top league or one of the sub-leagues of the top league.

The lower league (League C) has 95 hotels and 19 indicators, which means that more hotels are performing poorly in these 19 indicators than hotels that are at least average. The lower league is characterised by technical stage indicators containing supporting activities and technological conditions that can be crucial in customized or personalized services such as the websites' data collecting abilities or micro-segmentation of the target group.

This means that 90.5% of all participants perform poorly and the remaining 9.5% at best average in these indicators. This implies a serious gap between the A***** performers and the rest of the Hungarian Hotel industry.

Because of the overlap with other main leagues, there are going to be hotels that perform well in the 65 indicators in the top league but will struggle with these 19 indicators in the lower league. Therefore, respondents from all regions are included in these lower leagues; however, only 64% of hotels from Budapest are included. Unfortunately, proportionally the least response is from the Budapest region therefore if more hotels were to participate from this region this result might be different.

The final greater league that was identified is the middle league which represents those that are especially bad in the lower league indicators and good in the top league indicators. As this group is the most homogenous league, all 28 hotels are performing well in the 17 tailor-made service indicators assigned to these hotels, which means that other than performing well in the previously mentioned indicators, they are also great at encouraging the employee to perform individualized service and be truly hospitable. They are all performing outstandingly in encouraging and providing hospitality.

Looking at the leagues from the tailor-made indicator standpoint, the top league indicators focus on the functional aspects of tailor-made service and include all necessary supporting activities for individualized service.

The lower league contains most technical aspects and supporting indicators, which would require planning and investment in customization and personalization.

The middle league indicators focus on hospitality and encouragement, both of which is an essential part of great service.

The greater leagues could be divided into sub-leagues based on how they overlapped.

League A***** are the Leaders of Customization – Communication – Personalization (**35. Table**). There are only 4 hotels in this league that perform well in 46 indicators and average in the remaining 39 indicators, as they have no overlap with the lower league. The indicators are

focusing on acts of kindness, guest service, and individual service-supporting activities. They are the Leaders of all activities.

League C* are the conservatives of service and although they do perform well in certain aspects, they avoid most technical aspects of individualized service and offer no changes regarding the room. They are conservatives as they do not invest in technology or segmented marketing.

35. Table - Collection of Hotel Clusters

Name in Bi-cluster	Name of Bi-cluster	Members and indicators	Target group	Target group by origin
League A***	**Leaders** of tailor-made service	4 hotels 46 indicators	Leisure guests	international guests
League C*	The **Conservatives** of service	24 hotels 17 indicators	Leisure guests	domestic guests
League AB	The **Champions** of hospitality	5 hotels 17 indicators	Leisure guests	international 3 domestic guest 2
League ABC	The real **Midfielders**	23 hotels 0 indicators	Leisure guests	international guests
League CA	**Up-and - comers**	48 hotels, 2 indicators	Business guests	similar proportion.

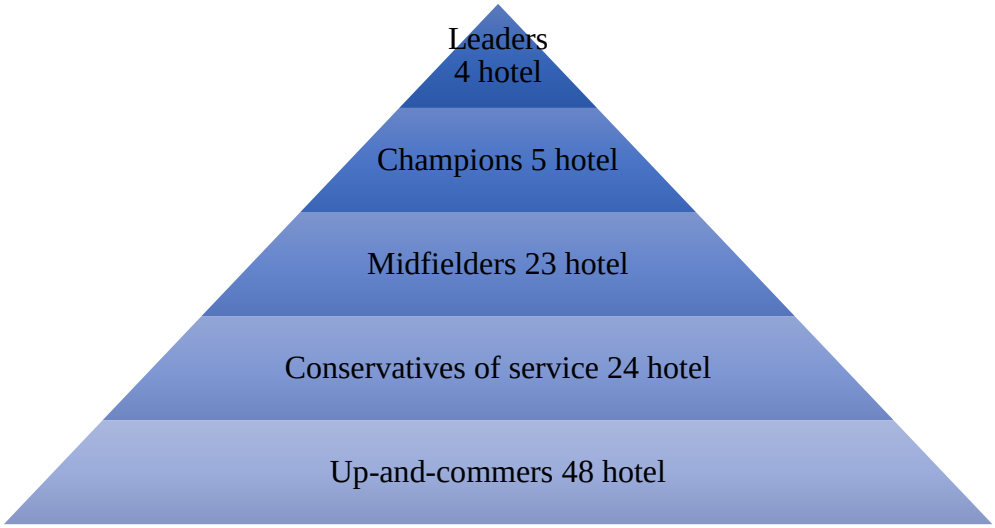
(Source: Own Edit)

League AB are the Champions of hospitality as they emphasized encouraging employee to be there for the guest and excel in hospitality.

League ABC is the real Midfielders. They are performed well on average in hospitality and have a tendency and need for individualized service, however they avoid most technical aspects of service and lack customized service offerings.

League CA the Up-and-comers are the group who are separated themselves from the conservatives and started some activities to collect guest data and do proper segmentation. These activities, if continued, shall help them to be able to offer more individualized service.

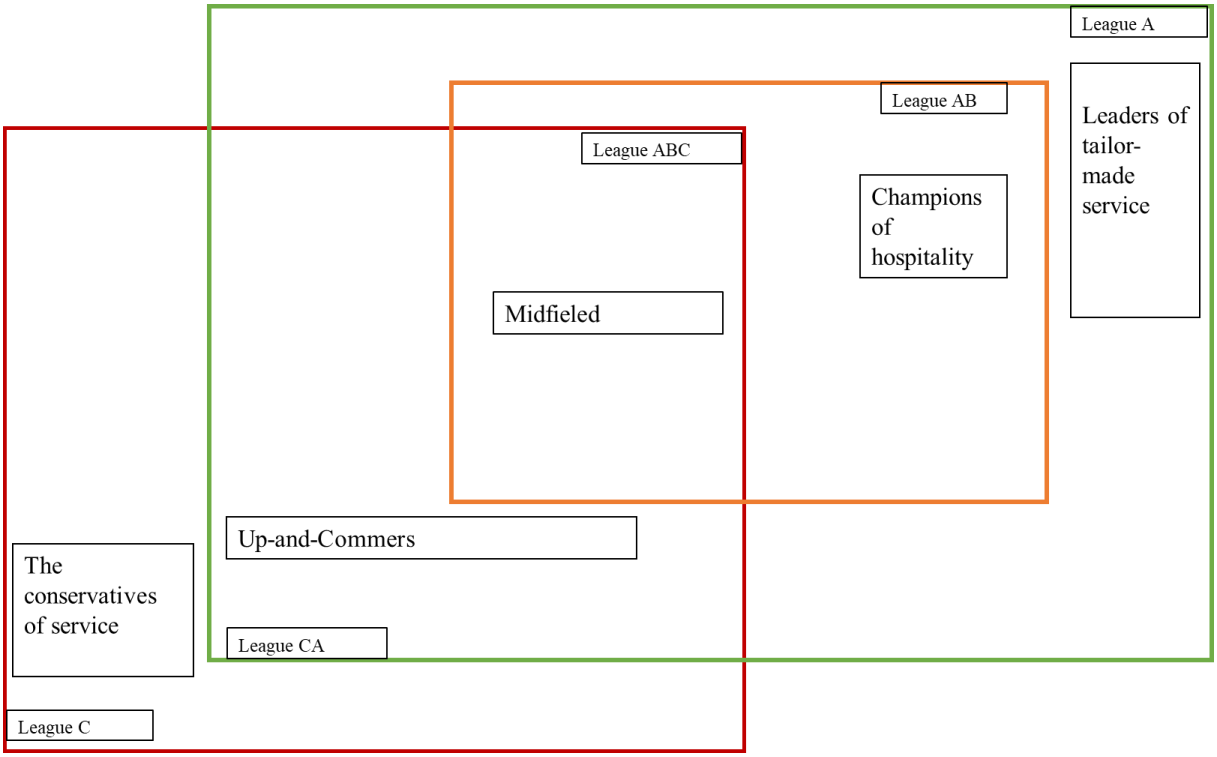
78. Figure - Hierarchy of Hotel Clusters



(Source: Own Edit)

Tailor-made service evolution of the Hungarian hospitality industry currently built as Figure pyramid in **78. Figure**. Leaders and Champions are the smallest groups while the Conservatives and Up-and-commers are the majority. Midfielders as in **79. Figure**, represent the middle of the pyramid.

79. Figure - Final Cluster Placement



(Source: Own Edit)

Thesis 2

It was determined that Hungarian hotels can be grouped in different clusters according to the level to which service is tailor-made.

Thesis 3

It was concluded that Tailor-made service indicators can be grouped into different clusters based on the performance of the hotel.

6.5. There is a relationship between the different characteristics and the level to which the service is tailor-made. (Hypothesis 4)

The hypothesis aims to determine if specific hotel characteristics such as size, star rating, target group or hotel type will affect the level to which service is tailor-made.

6.5.1. The method of testing Hypothesis 4

To test this hypothesis, three kinds of methods were deemed necessary. On one hand, Pearson correlation will be used in the case of room numbers (scale) and the level of tailor – made service score (scale), for H4a**.** The Pearson correlation coefficient (*r)* is between –1 and 1. It measures both the strength and direction of the relationship between two variables.
On the other hand, to compare the score results (scale) to the type of hotel, star rating and target group categorical variables (which are nominal), variance analysis is needed for H4b., H4c., H4d. ANOVA (one-way analysis of variance) is used to identify if there are statistically significant differences between the means of the independent groups. (Sajtos and Mitev, 2007; Sajtos László. et al., 2007) If the data is non-parametric, then Kruskal – Wallis test will be performed. Finally, to determine if there is a relationship between chain membership and tailor-made service t-test will be used, H4e.

6.5.2. The size of the hotel

This sub-hypothesis was set up to test a relationship between the hotel's number of rooms and their score on the tailor-made service scale. In order to investigate this relationship, correlation analysis has been chosen. The value of the correlation coefficient can be between +/-1.00 and 0.00, where the negative value negative means a negative correlation. (Molnár, 2015; Sajtos László. et al., 2007).
The room number varies from 10 - 429, while the score can be between 0 - 321.
The Pearson correlation in **36. Table** shows that there was no statistically significant correlation between the size of the hotel and the tailor-made service score. (p=0.711)

36. Table - Size of Hotel Pearson Correlation Tailor-made Service Scores

Correlations			
		Sumscore	Room Nr.
Sumscore	Pearson Correlation	1	-,037
	Sig. (2-tailed)		,711
	N	105	105
Room Nr.	Pearson Correlation	-,037	1
	Sig. (2-tailed)	,711	
	N	105	105

(Source: SPSS Output)

The room numbers and the sub-scores for the functional score (0-295) and technical score (0-26) were also compared but showed no statistically significant correlation between the variables (**37. Table**).

37. Table - Size of Hotel Pearson Correlation Tailor-made Service Scores Based on Stages

Correlations				
		Room Nr.	Functional All	Technical All
Room Nr.	Pearson Correlation	1	-,026	-,105
	Sig. (2-tailed)		,791	,288
	N	105	105	105
Functional All	Pearson Correlation	-,026	1	,466**
	Sig. (2-tailed)	,791		,000
	N	105	105	105
Technical All	Pearson Correlation	-,105	,466**	1
	Sig. (2-tailed)	,288	,000	
	N	105	105	105

(Source: SPSS Output)

Therefore, it can be concluded that (H4a.) there is no relationship between the size of the hotel and the level to which service is tailor-made, therefore the hypothesis can be rejected.

6.5.3. The type of hotel

This sub-hypothesis was directed to investigate the relationship between the hotel type and their score on the tailor-made service scale. To investigate this relationship, one-way ANOVA has been chosen, the test of Homogeneity of Variances was met. Most hotels are reportedly Wellness hotels. Depending on the hotel type, the length of the stay will be different; hence, there are more touchpoints with the customer.

38. Table - ANOVA of Hotel Types

ANOVA					
Sumscore					
	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	16220,556	8	2027,569	1,133	,348
Within Groups	171761,692	96	1789,184		
Total	187982,248	104			

(Source: SPSS Output)

The results showed $p > 0.05$ (**38. Table**) therefore there it can be concluded that there is no relationship between the type of the hotel and the level to which service is tailor-made, therefore the hypothesis is rejected.

6.5.4. The hotel's guest type

This sub-hypothesis aims to find a relationship between the hotel guest type and their score on the tailor-made service scale. To investigate this relationship, variance analyses has been chosen, but the test of Homogeneity of Variances was not met. Therefore, the nonparametric analysis of Kruskal-Wallis test was performed.

39. Table - Kruskal - Wallis Test

Test Statistics[a,b]	
	Sumscore
Chi-square	9,847
df	5
Asymp. Sig.	,080
a. Kruskal Wallis Test	
b. Grouping Variable: Target Group	

(Source: SPSS Output)

As the p value is greater than .05 (**39. Table**), it can be concluded that (H3c) there is no relationship between the hotel's guest type and the level to which service is tailor-made, therefore the hypothesis can be rejected.

6.5.5. The Star Rating.

This sub-hypothesis aims to find a relationship between the hotel's star rating and their score on the tailor-made service scale. To investigate this relationship, variance analyses has been chosen, and the test of Homogeneity of Variances was met. The ANOVA analysis showed a $p < .05$ significance (**40. Table**).

40. Table - ANOVA Star Rating

ANOVA					
Sumscore					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	25499,011	6	4249,835	2,563	,024
Within Groups	162483,236	98	1657,992		
Total	187982,248	104			

(Source: SPSS Output)

Therefore, it can be stated that (H4d) there is a relationship between the hotel's star rating and the level to which service is tailor-made.

To find out where is a stronger relationship, and to determine which specific groups are different from each other, post-hoc test was performed. Tukey's honestly significant difference was selected.

41. Table - Multiple Comparison Star Rating

Multiple Comparisons								
Dependent Variable:Sumscore								
	(I) Star-Rating		(J) Star-Rating		Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval
								Lower Bound / Upper Bound
Tukey HSD		3		2	9,118	20,173	,999	-51,61 / 69,85
				4	**36,935***	10,519	**,012**	5,27 / 68,60
				5	48,518	20,173	,208	-12,21 / 109,25
				3 Sup.	18,218	15,529	,903	-28,53 / 64,97
				4 Sup.	20,532	13,921	,759	-21,38 / 62,44
				5 Sup	10,818	30,073	1,000	-79,71 / 101,35
		4		2	-27,817	19,154	,772	-85,48 / 29,85
				3	**-36,935***	10,519	**,012**	-68,60 / -5,27
				5	11,583	19,154	,997	-46,08 / 69,25
				3 Sup.	-18,717	14,180	,841	-61,41 / 23,97
				4 Sup.	-16,403	12,398	,840	-53,73 / 20,92
				5 Sup	-26,117	29,399	,974	-114,62 / 62,39
*. The mean difference is significant at the 0.05 level.								

(Source: SPSS Output)

The output (**41. Table**) shows no significant difference between the different star-rating scores except between 3 and 4-star hotels, where 3-star hotels score significantly higher than 4-star hotels, therefore the hypothesis is confirmed.

6.5.6. Chain Membership

To determine if there is a relationship between chain membership and the score on the tailor-made service scale, t-test is going to be performed. The t-test is used to see how significant the differences between group means are.

As **42.Table** Independent Samples Test shows Sig. (2-tailed) is $p<0.05$ (**42. Table**), which signifies that there is a statistically significant difference between the two groups.

42. Table - Independent Samples Test

Group Statistics					
	Chain member	N	Mean	Std. Deviation	Std. Error Mean
Sumscore	No	74	232,66	41,346	4,806
	Yes	31	255,35	41,608	7,473

(Source: SPSS Output)

The analysis found that chain members, have a higher score, (255,35 +/- 41.6) compared to non-chain members (232,66 +/- 41.35) t_{103}=-2.56, p=0.012. Therefore, I can accept this hypothesis.

6.5.7. Conclusion of Hypothesis 4.

When analysing if there is a relationship between the different characteristics and the level to which the service is tailor-made, it was found that there is no relationship between the size of the hotel and the score on tailor-made service. That is a surprising result given the literature suggesting that individualised service demands more attention on the guest; therefore, a smaller establishment should have an advantage in this area. On the other hand, a big establishment have more intricate quality management, therefore they are more likely to need quality management representative or department. This could mean extra investment, but at the same time it could imply that there is a more refined strategy in place in hotels with quality management.

Similarly, to size, the type of the hotel or the type of the guest also had no significant relationship with the tailor-made service score, even though the literature around the subject pointed out that individualised service requires more interaction with the guest (hence more touchpoints). This would mean that a hotel where guests are staying for a longer period of time, such as a resort, should provide more opportunities for the staff to get to know the guest and provide individualised service compared to a city hotel where guests spend a short time in-house.

The star rating of the hotel had significant relationship with the tailor-made service score in the case of 3-star and 4-star hotels. Although 4-star hotels have higher quality, as having more service offerings, they scored significantly lower than the 3-star hotels of the sample.

Chain membership showed a significant difference, with chain members scoring significantly higher than non-chain members. It could be explained by the fact the chain members often share resources such as the marketing department and therefore have more opportunities to invest in supporting elements of individualized service. When it comes to the functional stage elements, chain hotels could have added benefit from standardization practices. As part of standardization, they pay more attention to individualization, interestingly enough, this also appears in the standards (Gyurácz-Németh, 2014), as they work with professional management, global rules, and good practices, which can have a ripple effect here as well.

Findings of Hypothesis 4.
Based on the analyses presented in the previous subsection the findings are as follows;

Finding 4a

It has been confirmed that there is no relationship between the size of the hotel and the level to which service is tailor-made.

Finding4b

It has been concluded that there is no relationship between the type of hotel and the level to which service is tailor-made.

Finding 4c

Based on the results, there is no relationship between the hotel's guest type and the level to which service is tailor-made.

Thesis 4
Based on the analyses presented in the previous the following theses can be formulated:

Thesis 4c

It was proven that there is a relationship between the hotel's star rating and the level to which service is tailor-made. The post-hoc analysis showed that 3-star hotels score significantly higher than 4-star hotels on the tailor-made service score.

Thesis 4e

It was determined that there is a relationship between chain membership and the level to which service is tailor-made.

6.6. There is a relationship between the level of tailor-made services and the importance of the tailor-made services determined by the Hotel Manager (Hypothesis 5)

General Manager is the main decision maker in the hotel strategy (Győrffy, 2004; Hayes et al., 2016; Jávor, 2009), therefore, their attitude is key when deciding on a more tailor-made service strategy.

6.6.1. The method of testing Hypothesis 5

The survey contains three questions regarding the importance of tailor-made service. (Based on Ariffin, 2008; 2013, Chellappa and Sin; 2005, Oztuk; 2017

- How important is it to you to provide tailor-made service to your guests?
- How important is it to your hotel that in your hotel's communication, you make the guest feel like they are special customers?
- How important is it to you to modify the hotel service supply based on the guest's individual needs?

The managers were asked to answer the above questions and rate their responses on a 1-7 Likert scale. To analyse the hypothesis, first, the internal consistency had to be analysed to assess if the three indicators were related. For that, Cronbach's alpha is a measure needed. In case of an acceptable alpha, the indicators can be coded into a value of importance. Finally, the relationship between the value of the score on the tailor-made service scale and the importance of providing tailor-made service determined by the Hotel Manager can be determined using Pearson rank correlation.

Reliability analyses shows (**43. Table**) that the alpha level is .853, which indicates a high level of internal consistency (Cronbach's Alpha in SPSS Statistics).

43. Table - Cronbach's Alpha

Reliability Statistics	
Cronbach's Alpha	N of Items
,853	3

(Source: SPSS Output)

The Hotel Managers in average gave tailor-made service a 6 out of 7 importance. The median is also 6 out of 7.

Pearson rank correlation on **44. Table** shows $p > .005$, therefore I can conclude that there is no relationship between tailor-made service scale and the importance of providing tailor-made service, therefore the hypothesis can be rejected.

44. Table - Pearsons Rank Correlation tailor-made services and the importance of the tailor-made services determined by the hotel manager

Correlations			
		Sumscore	TailorredMean
SumScore	Pearson Correlation	1	-,020
	Sig. (2-tailed)		,837
	N	105	105
Importance of tailor-made service	Pearson Correlation	-,020	1
	Sig. (2-tailed)	,837	
	N	105	105

(Source: SPSS Output)

6.6.2. Conclusion Hypothesis 5

Although General Managers agree that tailor-made service is important, there is no significant relationship between the level of importance indicated by them in a survey and the hotel scores. This can be explained by a lack of both financial and human resources, especially after the Covid-19 pandemic and considering the current economic situation. As the human factor is especially troubling in the past years, it is possible, that the General Managers are not able to convene their expectation of desired service outcome.

Finding 5

There is no relationship between the value of score on the tailor-made service scale and the importance of providing tailor made service determined by the Hotel Manager.

6.7. There is a difference in the level to which guest encounter phase are tailor made. (Hypothesis 6.)

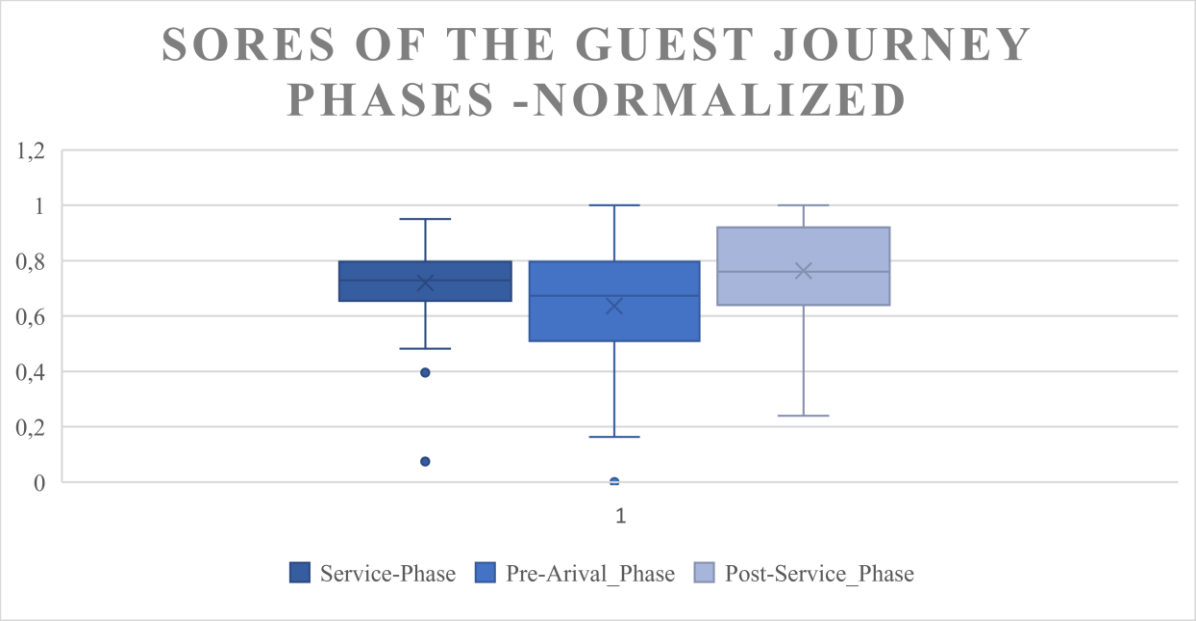
Although there are many tailor-made service indicators that can be applied to the entire service process, some indicators are specific to one specific phase in the Customer Journey model. The aim is to measure if there is a statistically significant difference between these phases.

6.7.1. The method of testing Hypothesis 6

To measure whether there is a difference in the level to which guest encounter phases are tailor-made, first, the 3 phases must be comparable. As each has a different number of indicators, they had to be normalized (0-1).

As it can be seen from the boxplot (**80. Figure**), the centre the centre of the sores are relatively close to each other, but there is some difference between the phases' distribution, hence further statistical analyses is needed.

80. Figure - Sores of the Guest Journey



(Source: SPSS Output)

After the score rates of the phases had been brought to a comparable scale, paired sample *t*-test was chosen to identify if there was a significant difference between the phases regarding the level of tailor-made service.
Paired sample *t*-test is a statistical procedure to determine if the mean difference between two sets of observations is zero. Common applications include case-control studies or repeated-measures designs, in other words, paired sample *t*-test are used when dependent samples are connected. The H0 is that the pairwise difference is equal (H0: μd = 0) (Goulden, 1959).

Paired Samples Correlations **45. Table** shows the bivariate Pearson correlation coefficient for each pair of variables entered which shows moderate relationship between the phases. (r=0.41-0.7 -moderated (Molnár, 2015; Sajtos and Mitev, 2007).

45. Table - Paired Samples Correlations

Paired Samples Correlations				
		N	Correlation	Sig.
Pair 1	Service_Phase & Pre_Arival_Phase	105	,672	,000
Pair 2	Service_Phase & Post_Service_Phase	105	,565	,000
Pair 3	Pre_Arival & Post_Service_Phase	105	,602	,000

(Source: SPSS Output)

The average difference between the two variables were the greatest between the pre-arrival and the post-service phase (-0.1272)

- There was a significant average difference between the service phase and pre-arrival phase (*t*104=5.392; p=.000), which means that, on average, the service phase scores were 0.082 points higher (on the normalized scale) than the pre-arrival phase scores.
- There was also a significant average difference between the service phase and the post-service phase (*t*104=-3.113; p=.002), which means that, on average, the service phase scores were 0.0447 points lower (on the normalized scale) than the post-service phase scores.
- Finally, there was a significant average difference between the pre-arrival and the post-service phase (*t*104=-7.444; p=.000), which means that on average, the pre-arrival phase scores were 0.1272 points lower (on the normalized scale) than the post-service phase scores.

Based on these results, the author can confirm that hotels performed best on the post-service scale and they core lowest of the pre-arrival phase, therefore the hypothesis can be accepted.

6.7.2. Conclusion of Hypothesis 6.

Hungarian hotels perform best in the post-service phase, followed by the service and pre-arrival phases. This was partially proven during the bi-cluster analysis as none of the post-service indicators was placed in the lower leagues.

This could mean that although many hotels put low emphasis on the marketing aspects and data collecting, they intend to create returning guests by proactively communicating with their guests after the service ended.

Thesis 6.

It was proven that there is a statistically significant difference in the level to which guest encounter phase are tailor made.

Hungarian hotels perform best in the post-service phase tailor-made service indicators and lowest in the pre-arrival phase tailor-made service indicators.

6.8. There is a difference in the tailor-made service level of the guest encounter stages. (Hypothesis 7)

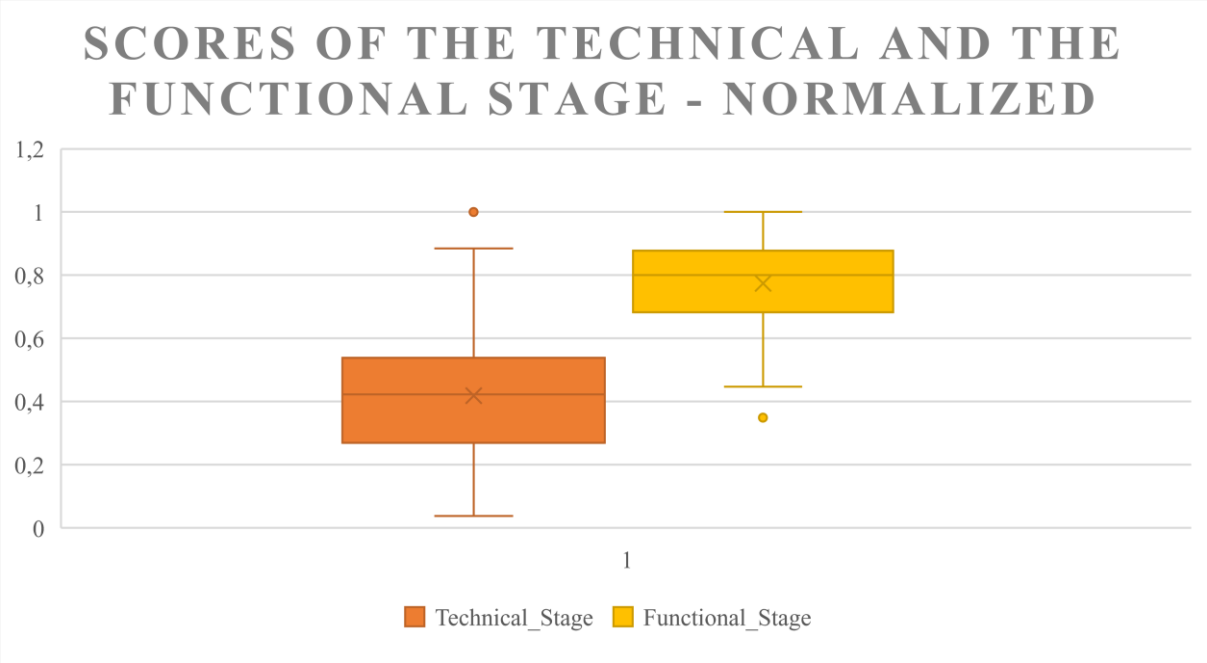
The tailor-made service indicators play on two stages, the technical and the functional stage. By normalizing the sores of the two sun-scales, it is possible to compare them.

6.8.1. The method of testing Hypothesis 7

To measure whether there is a difference in the level to which guest encounter stages are tailor-made, first, the 2 phases have to be comparable. As each has a different number of indicators, they had to be normalized (0-1).

It can be seen from the boxplot (**81. Figure**) that the centre of the functional stage scores is much higher than the centre of the technical stage scores, but to analyse if it is statistically significant, paired t-test is performed.

81. Figure - Scores of the Technical and the Functional Stage



(Source: Own Edit)

Paired Samples Correlations **46. Table** shows the bivariate Pearson correlation coefficient for each pair of variables entered which shows moderate relationship between the phases. (r=0.41-0.7 -moderated (Molnár, 2015; Sajtos and Mitev, 2007).

46. Table - Paired Samples Correlations of the Tailor-made Service Stages

Paired Samples Correlations				
		N	Correlation	Sig.
Pair 1	Technical_Stage & Functional_Stage	105	,466	,000

(Source: Own Edit)

There is a significant average difference between the technical stage and the functional stage (t_{104}=-21.148; p=.000) which means that on average the technical stage scores were 0.3554 point lower (on the normalized scale) than the functional stage scores (**47. Table**).

47. Table - Paired Sample Test Technical and Functional Stage

Paired Samples Test									
		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Technical_Stage - Functional_Stage	-,3554157	,1722103	,0168060	-,3887426	-,3220887	-21,148	104	,000

(Source: SPSS Output)

Based on this analysis, it can be concluded that hotels performed better on the functional tailor-made service scale indicators, therefore the hypothesis can be accapted.

Also, it is important to mention that at Hypothesis 4 with **37. Figure**, we could see that although there is no significant relationship between the number of rooms and the score in functional or technical stage scores, but there is a p=.000, r=.466** medium relationship, which indicates that although hotels in general perform better in the functional elements of tailormade service, those woes perform well in the functional stage, will also perform better on the technical stage.

Conclusion:

Technical stage indicators have higher investment needs, as the website, and hotel application development is a great financial burthen. Other aspects of the technical stage, like offering a pillow menu, or individualized offers for the minibar, have on the one hand financial aspects (as those items have to be purchased and stored) and on the other hand human resource aspects as the customization have to be done by an employee. Data collection, maintenance, and usage in order to create precise segments have high human resource need (number and competence). On the other hand, functional stage indicators are more focused on the things that are done which means that most hotels aim to provide great service with the resources they have. The results show that performing well on one stage will indicate that the hotel will perform well on the other stage too.

Thesis 7.

It was proven that there is a statistically significant difference in the level to which guest encounter stages are tailor-made Hungarian hotels.

Hungarian hotels perform best on the functional stage.

6.9.Conclusion of the Chapter

Dividing the hotels and the tailor-made service indicators into clusters showed a clear difference between the level to which service is tailor-made. The hierarchy of Hungarian hotels shows that a considerable part of the industry is in the middle or lower leagues, as there are more hotels assigned to the "Midfielders" and the "Up-and-comers" than to the "Champions" and "Leaders". This means that only a few hotels are on the top of the tailor-made service scale. Contrary to the fact that most hotels are performing as "Midfielders" or lower, in the clusters of tailor-made service, most of the indicators are situated in the top League, which means that indicators concentrating functional stage indicators such as acts of kindness and classical hospitality service, focusing on guest service are important to almost all players. On the other hand, the active personalisation and customisation of service and the encouragement of employees are, on average, less important in the Hungarian hotel field. After analysing the results, the findings show that the Hungarian hotel industry needs to emphasise the technical aspects of service. While hotels generally scored well on the functional scale, they scored low on the technical score. Later in the analysis, this difference is proven statistically significant.

While personalisation/customisation research in the hospitality industry puts emphasis on the technical aspects of service, in the case of the Hungarian hotel industry, it was shown that there is a low emphasis on the technical quality of service.

Literature suggests that tailor-made service requires a high amount of human resources and data. This would indicate that the more time the guest spends in the hotel, the more chance the hotel and the customer have to co-create value. However, the hypothesis's findings showed no statistically significant difference between the size of the hotel, the type of hotel or the type of guest. Therefore, the length of stay or the specific needs of different target groups have not affected the level of tailor-made service in the Hungarian hotel industry. This indicates that the extent to which hotel employees and guests have the chance to "encounter" did not affect the score the hotel reached. Furthermore, while the star rating system indicates the level of quality, this research showed that the only difference was between the three and four-star hotels regarding individualised service. Interestingly, three-star hotels perform better in service individualisation than four-star hotels.

At the same time, the results show that chain membership affected the level of individualisation of service. Although the literature suggests that to individualise service, the hotel employee has to spend more time and effort to get to know the guest, and chain members, based on the results of this research, yield higher scores on the tailor-made service scale than individual hotels. In addition, chain members emphasise standardisation which also affects their standard to tailor

service, and they usually share resources with their chain members, which could explain the results as to why they perform better on the overall tailor-made service scale.

Although General Managers are the main decision-makers of the hotel and hotel strategy, the results couldn't prove a relationship between the importance of service personalisation and customisation for the General Manager and its presence in the hotel service.

The research also looked at the different guest encounter phases and compared them based on the level of tailor-made service scores. The study showed that although based on the literature, the service phase should be the best performer, as this is the phase when the most encounters happen; therefore, the most chances for tailoring service occur, in the Hungarian hotel industry, the post-service phase performs the highest. Furthermore, the scores of the post-service phase were all in the top League cluster and showed significantly higher results in all cases. Altogether, the Hungarian hotels performed the worst in the pre-arrival phase, which also relies heavily on technology.

Finally, the research compares the technical stage and the functional stage indicators and found a statistically significant difference which shows that Hungarian hotels, in general, perform better in tailor-made items of the functional stage.

7. Evaluation of the results of the research

The following chapter will summarize the study by presenting the key research findings in relation with the research aims and questions. After discussing the value and contribution it will also review the limitations of the research and propose opportunities for future research.

7.1.Discussion

This research provides new insights into important aspects of our understanding of tailor-made service in the hostel industry. Firstly, a new customer journey model was conceptualized. Secondly, based on the customer journey model, a new measurement system was developed to measure tailor-made hotel service. Thirdly, the Hungarian hotel industry was clustered based on their ranking on the tailor-made service scale. Fourthly, the tailor-made service indicators were grouped based on how well hotels performed in them. Fifthly, the results of the scores were compared based on the hotel's characteristics. Sixthly, the relationship between the General Managers indicated the importance of service quality and the actual scores were analysed. Finally, the tailor-made service scores were compared based on the phases and stages conceptualized in the customer journey model.

Firstly, the literature shows (Chapter 3.1.) that although many of the customer journey models have included the pre-arrival and post-service phases, the tangible (backstage) elements of service were more emphatic in service blueprinting. At the same time, service blueprinting is very complex and hard to generalize for multiple establishments. Therefore, conceptualizing a new customer journey model was an essential first step in creating a new measurement model, and in itself can be considered as the renewal of scientific findings.

Secondly, hotel service quality models (Chapter 2.2.) are mostly built on SERVQUAL and consider the guest's perception of quality, while personalization/customization models (Chapter 5) focus on the measurement of a single aspect of service like the website, marketing, in-house applications, or the encounter with the employee. Although there has been limited research on service quality in hotels, the focus of research has been on customer expectations rather than hotel performance therefore, on the one hand, there is a lack of literature regarding the measurement of the entire hotel journey, and on the other hand, there is also limited research done from the hotel performance perspective. Therefore, creating a measurement system that can fill this GAP was one of the main goals of this research. Using qualitative methods and scale-building techniques a new gap-filling measurement system was tested.

Thirdly, while clustering the Hungarian hotel industry, bi-cluster analyses were performed, which is a new technique in social sciences. As few publications use bi-clustering algorithms in the social, business and economic sciences the analyses presented a new perspective on grouping methods. The results provided by the analyses enabled a new type of differentiation perspective of the Hungarian hotel industry. The results show that hotels belonging to the same league do not necessarily share the same characteristics in other aspects. Therefore, the results created a new characterization option for the hotels as 5 clusters of tailor-made service levels were identified.

The results novelty is that they provide an overview of the Hungarian hotel industry from a service individualization perspective. Also, when measuring hotel service characteristics, not only the star rating but the individualization clusters can be considered for future research. While in the case of the star rating, most hotels are four-star hotels, in the case of the tailor-

made service scale, the majority of hotels are "Up-and-comers", which is the lowest league. This shows that although in a classical sense, most hotels aim to be high quality, in the light of tailor-made service it is the minority who is able to meet "each" guest's needs.

Fourthly, as the literature showed (chapter x, table indicators), as research typically focused on one aspect of service individualization, there was no research done to compare the readiness of hotels (or service providers) to provide tailor-made service in the case of all indicators. The bi-clustering analyses novelty is that while finding the best performers it also grouped the indicators they performed best in. The study produced four clusters. The top league indicators focus on the functional aspects of tailor-made service and include all necessary supporting activities for individualized service. The middle league indicators focus on hospitality and encouragement, both of which is an essential part of great service while the lower league contains most, but not all, technical aspects and supporting indicators, which would require planning and investment in customization and personalization. This gives a new understanding of the strength and weaknesses of the Hungarian hotel industry in the case of tailor-made service.

Fifthly, in the chapter (Core Service Encounter) it was illustrated that personalization and customization techniques happen mostly during face-to-face service encounters, thanks to the adaptative skill of front-line employees. But tailoring the services to an individual customer is achievable in all phases. The chapter (on personalization) also presented that individualized service is time-consuming. Therefore, those hotels where guest spends more time in, should have more chances for "moments of truth". The results show that only star rating an chain membership had a statistically significant relationship with the level of the score hotels reached.

From a classical service quality viewpoint, three-star hotels should be lower quality than four-star ones. However, this result also shows that service quality ranking can be different from an individualization point of view.

Similar to the literature the results yielded a higher individualized service score for the chain members compared to the individual hotels. Chain members have a set of standardized operation procedures to follow, which could mean a more rigid environment for front-line employees to operate in, but regardless the result shows that they perform better on the tailor-made service scale.

Sixthly, hotel management studies highlight the role of the General Manager in planning, strategy, employee selection, etc., therefore, if individualizing service is important to the General Manager it should be reflected in the results of the hotel's performance. This study did not find any relationship between the two results. This could have multiple explanations. IT could be that although the concept is important for the managers, they were unable to train their limited number of employee, especially if there are other financial burdens to carry. Even before, but especially following the COVID-19 pandemic, there is a great need for hospitality front and back-line workers. Due to the fluctuation of the industry, and the difficulties of finding and keeping employees, as discussed by hotels in HHRA meetings, it is challenging to train a short-stay employee to provide individualized service. Also, more and more students of the Z Generation starts working in hospitality, while the older generations are retiring. As the results show, the technical aspects of tailor-made service are still sub-optimal in most hotels. The new generation has a different communication style than older generations and they lack the know-

how of hospitality. Without technical support, it takes time, to learn and adapt to the guest's needs.

Following the Covid-19 pandemic, in 2022, the economic difficulties have multiplied, among other things gas prices have risen. Given the challenging environment of the current inflation, hotels face fiscal challenges that make it difficult to invest time, energy and money in the development of a tailor-made service environment.

Finally, based on the newly created guest journey model, the tailor-made service scores were compared based on the phases and stages. The results showed that contrary to the literature stating that most personalization and customization techniques happen mostly during face-to-face service encounters discussed in the chapter (Core Service Encounter), the results showed that the post-service phase performs the highest. This was highlighted during the bi-cluster analysis as all of the post-service indicators were in the top leagues. Pre-arrival phase performed the worst out of the three stages, which indicates that many hotels put low emphasis on segmented marketing and data collecting.

When analysing the stages, it is clear that Hungarian hotels perform better in the functional indicators.

Based on the results, the most critical development opportunity for managers is improving the technical aspects of quality. Many of the technical aspect indicators in the lower league focus on data collection, maintenance and application. Micro-segmentation, and proper data collecting, could be a small change to implement but would affect many aspects of the hotels' service while having low investment costs. A database of the guest, which is analysed and maintained could provide a great tool for new and old employees to use, which simultaneously would also increase the functional aspects.

7.2.The novelty of the research

The following aspects of the study are novelty.

1. I have conceptualized a new customer journey model that can be applied to other sectors.
2. I have created a new, gap-filling, tailor-made service quality measurement system for hotels and I have also tested it.
3. I have analyzed the capability of the current Hungarian hospitality industry to provide tailor-made service, and I have grouped the hotels and examined their characteristics.
4. I have identified the strengths and weaknesses of the Hungarian hotels in providing tailor-made service by grouping the indicators of the scales.
5. I have found the relationship between the hotel characteristics and the level of tailor-made service they can provide.
6. I have presented and analyzed the difference between the tailor-made level of the different service encounter phases, and I have also presented the statistically significant differences.
7. I have analyzed the difference between the level of tailor-made service of the different encounter stages, and I have presented the statistically significant differences.
8. I have provided an overview of the Hungarian hotel industry from a service individualization perspective.

9. I have used bi-clustering analyses to find the best performers and grouped the indicators they performed best in.
10. The dissertation gives a new understanding of the strength and weaknesses of the Hungarian hotel industry in the case of tailor-made service.

7.3.Collection of theses

Thesis 1.

Based on the research it is possible to develop a measurement system to measure the level to which service is tailor-made in hotels.

Thesis 2.

It was determined that Hungarian hotels can be grouped in different clusters according to the level to which service is tailor-made.

Thesis 3.

It was concluded that tailor-made service indicators can be grouped in different clusters based on in which indicators hotels perform well and poorly.

Thesis 4c.

It was proven that there is a relationship between the hotel's star rating and the level to which service is tailor-made. The post-hoc analysis showed that 3-star hotels score significantly higher than 4-star hotels on the tailor-made service score.

Thesis 4e.

It was determined that there is a relationship between chain membership and the level to which service is tailor-made.

Thesis 6.

It was proven that there is a statistically significant difference in the level to which guest encounter phase are tailor made.

Hungarian hotels perform best in the post-service phase tailor-made service indicators and lowest in the pre-arrival phase tailor-made service indicators.

Thesis 7.

It was proven that there is a statistically significant difference in the level to which guest encounter stages are tailor-made Hungarian hotels.

Hungarian hotels perform best on the functional stage.

7.4.Collection of Findings

Finding 4a

It has been confirmed that there is no relationship between the size of the hotel and the level to which service is tailor-made.

Finding 4b

It has been concluded that there is no relationship between the type of hotel and the level to which service is tailor-made.

Finding 4c

Based on the results, there is no relationship between the hotel's guest type and the level to which service is tailor-made.

Finding 5

There is no relationship between the value of score on the tailor-made service scale and the importance of providing tailor made service determined by the Hotel Manager.

7.5.Summary

The main goal of the dissertation was to analyse the capability of the current Hungarian hospitality industry to provide tailor-made service. To be able to conclude the research, it was important to create a new measurement system.

First, the dissertation introduces the theoretical background of service quality research and presents how the topic matured over time. The conceptualisation of the service quality definitions concluded that service in hospitality is an interactive process that can be individualised and where the service provider uses specialised competencies and resources so that, with the participation of the guest, they are able to create value, which can either be the final product or the addition to a physical good. It was highlighted that quality is conformance to customer specifications and can only be judged by the consumer. Therefore, the dissertation followed with the conceptualisation of tailor-made service definitions and introduced and conceptualised personalisation, customisation and co-creation. As a result of comparing personalisation and customisation, it was concluded, that in the case of personalisation, the main initiator is the company by collecting guest data and creating the opportunity and space for personalisation. In customisation, the hotel already had pre-determined variations of their offer and the customer has a bigger role here than in personalisation as they will have to choose from the presented options. Co-creation is where the hotel and the guest cooperate, creating value and appearing in both versions of tailor-made service.

After the conceptualisation of the topic, the dissertation follows with the introduction of hospitality services.

Hospitality is often a complex field within the tourism scape and can also be looked at as how one person behaves toward another. The hotel service process is an ever more complex system as both the employee and the service environment play an important part in service delivery. Within the hospitality industry, guest satisfaction may be considered the 'degree to which a product or service meets the customer's expectations which resonates with the overall focus on tailor-made service.

The final part of the literature discussed customer journey models and service blueprinting to create a customer journey model that can be the base of the new measurement system. After conceptualising a customer journey model that fits the complexity of hospitality, but at the same time is suitable to apply to multiple establishments, the scoring system was built using qualitative methods in two rounds of expert interviews, including in total of 24 interviewees.

After the finalisation of the scoring system, the scale was fitted in a questionnaire and the form of an online survey distributed among the members of the Hungarian Hotels and Restaurants Association.

The analysis of the data and the result of the hypotheses are summarised in the following **48. table**:

48. Table - Summary of the Research

Research question	Hypotheses	Methods	Hypothesis fulfilled	Thesis / finding
Q1. - Is it possible to create a measurement system that fits the ideal hotel guest journey model? Q2. - What indicators should be involved in the process of creating a measurement system to determine / identify how tailor-made hotel services are in order to reach SQ?	H1. - It is possible to create a system that measures the tailor-made service level of the hotels.	Interview	✓	Thesis 1. - Based on the research it is possible to develop a measurement system to measure the level to which service is tailor-made in hotels.
Q3. - How tailored-made (personalized, customized) are the Hungarian hotel services?		GAP		There is a bigger gap between the maximum score and the archived scores in case of the Technical scale items than in the Functional scale items.
Q4. - Can the hotels be assigned to groups based on the tailored service scale scores? Q5. - What are the common characteristics of those hotels who got into the same cluster?	H2. - Hungarian hotels can be grouped in different clusters according to the tailor-made service.	Bi-cluster	✓	Thesis 2. - It was determined that Hungarian hotels can be grouped in different clusters according to the level to which service is tailor-made.
Q6. - Can the tailored service scale indicators be groped based on which indicators hotels perform well and poorly?	H3. - Tailor made service indicators can be grouped into different clusters based on the performance of the hotel.	Bi-cluster	✓	Thesis 3. - It was concluded that tailor-made service indicators can be grouped in different clusters based on in which indicators hotels perform well and poorly.

Q7. - What are the common characteristics of those hotels that score high on the tailor-made service measurement? Q8. - What are the common characteristics of those hotels that score low on the tailor-made service measurement?	H4. - There is a relationship between the different characteristics of a hotel and its tailor-made service level. H4a. - There is a relationship between the size and the tailor-made service level of a hotel. H4b. - There is a relationship between the hotel type and the tailor-made service level of a hotel. H4c. - There is a relationship between the hotel's guest type and tailor-made service level of a hotel. H4d. - There is relationship between the star rating of the hotel and tailor-made service level. H4e. - There is relationship between chain affiliation and the tailor-made service level of the hotel.	ANOVA	 	Finding 4a - It has been confirmed that there is no relationship between the size of the hotel and the level to which service is tailor-made. Finding4b - It has been concluded that there is no relationship between the type of hotel and the level to which service is tailor-made. Finding 4c - Based on the results, there is no relationship between the hotel's guest type and the level to which service is tailor-made. Thesis 4d - It was proven that there is a relationship between the hotel's star rating and the level to which service is tailor-made. The post-hoc analysis showed that 3-star hotels score significantly higher than 4-star hotels on the tailor-made service score. Thesis 4e - It was determined that there is a relationship between chain membership and the level to which service is tailor-made.

Q9. - What is the importance of providing tailored service for hotel managers? Q10. - Is there a relationship between the value of score on the tailored service scale and the importance of providing tailor made service determined by the Hotel Manager	H5 - There is a relationship between the level of tailor-made services and the importance of the tailor-made services determined by the hotel manager.	Pearson Rank Correlation		Finding 5 - There is no relationship between the value of score on the tailor-made service scale and the importance of providing tailor made service determined by the Hotel Manager.
Q11. - Is there a difference in the level to which guest encounter phase are tailor made?	H6. - There is a difference in the tailor-made service level of the guest encounter phases.	Paired *t*-test		Thesis 6 - It was proven that there is a statistically significant difference in the level to which guest encounter phase are tailor made. Hungarian hotels perform best in the post-service phase tailor-made service indicators and lowest in the pre-arrival phase tailor-made service indicators.
Q11. Is there a difference in the level to which guest encounter stages are tailor made?	H7. - There is a difference in the tailor-made service level of the guest encounter stages.	Paired *t*-test		Thesis 7. - It was proven that there is a statistically significant difference in the level to which guest encounter stages are tailor-made Hungarian hotels. Hungarian hotels perform best on the functional stage.

(Source: Own Edit)

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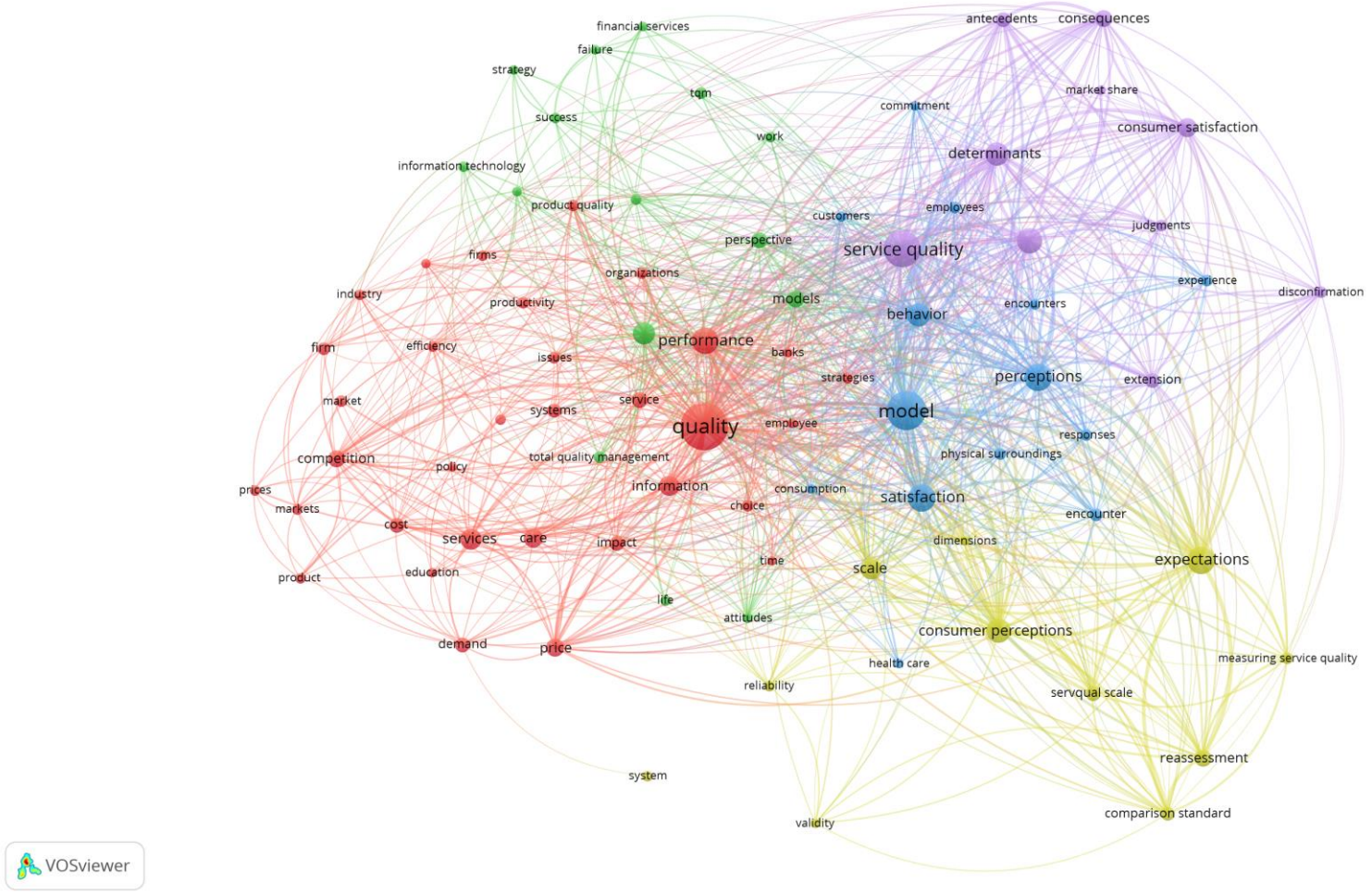
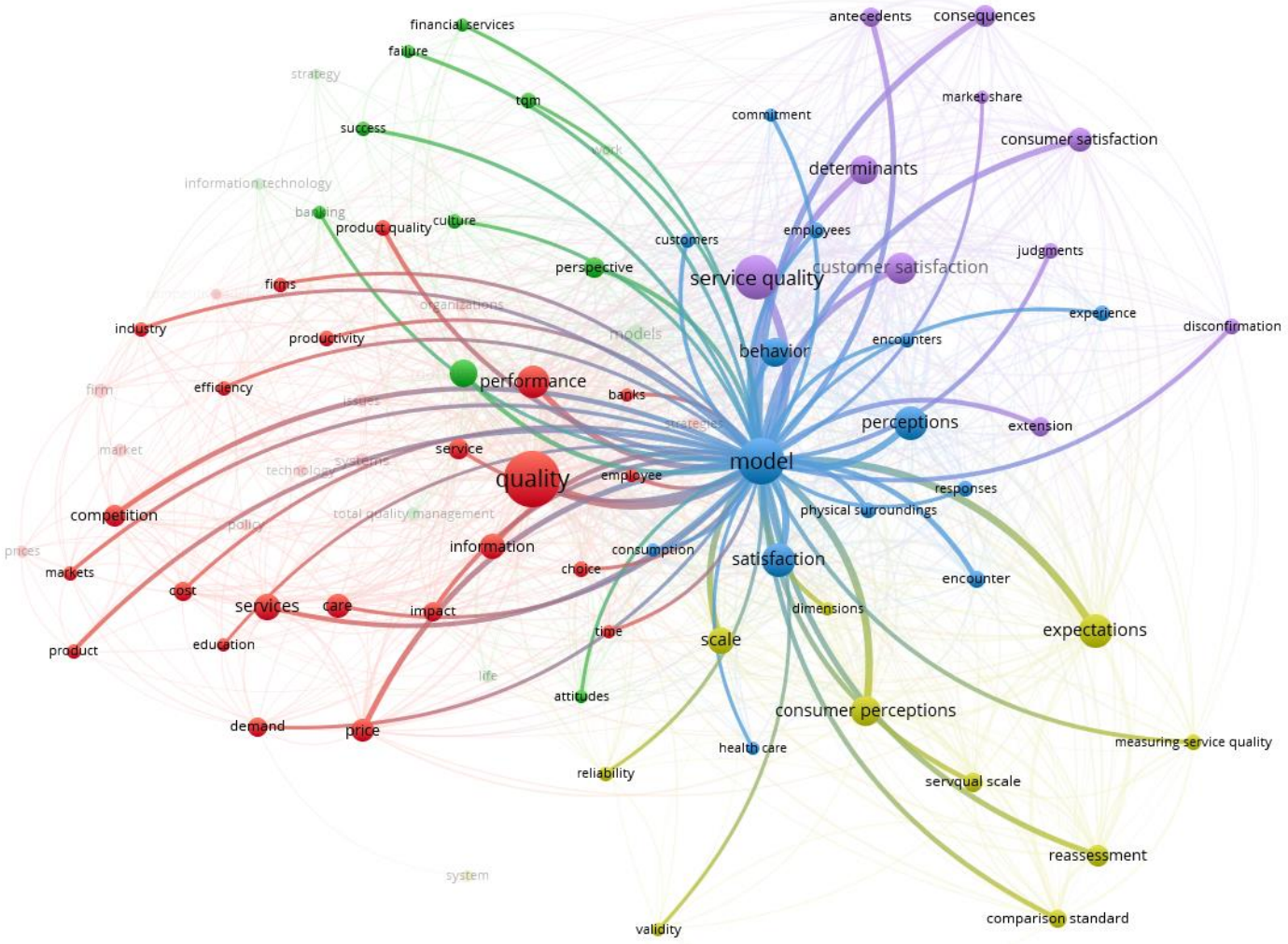
1. Appendix - Service Quality 90s'



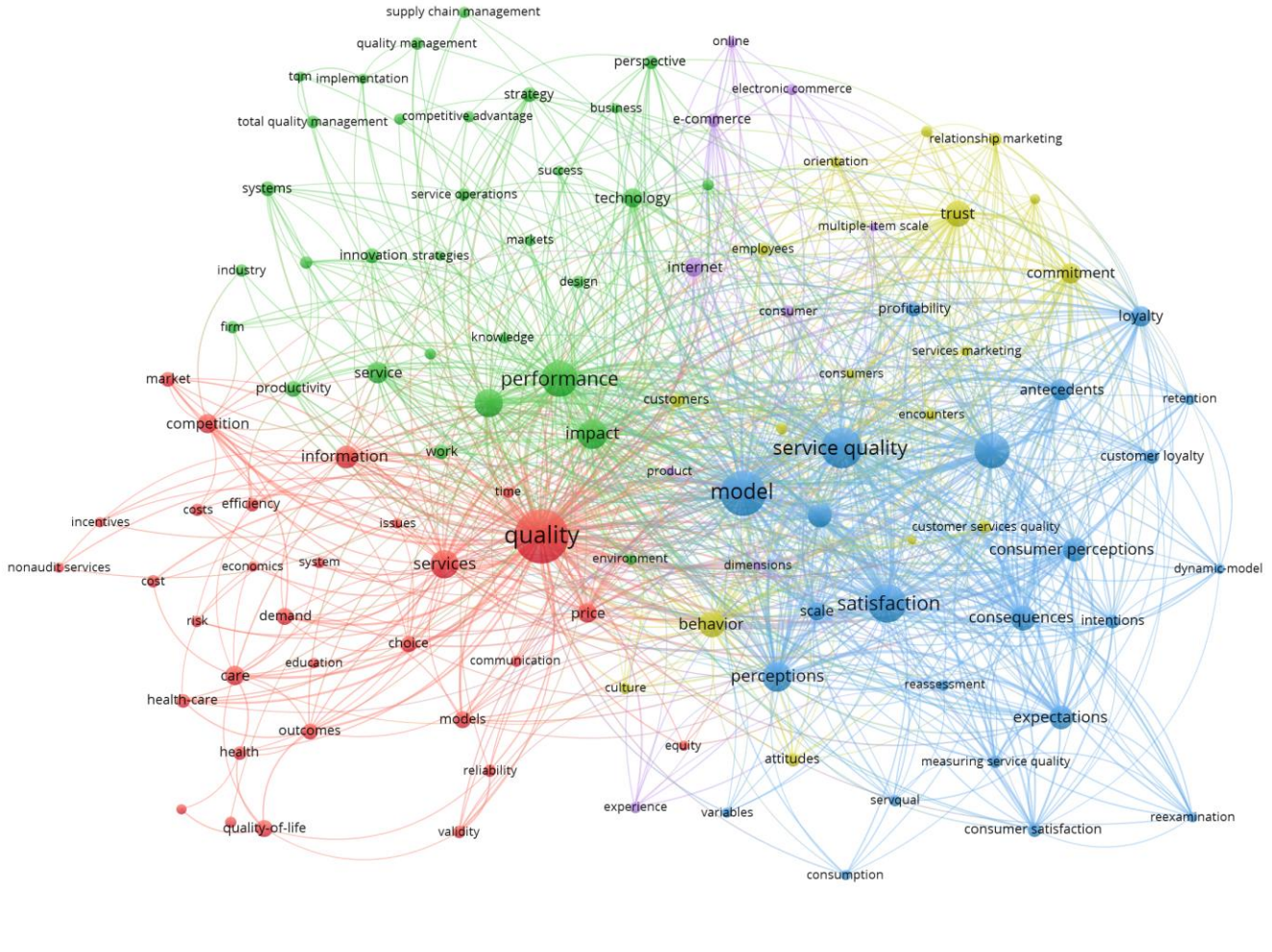
(Source: VOSviewer)

2. Appendix - Service Quality 90s' "model"



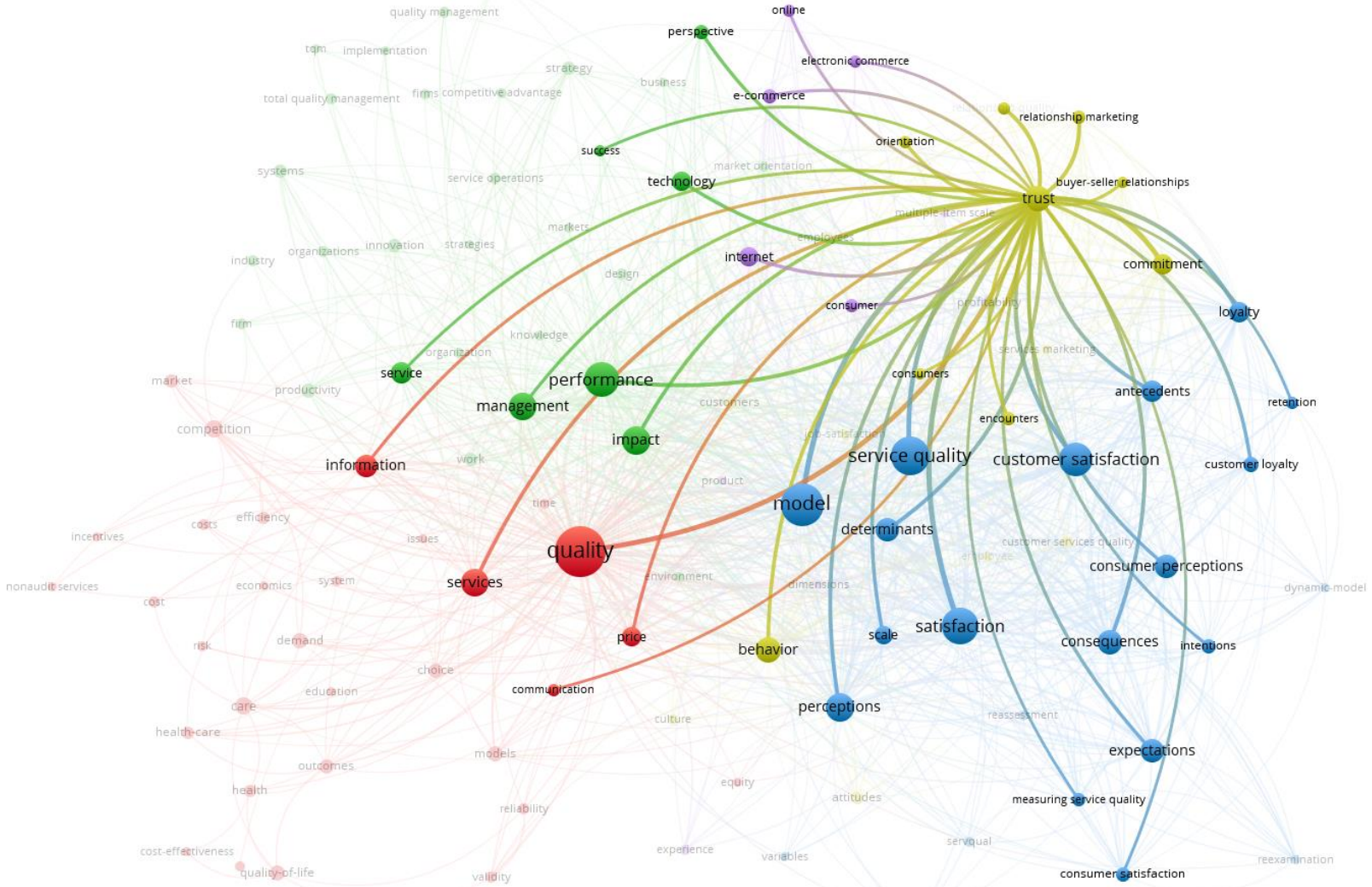
(Source: VOSviewer)

3. Appendix - Service Quality in the '00s



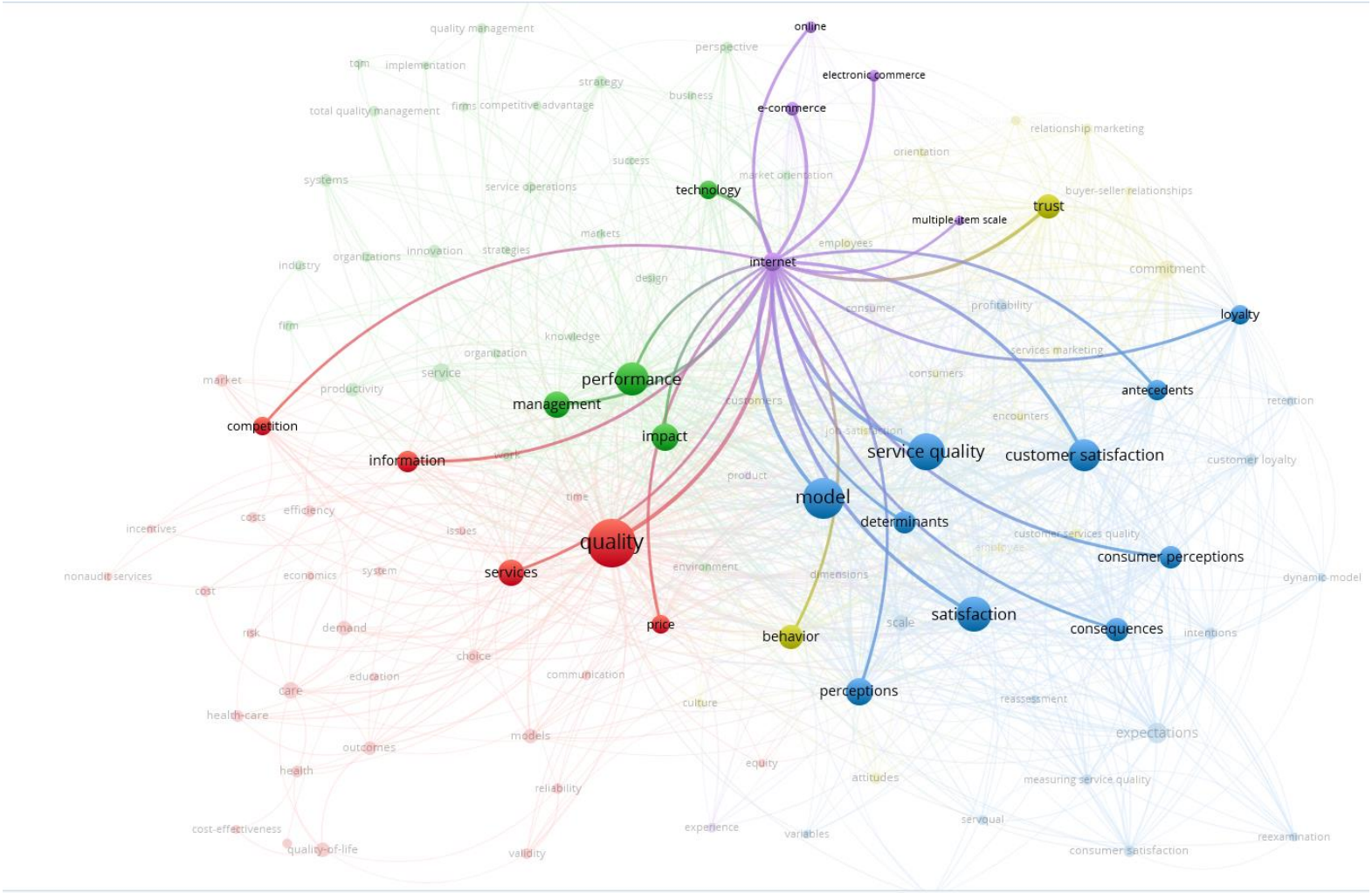
(Source: VOSviewer)

4. Appendix - Service Quality int the '00s "trust"



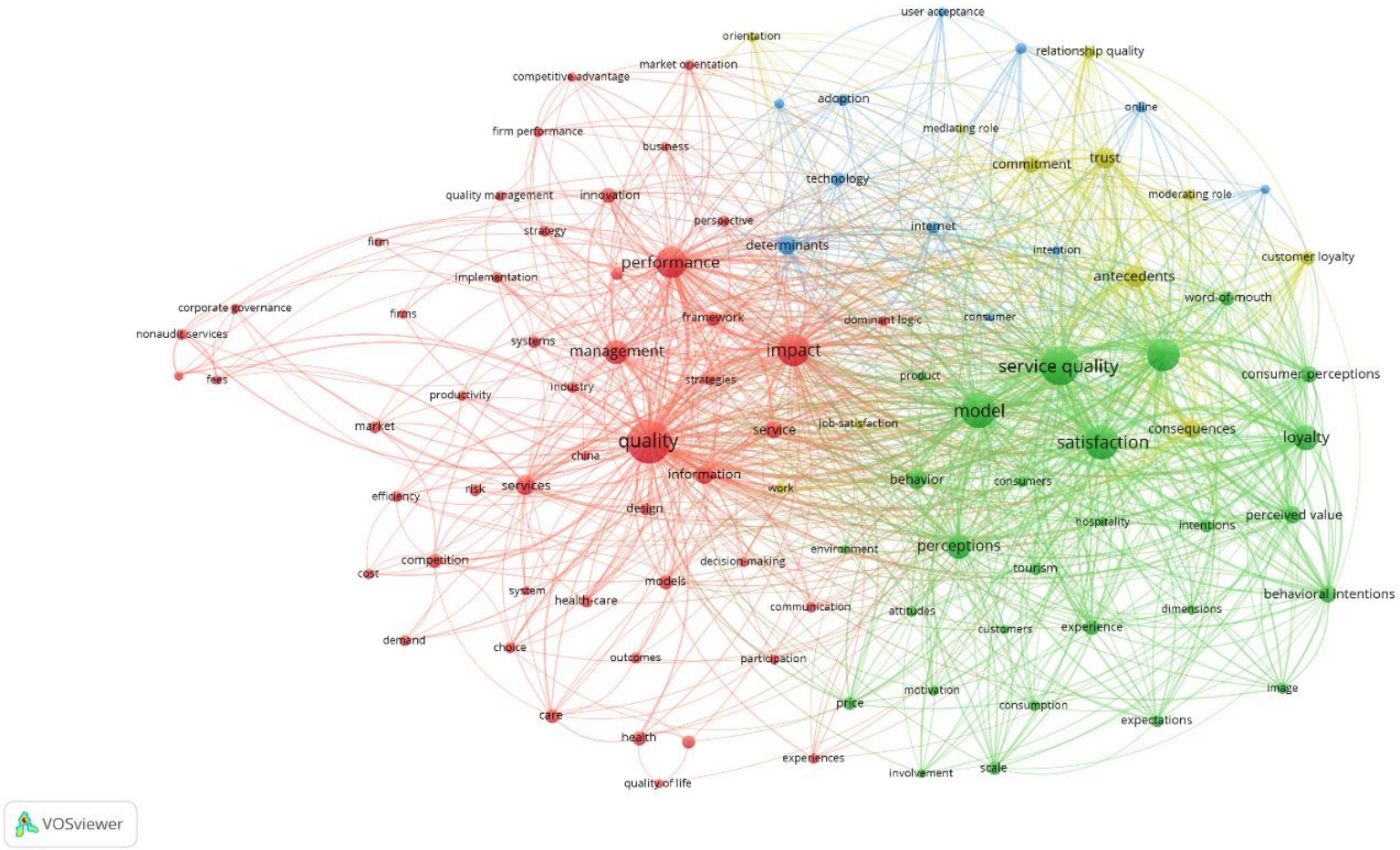
(Source: VOSviewer)

5. Appendix - Service Quality '00s "internet"



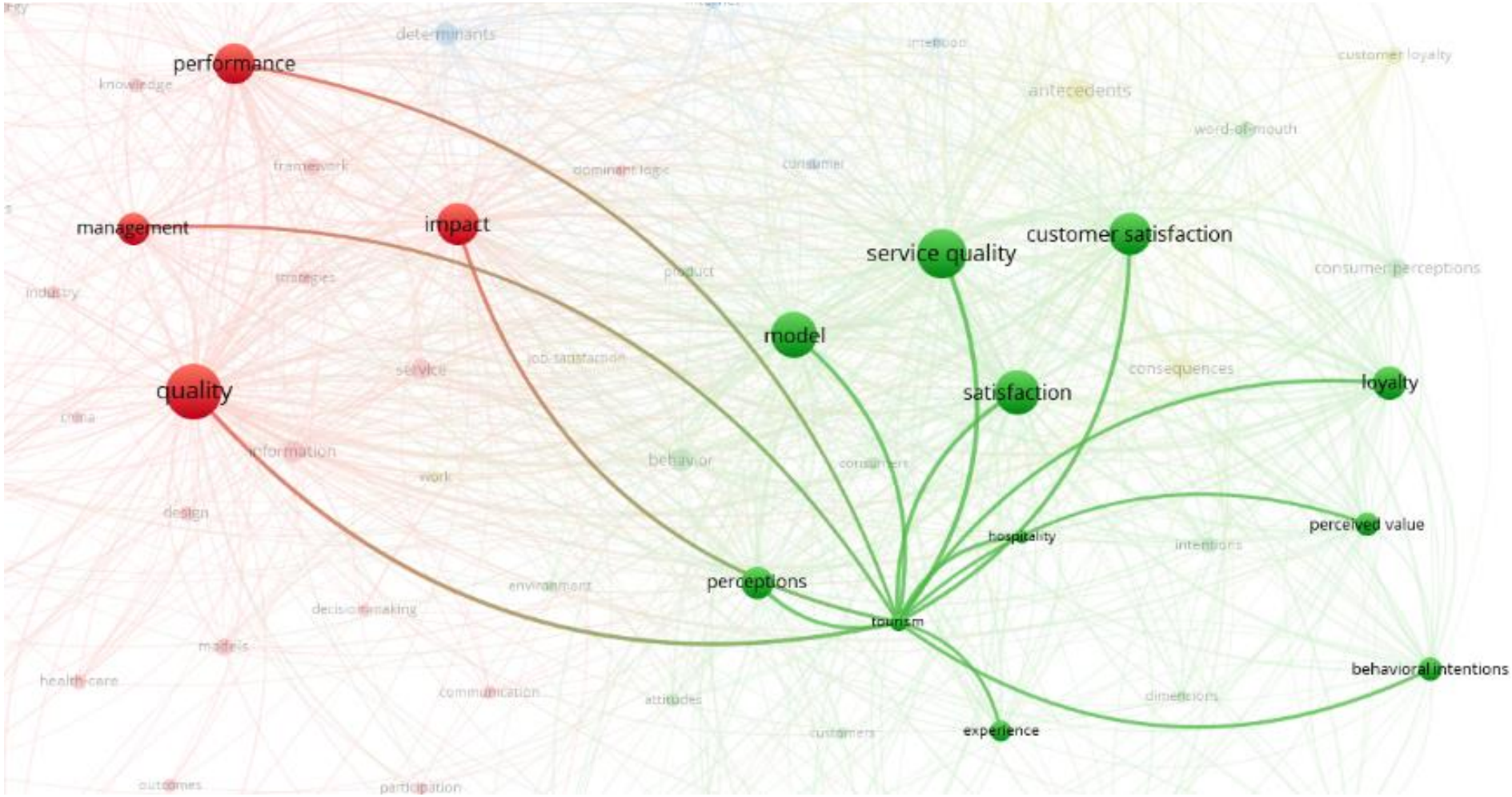
(Source: VOSviewer)

6. Appendix - Service Quality in the '10s



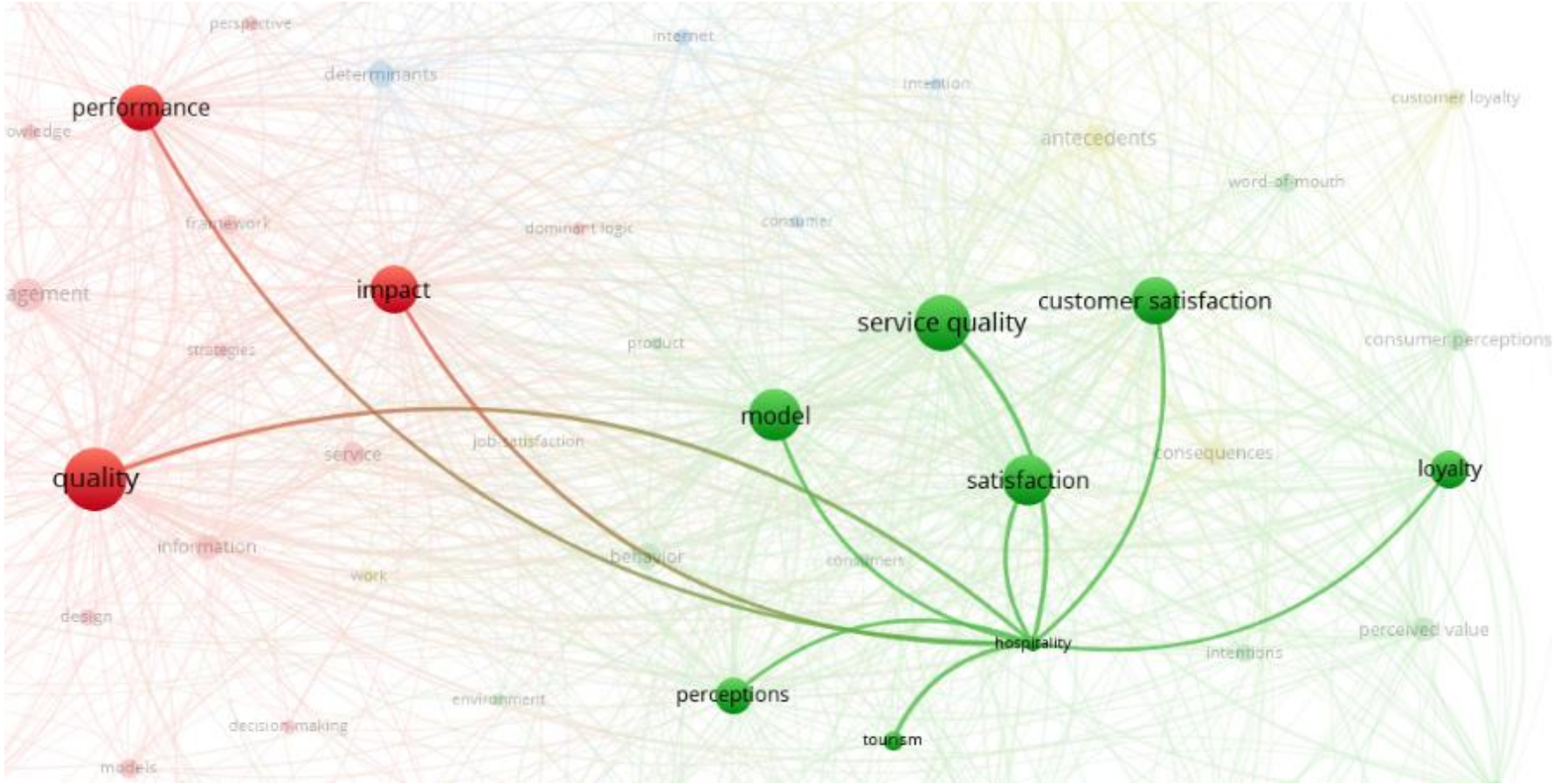
(Source: VOSviewer)

7. Appendix - Service Quality in the '10s "tourism"



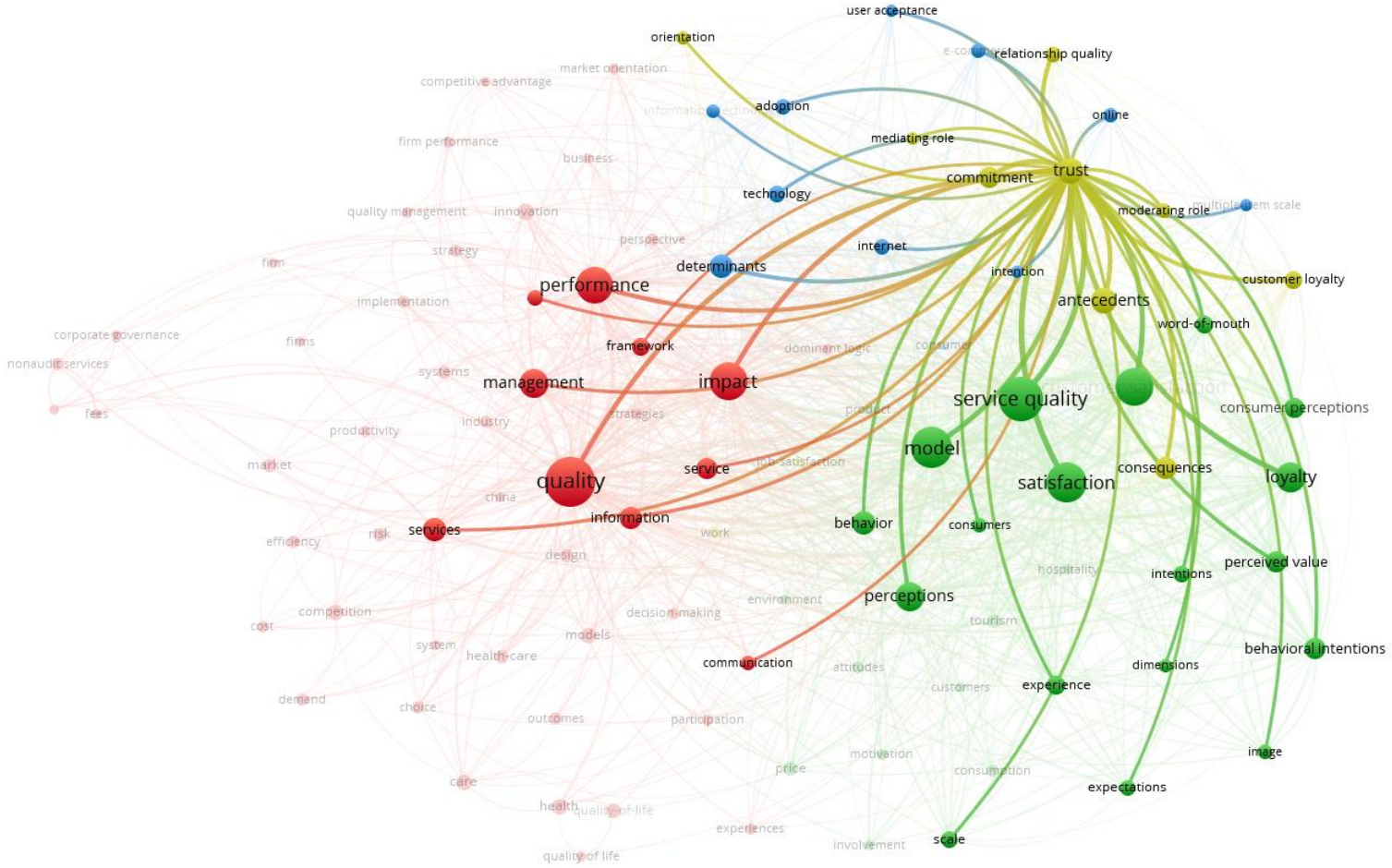
(Source: VOSviewer)

8. Appendix - Service Quality in the '10s "hospitality"



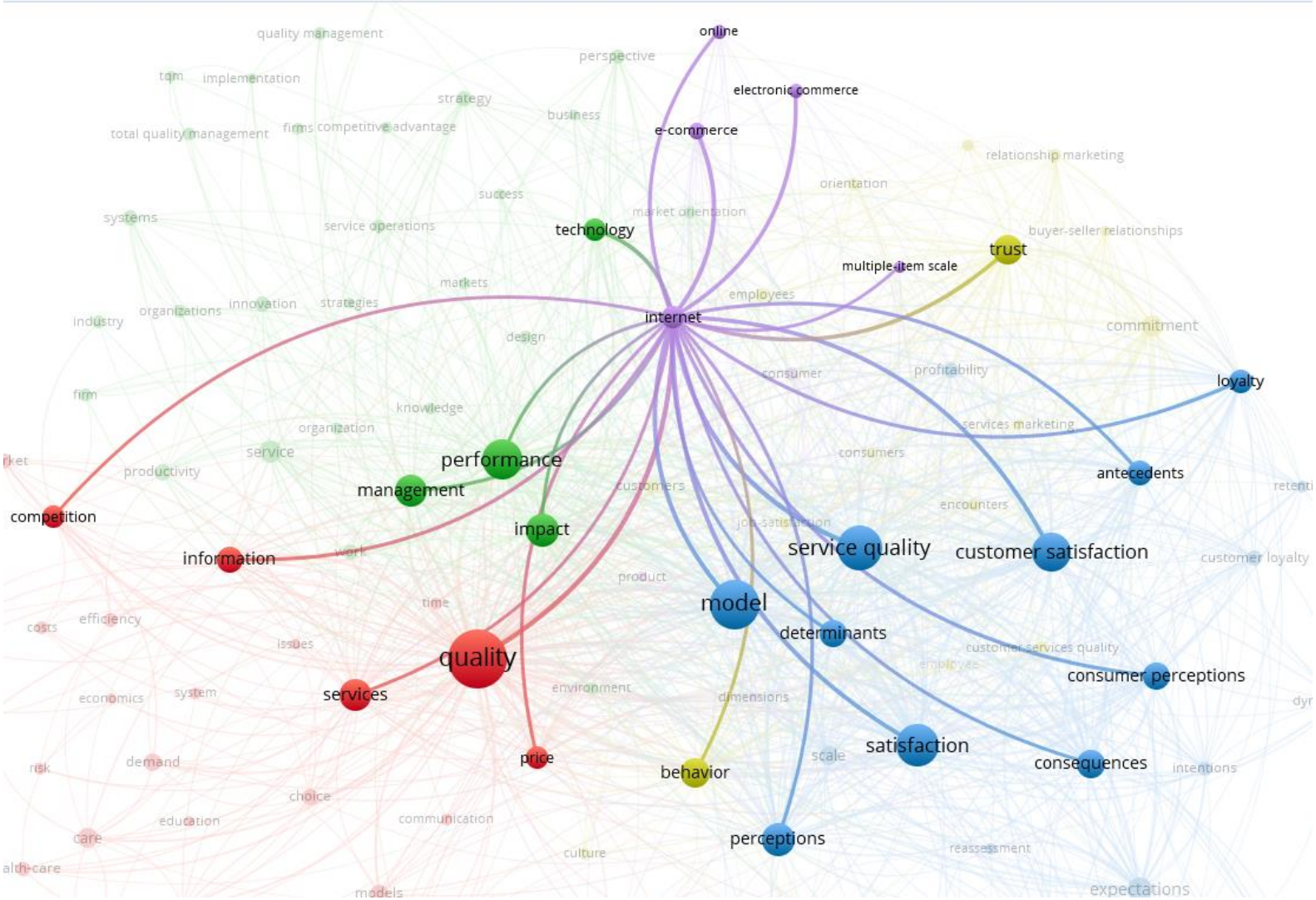
(Source: VOSviewer)

9. Appendix - Service Quality in the '10s "trust"



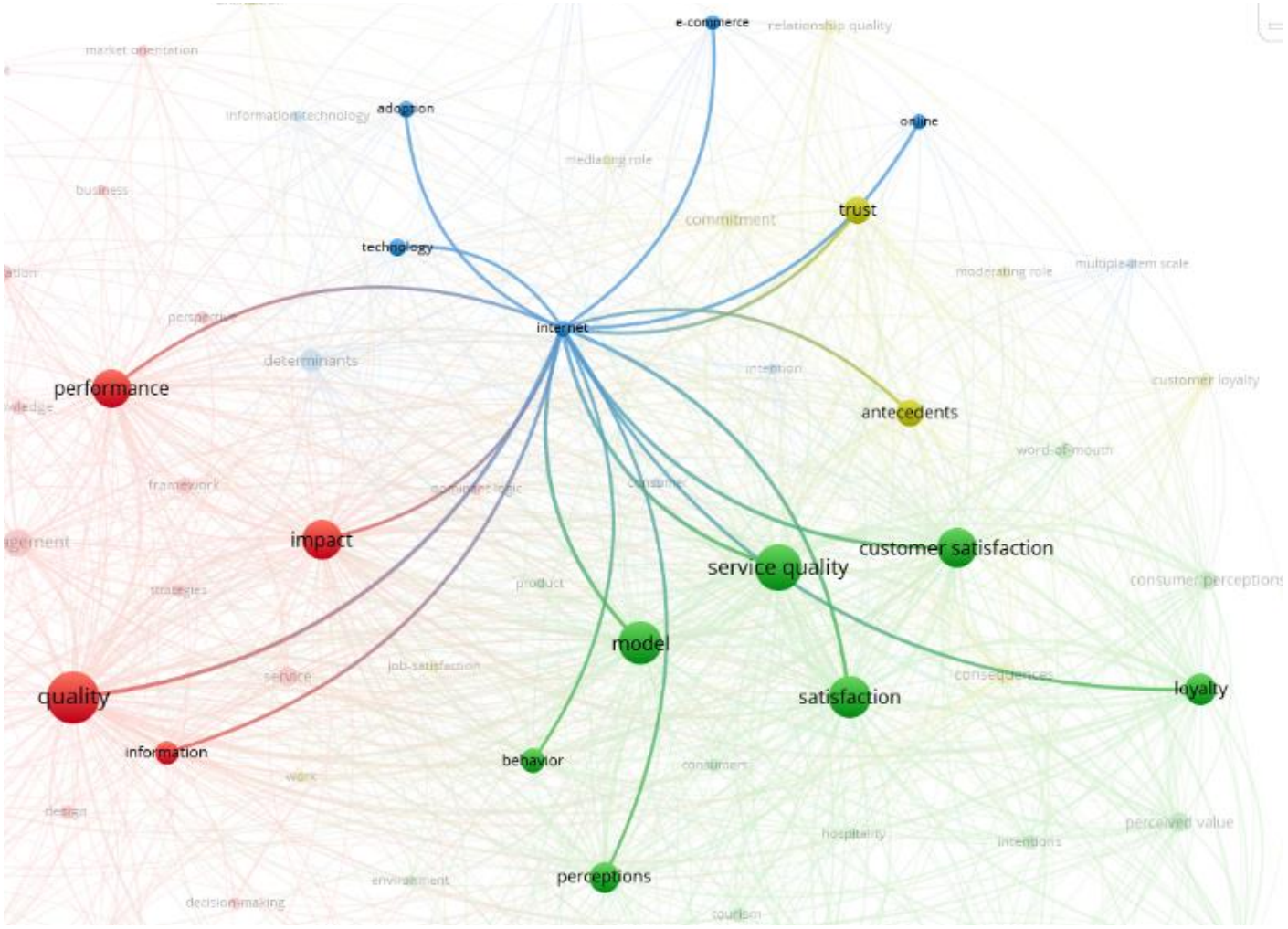
(Source: VOSviewer)

10. Appendix - Service Quality in the '00s "internet"



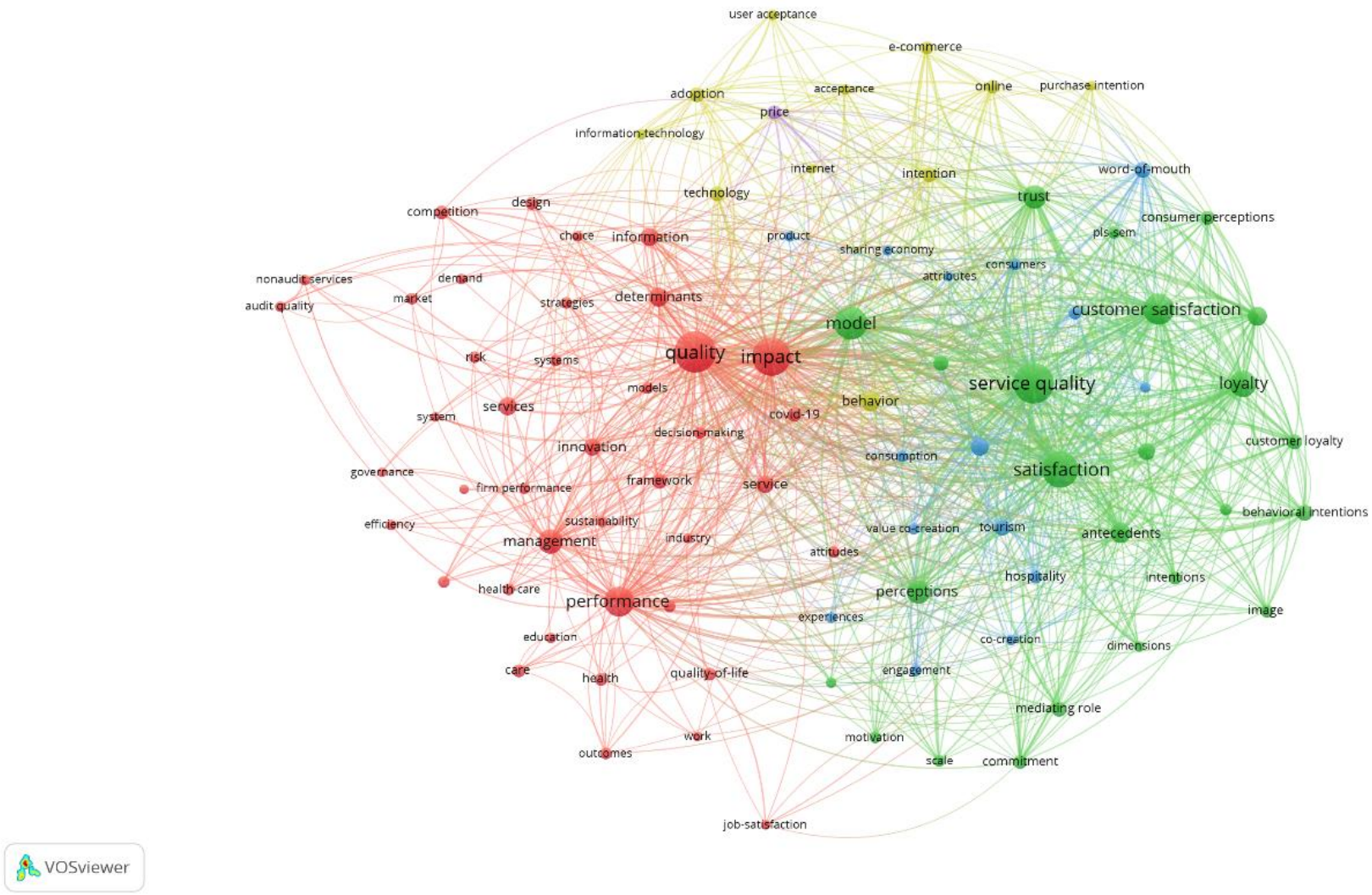
(Source: VOSviewer)

11. Appendix - Service Quality in the '10s "internet"



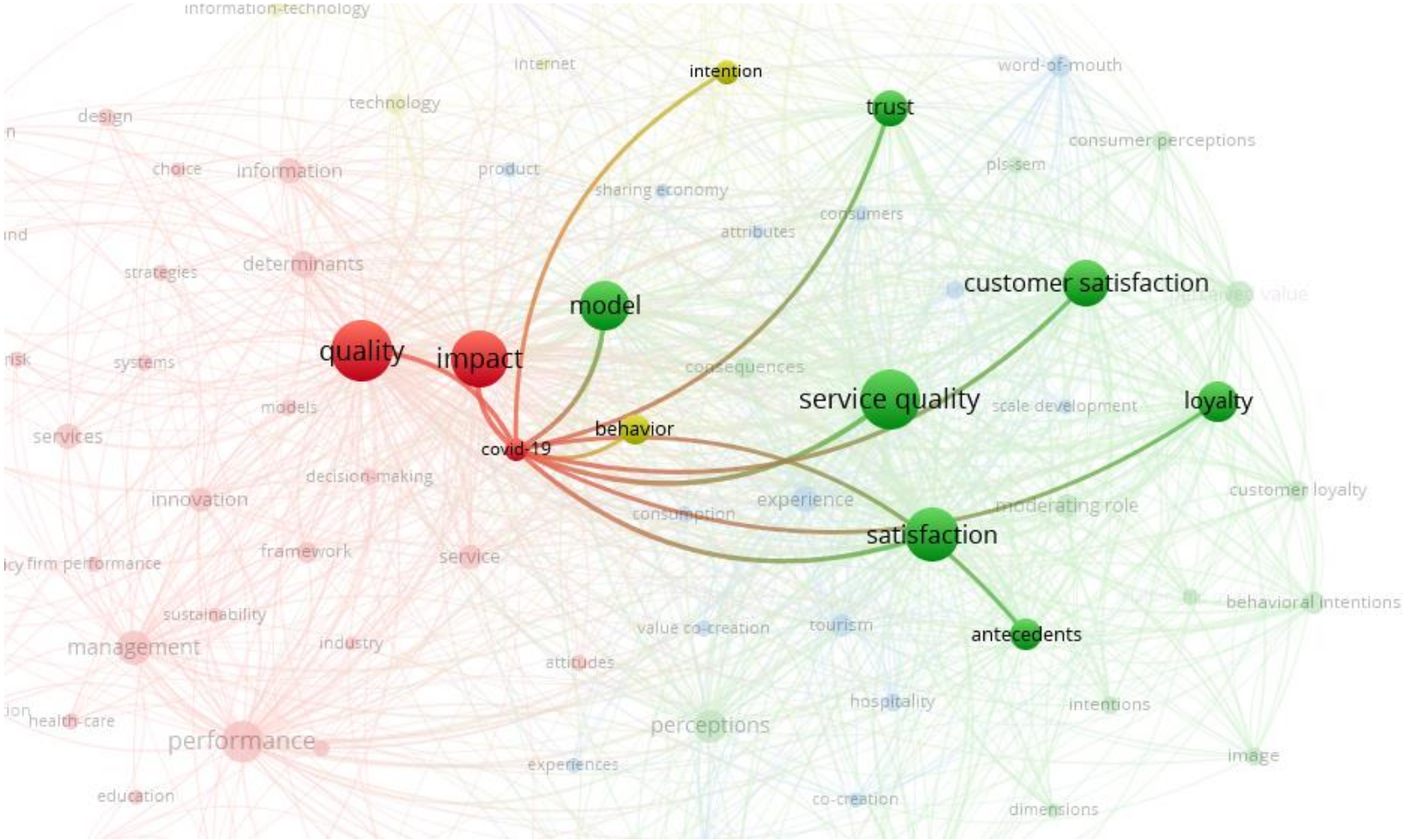
(Source: VOSviewer)

12. Appendix - Service Quality after 2020



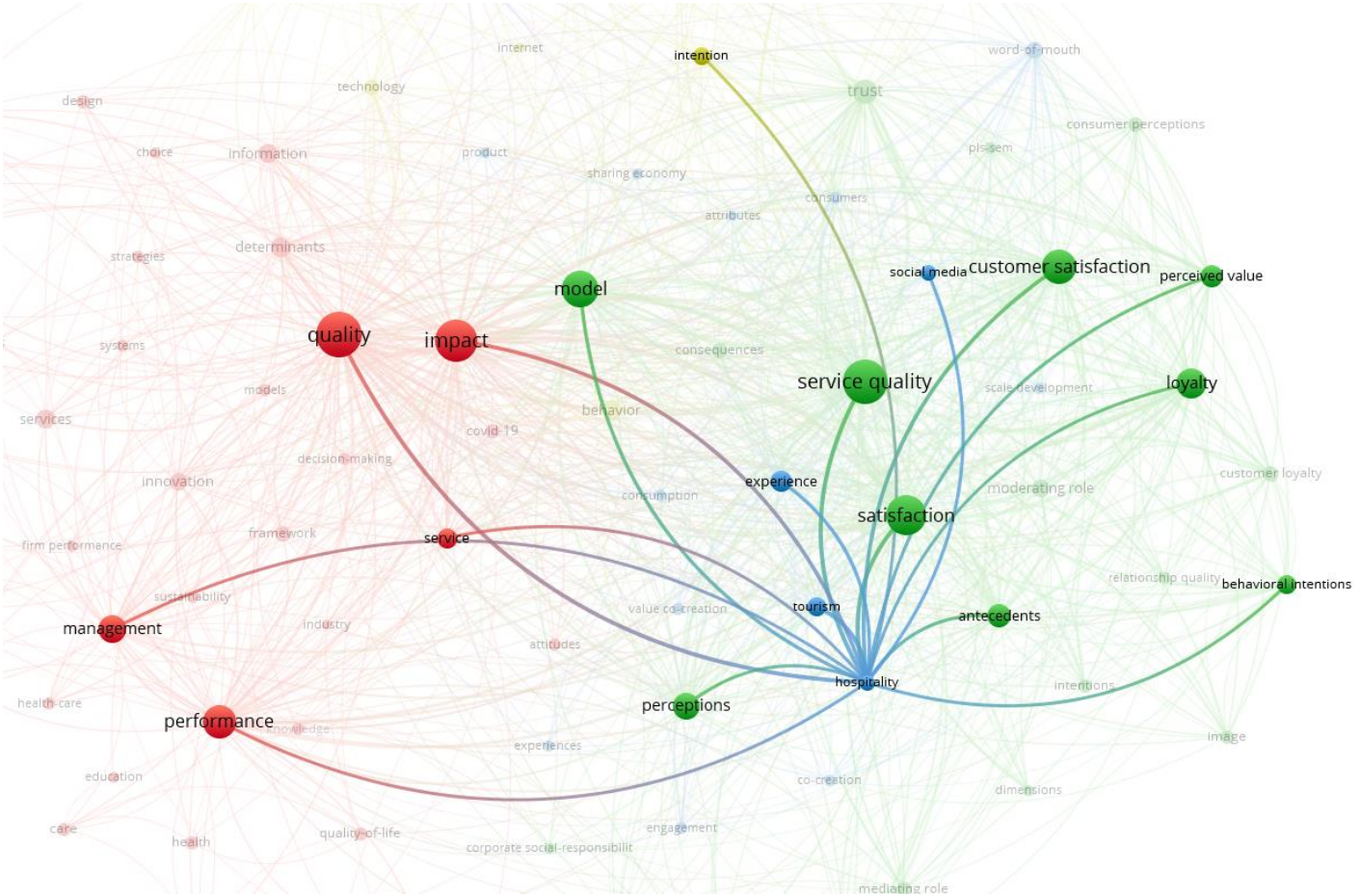
(Source: VOSviewer)

13. Appendix - Service Quality after 2020 "covid.19"



(Source: VOSviewer)

14. Appendix - Service Quality after 2020 "hospitality"



(Source: VOSviewer)

15. Appendix - Service Quality Models Before the 2000s

Author	Year	Name	Findings	Remarks
Grönroos	(1984)	SQ Model – Technical and functional quality mode	Technical quality focuses on what was delivered, (evaluated by the customer), and functional quality is how the service was delivered (consumers' perceptions). Corporate image has a positive impact on customer perceptions.	Distinction of technical and functional quality.
Parasuraman et al.,	(1985)	GAP Model	The differences between expectation and performance are measured in 5 GAP-s. 10 dimensions; reliability, responsiveness, competence, access, courtesy, communication, credibility, security, understanding and tangibles.	Dimensions distinguish tangible aspects and abstract phrases like competence. The model uses factors.
Haywood-Farmer	(1988)	SQ Attributes	Based on Parasuraman et al. (1985). If a service organization meets customers' preferences and expectations, consistently it has "high quality." Three primary attributes: physical facilities, processes and procedures, people's behaviour and conviviality, and professional judgment. Each attribute contains several factors, and these attributes together form the apex of a triangle. All aspects need attention especially in service.	Physical facilities, people's behaviour. The model uses factors.
Parasuraman et al.,	(1988)	SERVQUAL	Based on Parasuraman et al. (1985). Measuring customers' perceptions of SQ dimensions: reliability, responsiveness, tangibles, assurance and empathy with 22 items and 7-point Likert scale.	Usage of items. Creation of the scale.
Brogowicz et al.,	(1990)	Synthesised model of SQ	Based on Grönroos (1984) model and GAP (1985) model. New GAP is based on the potential customers' perceptions of SQ. Because of WOM, advertising, or	Distinction of technical and functional quality.

			other media communications; a SQ gap could already exists. The model integrates and tries to identify SQ associated with the traditional managerial framework, service design, operations, and marketing activities. It considers three factors, company image, external influences, and traditional marketing activities, as the factors influence technical and functional quality expectations.	Relevance of marketing in SQ.
Cronin and Taylor	(1992)	SERVPERF Performance only model	Based on Parasuraman et al. (1988) SQ relationship with consumer satisfaction and purchase intentions. Performance is the only factor that needs to be measured for SQ as SQ is a form of consumer attitude. The model uses; reliability, responsiveness, assurance, tangibles, and empathy, but they concluded that instead of performance-expectation GAP, the performance itself determines SQ. The research findings also showed that while SERVQUAL factors are inconsistent, SERVPERF is a more accurate SQ measurement.	Performance is a good indicator a SQ.
Mattsson	(1992)	Ideal value model of SQ	Based Cronin and Taylor (1992) and focuses on value. "Customers' expectation has desired attributes" is the standard for evaluation. They measure SQ from experience-based, ideal, minimum, tolerable, and desirable standards. The model portrays SQ as the outcome of a satisfaction process. This model has a perceived ideal standard, and the consumers' experience will be compared to that. It will produce the implicit negative disconfirmation on a pre-conscious value level. This negative disconfirmation will then determine	Customer expectation has desired attributes. Comparing the ideal standard to the experience.

			satisfaction on a "higher" attitude level.	
Teas	(1993)	Evaluated performance and normed quality model	Based on Parasuraman et al. (1988) Evaluated performance framework assumes that an individual evaluates an object with perceived certainty that it has a constant amount of each attribute. The model includes factors. Normed quality model: if the object is defined as the excellence norm, the equations can define the perceived quality of excellence norm in terms of the similarity between the excellence norm and the ideal object concerning other attributes. As the models are based on SERVQUAL they measure GAP and use Likert scale	Evaluation of performance.
Oliver	(1993)	Satisfaction – SQ model	The model integrates the satisfaction and the SQ literature. Based on this model, satisfaction is a function of the disconfirmation of predictive expectations regarding quality and non-quality dimensions. SQ is formed by comparing ideals and perceptions of performance in the quality dimensions. Perceived SQ is proposed to happen before satisfaction. Satisfaction is not related to disconfirmation of ideals only through SQ perceptions, and the model specifies that expectations do not influence performance perceptions.	SQ is only measured through perception.
Lovelock	(1994)	Extended GAP model	Based on Parasuraman et al (1985) He added a sixth gap to the model as GAP 6: Service Delivery and Perceived Service, The Perceptions Gap.	Importance of service delivery.
Berkley and Gupta	(1994)	IT alignment model	This model links the service and information strategies.	IT is an essential part of SQ.

			It presents IT as a way to improve SQ. This model describes where IT had been used or could be used to improve SQ dimensions, such as reliability, responsiveness, competence, access, communications, security, understanding, and knowing the customers. Based on the model, SQ and information system strategies should be considered connected and coordinated together. The model explains the process of coordinating service and IT strategies	
Dabholkar	(1996)	Attribute and overall affect model	The attribute model was created as a cognitive approach to decision making and is based on what consumers would expect from a self-service option. Consumers would evaluate different traits associated with the technology-based self-service option, and based on the evaluation, would they form their SQ expectations. It is based on the consumers' feelings towards technology use and approaches the decision making based on where the consumers would use their biases to form expectation toward self- SQ for a technology-based self-service option. The expected SQ will influence the consumer's intention to use the technology-based self-service.	Effects of the technology based self-service. Technology is evaluated based on different traits.
Dabholkar et al.,	(1996)	Retail Service Quality Scale (RSQS)	Based on Parasuraman et al. (1988) and Cronin and Taylor (1992) A multilevel model with five dimensions, six subdimensions, and 28 items. This model is based on a hierarchical structure for SQ. It includes three levels: SQ, primary dimensions and the subdimensions. In case of physical aspect (appearance and convenience), reliability dimension (promises and doing it	Using subdimensions for more detailed results. Not only the service process and reliability but the physical aspects are considered.

			right), and personal interaction dimension (inspiring confidence and courteous/helpful). The model and factors are based on the disconfirmation method (the gaps in SQ).	
Spreng and Mackoy	(1996)	Model of perceived SQ and satisfaction	Based on Oliver (1993) It is a modification of Oliver's model. It attempts to enhance understanding the constructs of perceived SQ and consumer satisfaction. The model concentrates on expectations, perceived performance desires, desired congruency, and expectation disconfirmation on overall SQ and customer satisfaction.	Increase understanding of perceived SQ.
Philip and Hazlett	(1997)	PCP Model or hierarchical structural model	Adopted Webster and Hung's (1994) and Parasuraman et al (1988) scales. It is a hierarchical model – based on three main attributes – pivotal, core, and peripheral. Pivotal attributes influence the consumers and the satisfaction level the most. Can be defined as the end product or output. Core attributes, around the pivotal attributes, are a mix of processes, people, and the organization structure, and through this can the pivotal attribute be reached. Finally, the peripheral attributes or the "incidental extras" add a "roundness" to the service encounter and create an enjoyable consumer experience. A consumer is satisfied if the pivotal attributes are achieved. However, as the service is frequently used, the core and peripheral attributes may begin to gain importance.	Differentiated the incidental extras from the service process.

			The attributes were shown in a triangle. Pivotal attributes were at the top, core attributes were at the second stage, and peripheral attributes were at the triangle's bottom side. The most important is the top.	
Sweeney	(1997)	Retail SQ and perceived value model	Based on Zeithaml (1988) and Grönroos (1984) In specific service encounters, SQ influences the perceived value and the willingness to buy through two alternative models. In this case, value is defined comparing what consumers get and what they give, suggesting that value compares benefits and sacrifices. The value constructs in this model are "value for money." The first model shows that not only the product quality and price perceptions, but also functional SQ and technical SQ perceptions will directly influence value perceptions. The second model states that functional SQ perceptions directly influence consumers willingness to buy.	Functional and technical service is differentiated. Willingness to buy and the value for money in measured.
Oh	(1999)	SQ, customer value and customer satisfaction model	This model integrates SQ, customer value, and customer satisfaction. The model focus is the post-purchase decision process. The model combines key variables such as perceptions, SQ, consumer satisfaction, customer value, and intentions to repurchase. The intention of WOM communication is and indicator of the above. Customer value has a role in customer's post-purchase decision-making process. It is right before	The importance to analyse the guest encounter phases separately. Focusing on the post – purchase phase only.

			customer satisfaction and repurchase intentions would appear.	

(Source: Own Edit)

16. Appendix - Service Quality Models After 2000s

Author	Year	Name	Findings	Remarks
Soteriou and Stavrinides	(2000)	Internal SQ DEA model	SQ in assessing performance of a branch. Regardless of the volume of products and services on the long term there might be eroding of SQ. The SQ model can be used for optimal resource utilization. The model points out which resources are not properly utilized. The inputs: 1. Consumable resources (personnel, space, time, etc.) 2. Number of accounts The branch personnel will have a perceived SQ, which will be the output of the model. The data envelope analysis (DEA) model compares based on the client base, based on how well a branch will transform the inputs (resources) into outputs (level of SQ). The DEA model finds the under-performers and suggests ways for improvement. It has two versions: the input minimization and the output maximization DEA model.	Finding the under-performers and suggesting ways for improvement to ensure the quality of service.
Caruana, et al.,	(2000)	SQ and satisfaction and value	Based on Parasuraman et al. (1988) and Oliver (1980), and Taylor and Baker (1994). The constructs of SQ, satisfaction and value are discussed. Value plays a moderating role between SQ and satisfaction.	Inclusion of multiple models.

			SQ be measured with 21 performance items in SERVQUAL, questions 1 and 2 were adapted from Oliver (1980), while question 3 was taken from Taylor and Baker (1994). The model used Items and Likert scale to measure. SQ and satisfaction have a proven connection. Value also influences satisfaction.	
Frost and Kumar	(2000)	INTSERVQUAL - Internal SQ model	Based on Parasuraman et al (1985) The purpose is to evaluate the dimensions and their relationships that determine SQ among internal customers such as front-line staff and internal suppliers such as support staff.	Satisfaction of internal consumers have to be considered for SQ.
Dabholkar et al.,	(2000)	Antecedents and mediator model	A comprehensive SQ model includes examining its antecedents, consequences, and mediators to provide a deeper understanding of conceptual issues related to SQ.	Comprehensive model.
Brady and Cronin	(2001)	SQ Model	Based on Dabholkar et al. (1996), Parasuraman et al (1988), Grönroos (1984) and Rust and Oliver (1994). Dabholkar et al.'s hierarchical model and precisely defined SERVQUAL dimensions: reliable, responsive, empathic, assured, and tangible. Model adopts two-dimension from Grönroos's (1984) model; functional quality and technical quality. The third dimension is adopted from Rust and Oliver's (1994) service environment. The theory supported the importance of multidimensional and multilevel SQ, they suggested three subdimensions for each dimension; interaction quality (attitude, behaviour, and expertise), physical	The three subdimensions for each dimension; interaction quality, physical service environment quality, and outcome quality affect SQ. Multidimensional and multilevel SQ measurement.

			service environment quality (ambient conditions, design, and social factors), and outcome quality (waiting time, tangibles, and valence) affect SQ. They created a measuring system for SQ by combining several models, used a 7-point Likert scale to measure the consumers' attitudes towards the items under the dimensions.	
Tsaur et al.,	(2002)	Fuzzy Multiple Criteria Decision-Makin	Based on, Saaty (1980). Parasuraman *et al*. (1985). SQ has various attributes. Intangible attributes are difficult to measure. This study incorporates the revised five-aspect representation of SQ proposed by Parasuraman, et al (1985) and 15 SQ evaluation criteria. Analytic hierarchy process (AHP). AHP method should be an exact measure of the difference of attribute preference for consumers.	Trying to measure the intangible attributes.
Luk and Layton	(2002)	The extended GAP model	Based on Parasuraman et al (1985). Employees are involved separately from managers in the measurement.	Employees and manager can have different view of SQ and also customer expectation.
Kuo et al.	(2013)	SQ on customer loyalty	Based on Parasuraman et al. (1988), DeWitt et al. (2008), Ryu et al. (2008) and Chang et al. (2009). A conceptual model of the effects of SQ on customer loyalty that reflects the mediating role of customer satisfaction and the moderating role of service recovery and perceived value. Customer satisfaction is positively influenced by SQ, and customer loyalty is positively influenced by customer satisfaction. Modified version of the 22-item SQ scale by Parasuraman et al. (1988).	The technique of including multiple models whilst modifying them.

			Scale items were modified for a travel agency. The questionnaire also included nine items on service recovery modified from DeWitt et al. (2008). The customer satisfaction section draws on Ryu et al. (2008) and includes four items. Perceived value questions came from Chang et al. (2009). Customer loyalty questions were adapted from Chen and Tsai (2008).	

(Source: Own Edit)

17. Appendix - Service Quality Models in Hospitality

Author	Year	Name	Findings	Remarks
Knutson et al.,	(1990)	LODGSERV	Based on Parasuraman et al. (1988) LODGSERV is designed to measure consumers' expectations for SQ in the hotel experience. Uses the five generic dimensions (Parasuraman et al (1988)) but operated with 26 items on a 7-point scale. The model can show whether the hotel is exceeding, meeting or falling below expectations.	SERVQUAL can be specialized to the hotel experience. Identifying where the hotel is exceeding meeting of failing expectations.
Getty and Thompson	(1995)	LODGQUAL	Based on Parasuraman et al (1988). Quality measurement in the lodging industry. Follows the same logic as the SERVQUAL scale, but tailored to the logging industry, includes 68 items and uses a 7-point Likert scale.	Tailoring scale to the specific industry.
Webster and Hung	(1994)	Adapted SERVQUAL	Based on Parasuraman et al. (1988). Based on SERVQUAL instrument Adapted for hotel application.	Look at SQ from the consumers point of view. Shows where immediate

			The concept of "decentring" (to see quality from the customer's perspective) is introduced. Measures SQ dimensions that are central to the hotel's quality strategy. Results show where immediate corrective action should be taken. Customer focus is a key dimension of total quality.	corrective action should be taken.
Akan	(1995)	Dimensions of SQ	Based on Parasuraman et al. (1988) Investigates the elements that contribute to SQ of the hotel industry. Examines whether the quality dimensions included in the SERVQUAL model apply in an international environment. Additional dimensions, identified by customers, that should be included in the SQ construct; and 30 items, 4 point Likert-type questions was designed, the service process. The attributes are comprised to three groups: (1) The hotel including items concerning exterior and interior appearance etc. (2) The personnel including items like knowledge and training and friendliness, (3) The service process such as accuracy, problem solving and specific processes.	Adjusting for hotels means that additional dimensions have to be considered. Focusing not only on the service process but the employee and the hotel's physical traits.
Wong Ooi Mei et al.,	(1999)	HOLSERV	Based on Parasuraman et al. (1988). SQ in the hospitality industry by extending the SERVQUAL scale to include eight new items that specifically pertain to the hospitality industry.	Employees, tangibles and reliability key dimensions. Employees have an important role

			SQ is represented by three dimensions in the hospitality industry, relating to employees (behaviour and appearance), tangibles and reliability. The best predictor of overall SQ is the dimensions referred to as "employees".	and cannot be omitted.
Akbaba	(2006)	SERVQUAL model apply in an international environment.	Based on Parasuraman et al. (1988) and Mei et al. (1999) SQ expectations of business hotels. Uses the five-dimensional structure of SERVQUAL; however, some of the dimensions were changed. The five SQ dimensions identified in this study were named as ''tangibles'', ''adequacy in service supply'', ''understanding and caring'', ''assurance'', and ''convenience''. Business travelers had the highest expectations for the dimension of ''convenience'' followed by ''assurance'', ''tangibles'', adequacy in service supply'', and ''understanding and caring''.	Dimension "understanding and caring"
Wilkins et al.,	(2007)	SQ in the Luxury hotel sector	Based on Parasuraman et al. (1988) Derived from the qualitative data and the literature, 63 items relating to hotel performance were included in the survey. (SERVQUAL and LODGQUAL scales were integrated, focus group interviews were used). There are three main types of SQ in hotels; physical product, service experience and quality and food and beverage	Important to highlight physical product, service experience and quality and food and beverage.
Albacete-Sáez et al.,	(2007)	SQ of Rural Establishment	Based on Parasuraman et al (1988). The methodology used to develop the dimensions and measurement scale for SQ in rural accommodation is based on proposals by experts in the validation of constructs. The concept of SQ established in this	Perceptions minus expectations.

			study centres on the paradigm of ‘‘perceptions minus expectations’’. After purification 7 dimensions and 36 items	

(Source: Own Edit)

18. Appendix - Service Quality Models After 2000s - IT

Author	Year	Name	Findings	Remarks
Broderick and Vachiraporn puk	(2002)	Internet banking model	Incorporates many literatures review. The SQ model of internet banking research used participant observation and narrative analyses. The goal is to identify how internet banking consumers perceived the different elements. The five key elements of the proposed model; expressed expectations, service setting attributes, comments on image, on specific aspects of the service encounter, or evidence of the level of customer participation.	Service setting attributes. The level of customer participation.
Zhu et al.,	(2002)	IT-based model	Based on Parasuraman et al. (1988, 1991) The model links IT-based service options perceived by the customer to traditional service dimensions. It explores the relationship between customers’ perceptions of SQ and IT-based services. The key variables affecting the perception of the consumer of IT-based services are identified while focusing on the linkages among the service dimensions (measured by SERVQUAL). The key elements are IT-based SQ, experiences in using IT-based	The IT-SQ and in person SQ connections.

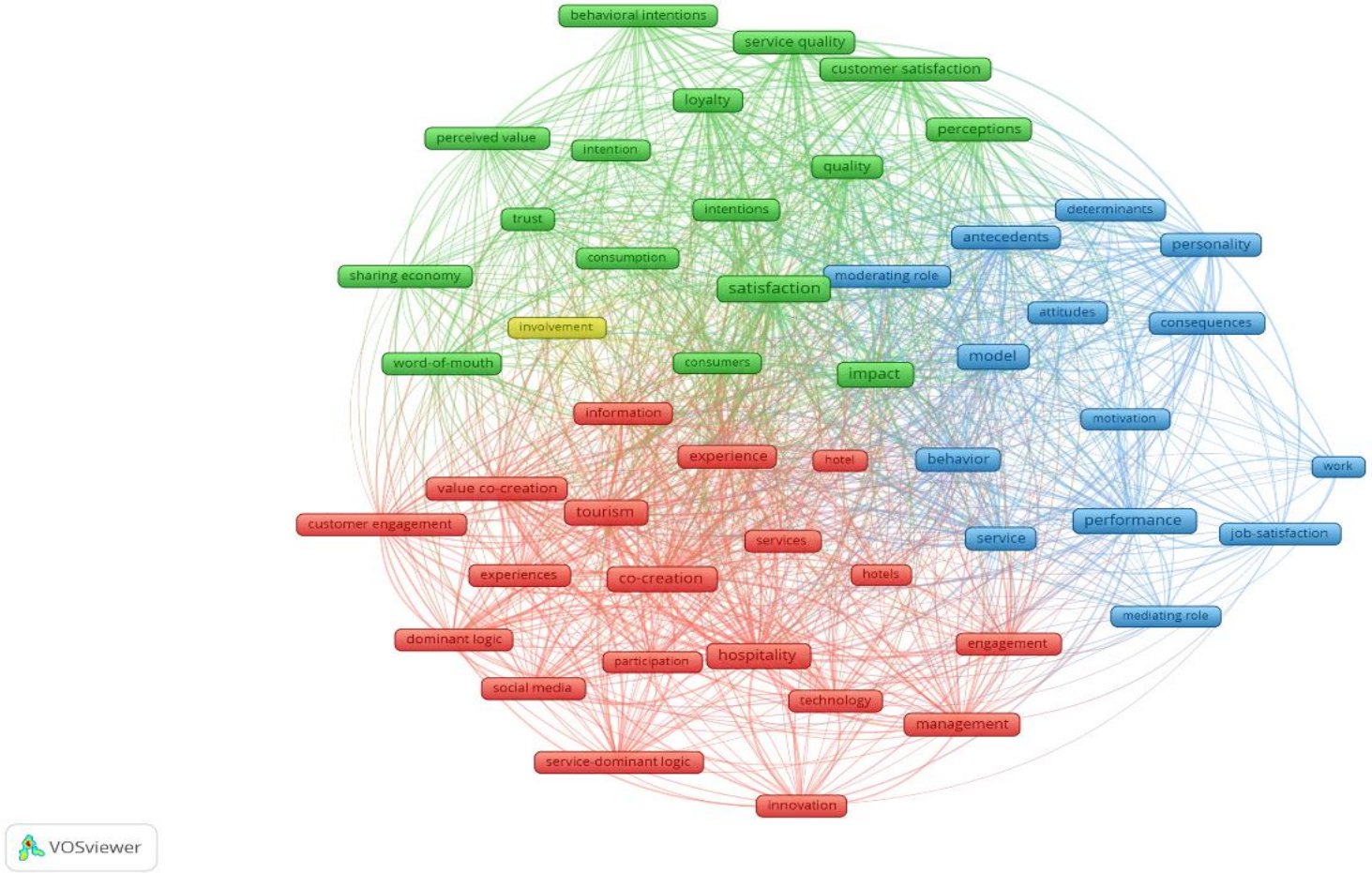
			services, preferences towards traditional services, and perceived IT policies.	
Santos	(2003)	Model of e-SQ	This model shows a conceptual model of e-SQ, with its determinants. E-SQ has incubative and active dimensions for increasing hit rates and customer retention. The design of a website done properly to provide consumers with easy access, how the technology is used, understanding the website, and attractions of a website. Active dimensions mean there has to be good support, fast speed of the website, and attentive maintenance to provide the customers	The design and usability of online surfaces such as a website has to be hight SQ.
Chen et al.	(2017)	e-SERVAR	Based on Parasuraman et al. (1988) SERVQUAL. E-SQ is a hierarchical, multidimensional construct consisting of the three primary dimensions of information quality; variability, system quality variability, and fulfillment quality variability. By reducing quality variability in e-service, it is possible to improve customers' overall e-SQ perception. It is also possible to identify different sources of quality variability in different types of e-services.	System quality variability element. Reducing quality variability in e-service.
Zeithaml et al.	(2000)	e-SQ	Based on Parasuraman et al. (1988) Dimensions to evaluate e-SQ: access, ease of navigation, efficiency, flexibility, reliability, personalization, security/privacy, responsiveness, assurance/trust, site aesthetics, and price	Dimensions to evaluate e-SQ. Personalization in e-SQ.

			knowledge. Perceived control and perceived convenience are critical to consumers. Price-value themes are strongly related to e-SQ.	
Loiacono	(2002, 2007)	WebQual	Based on Parasuraman et al. (1988) Website quality. A scale incorporating 12 items of web site quality: information fit-to-task, interactivity, trust, visual appeal, innovativeness, flow/emotional appeal, design appeal, intuitiveness, response time, integrated communications, business process and viable substitute.	Separate focused on the website quality.
Parasuraman et al.,	(2005)	E-S-QUAL and E-RecS-QUAL	Based on Parasuraman et al. (1988) Conceptualizes, constructs, refines, and tests a multiple-item scale (E-S-QUAL) for measuring the SQ delivered by Web sites on which customers shop online. The basic E-S-QUAL scale is a 22-item scale of four dimensions: efficiency, fulfilment, system availability, and privacy. The second scale, E-RecS-QUAL, for customers who had nonroutine encounters with the sites and contains 11 items in three dimensions: responsive-ness, compensation, and contact.	Differentiation of routine and non-routine consumer experience.
Huang et al.,	(2015)	M-S-QUAL	Based on Parasuraman et al. (1988) 51/49 items of the mobile SQ domain formed 544 of initial scale of physical/virtual products shopping scope. Five factors (contact, responsiveness, fulfilment,	Service through mobile devices must be considered separate for other e-services.

			privacy and efficiency) for the supporting services in the process of virtual product shopping and four factors (contact, responsiveness, fulfilment and efficiency) for the supporting services in the process of physical product shopping.	
He et al.	(2017)	TeleServQ	Conceptual framework of TeleServQ scale is proposed based on item sorting. It includes six dimensions including efficiency, system reliability, information quality, security, customisation and call centre service are identified. Some of the dimensions are consistent with the literature related to technology-based services, and others are specific in telematics context. Among six dimensions, efficiency and system reliability have the strongest relationship with customer satisfaction and loyalty intention.	Customisation aspects considered.
Noor et al.,	(2022)	AISAQUAL	AISAQUAL - Scale for Artificial Intelligence Service Agent - contains 26 items across six dimensions: efficiency, security, availability, enjoyment, contact and anthropomorphism. The new scale demonstrates good psychometric properties and can be used to evaluate SQ across AISA, providing a means of examining the relationships between AISA SQ and satisfaction, perceived value as well as loyalty.	Enjoyment as dimension of AISA.

(Source: Own Edit)

19. Appendix - Co-occurance Map Service Quality Hospitality



(Source: VOSviewer)

20. Appendix - Literature of Service Quality in Hospitality

Author	Aim of Article	Findings	Method	Remarks
(Nunnally, 1967, 1994)	Comprehensive texts in psychological measurement or test theory	Part 1: 1.Introduction 2. Scaling models 3. Validity Part 2: Internal Structure of Measures. 4. Variance and covariance 5. Multivariate Correlational Analysis 6. Theory of Measurement Error 7. Assessment of Reliability 8. Test Construction Part 3: Multivariate Analysis. 9. Fundamentals of Factor Analysis 10. Special Issues in Factor Analysis 11. Profile Analysis, Discriminatory Analysis, and Multidimensional Scaling Part 4: The Content Areas. 12. Measurement of Abilities 13. Measurement of Personality Traits 14. Measurement of Sentiments 15. Contingent Variables	Covers a wide range of topics	Methodology
(Churchill, 1979)	The goal is to organize the many definitions and measures of reliability and validity into an integrated whole so that the decision as to which to use and when is obvious.	Specify domain of construct Generate sample of items Collect data Purify measure Collect data Assess reliability Assess validity Develop norms	Conceptualization	Methodology Measurement development
(Oliver, 1980)	The purpose is to extend the literature and to propose a model which can expresses consumer satisfaction as a	The findings support the results of earlier studies on the expectation effect and recent interpretations of the disconfirmation effect. Post usage ratings of satisfaction appear to be a function of a linear	Questionnaire	expectation – experience = disconformation

	function of expectation and expectancy disconfirmation.	combination of an adaptation level component (expectations or prior attitude) and disconfirmation.		
(Fornell and Larcker, 1981)	The convergence and differentiation criteria applied by Bagozzi, are shown not to stand up under mathematical or statistical analysis. The authors argue that the choice of interpretative statistic must be based on the research objective.	Several aspects of the goodness-of-fit test in structural equation models are examined. Algebraic analysis demonstrates that the criteria presented by Bagozzi are not related to goodness of fit.	Using algebra and SEM	Methodology
(Grönroos, 1984)	The goal is to develop a model and to get a clear understanding of how the quality of services is perceived by customers.	The study differentiates expected and perceived service where perceived quality will be the outcome of the service experience. Here the customer can compare the experience with their expectations. Promises and Performance The instrumental performance of a product is the technical dimension of the product. In the context of services, it would be the technical result of a service production process. "(…) the quality dimensions are interrelated. An acceptable technical quality can be thought of as a prerequisite for a successful functional quality. On the other hand (…) temporary problems with the technical quality may be excused, if the functional quality is good enough" (p.43)	Questionnaire	The article is one of the main foundations of all SQ research, not only in hospitality. The importance of Functional Quality and Technical Quality

(Parasuraman et al. 1985)	they have created their service quality model where they attempted to show the difference or as they call gaps between costumer expectation and manager perception	Management perception-service quality specification gap, Service quality specifications-service delivery gap, Service delivery-external communications gap, Expected service-perceived service gap The research with the focus groups revealed that, the type of service does not matter as consumers used similar criteria in evaluating the level of service quality. These criteria seem to fall into 10 key categories which are labeled "service quality determinants. They have further developed they scale and in a later work 1988 created the SERVQUAL model.	Interviewed managers and focus groups	The article is one of the main foundations of all SQ research, not only in hospitality. SQ determinants, dimensions
(Baron and Kenny, 1986)	The goal was to distinguish between the properties of moderator and mediator variables.	The conceptual and strategic implications of making use of the distinction with regard to a wide range of phenomena, including control and stress, attitudes, and personality traits. They provided the first specific compendium of analytic procedures appropriate for making the most effective use of the moderator-mediator distinction both separately and in terms of a broader causal system that includes both moderators and mediators.	Conceptual model	Methodology
(Anderson and Gerbing, 1988)	Providing guidance for researchers on the use of structural equation	The study presents a comprehensive, two-step modelling approach that employs a series of nested	Conceptualization	Methodology

	modelling in practice for theory testing and development.	models and sequential chi-square difference tests. Measurement models using confirmatory factor analysis are reviewed. SEM has great potential for theory development and construct validation in psychology and the social sciences.		
(Bagozzi and Yi, 1988)	Criteria for evaluating SEMs with latent variables are defined, critiqued, and illustrated.	Model evaluation program is proposed based on the interpretation of evidence.	Complex analyses on SEM models	Methodology
(Parasuraman et al., 1988)	The paper describes the conceptualization of SQ and the development of a 22-item scale.	After the introduction of the 22-item scale SERVQUAL the article details the development, refinement and testing of the scale. The SERVQUAL model can assess consumer expectations and perceptions of the SQ.	two stages data collection refinement questionnaire	The article is one of the main foundations of all SQ research, not only in hospitality. consumer expectations and perceptions.
(Zeithaml, 1988)	In a conceptual model the paper defines and relates price, perceived quality and perceived value	Monetary costs can be further divided into transactional costs (perceived monetary price for purchase) and relational costs (perceived monetary price for maintenance, repair or replacement). Zeithaml (1988, p. 14) states: Value is the customer's overall assessment of the utility of a product based on perceptions of what is received and what is given. Zeithaml (1988) identified four dimensions of perceived value: value as low price, value as whatever the consumer wants in a product, value as the quality obtained for the price paid (tradeoff between one "give"	Focus group interviews	Using focus group interview to evaluate value. Value is more individualistic.

		component, price, and , one “get “ component, quality) and value as what the consumer gets for what they give. Value differs from quality as value is more individualistic and personal therefore a higher-level concept. Price is directly related to benefits and sacrifices since it serves as an extrinsic indicator.		
(Bitner, 1992a)	The purpose of this article is to integrate theories and empirical findings from diverse disciplines into a framework that describes how the built environment (i.e., the manmade, physical), or what is referred to here as the "services cape," affects both consumers and employees in service organizations.	The paper defines Environmental dimension (such as the Ambient conditions, Space and Signs), Holistic Environment (Perceived Servicescape), Moderators (as the employees” and Customers’ response), Internal Responses (Internal cognitive, emotional physiological internal responses) and Behaviour.	Conceptualization	The service cape or the built environment where service happens.
(Cronin and Taylor, 1992)	The goal is the conceptualization and measurement of SQ and to show the relationship between SQ, satisfaction and purchase intention.	A factor analysis of the SERVQUAL and SERVPERF scales. The empirical research indicates that the SERVPERF scale explains more of the variation in SQ than does SERVQUAL. Perceived SQ leads to satisfaction while SQ does not affect purchase intentions satisfaction does.	Questionnaire using bot SERVPERF and SERVQUAL scales.	The suty is important because most SQ models were buit on SERVQUAL and not SERVPERF
(Morgan and Hunt, 1994a)	The goal is to explore the nature of relationship marketing and key	After creating a model, the data collection was done via National Tire Dealers	Interviews to finalize model and questionnaire to	The creation of the questioner was preceded by interviews.

	characteristics. They test the conceptualized construct.	and Retreaders Association The causal model contained 13 hypotheses. Correlation analysis supported all 13 hypotheses while structural equation modeling, supports 12. "Relationship commitment and trust develop when firms attend to relationships by (1) providing resources, opportunities, and benefits that are superior to the offerings of alternative partners; (2) maintaining high standards of corporate values and allying oneself with exchange partner shaving similar values; (3) communicating valuable information, including expectations, market intelligence, and evaluations of the partner's performance; and (4) avoiding malevolently taking advantage of their exchange partner." (p.34)	analyse results. SEM	Commitment and trust bulit wen the firm can offer something that is superior compared to the competitors offering, standards, include expectations, and do not damages the consumer.
(Zeithaml et al., 1996)	Creating a conceptual model of the impact of SQ that will imply if the customer remains or leave the company.	Results show that customers are influenced by SQ. The research found differences in the service intentions. When customer experiences no problems, that will give the best results in behavioural intentions. However, the research also found that when companies would like to provide beyond the desired service level, they should do in a cost – effective manner. "Willing to pay more "intention is lower and flattens the satisfaction of the desired service level ergo the	Empirical study using mail survey (questionnaire)	Providing beyond the desired service level has to be cost effective

		satisfaction at one point will not get better doe to extra costs.		
(Oliver, 1997)	What is satisfaction	The book details the theoretical measurements of satisfaction, quality definitions and conceptual models.	Various approaches used throughout the book	Methodology
(Oliver, 1999)	Satisfaction and loyalty. What aspects of the consumer satisfaction response as implications for loyalty and what portion of loyalty response is due to this satisfaction component.	Satisfaction is a necessary step in loyalty formation but becomes less significant as loyalty begins to set through other mechanisms (like personal determinism and social bonding). When these are added to the model, ultimate loyalty emerges as a combination of perceived product superiority, personal fortitude, social bonding, and their synergistic effects. Loyalty cannot be achieved or pursued by everyone, for some satisfaction is the only feasible goal.	Conceptualization	Loyalty cannot be achieved by all companies. It will depend on the product and service they are providing.
(Baker and Crompton, 2000)	The goal is to prove that perceived performance quality would have a stronger total effect on behavioural intentions than satisfaction.	The analyses confirms that performance quality has a stronger effect on behavioural intentions than satisfaction.	Questionnaire – factor analyses - SEM	?
(Cronin et al., 2000)	The goal is to conceptualize the effects of quality, satisfaction, and value on consumers' behavioural intentions.	The results indicate that the research model outperforms the competing models. SQ and values effect behavioral intentions. The results both support and build on the extant literature and indicate that both SQ and service value lead to satisfaction. Thus, these findings add weight to Bagozzi's (1992)	6 survay concluded on different service industries. Factor analyses were concluded with LISREL-	SQ is more important to Consumers than costs associated with it.

		suggestion that cognitive evaluations precede emotional responses. The results stress the importance of value as a strategic objective. Service consumers seem to place greater importance on the quality of a service than they do on the costs associated with its acquisition.		
(Brady and Cronin, 1986)	Goal is to identify a new and integrated conceptualization of SQ in order to move forward with this research agenda.	A 35-item scale was developed. Customers form SQ perceptions based on three primary dimensions: outcome, interaction, and environmental quality. The first two are adapted from the Nordic school, (Grönroos's (1982, 1984) (while the third primary dimension reflects the influence of the service environment on quality perceptions. The qualitative and empirical results also indicate that the three primary dimensions are composed of multiple subdimensions. The combination of te sub dimensions constitutes a customer's overall perception of the SQ. Therefore; a hierarchical conceptualization SQ is appropriate. As it is suggested by the American school the results indicate that the reliability, responsiveness, and empathy of service providers are important to the provision of superior SQ,	Conceptualization followed with questionnaire factor analyses in LISREL	The combination and conceptualization of the Nordic and American school. Sub – dimensions are important to get a more detailed picture.

		The study consolidates multiple SQ conceptualizations into a single, comprehensive, multidimensional framework.		
(Podsakoff et al., 2003)	Method biases and potential sources. The goal is to examine the extent to which method biases influence behavioural research results and point of sources.	The strength of method biases may vary across research context, the common method variance is often a problem and researchers need to do whatever they can to control it. The paper provides recommendations for how to select appropriate procedural and statistical remedies for different types of research settings. Created a framework researchers can use when evaluation the potential biasing effects of method variance in their research	Literature review	Methodology
(Akbaba, 2006)	The SQ expectations of business hotels' customers.	Examine whether the quality dimensions included in the SERVQUAL model apply in an international environment, search for any additional dimensions. The five service quality dimensions identified ‘‘tangibles’’, ‘‘adequacy in service supply’’, ‘‘understanding and caring’’, ‘‘assurance’’, and ‘‘convenience’’. Business travelers had the highest expectations for the dimension of ‘‘convenience’’ followed by ‘‘assurance’’, ‘‘tangibles’’, adequacy in service supply’’, and ‘‘understanding and caring’.	SERVQUAL scale with items	see before?

(Hair et al., 2013, 2010)	Goal of the book is to introduce Multivariate data analyses	1 Overview of Multivariate Methods, 2 examining Your Data, 3 exploratory Factor Analysis, 4 Cluster Analysis, 5 Multiple Regression Analysis, 6 MANOVA: extending ANOVA, 7 Multiple Discriminant Analysis, 8. Logistic Regression: Regression with a Binary Dependent Variable, 9. Structural equation Modeling: An introduction, 10 SEM: confirmatory Factor Analysis, 11 Testing Structural equation Models, 12 Advanced SEM topics, 13 Partial Least Squares Structural equation Modeling (PLS-SEM)	various approaches used throughout the book	Methodology
(Ryu et al., 2012)	To create an integrated model that examines the impact of the elements of food SQ dimensions. (physical environment, food, and service), customer perceived value, satisfaction and behavioural intentions.	The quality of the physical environment, food, and service were significant determinants of image. The quality of the physical environment and food were significant predictors of customer perceived value. Image was also found to be a significant antecedent of customer perceived value. Customer perceived value is indeed a significant determinant of customer satisfaction, and customer satisfaction is a significant predictor of behavioral intentions.	Focus group interviews followed by data collection through questionnaire, 1-7 point Likert scale. then a structural model was used (SEM)	Image is important on the consumers evaluation.

(Source: Own Edit)

21. Appendix - Personalization Definitions

Author	Year	Personalization	Remarks
Surprenant and Solomon	(1987)	"Good service" often is translated as more personalized service. (...)	Encounter.

		Any behaviour occurring in the interaction intended to contribute to the individuation of a customer.	Human-to-human.
Mittal and Lassar	(1996)	"We define personalization as the social content of interaction between service employees and their customers. Thus, "personalization" concerns the manner in which service employees relate to customers as people - cold and impersonal at the one end to warm and personal at the other" p (96)	Encounter. Human-to-human.
Kokko and Moilanen,	(1997)	Changing the qualities of a service so that it fit into the customers' personal values. Includes personally planned details into service processes.	Encounter. Human-to-human.
Peppers and Rogers	(1997)	Personalization is customizing some feature of a product or service so that the customer enjoys more convenience, lower cost or some other benefit. Personalization can be initiated by the customer or by the firm.	Encounter. Human-to-human. Initiated by both.
Peppers et al.	(1999)	Personalization is customizing some features of a product or service so that the customer enjoys more convenience, lower cost, or some other benefit.	Encounter. Human-to-human.
Hanson	(1999)	"A specialized form of product differentiation, in which a solution is tailored for a specific individual." p (450)	Product differentiation.
Gilmore and Pine	(2000)	Personalization (or individualization which are used synonymously) in general means matching one object's nature with one subject's needs (i.e., customize products, services, content, communications to the needs of	Can target a single customer or a group.

		single customers or customer groups).	
Riecken	(2000)	Personalization is about building customer loyalty by building meaningful one-to-one relationships. This is done by understanding the needs of each individual and with knowledge and efficiency satisfy a goal and addresses each individual need in a given context	Encounter. Human-to-human.
Blom	(2000)	Personalization is a process that changes the functionality, interface, information content, or distinctiveness of a system to increase its personal relevance to the individual	Technology based.
Riemer and Totz	(2001)	The individualization of product or service attributes and parameters to customer-specific needs to increase customer satisfaction. (p.2)	Individualization of product or service.
Allen et al.	(2001)	Company-driven individualization of customer web experience. p (32-33)	Technology Company driven.
Imhoff et al.	(2001)	"Personalization is the ability of a company to recognize and treat its customers as individuals through personal messaging, targeted banner ads, special offers on bills, or other personal transactions." p (467)	Both technology based and personal encounters. Company driven.
Wind and Rangaswamy	(2001)	Personalization can be initiated by the customer (e.g. customizing the look and contents of a web page) or by the firm (e.g. individualized offering, greeting customer by name etc.). (p.15)	Initiated by both.
Fink et al.,	(2002)	One-to-one relationships with customers; direct access to personally relevant news, seamlessly integrating user preferences into the existing	Both technology based and personal encounters. Company driven.

		infrastructure, collecting information about user interests.	
Chiasson et al.,	(2002)	Personalization of information in order to customize interactions with end-users and reduce interaction complexity.	Technology based. Importance of information.
Kalyanam and McIntyre,	(2002)	One of the instruments of e-marketing mix, aspect of segmentation.	Marketing.
Billsus et al.	(2002)	Personalization as a result of adaptive technologies.	Technology based.
Cöner	(2003)	Personalization is performed by the company and is based on a match of categorized content to profiled users.	Technology based. Initiated by company. Importance of information.
Roberts	(2003)	"The process of preparing individualized communication for a specific person, based on stated or implied preferences." (p.462)	Encounter. Human to human. Importance of information.
Blom and Monk	(2003)	Personalization is a process that changes the functionality, interface, information content, or distinctiveness of a system to increase its personal relevance to the individual	Technology based. Importance of information.
Chellappa and Sin	(2005)	Personalization can be defined as the ability to proactively tailor products and product purchasing experiences to the tastes of individual consumers based upon their personal and preference information. Therefore, personalization is critically dependent on two factors: 1. vendors' ability to acquire and process consumer information, and 2. consumers' willingness to share information and use personalization services	Initiated by company. Importance of information.

Ho and Tam	(2006)	Delivering "the right content to the right person in the right format at the right time" (p. 96).	Company driven. Importance of information.
Serino et al.	(2005)	''Use of information about a particular user that provides tailored or personalized services for the user'' (p. 1).	Technology based. Importance of information.
Ho	(2006)	In customization, a web site provides choices for the users to modify a website's look and feel (user-driven process). Relevant content based on the preferences of groups of users is provided in adaptation. Personalization is a process of providing relevant content based on individual user preferences, and personalized web sites obtain preference information implicitly by tracking customer purchases or usage habits.	Technology based. Importance of information. Company driven.
Tam and Ho	(2006)	There are three types of personalization: user-driven personalization when the user specifies in advance the desired web layout and content that matches their interests and preferences with the tools and options provided. In transaction-driven personalization, an online merchant generates the personalized layout and content (based on previous transaction). Context-driven personalization employs an adaptive mechanism to personalize content and layout for each individual user based on the context and inference of users' processing objectives in real time (e.g., product inspection versus random browsing)	Technology based. Initiated by both.
Kumar and Stecke	(2007)	Mass personalization is a limiting case of mass customization. Mass personalization aims at a market segment of one while the latter	Company driven.

		mass customization at a market segment of few.	
Arora et al.	(2008)	Personalization is a firm's decision on the marketing mix suitable for the individual that is based on previously collected customer data.	Company driven. Importance of information.
Montgomery and Smith	(2008)	Personalization is automated by the marketer on behalf of the customer as opposed to customization that a customer requests on their own behalf (...). Personalization is the adaptation of products and services by the producer for the consumer using information that has been inferred from the consumer's behaviour or transactions.	Company driven.
Lee and Cranage	(2011)	Personalization refers to individualizing products, services, and contents according to customer interests and preferences.	Initiated by the company.

(Source: Own Edit)

22. Appendix - Mass Customization Definitions

Author	Year	Definition	Remarks
Davis	(1994)	''But mass customization is not restricted to products and services. It also applies to customers and markets'' (p. 180)	Also applied to marketing.
Ettlie and Ward	(1997)	''Mass customization—providing products that are created to the customers' specifications.'' (p. 56)	Individualized on a large scale.
von Hippel	(1998)	''Mass customization generally refers to the manufacturing of one-of-a-kind, 'custom' products . . . One can also logically extend the concept of mass customization to the production of customized services.'' (p. 631–2)	One-of-a-kind manufacturing.
Åhlström and Westbrook	(1999)	''Mass customization is a term first coined to describe a trend towards the production and distribution of individually customized goods and services for a mass market.'' (p. 262)	Customized production.
Gilmore and Pine	(2000)	Mass customization is the individualization of products (and services) at the cost of one-size fits all.	Individualized on a large scale.

Zipkin	(2001)	‘‘Mass customization is the capability . . . to offer individually tailored products or services on a large scale.’’ (p. 81)	Individualized on a large scale.
Duray	(2002)	‘‘. . . offering unique products in a mass-produced, low-cost, high volume production environment.’’ (p. 314)	Individualized on a large scale.

(Source: Own Edit)

23. Appendix - Customization Definitions

Author	Year	Definition	Remarks
Pine et al.	(1995)	‘‘Customization means manufacturing a product or delivering a service in response to a particular customer’s needs, and mass customization means doing it in a cost-effective way.’’ (p. 105)	A response to consumer needs.
Anderson et al.	(1997)	The degree to which the firm’s offering is tailored to meet heterogeneous customers’ needs.	Company offers from a selection based on needs.
Peppers et al.	(1999)	Based on the interaction, treating a particular customer differently.	Based on the consumer.
Glazer	(1999)	Customization is flexible manufacturing and operations. It can be strategies based on flexible marketing.	Flexible manufacturing.
Hanson	(1999)	“The combining of individual-level information and flexible product design” (p. 445)	Flexible design.
Allen et al.	(2001)	“Customer-driven individualization of customer web experience” (pp. 57-58)	Customer driven.
Imhoff et al.	(2001)	“Customization includes individualization of features, e.g. web site content, by customers” (p. 374)	Customer driven.
Wind and Rangaswamy	(2001)	Customization, initiated by the customer. “... a business strategy to recast a company’s marketing and customer interfaces to be buyer-centric” (p. 14)	Customer driven.

Sundbo	(2002)	Customization of services as the opposite of service standardization.	Customization opposite to standardization.
Cöner	(2003)	Customization is performed by the user.	Customer driven.
Roberts	(2003)	"The process of producing a product, service, or communication to the exact specifications/desires of the purchaser or recipient" (p. 459)	Based on needs.
Ansari and Mela	(2003)	Customization of communications by means of clickstream data.	Technology based.
Arora et al.	(2008)	Customization allows customers to (partly) adapt the marketing mix to their individual preferences.	Based on customer.
Valenzuela et al.	(2009)	Customization is a process by which consumers adapt offerings to their own preferences.	Based on customer.

(Source: Own Edit)

24. Appendix - Co-creation Definitions

Author	**Year**	**Co-creation**	**Remarks**
Mossberg	(2008)	"The tourist as co-creator of the experience environment." (p. 63)	Focus on customer. Environment.
Li and Petrick	(2008)	"The customer as co-creator of value and co-producer of experience." (p. 240)	Focus on customer. Value. Experience.
Lichrou et al.	(2008)	"Tourists are co-creators of places through narratives" (p. 31)	Focus on customer. Environment.
Zouni and Kouremenos	(2008)	"It involves both the marketer and the customer interacting in all aspects of the design, production, and consumption of a service" (p. 292)	Interaction between company and customer.
Morgan et al.	(2009)	"The customer as an active participant and creator of experiences through interaction rather than a passive consumer" (p. 205)	Focus on customer. Interaction between company and customer. Experience.

Samuelsen	(2010)	"The consumers involvement in the creation of the experience product (as co-producers or co-creators)" (p. 3)	Focus on customer. Experience.
Salvado	(2011)	"The tourism co-creation experience results from the interaction of an individual at a specific place and time and within the context of a specific act." (p. 101)	Focus on customer. Interaction between company and customer. Experience
Wang et al.	(2011)	"Activities in which both the service provider and customer collaborate in the customer's consuming and experiencing particular services." (p. 135)	Interaction between company and customer. Experience.
Sandra and Björk	(2012)	"Firms and tourists are interconnected, inter – dependent and interact to co-create experiences over time." (p. 3)	Interaction between company and customer. Experience.
Tajzadeh-Namin	(2012)	"The personalized experience that is unique to each individual customer/ tourist." (p. 203)	Personalization. Focus on customer. Experience.
Lugosi and Walls	(2013)	"Tourists are co-producers and actively build their own consumption experiences through the interaction between the environment, organizations, employees, locals and other consumers." (p. 53)	Focus on customer. Interaction between company and customer. Experience.
Räikkönen and Honkanen	(2013)	"Co-creation experiences are the basis of value derived from interactions between customers and companies." (p. 109)	Interaction between company and customer. Value.
Bertella	(2014)	"The active role played by tourists in creating and giving meaning to an experience that touches them deeply." (pp. 115–116)	Focus on customer. Experience

(Source: Own Edit)

25. Appendix - Literature of Items

Author	
Chellappa and Sin, 2005	Web personalization
PER1	I value Web pages that are personalized for the device (e.g. computer, palm, mobile phone etc.), browser (e.g. Netscape, Internet explorer) and operating system (e.g. Windows, Unix) that I use.
PER2	I value Web sites that are personalized for my usage experience preferences
PER3	I valueWeb sites that acquire my personal preferences and personalize the services and products themselves
PER4	I value goods and services that are personalized based on information that is collected automatically (such as IP address, pages viewed, access time) but cannot identify me as an individual.
PER5	I value goods and services that are personalized on information that I have voluntarily given out (such as age range, salary range, Zip Code) but cannot identify me an individual. as
PER6	I value goods and services that are personalized on information I have voluntarily given out and can identify me as an individual (such as name, shipping address, card information). credit
Mittal and Lassar, 1996	SERQUAL-P
9.	Everyone at is polite and courteous.'
10.	The employees display personal warmth in their behavior
11.	All the persons working at are friendly and pleasant
12.	The employees take the time to know you personally
Nyheim et al., 2015	**Perceived personalization**
1	Personalized advertising on this application makes purchasing recommendations that match my needs
2	I think that personalized advertising on this application enables me to order products that are tailor-made for me
3	Overall, personalized advertising on this application is tailored to my situation
4	Personalized advertising on this application makes me feel that I am a unique customer
5	I believe that personalized advertising on this application is customized to my needs
Modym and Lehto 2017	
1	Personalized communication by the hotel barand/airbnb maes me feel that I am a uniqe customer
2	I belive that communication by the hotel brand is customized to my needs
3	Communication with the hotel brand provides me with product and service recommedations that are tailormade for me

(Ball, Coelho and Vilares, 2006)	
y41	"My bank" offers me products and services that satisfy my specific needs
y42:	"My bank" offers products and services that I could not find in another bank
y43:	If I changed from banks I wouldn't obtain products and services as personalized as I have now
(Ozturk et al., 2017)	
1	When I searched for a hotel, MHB provided recommendations close to where I was.
2	When I searched for a hotel room, MHB provided personalized search results.
3	I feel that MHB provided me with information and products according to my preferences.
4	Overall, I feel that my personal needs have been met when using MHB.
Ho and Bodoff 2014	based on Nyheim et al. (2015) *Personalization*
	Personalized communication by the hotel brand/Airbnb makes me feel that I am a unique customer
	I believe that communication by the hotel brand/Airbnb is customized to my needs
	Communication by the hotel brand/Airbnb provides me with product and service recommendations that are tailormade for me
Ho and Bodoff 2014	based on van der Heijden, 2004) Study 1: The lab study
PU1	I could decide more quickly which book I wanted to select than in the past.
PU2	I could better decide which book I wanted to select than in the past.
PU3	I was better informed about relevant books.
PU4	I could decide more quickly whether I wanted to explore a particular book or not.
PU5	I could better decide whether I wanted to select a particular book or not.
	Study 2: The field study
	By using the personalization agent,
PU1	I could decide more quickly which song I wanted to select than in the past.
PU2	I could better decide which song I wanted to select than in the past.
PU3	I was better informed about new songs.
PU4	I could decide more quickly whether I wanted to explore a particular song or not.
PU5	I could better decide whether I wanted to select a particular song or not.
Ho and Bodoff 2014	Attitude Valence based on (Bhattacherjee and Premkumar 2004)
Valence1.	Using the personalization agent in my book selection is a (bad … good) idea.
Valence2.	Using the personalization agent in my book selection will be (unpleasant … pleasant).

Valence3.	Overall, I (dislike … like) the idea of using the personalization agent in my book selection.
	Study 2: The field study
Valence1.	Using the personalization agent in my song selection is a (bad … good) idea.
Valence2.	Using the personalization agent in my song selection will be (unpleasant … pleasant).
Valence3.	Overall, I (dislike … like) the idea of using the personalization agent in my song selection.
Ho and Bodoff 2014	Tam and Ho 2006
	The book recommendations shown at the bottom of the window are personalized to my needs
	The book recommendations displayed at the bottom of the window match my needs
	The book recommendations are personalized to me
Ho and Bodoff 2014	Berger and Mitchell 1989
Conf1	How confident are you in the estimation of the goodness of personalized items
Conf 2	How precise is your estimation of the goodness of personalized items?
Jan Blom 2000	
	Function 1 Making te interface suitable for visually impaired
	Function 2 Receiving information of the area of interest
	Function 3 Recommended products of the basis of preferences of similar-minded consumers
Morosan, and deFranco, 2016	
	The hotel app can provide me with personalizes services, products, or information tailored to my specific hotel stay
	The hotel app can provide me with more relevant services, products, or information tailored to my preferences or personal interests,
	The hotel app can provide me with the kind of personalized services, products or information that i might like.
Xu, et al.	
	the level of personalization at the website was about right not too much or too little
	the website understood my specific needs during the laptop selection task
	the website had features that were personalized for me
	what control panel style do you prefer
	what exterior color do you prefer
	human based services on the website like chat service
Ariffin 2013	
1	Hotel staff knew my name and/or nationality
2	The hotel staff treated me with full respect
3	The hotel staff made eye contact with me during conversation
4	the hotel made me feel like an important person

5	the hotel staff gave me authentic smiles all the time
6	the hotel stuff tried to be helpful in solving my problem
7	I was given a warm welcome at the door step
8	The hotel ensured the security of all guests
9	The hotel staff walked with me to the guest room upon check-in
10	The hotel presented me with an unexpected welcoming token of gift
11	The hotel staff helped me with my luggage (if any)
12	the hotel understood my special requirements while staying the hotel
13	Buliding good relationship rather than making money seemed to be the most important drive of the hotel
14	i was given warm "good bye" after checking out at the counter
15	I was entertained with the service provided by the hotel
16	I was treated as a friend rather than a customer
17	The hotel staff ensured that my meals had been taken care of
18	The hospitable behaviour seemed to be rendered as a natural extentionof their characters regardless of any control and incentive systems
19	the hospitable behaviour seemed to be motivated by genuin needs to please and care for their guests and not to deliberately impress the guest
20	The hotell ensured that all aspects of the room were in good conditions
21	I felt as if i was at home while staying at the hotel
22	the hotel staff ensured that the room was comfortable for me
Battancout and Gwinner 1995	
	personalization or friendliness
	conversation, which moves from formal to familiar
	being friendly with costumers
	small talk
Blom and Monk, 2003 2014	"Theory of personalization of appearance"
1.	Ease of use
2.	Being able to change the aesthetics of the design to my preferences
3.	Being able to recognize my copy of the product or system
4.	Being able to reflect my personal identity
5.	Being able to reflect my membership of some group
6.	Feeling familiar with the system or product
7.	The system of product feels personal
8.	Feeling in control of the system or product
9.	A feeling of ownership of the system or product
10.	Being fed up with the appearance of the product or system and wanting to repersonalize it
11.	Having fun with the product or system
12.	Making me happy
13.	Being emotionally attached to the system or product
14.	Being able to accommodate my current emotional state
Pijls & Schreiber 2012	"Capturing the guest experience in hotels…" - affectvive experrience interaction with hotel staff

	the contact with the employees exceeds my expectation
	I perceive the contact with the employees as being pleasant
	the employees seem reliable to me
	the employees make me feel at ease
	the employees are empathetic towards me
	the employees seem approachable to me
Gwinner et al. 2005	"Service Customaziation Through Employee Adaptiveness"
	If I work hard I can adapt my behavior to the needs of the customer
	If I put forth the effort I can customize the service offering to the needs of the customer
	If I work hard I can personalize the service for the customer
	If put forth the effort I am able to change my behavior to suit the needs of the situation
	I have the skills necessary to adapt to meet customer needs
Elgaraihy 2013	"Developing and Validating a Hospitality Service Quality Scalein Saudi Arabia"
6	Staff members responded immediately to my requests
7	Room service was done immediately
8	The hotel operates working hours to be appropriate to all its customers
9	The hotel has staff members who give you individual attention
10	The hotel considers your best interest at the top of its priorities
11	staff members of the hotel understand your specific demands
12	The hotel has staff members who are efficient
Parasuraman et al. 1988	"A Multiple-Item Scale for Measuring Consumer Perceptions of Service Quality"
E5	When these firms promise to do something by a certain time, they should do so
E6	When customers have problems, these firms should be sympathetic and reassuring
E8	They should provide their services at the time they promise to do so
E9	They should keep their records accurately
E10	They shouldn't be expected to tell customers exactly when services will be performed
E11	It is not realistic for customers to expect prompt service from employees of these firms
E12	Their employees don't always have to be willing to help customers
E13	It is okay if they are too busy to respond to customer requests promptly
E16	Their employees should be polite
Aydin 2018	"Role of Personalization in Shaping Attitudes Towards Social Media Ads"
	I feel that facebook advertisements are tailored to me (Ünal et al., 2011; Xu et al ., 2008)
	I feel that contents in Facebook advertisements are personalized (Ünal et al., 2011; Xu et al ., 2008)
	I feel that Facebook advertising is personalized for my usage (Ünal et al., 2011; Xu et al ., 2008)
	I feel that Facebook advertising is delivered to me in a timely way (Ünal et al., 2011; Xu et al ., 2008)

(Kapeš et al., 2022)	The hotel adjusted the response to the specific problem of the guest.
	In the response, the hotel partially restated the problem.
	The guest is invited to interact with the hotel.
	The hotel knows exactly to whose review it responds.

(Source: Own Edit)

26. Appendix - Technical Stage, Pre-arrival phase, Website - Fusion

Nr.	Author	Indicator from Literature	Key focus		Transformed Indicator	Score
1	Chellappa and Sin, 2005	I value Web sites that are personalized for my usage experience preferences	Website	1;2	Our website has features that personalized for the users' preferences	0-1
2	Jingjun Xu, Izak Benbast Ronald Cenfetelli research note …	The website had features that were personalized for me	Website	x	x	x
3	Jingjun Xu, Izak Benbast Ronald Cenfetelli research note …	what control panel style do you prefer	Website	3	Control panel style can be customized by user	0-1
4	Jingjun Xu, Izak Benbast Ronald Cenfetelli research note …	what exterior color do you prefer	Website	4	Exterior color can be customized by user	0-1
5	Jingjun Xu, Izak Benbast Ronald Cenfetelli research note …	human based services on the website like chat service	Website	5	The website has a Chat service	0-2

6	Jan Blom 2000	Making the interface suitable for visually impaired	Website	6	The website has feature for the visually impaired	0-1
7	_(Chellappa and Sin, 2005)	I value Web pages that are personalized for the device (e.g. computer, palm, mobile phone etc.), browser (e.g. Netscape, Internet explorer) and operating system (e.g. Windows, Unix) that I use.	Website	7	Our website is automorphically fits to the e.g. computer, palm, mobile phone etc.), browser (e.g. Netscape, Internet explorer) and operating system (e.g. Windows, Unix) that the guest uses.	0-1
8	cristian Morosan, agnes deFranco 2016 adapted from Li, Sarathy and xu 2011; (Piccoli et al., 2022)	Research done assuming there is a hotel Application	Hotel App	8	We have a hotel App	0-1
9	Jan Blom 2000	Receiving information of the area of interest	Personalized recommendations	9;10;11;12	The hotel app can provide the guest with personalized services, products, or information tailored to their preferences or personal interests.	0-1
10	cristian Morosan, agnes deFranco 2016 "modeling guests' intention to use …)adapted from Li, Sarathy and xu 2011	The hotel app can provide me with more relevant services, products, or information tailored to my preferences or personal interests,	Personalized recommendations	x	x	x

11	(Ozturk et al., 2017)	Overall, I feel that my personal needs have been met when using MHB.	Personalized recommendations	xx	xx	xxx
12	cristian Morosan, agnes deFranco 2016 "modeling guests' intention to use …)adapted from Li, Sarathy and xu 2011	The hotel app can provide me with the kind of personalized services, products or information that i might like.	Personalized recommendations	x	x	x
13	Tam and Ho 2006	The book recommendations shown at the bottom of the window are personalized to my needs	Personalized recommendations	13; 14; 15;16	The website aquires the specific needs of the guest and shows service recommendations based on their personal needs	0-1
14	Jingjun Xu, Izak Benbast Ronald Cenfetelli research note …	the website understood my specific needs during the laptop selection task	Website function	x	x	
15	(Nyheim et al., 2015)	Personalized advertising on this application makes purchasing recommendations that match my needs	Advertising	x		
16	(Nyheim et al., 2015) in Modym suess and Lehto 2017	I believe that personalized advertising on this application is customized to my needs	Advertising			
17	Chellappa and Sin, 2005	I value Web sites that acquire my personal preferences and personalize the services and products themselves	Website function	17; 18	The Web site acquires the guests' personal preferences and offers services and products that	0-1

					are tailor-made for the guest	
18	(Nyheim et al., 2015)	I think that personalized advertising on this application enables me to order products that are tailor-made for me	Advertising	x	x	
19	Jingjun Xu, Izak Benbast Ronald Cenfetelli research note …	the level of personalization at the website was about right not too much or too little	personalization level		N/A	
20	(Chellappa and Sin, 2005)	I value goods and services that are personalized based on information that is collected automatically (such as IP address, pages viewed, access time) but cannot identify me as an individual.	Website function	20	Our website automatically collects data (such as IP address, pages viewed, access time) but cannot identify the guest as an individual and offers goods or services based on that.	0-1
21	(Ozturk et al., 2017)	When I searched for a hotel, MHB provided recommendations close to where I was.	Personalized recommendations	21	Our hotel uses Search engine optimalization to appear for searching accommodation nearby	0-1
22	(Ozturk et al., 2017)	When I searched for a hotel room, MHB provided personalized search results.	Personalized recommendations	22	Our hotel makes sure that we appear as a personalized search result through search engine optimalization	0-1
23	(Ozturk et al., 2017)	I feel that MHB provided me with information and products according to my preferences.	Personalized recommendations	23	Our hotel makes sure that we provide information and products according to our	

					guests preferences.	
24	Gökhan Aydin 2018	I feel that facebook advertisements are tailored to me (Ünal et al., 2011; Xu et al ., 2008)	Perceived personalization	24,15	We aim to advertise our hotel in a way that it feels personalized for our potential guests, even based on the previous searches or interests.	0-1
25	Gökhan Aydin 2018	I feel that contents in Facebook advertisements are personalized (Ünal et al., 2011; Xu et al ., 2008)	Perceived personalization	x		

(Source: Own Edit)

27. Appendix - Functional Stage, Pre-arrival phase, Pre-arrival communication - Fusion

	Author	**Indicator**	**Key focus**		**Transformed Indicator**	**Score**
1	(Ozturk et al., 2017)	Communication by the hotel brand/Airbnb provides me with product and service recommendations that are tailormade for me	Advertising	1	Communication by our hotel brand provides our customers with product and service recommendations that are tailormade for them	0-5
2	Ho and Bodoff 2014	The book recommendations are personalized to me	Perceived personalization	2	We recommend products and services that are are personalized to our customer's interest based on our communication with that customer	0-5

3	Jan Blom 2000	Function 3 Recommending products of the basis of preferences of similar-minded consumers	Advertising	3	We recommend products and services that are personalized to our customer's interest based on of the basis of preferences of similar-minded consumers	0-5
4	(Ozturk et al., 2017)	Personalized communication by the hotel brand/Airbnb makes me feel that I am a unique customer	communication	4, 5	We aim to use personalized communication so our brand can make the guest feel that they are a unique customer	0-5
5	(Nyheim et al., 2015) in Modym suess and Lehto 2017	Personalized advertising on this application makes me feel that I am a unique customer	communication	x		
6	Gökhan Aydin 2018	I feel that Facebook advertising is delivered to me in a timely way (Ünal et al., 2011; Xu et al ., 2008)	Advertising	x	We aim to give personalized recommendation in a timely way.	0-5
7	Perceived Usefulness (Van der Heijden 2004)	PU1: I could decide more quickly which song I wanted to select than in the past.	decision making	NA		
8	Perceived Usefulness (Van der Heijden 2004)	PU2: I could better decide which song I wanted to select than in the past.	decision making	NA		
9	Based on previous	x	x		We aim to adjust our communication style (either on phone on in written channels) based on the guest type and characteristics (age, gender, interest, etc)	0-5
9	Ho and Bodoff 2018 Attitude	Valence1. Using the personalization agent in	decision making	x	x	

	Valence (Bhattacherjee and Premkumar 2004)	my song selection is a (bad … good) idea.				
10	Ho and Bodoff 2018 Attitude Valence (Bhattacherjee and Premkumar 2004)	Valence2. Using the personalization agent in my song selection will be (unpleasant … pleasant).	decision making	x	x	
11	Ho and Bodoff 2018 Attitude Valence (Bhattacherjee and Premkumar 2004)	Valence3. Overall, I (dislike … like) the idea of using the personalization agent in my song selection.	decision making	x	x	

(Source: Own Edit)

28. Appendix - Functional Stage, Service Phase, Arrival - Fusion

	Author	**Indicator**	**Key focus**		**Transformed Indicator**	**Score**
1	Affrin and Maghzi 2012 from Lashley (2008)	Given a warm welcome at the doorstep	Welcome	1,2	We aim to provide an authentic warm welcome to the guest	0-5
2	Ariffin 2013	I was given a warm welcome at the doorstep	Welcome	x	x	
3	Ariffin 2013	The hotel staff walked with me to the guest room upon check-in	Help	3,4	Guest are walked to the guestroom after check -in	0-5
4	Affrin and Maghzi 2012 – In depth interview	Walked to the hotel room by the staff upon check in	help	x	x	
5	Ariffin 2013	The hotel presented me with an unexpected welcoming token of gift	Gifting	5	We place different welcome gifts in the guestroom (to all guest)	0-5

6	Affrin and Maghzi 2012 from King (1995)	Presented with an unexpected welcoming token or gift	Gifting	6	We place different welcome gifts in the guestroom (of VIP guest)	0-5

(Source: Own Edit)

29. Appendix - Technical Stage, Service Phase, Arrival - Fusion

1	(Shih et al., 2019)	Greetings from Emily, name introduction greeting card with a hand-written message	Welcome	1	We place introduction greeting card with a hand-written message and guests name in the room	0-1

(Source: Own Edit)

30. Appendix - Functional Stage, Service Phase, In Room and Hotel Amenities - Fusion

	Author	**Indicator**	**Key focus**		**Transformed Indicator**	**Score**
1	Wael Hassan El-garaihy 2013	The hotel operates working hours to be appropriate to all its customers	convenience	1	The hotel operates working hours to be appropriate to all its customers	0-5
2	Affrin and Maghzi 2012 from Martin (1986)	Understanding my special requirements while staying in a hotel	Requirements	2	We pay attention to the special requirements of our guests while staying in a hotel	0-5
3	Wael Hassan El-garaihy 2013	Staff members responded immediately to my requests	immediate response	3, 4	We respond immediately to all guest requests	0-5
4	Wael Hassan El-garaihy 2013	Room service was done immediately	immediate response	x		
5	Affrin and Maghzi 2012 from	Ensured that my meals had been taken care of	meals	5,6	We make sure, that there are appropriate	0-5

	Lashley et al. (2005)				meals for all guest (religion, allergies, dietary restrictions)	
6	Ariffin 2013	The hotel staff ensured that my meals had been taken care of	meals	x	x	
7	Affrin and Maghzi 2012 from Lashley (2008)	Ensured that the room was comfortable for me (and my companions)	room	7,8	We make sure that the chosen room is comfortable for the guest	0-5
8	Ariffin 2013	The hotel staff ensured that the room was comfortable for me	room	x		
9	Affrin and Maghzi 2012 from Lashley (2008)	Ensured all aspects of the room was in good condition	room	9,10	We make sure that all aspects of the room is in good condition and suitable for the guest	0-5
10	Ariffin 2013	The hotel ensured that all aspects of the room were in good conditions	room	x		

(Source: Own Edit)

31. Appendix - Functional Stage, Service Phase, Check-out - Fusion

	Author	**Indicator**	**Key focus**	**Transformed Indicator**	**Score**
1	Affrin and Maghzi 2012	Given warm “good bye” after checking out at the counter	Goodbye	We give a warm “good bye” after checking out at the counter	0-5
2	Ariffin 2013	i was given warm "good bye" after checking out at the counter			
3	Interview (Dutch)		check out	Based on previous conversation with the guest we are recommending them with activities for the last day	0-5

(Source: Own Edit)

32. Appendix - Functional Stage, Service Phase - Fusion

	Author	Indicator	Key focus		Transformed Indicator	Score
1	Ariffin 2013	The hotel staff helped me with my luggage (if any)	Help	1,2	The hotel staff helps with the luggage	0-5
2	Affrin and Maghzi 2012 from Indepth interviews	The hotel staff helped me with my luggage (if any)	Help	x		
3	Affrin and Maghzi 2012 from Grandey et al. (2005)	The hotel staff gave me authentic smiles all the time	Staff behavior	3, 4	Our staff gives authentic smiles all the time	0-5
4	Ariffin 2013	the hotel staff gave me autherntic smiles all the time	Staff behavior	x		
5	(Mittal and Lassar, 1996)	The employees display personal warmth in their behavior.	Staff behavior	5	We encourage the employees to display personal warmth in their behavior.	0 -5
6	Pijls & Schreiber 2014	affectvive experrience interaction with hotel staff…..the employees seem approachable to me	Staff behavior	6	We encourage the employees to be approachable	0-5
7	Ariffin 2013 from in depth interviews	The hotel staff made eye contact with me during conversation	Staff behavior	7,8	We encourage the employees to make eye contact with the guest during conversation	0-5
8	Affrin and Maghzi 2012	The hotel staff made eye contact with me during conversations Indepth interviews	Staff behavior	x	x	
9	Ariffin 2013	the hotel understood my special requirements while staying the hotel	requirements	9	We are doing everything to understand the special requirements	0-5

					of the guest while staying the hotel	
10	Affrin and Maghzi 2012	The hotel staff knew my name and/or nationality	Staff knowledge	10, 11	The employee has to know the name and / or nationality of the guest	0-5
11	Ariffin 2013	Hotel staff knew my name and/or nationality	Staff knowledge	x		
12	Ariffin 2013	The hotel ensured the security of all guests	Security	NA		
13	Affrin and Maghzi 2012 from Telfer (2000)	Ensured the security of all guests	Security	NA		
14	Affrin and Maghzi 2012 from Hepple et al. (1990)	Felt as if I was at home while staying at the hotel	Feeling	NA		
15	Ariffin 2013	I felt as if i was at home while staying at the hotel	Feeling	NA		

(Source: Own Edit)

33. Appendix - Technical Stage, Service Phase - Fusion

	Author	Indicator	Key focus		Transformed Indicator	Score
1	(Piccoli et al., 2022)	Customize the stay	Room	1	It is possible for the guest to ask for minor changes regarding the room during their stay	0-1
2	(Piccoli et al., 2022)	Temperature		2	The guest can choose a specific temperature they want their room to be	0-1
3	(Piccoli et al., 2022)	Bed		3	The guest can choose what kind of bed/Matras	0-2

					they want in their room	
4	(Piccoli et al., 2022)	Bedding		4	The guest can choose the style and the type of the beddig	0-1
5	(Piccoli et al., 2022)	Pillow		5	The guest can choose what kind of pillow they want.	0-1
6	Duch intervi	minibar no alcohol		6	The guest can choose to have no alcohol in their minibar	0-1
7	Dutch interview	"regular guest will get their favorite drinks in the room even if that is not the brand the hotel normally works with)"		7	We put the favorite drink of the guest in the room even if that is not the brand the hotel normally works with	0-2

(Source: Own Edit)

34. Appendix - Functional Stage, Post-service Phase - Fusion

	Author	**Indicator**	**Key focus**		**Transformed Indicator**	**Score**
1	(Kapeš et al., 2022)	The hotel adjusted the response to the specific problem of the guest.	specific problem	1, 2	Our hotel hotel adjusts the response to the specific problem of the guest.	0-5
2	(Kapeš et al., 2022)	In the response, the hotel partially restated the problem.	restated	x		
3	(Kapeš et al., 2022)	The guest is invited to interact with the hotel.	interaction	3	The guest is invited to interact with us.	0-5
4	(Kapeš et al., 2022)	The hotel knows exactly to whose review it responds.	knowledge	4	Our hotel / employee knows exactly to	0-5

					whose review it responds	
5	(Shin et al., 2019)	The studies find that online reviewers (previous guests) are more empowered when they receive a personalized response and when they have positive service experiences.		5	Our hotel / employee gives an individual response to all guest reviews and comments.	0-5

(Source: Own Edit)

35. Appendix - Functional Stage

	Author	Indicator	Key focus		Transformed Indicator	Score
1	Gwinner & Bitner & Brown & Kumar 2010	If I work hard, I can adapt my behavior to the needs of the customer	adapting behavior	1, 2	Our employee changes their behavior to suit the needs of the guest	0-5
2	Gwinner & Bitner & Brown & Kumar 2010	I have the skills necessary to adapt to meet customer needs	adapting behavior	x	x	
3	Blom and Monk, 2003 2028	Being able to accommodate my current emotional state	adapting behavior	3, 4	Our employee changes their behavior to suit the needs of the situation	0-5
4	Gwinner & Bitner & Brown & Kumar	If put forth the effort I am able to change my behavior to suit the needs of the situation	adapting behavior	x		
5	Pijls & Schreiber	the employees are empathetic towards me	Empathy	5, 6	The employee is empathetic towards the guest when they have a problem	0-5
6	Parasuraman & Zeithaml	When customers have problems, these firms should be sympathetic and reassuring	Empathy	x		

7	Wael Hassan El-garaihy 2013	Staff members responded immediately to my requests	Responding on time	7,8,9	The employee responds immediately to guest requests	0-5
8	Parasuraman & Zeithaml	It is not realistic for customers to expect prompt service from employees of these firms	Responding on time	x		
9	Parasuraman & Zeithaml	It is okay if they are too busy to respond to customer requests promptly	Responding on time	x		
10	Parasuraman & Zeithaml	When these firms promise to do something by a certain time, they should do so	Providing service on time	10, 11, 12	When our employee promise to do something by a certain time, they do so	0-5
11	Parasuraman & Zeithaml	They should provide their services at the time they promise to do so	Providing service on time	x		
12	Parasuraman & Zeithaml	They shouldn't be expected to tell customers exactly when services will be performed	Providing service on time	x		
13	Parasuraman & Zeithaml 1992	They should keep their records accurately	Accuracy	13	We make sure that our information is accurate and update our records frequently	0-5
14	Service quality (Ekinci, 2001).	Staff were talented and displayed a natural expertise.	Professiona lism	14,15	Our employee is talented and displays a natural expertise in case of all requests.	0-5
15	Pijls & Schreiber 2017	The employees seem reliable to me	Professiona lism	x		
16	Wael Hassan El-garaihy 2013	The hotel has staff members who are efficient	Professiona lism	16	Our employee is efficient.	0-5

17	Pijls & Schreiber 2015	The contact with the employees exceeds my expectation	Professionalism	17	Our employee aims to exceed guest expectation	
18	Chellappa and Sin, 2005	I value goods and services that are personalized on information that I have voluntarily given out (such as age range, salary range, Zip Code) but cannot identify me an individual.	Personalized service	18, 21	Our employee / hotel personalizes goods and services that are based on information that the guest has voluntarily given out (such as age range, salary range, Zip Code) but cannot identify them as an individual.	0-5
19	Chellappa and Sin, 2005	I value goods and services that are personalized on information I have voluntarily given out and can identify me as an individual (such as name, shipping address, card information).	Personalized service	19, 21	Our employee personalizes goods and services that based on information that the guest gave voluntarily and can identify them as an individual (such as name, shipping address, card information).	0-5
20	Gwinner & Bitner & Brown & Kumar 2007	If I put forth the effort, I can customize the service offering to the needs of the customer	Personalized service	20	Our employee can customize the service offering to the needs of the customer. (example: food allergies etc)	0-5

21	Gwinner & Bitner & Brown & Kumar 2008	If I work hard, I can personalize the service for the customer	Personalized service	x		
22	Wael Hassan El-garaihy 2013	staff members of the hotel understand your specific demands	Personalized service	22	Our employee / hotel makes sure to take the time and understand the specific demands	0-5
23	Ball, Coelho and Vilares, 2006	"My bank" offers me products and services that satisfy my specific needs	Personalized service	23	Our employee / hotel offers customers products and services that satisfy they specific needs	0-5
24	Service quality Ekinci, 2001	Staff seemed to anticipate what I wanted.	Personalized service	24	Our employee / hotel anticipates what the guest wants before they ask.	0-5
25	Jan Blom 2002	Recommending products of the basis of preferences of similar-mindend consumers	Personalized service	25	Our employee / hotel recommends products of the basis of preferences of similar-minded consumers	0-5
26	Affrin and Maghzi 2012 from Heal (1990)	The hospitable behavior seemed to be rendered as a natural extension of their characters regardless of any control and incentive systems	Employee behavior	26,27,28, 29	We make sure that the hospitable behavior from our employee seems to be motivated by genuine needs to please and care for their guests as an extension of their characteristic	
27	Affrin and Maghzi 2012 from	The hospitable behavior seemed to be motivated by	Employee behavior	x		

	Solnet (2006)	genuine needs to please and care for their guests and not to deliberately impress the guests				
28	Ariffin 2013	The hospitable behavior seemed to be rendered as a natural extension of their characters regardless of any control and incentive systems	Employee behavior	x		
29	Ariffin 2013	the hospitable behaviour seemed to be motivated by genuin needs to please and care for their guests and not to deliberately impress the guest	Employee behavior	x		
30	Wael Hassan El-garaihy 2013	The hotel considers your best interest at the top of its priorities	Important person	30	Our hotel / employee considers the best interest of the guest our / their top priority	0-5
31	Ariffin 2013	the hotel made me feel like an important person	Important person	31, 32	Our hotel / our employee aims to make the guest feel like an important person	0-5
32	Affrin and Maghzi 2012 from Nouwen (1975)	The hotel made me feel like an important person	Important person	x		
33	Service quality (Ekinci, 2001).	Staff were helpful and friendly.	Help	33,34,35,36	Our employee always tries to be helpful in solving guests' problems, even coming up with unique solutions	0-5

34	Ariffin 2013	the hotel stuff tried to be helpful in solving my problem	Help	x		
35	Affrin and Maghzi 2012 2028	The hotel staff tried to be helpful in solving my problems	Help	x		
36	Parasuraman & Zeithaml 1995	Their employees don't always have to be willing to help customers	Help	x		
37	Wael Hassan El-garaihy 2013	The hotel has staff members who give you individual attention	Attention	37	Our employee amis to give guests individual attention	0-5
38	(Mittal and Lassar, 1996)	The employees take the time to know you personally	Attention	38, 39	Our employee takes time (and ahs time) to get to know the guest personally	0-5
39	Service quality (Ekinci,.	Staff listened to me	Attention	x		
40	Ariffin 2013 from Gober and Tannehill (1984), Tschohl (1980)	The hotel staff treated me with full respect	Respect	40, 41	The hotel employee treats guest with full respect	0-5
41	Affrin and Maghzi 2012	The hotel staff treated me with full respect	Respect	x		
42	Parasuraman & Zeithaml	Their employees should be polite	Politeness	42, 43, 44	Our employees are polite with all guests	0-5
43	(Mittal and Lassar,)	Everyone at is polite and courteous.’	Politeness	x		
44	Pijls & Schreiber	I perceive the contact with the employees as being pleasant	Politeness	x		
45	Ariffin 2013	I was treated as a friend rather than a customer	Friendly	45, 46	Our employee aims to treat the guest as a friend rather than a customer.	0-5

46	Affrin and Maghzi 2012 from Lashley (2008)	Treated as a friend rather than a customer	Friendly	x		
47	(Mittal and Lassar,)	All the persons working at are friendly and pleasant.	Friendly	47, 48, 49	Our employee are friendly with all guests	0-5
48	Pijls & Schreiber	the employees make me feel at ease	Employee behavior	x		
49	Battancout and Gwinner	being friendly with costumers				
50	Ariffin 2013 2	Building good relationship rather than making money seemed to be the most important drive of the hotel	Employee behavior	50, 51	It is important that the guest feels that Building good relationship rather than making money seemed to be the most important drive of the hotel	0-5
51	Affrin and Maghzi 2012	Building good relationship rather than making money seemed to be the most important drive of the hotel	Employee behavior	x		
52	Battancout and Gwinner	conversation, which moves from formal to familiar	Small talk	52, 53	We allow / encourage our employee to move to a familiars (informal) talk with the guest who needs that	0-5
53	Battancout and Gwinner	small talk	small talk	x		

(Source: Own Edit)

36. Appendix - Technical Stage - Fusion

	Author	Indicator	Key focus		Transformed Indicator	Score

1	Ball, Coelho and Vilares, 2006	"My bank" offers products and services that I could not find in another bank	Products	1, 2	Our hotel offers personalized products and services that our customers could not find in another hotel.	0-1
2	Ball, Coelho and Vilares, 2006	If I changed from banks I wouldn't obtain products and services as personalized as I have now	Products	x		
3	Blom and Monk, 2003	Being able to reflect my personal identity	Personal touch	3, 4	There is opportunity for the guest to reflect their personal identity and belonging on the service and products we provide them	0-1
4	Blom and Monk, 2003	Being able to reflect my membership of some group	Personal touch	x		
5	Blom and Monk, 2003	Being fed up with the appearance of the product or system and wanting to re personalize it	Personal touch	5,6	When a guest is fed up with the appearance of the product or system we provide them the option that they can re personalize it	0-2
6	Blom and Monk, 2003	The system of product feels personal	Familiarity	x		
7	Blom and Monk, 2003	Feeling familiar with the system or product	Familiarity	7	Our hotel application is similar to what most customers use in their everyday lives.	0-1
8	Blom and Monk, 2003	Having fun with the product or system	Fun	8	The system/ product is created in a way that it is fun for the guest to use	0-1

9	Cristian Morosan, Agnes deFranco 2016 "modeling guests' intention to use …) adapted from Li, Sarathy and xu 2011	The hotel app can provide me with personalized services, products, or information tailored to my specific hotel stay	Personalized recommendations	9,10,11	The hotel app can provide the guest with personalized services, products, or information tailored to their specific hotel stay	0-1
10	(Nyheim et al., 2015)	Overall, personalized advertising on this application is tailored to my situation	Advertising	x		
11	Gökhan Aydin 2018	I feel that Facebook advertising is personalized for my usage (Ünal et al., 2011; Xu et al ., 2008)	Percived personalization	x		

(Source: Own Edit)

37. Appendix - Technical Stage, Pre-arrival Phase, Website - after Fusion

Transformed Indicator	Score
Our website has features that personalized for the users' preferences	0-1
Control panel style can be customized by user	0-1
Exterior color can be customized by user	0-1
The website has a Chat service	0-2
The website has feature for the visually impaired	0-1
Our website is automorphically fits to the e.g. computer, mobile phone etc.), browser (e.g. Netscape, Internet explorer) and operating system (e.g. Windows, Unix) that the guest uses.	0-1
We have a hotel App	0-1
The hotel app can provide the guest with personalized services, products, or information tailored to their preferences or personal interests.	0-1
The website acquires the specific needs of the guest and shows service recommendations based on their personal needs	0-1
The Web site acquires the guests' personal preferences and offers services and products that are tailor-made for the guest	0-1
Our website automatically collects data (such as IP address, pages viewed, access time) but cannot identify the guest as an individual and offers goods or services based on that.	0-1
Our hotel uses Search engine optimalization to appear for searching accommodation nearby	0-1
Our hotel makes sure that we appear as a personalized search result through search engine optimalization	0-1
Our hotel makes sure that we provide information and products according to our guests' preferences.	0-1

We aim to advertise our hotel in a way that it feels personalized for our potential guests, even based on the previous searches or interests.	0-1

(Source: Own Edit)

38. Appendix - Functional Stage, Pre-arrival Phase, Pre-arrival communication - after Fusion

Transformed Indicator	Score
Communication by our hotel brand provides our customers with product and service recommendations that are tailormade for them	0-5
We recommend products and services that are personalized to our customer's interest based on our communication with that customer	0-5
We recommend products and services that are personalized to our customer's interest based on of the basis of preferences of similar-minded consumers	0-5
We aim to use personalized communication so our brand can make the guest feel that they are a unique customer	0-5
We aim to give personalized recommendation in a timely way.	0-5
We aim to adjust our communication style (either on phone on in written channels) based on the guest type and characteristics (age, gender, interest, etc)	0-5

(Source: Own Edit)

39. Appendix - Functional Stage, Servcie Phase, Arrival - after Fusion

Transformed Indicator	Score
We aim to provide an authentic warm welcome to the guest	0-5
Guests are walked to the guestroom after check -in	0-5
We place different welcome gifts in the guestroom (to all guest)	0-5
We place different welcome gifts in the guestroom (of VIP guest)	0-5

(Source: Own Edit)

40. Appendix - Technical Stage, Servcie Phase, Arrival - after Fusion

Transformed Indicator	Score
We place introduction greeting card with a hand-written message and guests name in the room	0-4

(Source: Own Edit)

41. Appendix - Functional Stage, Service Phase -after Fusion

Transformed Indicator	Score
The hotel operates working hours to be appropriate to all its customers	0-5
We pay attention to the special requirements of our guests while staying in a hotel	0-5
We respond immediately to all guest requests	0-5
We make sure, that there are appropriate meals for all guest (religion, allergies, dietary restrictions)	0-5
We make sure that the chosen room is comfortable for the guest	0-5

We make sure that all aspects of the room are in good condition and suitable for the guest	0-5

(Source: Own Edit)

42. Appendix - Functional Stage, Service Phase, Check-out -after Fusion

Transformed Indicator	Score
We give a warm "good bye" after checking out at the counter	0-5
Based on previous conversation with the guest we are recommending them with activities for the last day	0-5

(Source: Own Edit)

43. Appendix - Functional Stage, Service Phase - after Fusion

Transformed Indicator	Score
The hotel staff helps with the luggage	0-5
Our staff gives authentic smiles all the time	0-5
We encourage the employees to display personal warmth in their behavior.	0 -5
We encourage the employees to be approachable	0-5
We encourage the employees to make eye contact with the guest during conversation	0-5
We are doing everything to understand the special requirements of the guest while staying the hotel	0-5
The employee has to know the name and / or nationality of the guest	0-5

(Source: Own Edit)

44. Appendix - Technical Stage, Service Phase - after Fusion

Transformed Indicator	Score
It is possible for the guest to ask for minor changes regarding the room during their stay	0-1
The guest can choose a specific temperature they want their room to be	0-1
The guest can choose what kind of bed/Matras they want in their room	0-2
The guest can choose the style and the type of the bedding	0-1
The guest can choose what kind of pillow they want.	0-1
The guest can choose to have no alcohol in their minibar	0-1
We put the favorite drink of the guest in the room even if that is not the brand the hotel normally works with	0-2

(Source: Own Edit)

45. Appendix - Functional Stage, Post-service phase, Post-communication - after Fusion

Transformed Indicator	Score

Our hotel hotel adjusts the response to the specific problem of the guest.	0-5
The guest is invited to interact with us.	0-5
Our hotel / employee knows exactly to whose review it responds	0-5
Our hotel / employee gives an individual response to all guest reviews and comments.	0-5

(Source: Own Edit)

46. Appendix - Functional Stage - after Fusion

Transformed Indicator	**Score**
Our employee changes their behavior to suit the needs of the guest	0-5
Our employee changes their behavior to suit the needs of the situation	0-5
The employee is empathetic towards the guest when they have a problem	0-5
The employee responds immediately to guest requests	0-5
When our employee promise to do something by a certain time, they do so	0-5
We make sure that our information is accurate and update our records frequently	0-5
Our employee is talented and displays a natural expertise in case of all requests.	0-5
Our employee is efficient.	0-5
Our employee aims to exceed guest expectation	0-5
Our employee / hotel personalizes goods and services that are based on information that the guest has voluntarily given out (such as age range, salary range, Zip Code) but cannot identify them as an individual.	0-5
Our employee personalizes goods and services that based on information that the guest gave voluntarily and can identify them as an individual (such as name, shipping address, card information).	0-5
Our employee can customize the service offering to the needs of the customer. (example: food allergies etc)	0-5
Our employee / hotel makes sure to take the time and understand the specific demands	0-5
Our employee / hotel offers customers products and services that satisfy they specific needs	0-5
Our employee / hotel anticipates what the guest wants before they ask.	0-5
Our employee / hotel recommends products of the basis of preferences of similar-minded consumers	0-5

We make sure that the hospitable behavior from our employee seems to be motivated by genuine needs to please and care for their guests as an extension of their characteristic	0-5
Our hotel / employee considers the best interest of the guest our / their top priority	0-5
Our hotel / our employee aims to make the guest feel like an important person	0-5
Our employee always tries to be helpful in solving guests' problems, even coming up with unique solutions	0-5
Our employee aims to give guests individual attention	0-5
Our employee takes time (and has time) to get to know the guest personally	0-5
The hotel employee treats guest with full respect	0-5
Our employees are polite with all guests	0-5
Our employee aims to treat the guest as a friend rather than a customer.	0-5
Our employee is friendly with all guests	0-5
It is important that the guest feels that building good relationship rather than making money seemed to be the most important drive of the hotel	0-5
We allow / encourage our employee to move to a familiar (informal) talk with the guest who needs that	0-5

(Source: Own Edit)

47. Appendix - Technical Stage - after Fusion

Transformed Indicator	**Score**
Our hotel offers personalized products and services that our customers could not find in another hotel.	0-1
There is opportunity for the guest to reflect their personal identity and belonging on the service and products we provide them	0-1
When a guest is fed up with the appearance of the product or system we provide them the option that they can re personalize it	0-2
Our hotel application is similar to what most customers use in their everyday lives.	0-1
The system/ product is created in a way that it is fun for the guest to use	0-1
The hotel app can provide the guest with personalized services, products, or information tailored to their specific hotel stay	0-1

(Source: Own Edit)

48. Appendix - First Interview Technical Stage - Experts

	Technical Stage	**Technical Stage**	**Technical Stage**	**Technical Stage**

	Expert One	Expert Two	Expert Three	Expert Four
Our website has features that is personalised for the users' preferences.	I1	I1	I1	I1
Control panel style can be customized by user.	I2	I2	I2	I2
Exterior colour can be customized by user.	I3	I3	I3	I3
The website has a Chat service.	I4	I4	I4	I4
The website has features for the visually impaired.	I5	I5	I5	I5
Our website automorphically fits the e.g. computer, mobile phone etc.), browser (e.g. Netscape, Internet explorer) and operating systems (e.g. Windows, Unix) that the guest uses.	I6	I6	I6	I6
We have a hotel App.	I7	I7	I7	I7
The hotel app can provide the guest with personalized services, products, or information tailored to their preferences or personal interests.	I8	I8	I8	I8
The website acquires the specific needs of the guest and shows service recommendations based on their personal needs.	I9	I9	I9	I9
The Web site acquires the guests' personal preferences and offers services and products that are tailor-made for the guest.	I10	I10	I10	I10
Our website automatically collects data (such as IP address, pages viewed, access time) but cannot identify the guest as an individual and offers goods or services based on that.	I11	I11	I11	I11
Our hotel uses Search engine optimization to appear for searching accommodation nearby.	I12	I12	I12	I12
Our hotel makes sure that we appear as a personalized search result through search engine optimization.	I13	I13	I13	I13
Our hotel makes sure that we provide information and products according to our guests' preferences.	I14	I14	I14	I14

We aim to advertise our hotel in a way that it feels personalized for our potential guests, even based on previous searches or interests.	I15	I15	I15	I15
We place a greeting card with a hand-written message and the guest's name in the room.	I16	I16	I16	I16
It is possible for the guest to ask for minor changes regarding the room during their stay.	I17	I17	I17	I17
The guest can choose a specific temperature they want their room to be.	I18	I18	I18	I18
The guest can choose what kind of bed/Matras they want in their room.	I19	I19	I19	I19
The guest can choose the style and the type of the bedding.	I20	I20	I20	I20
The guest can choose what kind of pillow they want.	I21	I21	I21	I21
The guest can choose to have no alcohol in their minibar.	I22	I22	I22	I22
We put the favourite drink of the guest in the room even if that is not the brand the hotel normally works with.	I23	I23	I23	I23
Our hotel offers personalized products and services that our customers could not find in another hotel.	I24	I24	I24	I24
There is an opportunity for the guest to reflect their identity and belonging on the service and products we provide them.	I25	I25	I25	I25
When a guest is fed up with the appearance of the product or system, we provide them with the option that they can re-personalize it.	I26	I26	I26	I26
Our hotel application is similar to what most customers use in their everyday lives.	I27	I27	I27	I27
The system/ product is created in a way that is fun for the guest to use.	I28	I28	I28	I28
The hotel app can provide the guest with personalized services, products, or information tailored to their specific hotel stay.	I29	I29	I29	I29

(Source: Own Edit)

49. Appendix - Technical Stage after First Interview

Indicator ID	Indicator
I1	Our website has features that personalized for the users' preferences (for example, on the webpage they can choose what segment they belong to, and they can choose an option on the website to browse offers only based on their specific needs or interests.).
I4	The website has a Chat service.
I5	The website has features for the visually impaired.
I6	Our website automorphically fits the e.g. computer, mobile phone etc.), browser (e.g. Netscape, Internet explorer) and operating system (e.g. Windows, Unix) that the guest uses.
I7	We have a hotel App.
I8	The hotel app can provide the guest with personalized services, products, or information tailored to their preferences or personal interests.
I9	The website acquires the specific needs of the guest and shows service recommendations based on their personal needs.
I11	Our website automatically collects data (such as IP address, pages viewed, access time) but cannot identify the guest as an individual and offers goods or services based on that.
I13	Our hotel makes sure that we appear as a personalized search result through search engine optimization.
I14	Our hotel makes sure that we provide information and products according to our guests' preferences.
I15	We aim to advertise our hotel in a way that feels personalized for our potential guests, even based on previous searches or interests.
I16	We place a greeting card with a hand-written message and the guest's name in the room.
I17	It is possible for the guest to ask for minor changes regarding the room during their stay.
I18	The guest can choose a specific temperature they want their room to be.
I20	The guest can choose the style and the type of the bedding.
I21	The guest can choose what kind of pillow they want.
I22	The guest can choose to have no alcohol in their minibar.

I23	We put the favourite drink of the guest in the room even if that is not the brand the hotel normally works with.
I27	Our hotel application is similar to what most customers use in their everyday lives.
I29	The hotel app can provide the guest with personalized services, products, or information tailored to their specific hotel stay.

(Source: Own Edit)

50. Appendix - First Interview Functional Stage - Experts

	Functional stage Expert One	Functional stage Expert Two	Functional stage Expert Three
Communication by our hotel brand provides our customers with product and service recommendations that are tailormade for them.	I30	I30	I30
We recommend products and services that are personalized to our customer's interests based on our communication with that customer.	I31	I31	I31
We recommend products and services that are personalized to our customer's interest based on of the basis of preferences of similar-minded consumers.	I32	I32	I32
We aim to use personalized communication so our brand can make the guest feel that they are a unique customer.	I33	I33	I33
We aim to give personalized recommendation in a timely way.	I34	I34	I34
We aim to adjust our communication style (either on phone on in written channels) based on the guest type and characteristics (age, gender, interest, etc).	I35	I35	I35
The guest is invited to interact with us.	I36	I36	I36
Our hotel / employee knows exactly to whose review it responds.	I37	I37	I37
Our hotel / employee gives an individual response to all guest reviews and comments.	I38	I38	I38
Our employee changes their behaviour to suit the needs of the guest.	I39	I39	I39
We aim to provide an authentic warm welcome to the guest.	I40	I40	I40
Guests are walked to the guestroom after check-in.	I41	I41	I41

We place different welcome gifts in the guestroom (to all guest).	I42	I42	I42
We place different welcome gifts in the guestroom (of VIP guest).	I43	I43	I43
The hotel operates working hours to be appropriate to all its customers.	I44	I44	I44
We pay attention to the special requirements of our guests while staying in a hotel.	I45	I45	I45
We respond immediately to all guest requests.	I46	I46	I46
We make sure, that there are appropriate meals for all guests (religion, allergies, dietary restrictions).	I47	I47	I47
We make sure that the chosen room is comfortable for the guest.	I48	I48	I48
We make sure that all aspects of the room are in good condition and suitable for the guest.	I49	I49	I49
We give a warm “goodbye ” after checking out at the counter	I50	I50	I50
Based on previous conversations with the guest we are recommending them with activities for the last day.	I51	I51	I51
The hotel staff helps with the luggage.	I52	I52	I52
Our staff gives authentic smiles all the time.	I53	I53	I53
We encourage the employees to display personal warmth in their behaviour.	I54	I54	I54
We encourage the employees to be approachable.	I55	I55	I55
We encourage the employees to make eye contact with the guest during conversation.	I56	I56	I56
We are doing everything to understand the special requirements of the guest while staying at the hotel.	I57	I57	I57
The employee has to know the name and / or nationality of the guest.	I58	I58	I58
Our employee changes their behaviour to suit the needs of the guest.	I59	I59	I59
Our employee changes their behaviour to suit the needs of the situation.	I60	I60	I60

The employee is empathetic towards the guest when they have a problem.	I61	I61	I61
The employee responds immediately to guest requests.	I62	I62	I62
When our employee promise to do something by a certain time, they do so.	I63	I63	I63
We make sure that our information is accurate and update our records frequently.	I64	I64	I64
Our employee is talented and displays a natural expertise in case of all requests.	I65	I65	I65
Our employee is efficient.	I66	I66	I66
Our employee aims to exceed guest expectations.	I67	I67	I67
Our employee / hotel personalizes goods and services that are based on information that the guest has voluntarily given out (such as age range, salary range, Zip Code) but cannot identify them as an individual.	I68	I68	I68
Our employee personalizes goods and services that based on information that the guest gave voluntarily and can identify them as an individual (such as name, shipping address, card information).	I69	I69	I69
Our employee can customize the service offering to the needs of the customer. (example: food allergies etc)	I70	I70	I70
Our employee / hotel makes sure to take the time and understand the specific demands.	I71	I71	I71
Our employee / hotel offers customers products and services that satisfy their specific needs.	I72	I72	I72
Our employee / hotel anticipates what the guest wants before they ask.	I73	I73	I73
Our employee / hotel recommends products on the basis of preferences of similar-minded consumers.	I74	I74	I74
We make sure that the hospitable behaviour from our employee seems to be motivated by genuine needs to please and care for their guests as an extension of their characteristic.	I75	I75	I75
Our hotel / employee considers the best interest of the guest our / their top priority.	I76	I76	I76
Our hotel / our employee aims to make the guest feel like an important person.	I77	I77	I77

Our employee always tries to be helpful in solving guests' problems, even coming up with unique solutions.	I78	I78	I78
Our employee aims to give guests individual attention.	I79	I79	I79
Our employee takes time (and has time) to get to know the guest personally.	I80	I80	I80
The hotel employee treats guest with full respect.	I81	I81	I81
Our employees are polite with all guests.	I82	I82	I82
Our employee aims to treat the guest as a friend rather than a customer.	I83	I83	I83
Our employee is friendly with all guests.	I84	I84	I84
It is important that the guest feels that building a good relationship rather than making money seemed to be the most important drive of the hotel.	I85	I85	I85
We allow / encourage our employee to move to a familiar (informal) talk with the guest who needs that.	I86	I86	I86

(Source: Own Edit)

51. Appendix - Functional Stage after First Interview

Indicator ID	Indicator
I30	Communication by our hotel brand provides our customers with product and service recommendations that are tailormade for them.
I31	We recommend products and services that are personalized to our customer's interest based on our communication with that customer.
I32	We recommend products and services that are personalized to our customer's interest based on of the basis of preferences of similar-minded consumers.
I33	We aim to use personalized communication so our brand can make the guest feel that they are a unique customer.
I34	We aim to give personalized recommendation in a timely way.
I35	We aim to adjust our communication style (either on phone on in written channels) based on the guest type and characteristics (age, gender, interest, etc).
I36	Our hotel adjusts the response to the specific problem of the guest.
I37	The guest is invited to interact with us.
I38	Our hotel / employee knows exactly to whose review it responds.

I39	Our hotel / employee gives an individual response to all guest reviews and comments.
I40	We aim to provide an authentic warm welcome to the guest
I43	We place different welcome gifts in the guestroom (for VIP guests).
I44	The hotel operates working hours to be appropriate to all its customers.
I45	We pay attention to the special requirements of our guests while staying in a hotel.
I46	We respond immediately to all guest requests.
I47	We make sure, that there are appropriate meals for all guest (religion, allergies, dietary restrictions).
I49	We make sure that all aspects of the room are in good condition and suitable for the guest.
I50	We give a warm "goodbye " after checking out at the counter.
I51	Based on previous conversations with the guest we are recommending them with activities for the last day.
I54	We encourage the employees to display personal warmth in their behaviour.
I55	We encourage the employees to be approachable.
I56	We encourage the employees to make eye contact with the guest during conversation.
I57	We are doing everything to understand the special requirements of the guest while staying at the hotel.
I59	Our employee changes their behaviour to suit the needs of the guest.
I60	Our employee changes their behaviour to suit the needs of the situation.
I61	The employee is empathetic towards the guest when they have a problem.
I62	The employee responds immediately to guest requests.
I63	When our employee promise to do something by a certain time, they do so.
I64	We make sure that our information is accurate and update our records frequently.
I65	Our employee is talented and displays a natural expertise in case of all requests.
I66	Our employee is efficient.
I67	Our employee aims to exceed guest expectations.
I68	Our employee / hotel personalizes goods and services that are based on information that the guest has voluntarily given out (such as age range, salary range, Zip Code) but cannot identify them as an individual.

I69	Our employee / hotel personalizes goods and services that based on information that the guest gave voluntarily and can identify them as an individual (such as name, shipping address, card information).
I70	Our employee / hotel can customize the service offering to the needs of the customer. (example: food allergies etc).
I71	Our employee / hotel makes sure to take the time and understand the specific demands.
I72	Our employee / hotel offers customers products and services that satisfy they specific needs.
I73	Our employee / hotel anticipates what the guest wants before they ask.
I74	Our employee / hotel recommends products on the basis of the preferences of similar-minded consumers.
I75	We make sure that the hospitable behaviour from our employee seems to be motivated by genuine needs to please and care for their guests as an extension of their characteristic.
I76	Our hotel / employee considers the best interest of the guest our / their top priority.
I77	Our hotel / our employee aims to make the guest feel like an important person.
I78	Our employee always tries to be helpful in solving guests' problems, even coming up with unique solutions.
I79	Our employee aims to give guests individual attention.
I80	Our employee takes time (and has time) to get to know the guest personally.
I81	The hotel employee treats guest with full respect.
I82	Our employees are polite with all guests.
I83	Our employee aims to treat the guest as a friend rather than a customer.
I84	Our employee is friendly with all guests.
I85	It is important that the guest feels that building a good relationship rather than making money seemed to be the most important drive of the hotel.
I86	We allow / encourage our employee to move to a familiar (informal) talk with the guest who needs that.

(Source: Own Edit)

52. Appendix - First Interview Marketing - Experts

	Markering Expert 1	Markering Expert 2	Markering Expert 3	Markering Expert 4

Our website has features that personalized for the users' preferences.	I1	I1	I1	I1
Control panel style can be customized by the user.	I2	I2	I2	I2
Exterior colour can be customized by the user.	I3	I3	I3	I3
The website has a Chat service.	I4	I4	I4	I4
The website has features for the visually impaired.	I5	I5	I5	I5
Our website automorphically fits the e.g. computer, mobile phone etc.), browser (e.g. Netscape, Internet explorer) and operating systems (e.g. Windows, Unix) that the guest uses.	I6	I6	I6	I6
We have a hotel App.	I7	I7	I7	I7
The hotel app can provide the guest with personalized services, products, or information tailored to their preferences or personal interests.	I8	I8	I8	I8
The website acquires the specific needs of the guest and shows service recommendations based on their personal needs.	I9	I9	I9	I9
The Web site acquires the guests' personal preferences and offers services and products that are tailor-made for the guest.	I10	I10	I10	I10
Our website automatically collects data (such as IP address, pages viewed, access time) but cannot identify the guest as an individual and offers goods or services based on that.	I11	I11	I11	I11
Our hotel uses Search engine optimization to appear for searching accommodation nearby.	I12	I12	I12	I12
Our hotel makes sure that we appear as a personalized search result through search engine optimization.	I13	I13	I13	I13

Our hotel makes sure that we provide information and products according to our guests' preferences.	I14	I14	I14	I14
We aim to advertise our hotel in a way that feels personalized for our potential guests, even based on previous searches or interests.	I15	I15	I15	I15
Communication by our hotel brand provides our customers with product and service recommendations that are tailormade for them.	I30	I30	I30	I30
We recommend products and services that are personalized to our customer's interest based on our communication with that customer. (During booking/Before arrival).	I31	I31	I31	I31
We recommend products and services that are personalized to our customer's interests based on the basis of preferences of similar-minded consumers. (During booking/Before arrival).	I32	I32	I32	I32
We aim to use personalized communication so our brand can make the guest feel that they are a unique customer.	I33	I33	I33	I33
We aim to give personalized recommendations in a timely way.	I34	I34	I34	I34
We aim to adjust our communication style (either on phone on in written channels) based on the guest type and characteristics (age, gender, interest, etc)	I35	I35	I35	I35
Our hotel adjusts the response to the specific problem of the guest.	I36	I36	I36	I36
The guest is invited to interact with us.	I37	I37	I37	I37
Our hotel / employee knows exactly to whose review it responds	I38	I38	I38	I38
Our hotel / employee gives an individual response to all guest reviews and comments.	I39	I39	I39	I39

(Source: Own Edit)

53. Appendix – Marketing after First Interview

Indicator ID	Indicator
I1	Our website has features that are personalized for the users' preferences (for instance based on segments they can choose to browse between offers to their specific needs or interests.)
I4	The website has a Chat service
I5	The website has features for the visually impaired
I6	Our website automorphically fits the (e.g. computer, mobile phone etc.), browser (e.g. Netscape, Internet explorer) and operating system (e.g. Windows, Unix) that the guest uses.
I7	We have a hotel App.
I8	The hotel app can provide the guest with personalized services, products, or information tailored to their preferences or personal interests.
I9	The website acquires the specific needs of the guest and shows service recommendations based on their personal needs.
I11	Our website automatically collects data (such as IP address, pages viewed, access time) but cannot identify the guest as an individual and offers goods or services based on that.
I13	Our hotel makes sure that we appear as a personalized search result through search engine optimalization (we use google ads).
I14	Our hotel makes sure that we provide information and products according to our guests' preferences. (we use content marketing)
I15	We aim to advertise our hotel in a way that feels personalized for our potential guests, even based on previous searches or interests.
I30	Communication by our hotel brand provides our customers with product and service recommendations that are tailor-made for them
I31	We recommend products and services that are personalized to our customer's interest based on our communication with that customer. (During booking/Before arrival)
I32	We recommend products and services that are personalised to our customer's interests based on the basis of preferences of similar-minded consumers. (During booking/Before arrival)
I33	We aim to use personalized communication so our brand can make the guest feel that they are a unique customer
I34	We aim to give personalized recommendations in a timely way.

I35	We aim to adjust our communication style (either on phone on in written channels) based on the guest type and characteristics (age, gender, interest, etc)
I36	Our hotel adjusts the response to the specific problem of the guest.
I37	The guest is invited to interact with us.
I38	Our hotel / employee knows exactly to whose review it responds
I39	Our hotel / employee gives an individual response to all guest reviews and comments.

(Source: Own Edit)

54. Appendix - Post-service Phase after First Interview

Indicator ID	Indicator
I33	We aim to use personalised communication so our brand can make the guest feel that they are a unique customer
I34	We aim to give personalised recommendations in a timely way.
I35	We aim to adjust our communication style (either on phone on in written channels) based on the guest type and characteristics (age, gender, interest, etc)
I36	Our hotel adjusts the response to the specific problem of the guest.
I37	The guest is invited to interact with us.
I38	Our hotel / employee knows exactly to whose review it responds
I39	Our hotel / employee gives an individual response to all guest reviews and comments.

(Source: Own Edit)

55. Appendix - First Interview Service Phase - Experts

	Service Phase Expert One	**Service Phase Expert Two**	**Service Phase Expert Three**	**Service Phase Expert Four**
We place an greeting card with a hand-written message and the guest's name in the room	I16	I16	I16	I16
It is possible for the guest to ask for minor changes regarding the room during their stay	I17	I17	I17	I17
The guest can choose a specific temperature they want their room to be	I18	I18	I18	I18
The guest can choose what kind of bed/Matras they want in their room	I19	I19	I19	I19

The guest can choose the style and the type of the bedding	I20	I20	I20	I20
The guest can choose what kind of pillow they want.	I21	I21	I21	I21
The guest can choose to have no alcohol in their minibar	I22	I22	I22	I22
We put the favorite drink of the guest in the room even if that is not the brand the hotel normally works with	I23	I23	I23	I23
We place introduction greeting card with a hand-written message and guests name in the room	I40	I40	I40	I40
Guests are walked to the guestroom after check -in	I41	I41	I41	I41
We place different welcome gifts in the guestroom (to all guest)	I42	I42	I42	I42
We place different welcome gifts in the guestroom (of VIP guest)	I43	I43	I43	I43
The hotel operates working hours to be appropriate to all its customers	I44	I44	I44	I44
We pay attention to the special requirements of our guests while staying in a hotel	I45	I45	I45	I45
We respond immediately to all guest requests	I46	I46	I46	I46
We make sure, that there are appropriate meals for all guest (religion, allergies, dietary restrictions)	I47	I47	I47	I47
We make sure that the chosen room is comfortable for the guest	I48	I48	I48	I48
We make sure that all aspects of the room is in good condition and suitable for the guest	I49	I49	I49	I49
We give a warm “good bye” after checking out at the counter	I50	I50	I50	I50
Based on previous conversation with the guest we are recommending them with activities for the last day	I51	I51	I51	I51
The hotel staff helps with the luggage	I52	I52	I52	I52
Our staff gives authentic smiles all the time	I53	I53	I53	I53
We encourage the employees to display personal warmth in their behaviour.	I54	I54	I54	I54
We encourage the employees to be approachable	I55	I55	I55	I55

We encourage the employees to make eye contact with the guest during conversation	I56	I56	I56	I56
We are doing everything to understand the special requirements of the guest while staying at the hotel	I57	I57	I57	I57
The employee has to know the name and / or nationality of the guest	I58	I58	I58	I58

(Source: Own Edit)

56. Appendix - Service Phase after First Interview

Indicator ID	Indicator
I16	We place a greeting card with a hand-written message and the guest's name in the VIP the room.
I17	It is possible for the guest to ask for minor changes regarding the room during their stay.
I18	The guest can choose a specific temperature they want their room to be.
I20	The guest can choose the style and the type of the bedding.
I21	The guest can choose what kind of pillow they want.
I22	The guest can choose to have no alcohol in their minibar.
I23	We put the favourite drink of the guest in the room even if that is not the brand the hotel normally works with.
I40	We aim to provide an authentic warm welcome to the guest.
I43	We place different welcome gifts in the guestroom (of VIP guest).
I44	The hotel operates working hours to be appropriate to all its customers.
I45	We pay attention to the special requirements of our guests while staying in a hotel.
I46	We respond immediately to all guest requests.
I47	We make sure, that there are appropriate meals for all guest (religion, allergies, dietary restrictions).
I49	We make sure that all aspects of the room are in good condition and suitable for the guest.
I50	We give a warm "goodbye" after checking out at the counter.
I51	Based on a previous conversation with the guest we are recommending them with activities for the last day.
I54	We encourage the employees to display personal warmth in their behaviour.

I55	We encourage the employees to be approachable.
I56	We encourage the employees to make eye contact with the guest during conversation.
I57	We are doing everything to understand the special requirements of the guest while staying at the hotel.
I58	The employee has to know the name and / or nationality of the guest.

(Source: Own Edit)

57. Appendix - Score Indicators after First Interview

Indicator ID	Indicator
I1	Our website has features that personalized for the users' preferences (for example, on the webpage they can choose what segment they belong to, and they can choose an option on the website to browse offers only based on their specific needs or interests.).
I5	The website has features for the visually impaired.
I6	Our website automorphically fits the e.g. computer, mobile phone etc.), browser (e.g. Netscape, Internet explorer) and operating system (e.g. Windows, Unix) that the guest uses.
I7	We have a hotel App.
I8	The hotel app can provide the guest with personalized services, products, or information tailored to their preferences or personal interests.
I9	The website acquires the specific needs of the guest and shows service recommendations based on their personal needs.
I11	Our website automatically collects data (such as IP address, pages viewed, access time) but cannot identify the guest as an individual and offers goods or services based on that.
I13	Our hotel makes sure that we appear as a personalized search result through search engine optimization.
I14	Our hotel makes sure that we provide information and products according to our guests' preferences.
I15	We aim to advertise our hotel in a way that it feels personalized for our potential guests, even based on the previous searches or interests.
I17	It is possible for the guest to ask for minor changes regarding the room during their stay.
I18	The guest can choose a specific temperature they want their room to be.
I20	The guest can choose the style and the type of the bedding.

I21	The guest can choose what kind of pillow they want.
I22	The guest can choose to have no alcohol in their minibar.
I23	We put the favourite drink of the guest in the room even if that is not the brand the hotel normally works with.
I27	Our hotel application is similar to what most customers use in their everyday lives.
I29	The hotel app can provide the guest with personalized services, products, or information tailored to their specific hotel stay.
I30	Communication by our hotel brand provides our customers with product and service recommendations that are tailormade for them.
I31	We recommend products and services that are personalized to our customer's interest based on our communication with that customer. (During booking/Before arrival)
I32	We recommend products and services that are personalized to our customer's interest based on of the basis of preferences of similar-minded consumers. (During booking/Before arrival)
I33	We aim to use personalized communication so our brand can make the guest feel that they are a unique customer
I34	We aim to give personalized recommendations in a timely way.
I35	We aim to adjust our communication style (either on phone on in written channels) based on the guest type and characteristics (age, gender, interest, etc).
I36	Our hotel adjusts the response to the specific problem of the guest.
I37	We are proactive in encouraging feedback, guest is invited to interact with us.
I38	Our hotel / employee knows exactly to whose review it responds.
I39	Our hotel / employee gives an individual response to all guest reviews and comments.
I40	We aim to provide an authentic warm welcome to the guest.
I43	We place different welcome gifts in the guestroom (of VIP guest).
I44	The hotel operates working hours to be appropriate to all its customers.
I45	We pay attention to the special requirements of our guests while staying in a hotel.
I46	We respond immediately to all guest requests.
I47	We make sure, that there are appropriate meals for all guest (religion, allergies, dietary restrictions).
I49	We make sure that all aspects of the room is in good condition and suitable for the guest.
I50	We give a warm "goodbye" after checking out at the counter.

I51	Based on a previous conversation with the guest we are recommending them with activities for the last day.
I52	The hotel staff helps with the luggage.
I53	Our staff gives authentic smiles all the time.
I54	We encourage the employees to display personal warmth in their behaviour.
I55	We encourage the employees to be approachable.
I56	We encourage the employees to make eye contact with the guest during conversation.
I57	We are doing everything to understand the special requirements of the guest while staying at the hotel.
I58	The employee has to know the name and / or nationality of the guest.
I59	Our employee changes their behaviour to suit the needs of the guest.
I60	Our employee changes their behaviour to suit the needs of the situation.
I61	The employee is empathetic towards the guest when they have a problem.
I62	The employee responds immediately to guest requests.
I63	When our employee promise to do something by a certain time, they do so.
I64	We make sure that our information is accurate and update our records frequently.
I65	Our employee is talented and displays a natural expertise in case of all requests.
I66	Our employee is efficient.
I67	Our employee aims to exceed guest expectations.
I68	Our employee / hotel personalizes goods and services that are based on information that the guest has voluntarily given out (such as age range, salary range, Zip Code) but cannot identify them as an individual.
I69	Our employee / hotel personalizes goods and services that based on information that the guest gave voluntarily and can identify them as an individual (such as name, shipping address, card information).
I70	Our employee can customize the service offering to the needs of the customer. (example: food allergies etc).
I71	Our employee / hotel makes sure to take the time and understand the specific demands.
I72	Our employee / hotel offers customers products and services that satisfy their specific needs.
I73	Our employee / hotel anticipates what the guest wants before they ask.
I74	Our employee / hotel recommends products on the basis of the preferences of similar-minded consumers.

I75	We make sure that the hospitable behaviour from our employees seems to be motivated by genuine needs to please and care for their guests as an extension of their characteristics.
I76	Our hotel / employee considers the best interest of the guest our / their top priority.
I77	Our hotel / our employee aims to make the guest feel like an important person.
I78	Our employee always tries to be helpful in solving guests' problems, even coming up with unique solutions.
I79	Our employee aims to give guests individual attention.
I80	Our employee takes time (and has time) to get to know the guest personally.
I81	The hotel employee treats guest with full respect.
I82	Our employees are polite with all guests.
I83	Our employee aims to treat the guest as a friend rather than a customer.
I84	Our employee is friendly with all guests.
I85	It is important that the guest feels that building a good relationship rather than making money seemed to be the most important drive of the hotel.
I86	We allow / encourage our employee to move to a familiar (informal) talk with the guest who needs that.
I87	The hotel does micro-segmentation.
I88	The hotel sends out segment-based newsletters.
4a	The website has a Chat service operated by chatbot.
4b	The website has a Chat service operated by an employee.
I16a	We place a greeting card with a printed message and the guest's name in the room.
I16b	We place introduction greeting card with a hand-written message and guests name in the room.
I89	The hotel has specific gifts or budget to use when the employee finds a guest should get a gift (birthday, honeymoon special occasion, etc.).
I90	There are employee trainings for the employees so they can provide the level of quality service the hotel aims to provide.
I91	Providing personalized service is encouraged by reward.
I92	We store and update guest data frequently.
I93	We have employees or an outsider company to analyse our guest data and previous statistics.

I94	We send out a guest satisfaction survey after the guest checked out. For instance Medallia.
I95	our employees are proactive and take the initiative to get to know the guest better.
I96	We have and use the function on the TV to display the guest's name and welcome the guest into the room.
I97	We aim to choose employees who are motivated in guest service.
I98	Fast check-out and check-in are granted for regulars.

(Source: Own Edit)

58. Appendix - Survey Questionnaire Part without the Scoring System

Szállodai szolgáltatások személyre szabásának mérése

Tisztelt Hölgyem/Uram!

Köszönöm, hogy részt vesz a kutatásban! A pandémia és a jelenlegi gazdasági helyzet nagy terhet rótt a szállodai ágazatra, amit még a jelenlegi szakképzett munkaerő hiánya is terhel. Jelen kutatás célja, annak felmérése, hogy a magyarországi szállodák jelenleg milyen szolgáltatási színvonalon üzemelnek, ezen belül is a szolgáltatások személyre szabottsági szintje hogyan alakul. A kérdőív kitöltése 15 percet vesz igénybe. Amennyiben érdekli, hogy az Ön szállodája milyen pontszámot ért el, és hogy ez alapján hol helyezkedik el a jelenlegi piacon, kérem a kérdőív végén adja meg az elérhetőségét, hogy az eredményeket el tudjam küldeni.

A kérdőívben megadott válaszok a GDPR és a Kutatási anonimitás szabályainak megfelelően kerülnek kezelésre. A kutatómunka során a szálloda nem kerül megnevezésre.

35 kérdés található ebben a kérdőívben.

Szolgáltatások személyre szabottságának mérése

A szolgáltatások személyre szabása az a jelenség, amikor a szálloda és alkalmazottai törekednek a vendég elvárásain túli élményt nyújtani, és minden vendég szükségleteit a lehetőségekhez mérten egyénileg kezelni. Ilyen lehet például a különböző étel allergiával küzdő vendégek számára biztosított alternatív kínálat, vagy akár annak lehetősége, hogy egy adott ételt, az allergiát/intoleranciát figyelembe véve másként készítik el.

A kérdőívben megjelennek olyan fogalmak, mint *vendég igény* és *vendég preferencia*, ezeket a fogalmakat fontos megkülönböztetnünk. A vendég igénye lehet például a növényi alapú tej a reggelihez, míg preferenciája, hogy ez kókusztej legyen.

Kérem, jelölje meg, hogy az Önök szállodájában megtalálhatóak-e az alábbi elemek.

Kérem, az összes felsorolt elemnél jelölje be a megfelelő választ:

	Igen, megtalálható	**Nem, nincs ilyen.**
Weboldalunk olyan funkciókkal rendelkezik, amelyek a felhasználók preferenciáinak megfelelően személyre szabottak. (Például az alapján, hogy milyen szegmenshez tartoznak, választhatnak a weboldalon arra vonatkozóan, hogy az ajánlatok között csak az adott igényeiknek vagy érdeklődési körüknek megfelelően böngésznek.)		
A foglalási motor rendelkezik olyan funkciókkal, amelyek segítségével a felhasználók már a szoba foglalásánál (preferenciáinak megfelelően) személyre szabhatják foglalásukat. (Például, milyen párnát kér, milyen masszázst kér, egyéb szolgáltatások.)		
A weboldal a látássérültek számára is használható.		
Weboldalunk illeszkedik a vendég által használt eszközhöz (pl. számítógéphez, mobiltelefonhoz stb.), böngészőhöz (pl. Netscape, Internet Explorer, Mozzilla) és operációs rendszerhez (pl. Windows, Unix).		
A weboldal összegyűjti a vendég specifikus igényeit, és a személyes igényei		

	Igen, megtalálható	Nem, nincs ilyen.
alapján jeleníti meg a szolgáltatási ajánlásokat.		
Weboldalunk automatikusan adatokat gyűjt, ami alapján ugyan beazonosítani nem tudja a vendéget, (például IP-címet, megtekintett oldalakat, hozzáférési időt), de ezek alapján tud kínálni termékeket vagy szolgáltatásokat.		
A weboldal rendelkezik egy Chat szolgáltatással, amelyet chatbot üzemeltet.		
A weboldalnak van egy chat szolgáltatása, amelyet egy alkalmazott üzemeltet.		

Kérem, jelölje meg, hogy jelenleg az Önök szállodájára mennyire igazak az alábbi kijelentések. Kérem jelölje meg a 0-t ha egyáltalán nem foglalkoznak ezzel (akár mert nem fontos vagy mert nincs kapacitás), 5-t ha az esetek túlnyomó többségében figyelnek erre, és így járnak el.

Kérem, az összes felsorolt elemnél jelölje be a megfelelő választ:

	0 - Nincs ilyen	1	2	3	4	5 - Szinte minden esetre igaz.
A szállodamárkánk kommunikációja személyre szabott termék- és szolgáltatásajánlásokat nyújt ügyfeleinknek.						

	0 - Nincs ilyen	1	2	3	4	5 - Szinte minden esetre igaz.
Célunk a személyre szabott kommunikáció használata, hogy márkánk a különlegességérzését keltse a vendégben.						
Célunk, hogy kommunikációs stílusunkat (akár telefonon, akár írott csatornákon) a vendég típusa és jellemzői (életkor, nem, érdeklődés stb.) alapján módosítsuk.						
Lehetővé tesszük / ösztönözzük alkalmazottunkat, hogy informális / bizalmas stílusban beszéljen a vendéggel, amennyiben úgy érzi a vendégnek erre van szüksége.						
Minden vendégkérésre azonnal válaszolunk (email, telefon stb.).						
Az adott ügyféllel folytatott kommunikációnk alapján olyan termékeket és szolgáltatásokat ajánlunk, amelyek ügyfeleink érdeklődésének megfelelően személyre szabottak. (Még mielőtt megérkeznének a szállodába.)						
Már mielőtt megérkezne a hotelbe, még a foglalás során olyan termékeket és szolgáltatásokat ajánlunk ügyfeleinknek, melyek a hasonló gondolkodású						

	0 - Nincs ilyen	1	2	3	4	5 - Szinte minden esetre igaz.
fogyasztók preferenciái alapján személyre szabottak.						
Célunk, hogy személyre szabott ajánlásainkat időben megtegyük (tehát még foglalás során).						
Szállodánk a vendég egyedi problémáját figyelembe véve módosítja az általános reakcióját és egyénileg reagál (tehát nem standardot követ).						
A vendéggel folytatott korábbi beszélgetéseket figyelembe véve teszünk program/tevékenység ajánlatot az utolsó napra. (Amikor a vendég távozott a szobából, de még nem kezdni meg hazautazását.)						
Alkalmazottunk / szállodánk a hasonló gondolkodású fogyasztók preferenciáinak alapján ajánl termékeket.						

A kérdőívben megjelennek olyan fogalmak, mint *vendég igény* és *vendég preferencia*, ezeket a fogalmakat fontos megkülönböztetnünk. A vendég igénye lehet például a növényi alapú tej a reggelihez, míg preferenciája, hogy ez kókusztej legyen.

Kérem, jelölje meg, hogy az Önök szállodájában megtalálhatóak-e az alábbi elemek.

Kérem, az összes felsorolt elemnél jelölje be a megfelelő választ:

	Igen, megtalálható	Nem, nincs ilyen.
A szálloda mikrószegmentációt is végez.		
A szálloda szegmentációs alapon küld ki hírleveleket és új ajánlatokat.		
Van alkalmazottunk vagy külső céges partnerünk, aki a vendégek adaival és a statisztikák elemzésével foglalkozik.		
Szállodánk gondoskodik arról, hogy személyre szabott keresési eredményként jelenjünk meg a keresőmotorok optimalizálásával. (SEO)		
Tároljuk és gyakran frissítjük a vendégek adatait, (már az érkezést megelőzően és a távozást követően is) melyeket re-marketing kampányok során fel is használunk.		

Mikroszegmentálásnak azt nevezzük, amikor a piacot megpróbáljuk a lehető legszűkebb réspiacokra felbontani úgy, hogy egyes csoportokba adott esetben akár pár száz, pár ezer ember tartozzon csak. Ezek az emberek azonban nagyon egyforma tulajdonságokkal rendelkeznek, nem csak annyi a közös bennük, hogy például egykorúak, hanem messzemenőkig azonos tulajdonságokkal rendelkeznek: akár földrajzi elhelyezkedésben, érdeklődési körben, problématudatban, demográfiai adatokban, stb

Kérem, jelölje meg, hogy az Önök szállodájában megtalálható-e az alábbi elem.

Kérem, az összes felsorolt elemnél jelölje be a megfelelő választ:

	Igen, megtalálható	Nem, nincs ilyen.
Van (egy) szállodai alkalmazásunk (Applikációnk).		

Kérem, jelölje meg, hogy az Önök szállodájában megtalálhatóak-e az alábbi elemek.

Csak akkor válaszolj erre a kérdésre, ha az alábbi feltételek teljesülnek:
A válasz 'Igen, megtalálható' kérdéshez ' [G02Q24]' (Kérem, jelölje meg, hogy az Önök szállodájában megtalálható-e az alábbi elem. (Van (egy) szállodai alkalmazásunk (Applikációnk).))
Kérem, az összes felsorolt elemnél jelölje be a megfelelő választ:

	Igen, megtalálható	Nem, nincs ilyen.
A szállodai alkalmazás képes olyan személyre szabott szolgáltatásokat, vagy információkat nyújtani a vendégnek, amelyek az ő preferenciájához vagy személyes érdeklődési köréhez igazodik. (Már érkezés elött, vagy visszatérő vendég esetén a múltbeli tapasztalatok alapján.)		
Szállodai alkalmazásunk hasonló ahhoz, amit a legtöbb ügyfél mindennapi életében is használ.		
A szállodai alkalmazás képes személyre szabott szolgáltatásokat, termékeket vagy egyéni információkat nyújtani a vendégnek, amik az adott szállodai tartózkodásra szabottak.		

A kérdőívben megjelennek olyan fogalmak, mint *vendég igény* és *vendég preferencia*, ezeket a fogalmakat fontos megkülönböztetnünk. A vendég igénye lehet például a növényi alapú tej a reggelihez, míg preferenciája, hogy ez kókusztej legyen.

Kérem, jelölje meg, hogy jelenleg az Önök szállodájára mennyire igazak az alábbi kijelentések. Kérem jelölje meg a 0-t ha egyáltalán nem foglalkoznak ezzel (akár

mert nem fontos vagy mert nincs kapacitás), 5-t ha az esetek túlnyomó többségében figyelnek erre, és így járnak el.

*****

Kérem, az összes felsorolt elemnél jelölje be a megfelelő választ:

	0 - Nincs ilyen	**1**	**2**	**3**	**4**	**5 - Szinte minden esetre igaz.**
Szállodánk gondoskodik arról, hogy az információkat és termékeket vendégeink preferenciáinak megfelelően nyújtson.						
Célunk, hogy szállodánkat úgy reklámozzuk, hogy az személyre szabott legyen potenciális vendégeink számára, akár a korábbi online keresései vagy érdeklődési köre alapján.						
Különböző üdvözlő ajándékokat helyezünk el a vendégszobában (VIP vendégek számára).						
Gondoskodunk arról, hogy a szoba minden eleme jó állapotban és a vendég fogadására alkalmas állapotban legyen.						

A kérdőívben megjelennek olyan fogalmak, mint *vendég igény* és *vendég preferencia*, ezeket a fogalmakat fontos megkülönböztetnünk. A vendég igénye lehet például a növényi alapú tej a reggelihez, míg preferenciája, hogy ez kókusztej legyen.

Kérem, jelölje meg, hogy jelenleg az Önök szállodájára mennyire igazak az alábbi kijelentések. Kérem jelölje meg a 0-t ha egyáltalán nem foglalkoznak ezzel (akár

mert nem fontos vagy mert nincs kapacitás), 5-t ha az esetek túlnyomó többségében figyelnek erre, és így járnak el.

Kérem, az összes felsorolt elemnél jelölje be a megfelelő választ:

	0 - Nincs ilyen	1	2	3	4	5 - Szinte minden esetre igaz.
Célunk, hogy hiteles, meleg fogadtatásban részesítsük a vendégeket.						
A szálloda egységeinek nyitvatartása úgy kerül meghatározásra, hogy az minden ügyfélnek megfeleljen.						
A szálloda személyzete segít a poggyásszal.						
A szobában üdvözlőlapot helyezünk el nyomtatott üzenettel és a vendégek nevével.						
A szobában üdvözlőlapot helyezünk el kézzel írt üzenettel és a vendégek nevével.						

Kérem, jelölje meg, hogy az Önök szállodájában megtalálhatóak-e az alábbi elemek.

Kérem, az összes felsorolt elemnél jelölje be a megfelelő választ:

	Igen, megtalálható	Nem, nincs ilyen.
A vendégnek van lehetősége az itt tartózkodása alatt kisebb változtatásokat kérni a szobával kapcsolatban (ágy áttolása, könnyen mozdítható asztal kivétele, stb.).		
A vendég kiválaszthatja azt a hőmérsékletet, amelyet szeretne a szobájában (és ezt akár a szálloda előre be is állítja neki).		
A vendég kiválaszthatja az ágynemű stílusát vagy típusát.		
A vendég kiválaszthatja, hogy milyen párnát szeretne.		
A vendég dönthet úgy, hogy ne tegyenek alkoholt a minibárjában.		
A vendég kedvenc italát akkor is a szobába tesszük, ha nem ez az a márka, amellyel a szálloda általában dolgozik.		
A szállodának vannak konkrét ajándékai vagy költségkerete, amelyeket akkor használ fel, ha az alkalmazott (recepció, guest relations stb.) a vendégnek ajándékot adna (születésnap, nászút különleges alkalom stb.).		
Rendelkezünk és használjuk is a TV-n található funkciót, melynek segítésével megjeleníthető a vendég		

	Igen, megtalálható	Nem, nincs ilyen.
neve, és üdvözölhetjük a vendéget a szobában.		

Kérem, jelölje meg, hogy jelenleg az Önök szállodájára mennyire igazak az alábbi kijelentések. Kérem jelölje meg a 0-t ha egyáltalán nem foglalkoznak ezzel (akár mert nem fontos vagy mert nincs kapacitás), 5-t ha az esetek túlnyomó többségében figyelnek erre, és így járnak el.

Kérem, az összes felsorolt elemnél jelölje be a megfelelő választ:

	0 - Nincs ilyen	1	2	3	4	5 - Szinte minden esetre igaz.
Gondoskodunk arról, hogy adataink pontosak legyenek, és gyakran frissítjük nyilvántartásainkat (a vendégről a vendég tartózkodása alatt).						
A szállodában való tartózkodás során odafigyelünk vendégeink különleges igényeire.						
Gondoskodunk arról, hogy minden vendég számára megfelelő ételek álljanak rendelkezésre (vallás, allergia, étrendi korlátozások).						
Meleg, szívélyes "búcsúban" részesítünk minden vendéget a recepción, miután kijelentkezett a szobából.						
Mindent megteszünk annak érdekében, hogy megértsük a vendég						

	0 - Nincs ilyen	1	2	3	4	5 - Szinte minden esetre igaz.
különleges igényeit a szállodai tartózkodása alatt.						
Az alkalmazott azonnal válaszol a vendégek tartózkodása során felmerült kéréseire.						
Amikor alkalmazottunk megígéri, hogy egy bizonyos időpontig megtesz valamit, akkor ezt teljesíti.						
Gyors kijelentkezés és bejelentkezés biztosított a törzsvendégek számára.						

A kérdőívben megjelennek olyan fogalmak, mint *vendég igény* és *vendég preferencia*, ezeket a fogalmakat fontos megkülönböztetnünk. A vendég igénye lehet például a növényi alapú tej a reggelihez, míg preferenciája, hogy ez kókusztej legyen.

Kérem, jelölje meg, hogy jelenleg az Önök szállodájára mennyire igazak az alábbi kijelentések. Kérem jelölje meg a 0-t ha egyáltalán nem foglalkoznak ezzel (akár mert nem fontos vagy mert nincs kapacitás), 5-t ha az esetek túlnyomó többségében figyelnek erre, és így járnak el.

Kérem, az összes felsorolt elemnél jelölje be a megfelelő választ:

	0 - Nincs ilyen	1	2	3	4	5 - Szinte minden esetre igaz.
Arra biztatjuk az alkalmazottakat, hogy viselkedésükben szívélyességet, jóindulatot tanúsítsanak.						

	0 - Nincs ilyen	1	2	3	4	5 - Szinte minden esetre igaz.
Arra ösztönözzük az alkalmazottakat, hogy legyenek elérhetőek a vendégek számára.						
Arra biztatjuk az alkalmazottakat, hogy beszélgetés közben tartsanak szemkontaktust a vendéggel.						
A munkavállaló számára munkavállalói képzések állnak rendelkezésre, hogy olyan szintű minőségi szolgáltatást tudjon nyújtani, amelyet a szálloda megkíván.						
Célunk, hogy olyan alkalmazottat válasszunk a felvételi eljárás során, aki motivált a vendégszolgálatban.						
Alkalmazottiank a vendég igényeinek megfelelően változtatják viselkedésüket.						
Alkalmazottaink a helyzet igényeinek megfelelően változtatják viselkedésüket.						

	0 - Nincs ilyen	1	2	3	4	5 - Szinte minden esetre igaz.
A munkavállalóink empatikusak a vendéggel szemben, amikor a vendégnek problémája van.						
Alkalmazottaink mindig igyekeznek segíteni a vendégek problémáinak megoldásában, még egyedi megoldásokkal is előállva.						
Szállodánk / alkalmazottaink a vendég érdekeit tartják a legfontosabbnak.						

A kérdőívben megjelennek olyan fogalmak, mint *vendég igény* és *vendég preferencia*, ezeket a fogalmakat fontos megkülönböztetnünk. A vendég igénye lehet például a növényi alapú tej a reggelihez, míg preferenciája, hogy ez kókusztej legyen.

Kérem, jelölje meg, hogy az Önök szállodájában megtalálható-e az alábbi elem.

Kérem, az összes felsorolt elemnél jelölje be a megfelelő választ:

	Igen, megtalálható	Nem, nincs ilyen.
Ösztönözzük és jutalmazzuk a személyre szabott szolgáltatásnyújtást.		

Kérem, jelölje meg, hogy jelenleg az Önök szállodájára mennyire igazak az alábbi kijelentések. Kérem jelölje meg a 0-t ha egyáltalán nem foglalkoznak ezzel (akár mert nem fontos vagy mert nincs kapacitás), 5-t ha az esetek túlnyomó többségében figyelnek erre, és így járnak el.

Kérem, az összes felsorolt elemnél jelölje be a megfelelő választ:

	0 - Nincs ilyen	1	2	3	4	5 - Szinte minden esetre igaz.
Proaktívan ösztönözzük a visszajelzéseket, a vendégeket arra kérjük, hogy lépjenek kapcsolatba velünk.						
Szállodánk / alkalmazottunk pontosan tudja, vagy arra törekszik, hogy megtalálja, kinek a véleményére válaszol.						
Szállodánk / alkalmazottunk egyéni választ ad minden vendégértékelésre és megjegyzésre.						
A vendégelégedettség felmérését a vendég kijelentkezése után küldjük ki. Például Medallia.						

Kérem, jelölje meg, hogy jelenleg az Önök szállodájára mennyire igazak az alábbi kijelentések. Kérem jelölje meg a 0-t ha egyáltalán nem foglalkoznak ezzel (akár mert nem fontos vagy mert nincs kapacitás), 5-t ha az esetek túlnyomó többségében figyelnek erre, és így járnak el.

Kérem, az összes felsorolt elemnél jelölje be a megfelelő választ:

	0 - Nincs ilyen	1	2	3	4	5 - Szinte minden esetre igaz.
Alkalmazottaink tehetségesek és szakértelemmel kezelnek minden kérést.						
Alkalmazottaink hatékonyak.						
Alkalmazottaink célja, hogy felülmúlják a vendégek elvárásait.						
Alkalmazottaink / szállodánk személyre szabja azokat az termékeket és szolgáltatásokat, amelyek a vendég által önként megadott információkon alapulnak (például korosztály, irányítószám), de nem lehet a vendéget, mint személyt beazonosítani.						
Alkalmazottaink / szállodánk személyre szabja termékeket az árukat és szolgáltatásokat a vendég által önkéntesen megadott olyan információk alapján, amik beazonosításra is alkalmasak lehetnek, (például név, szállítási cím, kártyaadatok).						
Alkalmazottaink az ügyfél igényeinek megfelelően testre szabhatják a szolgáltatási kínálatot						

	0 - Nincs ilyen	1	2	3	4	5 - Szinte minden esetre igaz.
(például: ételallergiák alapján módosítanak a menü elemeken stb.).						
Alkalmazottainak / szállodánk gondoskodik arról, hogy időt szánjon és megértse a vendég konkrét igényeit.						
Alkalmazottaink / szállodánk olyan termékeket és szolgáltatásokat kínál ügyfeleinknek a szállodában tartózkodás során, amelyek megfelelnek az adott vendég egyedi igényeinek.						
Alkalmazottunk / szállodánk előre látja, hogy mit akar a vendég, még mielőtt a vendég kérné.						
Gondoskodunk arról, hogy alkalmazottainak vendégszerető viselkedése olyannak érződjön, amit valódi igények motiválnak, az, hogy kedveskedjenek és gondoskodjanak vendégeikről, személyiségük kiterjesztéseként érződjön és ne feladatként.						
Alkalmazottaink/ szállodánk célja, hogy a vendég fontos embernek érezze magát.						

	0 - Nincs ilyen	1	2	3	4	5 - Szinte minden esetre igaz.
Alkalmazottaink célja, hogy egyéni figyelmet szenteljenek a vendégeknek a szállodai tartózkodás során.						
A szálloda alkalmazottjai teljes tisztelettel bánnak a vendéggel.						
Munkatársaink udvariasak minden vendéggel.						
Alkalmazottaink barátságosak minden vendéggel.						
Fontos, hogy a vendég úgy érezze, hogy a jó kapcsolat kiépítése a szálloda legfontosabb hajtóereje és nem a pénzkeresés.						
Alkalmazottaink proaktívak és kezdeményezik a vendég jobb megismerését.						

A kérdőívben megjelennek olyan fogalmak, mint *vendég igény* és *vendég preferencia*, ezeket a fogalmakat fontos megkülönböztetnünk. A vendég igénye lehet például a növényi alapú tej a reggelihez, míg preferenciája, hogy ez kókusztej legyen.

Szálloda adatok.

A következő kérdések a szálloda tulajdonságaira vonatkoznak. Ennek célja, hogy a kutatás végén feltárhassuk, milyen tulajdonságokkal rendelkeznek azok a szállodák, amik a személyre szabott szolgáltatások különböző fázisain hasonló szinten helyezkednek el.

A kérdőívben megadott válaszok a GDPR és a kutatási anonimitás szabályainak megfelelően kerülnek kezelésre. A kutatómunka során a szálloda nem kerül megnevezésre.

Tagja a Magyar Szállodák és Éttermek Szövetségének? (Kérem, jelölje be a megfelelő választ!)

Kérem, csak **egyet** válasszon az alábbiak közül:

- Igen
- Nem

Ez egy kérdés súgószöveg.

Az alábbiak közül mi a szálloda elsődleges célcsoportja?

Kérem, válasszon egyet az alábbiak közül
Kérem, csak **egyet** válasszon az alábbiak közül:

- Üzleti utazók
- Szabadidős utazók

Kérem jelölje be, az alábbiak közül mi a szálloda elsődleges célcsoportja!

Csak akkor válaszolj erre a kérdésre, ha az alábbi feltételek teljesülnek:
A válasz '

Szabadidős utazók

' kérdéshez ' [G01Q02]' (Az alábbiak közül mi a szálloda elsődleges célcsoportja?)
Kérem, válasszon egyet az alábbiak közül
Kérem, csak **egyet** válasszon az alábbiak közül:

- Fiatalok.
- Fiatal gyermektelen párok.
- Családok.

- Már gyermektelen párok.

- Nyugdíjasok.

- Egyéb

Van a szállodának másodlagos célcsoportja?

Kérem, csak **egyet** válasszon az alábbiak közül:

- Igen
- Nem

Az alábbiak közül mi a szálloda másodlagos célcsoportja?

Csak akkor válaszolj erre a kérdésre, ha az alábbi feltételek teljesülnek:
A válasz 'Igen' kérdéshez ' [G01Q04]' (Van a szállodának másodlagos célcsoportja?)
Kérem, válasszon egyet az alábbiak közül
Kérem, csak **egyet** válasszon az alábbiak közül:

- Üzleti utazók.

- Szabadidős utazók.

- Egyéb

Kérem jelölje be, az alábbiak közül mi a szálloda másodlagos célcsoportja!

Csak akkor válaszolj erre a kérdésre, ha az alábbi feltételek teljesülnek:
A válasz '

Szabadidős utazók.

' kérdéshez ' [G01Q05]' (Az alábbiak közül mi a szálloda másodlagos célcsoportja?)
Kérem, válasszon egyet az alábbiak közül

Kérem, csak **egyet** válasszon az alábbiak közül:

- Fiatalok.
- Fiatal gyermektelen párok.
- Családok.
- Már gyermektelen párok.
- Nyugdíjasok.
- Egyéb

Honnan érkezik a szálloda elsődleges célcsoportja? *

Kérem, válasszon egyet az alábbiak közül
Kérem, csak **egyet** válasszon az alábbiak közül:

- Belföldi turisták
- Külföldi turisták

Melyik jellemzőbb inkább a vendégkörükre?

Kérem, válasszon egyet az alábbiak közül
Kérem, csak **egyet** válasszon az alábbiak közül:

- Egyéni utazók
- Csoportos utazók

Mi a szálloda üzemeltetés szerinti besorolása?

Kérem, válasszon egyet az alábbiak közül
Kérem, csak **egyet** válasszon az alábbiak közül:

- Városi szálloda
- Üdülő vagy sport szálloda
- Fürdő vagy gyógy szálloda
- Konferencia szálloda
- Repülőtéri vagy tranzit szálloda
- Wellness szálloda
- Apartment szálloda
- Garni szálloda
- Kastélyszálloda
- Egyéb

Mióta dolgozik ebben a pozícióban?

Kérem, válasszon egyet az alábbiak közül

Kérem, csak **egyet** válasszon az alábbiak közül:

- 1990
- 1991
- 1992
- 1993
- 1994
- 1995
- 1996
- 1997
- 1998
- 1999
- 2000
- 2001
- 2002
- 2003
- 2004
- 2005
- 2006
- 2007
- 2008
- 2009
- 2010
- 2011
- 2012
- 2013
- 2014
- 2015
- 2016
- 2017
- 2018
- 2019
- 2020
- 2021
- 2022
- Egyéb

Tagja a szálloda szállodaláncnak?

Kérem, csak **egyet** válasszon az alábbiak közül:

- Igen
- Nem

Hány csillagos a szálloda?

Kérem, válasszon egyet az alábbiak közül
Kérem, csak **egyet** válasszon az alábbiak közül:

- 2
- 2 superior
- 3
- 3 superior
- 4
- 4 superior
- 5
- 5 superior
- Nincs besorolva.

Amennyiben még nincs besorolva, milyen csillag kategóriát céloz meg?

Csak akkor válaszolj erre a kérdésre, ha az alábbi feltételek teljesülnek:
A válasz 'Nincs besorolva.' kérdéshez ' [G01Q13]' (Hány csillagos a szálloda?)
Kérem, válasszon egyet az alábbiak közül
Kérem, csak **egyet** válasszon az alábbiak közül:

- 2
- 2 superior
- 3
- 3 superior
- 4
- 4 superior
- 5
- 5 superior

Van az Önök szállodájában Guest Relation pozíció?

Kérem, csak **egyet** válasszon az alábbiak közül:

- Igen
- Nem

Van az Önök szállodájában Concierge pozíció?

Kérem, csak **egyet** válasszon az alábbiak közül:

- Igen
- Nem

Kérem, adja meg üzemeltetési idő szerinti besorolásukat, egy átlagos év esetébe.

Kérem, válasszon egyet az alábbiak közül
Kérem, csak **egyet** válasszon az alábbiak közül:

- Egész évben üzemelő
- Szezonális
- Egyéb

A 2022-es energia válság eltérő lehet a szokásostól.

Kérem, adja meg a szálloda irányító számát.

Kérem, ide írja a válaszát:

Kérem, adja meg a szálloda szobaszámát.

Kérem, ide írja a válaszát:

Kérem, adja meg, hogy átlagosan hány alkalmazott dolgozik a szállodában.

Kérem, ide írja a válaszát:

Mi az Ön pozíciója?

Kérem, ide írja a válaszát:

Kérem, jelölje be a megfelelő számot annak függvényében, hogy szállodájuk mennyire tartja fontosnak az alábbiakat. Amennyiben egyáltalán nem tartja fontosnak, válassza az 1 míg, ha nagyon fontosnak tartja válassza a 7 számot.

Kérem, az összes felsorolt elemnél jelölje be a megfelelő választ:

	1 - egyáltalán nem fontos	2	3	4	5	6	7 - nagyon fontos
Az Önök szállodája, mennyire tartja fontosnak, hogy személyre szabott szolgáltatást nyújtson a vendégeknek?							
Az Önök szállodája, mennyire tartja fontosnak, kommunikációjában éreztesse a vendéggel, hogy különleges ügyfél?							
Az Önök szállodája, mennyire tartja fontosnak, hogy kínálatát úgy alakítsa, hogy az megfeleljen a vendég egyéni igényeinek?							

Köszönöm a kérdőív kitöltését!

Köszönöm, hogy részt vett a kutatásban! Amennyiben szeretné megkapni az eredményeket, kérem, itt adja meg elérhetőségét:

Kérem, ide írja a válaszát:

Kérdőív elküldése.
Köszönjük, hogy kitöltötte a kérdőívet.

59. Appendix - R-Studio Output Threshold 0.5

```
library(seriation) #For seriate a matrix
library(biclust) #General biclustering functions
## Loading required package: MASS
## Loading required package: grid
## Loading required package: colorspace
## Loading required package: lattice
##
```

```
## Attaching package: 'lattice'
## The following object is masked from 'package:seriation':
##
##     panel.lines
library(BiocManager)
library(iBBiG) #iBBiG biclustering
library(BicARE) #BicARE biclustering
## Loading required package: Biobase
## Loading required package: BiocGenerics
##
## Attaching package: 'BiocGenerics'
## The following objects are masked from 'package:stats':
##
##     IQR, mad, sd, var, xtabs
## The following objects are masked from 'package:base':
##
##     anyDuplicated, aperm, append, as.data.frame, basename, cbind,
##     colnames, dirname, do.call, duplicated, eval, evalq, Filter, Find,
##     get, grep, grepl, intersect, is.unsorted, lapply, Map, mapply,
##     match, mget, order, paste, pmax, pmax.int, pmin, pmin.int,
##     Position, rank, rbind, Reduce, rownames, sapply, setdiff, sort,
##     table, tapply, union, unique, unsplit, which.max, which.min
## Welcome to Bioconductor
##
##     Vignettes contain introductory material; view with
##     'browseVignettes()'. To cite Bioconductor, see
##     'citation("Biobase")', and for packages 'citation("pkgname")'.
## Loading required package: multtest
## Loading required package: GSEABase
## Loading required package: annotate
## Loading required package: AnnotationDbi
## Loading required package: stats4
## Loading required package: IRanges
## Loading required package: S4Vectors
##
## Attaching package: 'S4Vectors'
## The following objects are masked from 'package:base':
##
##     expand.grid, I, unname
##
## Attaching package: 'IRanges'
## The following object is masked from 'package:grDevices':
##
##     windows
##
```

```
## Attaching package: 'AnnotationDbi'
## The following object is masked from 'package:MASS':
##
##     select
## Loading required package: XML
## Loading required package: graph
##
## Attaching package: 'graph'
## The following object is masked from 'package:XML':
##
##     addNode
##
## Attaching package: 'BicARE'
## The following object is masked from 'package:biclust':
##
##     bicluster
library(BcDiag) #Diagnostics of biclusters
## Citation: S. Hochreiter et al.,
## FABIA: Factor Analysis for Bicluster Acquisition,
## Bioinformatics 26(12):1520-1527, 2010.
## BibTex: enter 'toBibtex(citation("fabia"))'
##
## Homepage: http://www.bioinf.jku.at/software/fabia/fabia.html
##
## FABIA Package Version 2.44.0
#Additional statistic packages
library(ggplot2)
library(factoextra) #Additional distance functions
## Welcome! Want to learn more? See two factoextra-related books at https://goo.gl/ve3WBa
library(corrgram) #Correlation diagram
##
## Attaching package: 'corrgram'
## The following object is masked from 'package:lattice':
##
##     panel.fill
library(futile.logger)
library(VennDiagram) #VennDiagram
library(rJava)
library(venneuler) #VennDiagram


#For formatted and interactive tables and figures
library(knitr) #Formatted tables, figures


#For manipulating Excel files
library(readxl) #Read Excel file
```

```
library(xlsx) #Write Excel file

normalize <- function(x) {

return ((x - min(x)) / (max(x) - min(x)))

}

NA2mean <- function(x) replace(x, is.na(x), mean(x, na.rm = TRUE))

bicare2biclust <- function(x){

    if(class(x)=="Biclust"){

        return(x)

    } else if(class(x)=="biclustering"){

        Parameters <- list(numberofbicluster=x$param[1,2],residuthreshold=x$param[2,2],genesinitialprobabil
ity=x$param[3,2],samplesinitialprobability=x$param[4,2],numberofiterations=x$param[5,2],date=x$param[6,2])

        RowxNumber <- t(x$bicRow==1)

        NumberxCol <- x$bicCol==1

        Number <- as.numeric(dim(RowxNumber)[2])

        info <- list()

        return(new("Biclust",Parameters=Parameters,RowxNumber=RowxNumber,NumberxCol=NumberxCol,Number=Numbe
r,info=info))

    }

}

DATA<-read_excel("phdbiclust.xlsx")

DATA[is.na(DATA)] <- 0

ALL<-DATA[,-1]

rownames(ALL)<-as.matrix(DATA[,1])

remove(DATA)

orig_mtx<-as.matrix(ALL)

orig_mtx[is.na(orig_mtx)]<-0


mtx<-orig_mtx

RESPONDENT<-ALL


for (i in 1:ncol(mtx)){

  mtx[,i]<-normalize(mtx[,i])

}

for (i in 1:ncol(RESPONDENT)){

  RESPONDENT[,i]<-normalize(RESPONDENT[,i])

}

RESPONDENT[is.na(RESPONDENT)] <- 0

mtx[is.na(mtx)] <- 0


weights<-matrix(1/ncol(RESPONDENT),1,ncol(RESPONDENT))

colnames(weights)<-colnames(RESPONDENT)

BR<-rowSums(RESPONDENT*weights)/max(rowSums(RESPONDENT*weights))

RANK_RESPONDENT<-as.matrix(rank(-BR))

rownames(RESPONDENT)<-rownames(mtx)

rownames(ALL)<-rownames(mtx)

rownames(RANK_RESPONDENT)<-rownames(RESPONDENT)
```

Firstly, to obtain a preliminary picture of the possible bi-clusters, the seriation of the original data is done.

```
ORIG_SER <- c(seriate(get_dist(orig_mtx,"euclidean"),method="HC_COMPLETE"),seriate(get_dist(t(orig_mtx),"spearman"),method="HC_COMPLETE"))

ORIG_ORDERED<-orig_mtx[get_order(ORIG_SER,dim=1),get_order(ORIG_SER,dim=2)]

rownames(ORIG_ORDERED) <- rownames(mtx[get_order(ORIG_SER,dim=1),get_order(ORIG_SER,dim=2)])
```

After seriation, plotting the heat map of the original data (see **Fig. 1**) can help to detect the possible bi-clusters. On **Fig. 1** blue cells indicate a lower value of the indicators, and red cells mean a higher value of the indicators.

```
hmap(as.matrix(ORIG_ORDERED),col=colorspace::diverging_hcl(100, "Red-Green",rev = FALSE),showdist="both")
```

Fig. 1 Heat map of the original matrix after seriation

Seriation of normalized data

After the normalization of the original data, seriation is done on the normalized data.

```
ALL_SER <- c(seriate(get_dist(mtx,"euclidean"),method="HC_COMPLETE"),seriate(get_dist(t(mtx),"spearman"),method="HC_COMPLETE"))
```

```
ALL_ORDERED<-mtx[get_order(ALL_SER,dim=1),get_order(ALL_SER,dim=2)]

rownames(ALL_ORDERED) <- rownames(mtx[get_order(ALL_SER,dim=1),get_order(ALL_SER,dim=2)])
```

Estimating the number of bi-clusters

After seriation, plotting the heat map of the normalized original data (see **Fig. 2**) can help to detect the possible bi-clusters.

```
hmap(as.matrix(ALL_ORDERED),col=colorspace::diverging_hcl(100, "Red-Green",rev = FALSE),showdist="both")
```

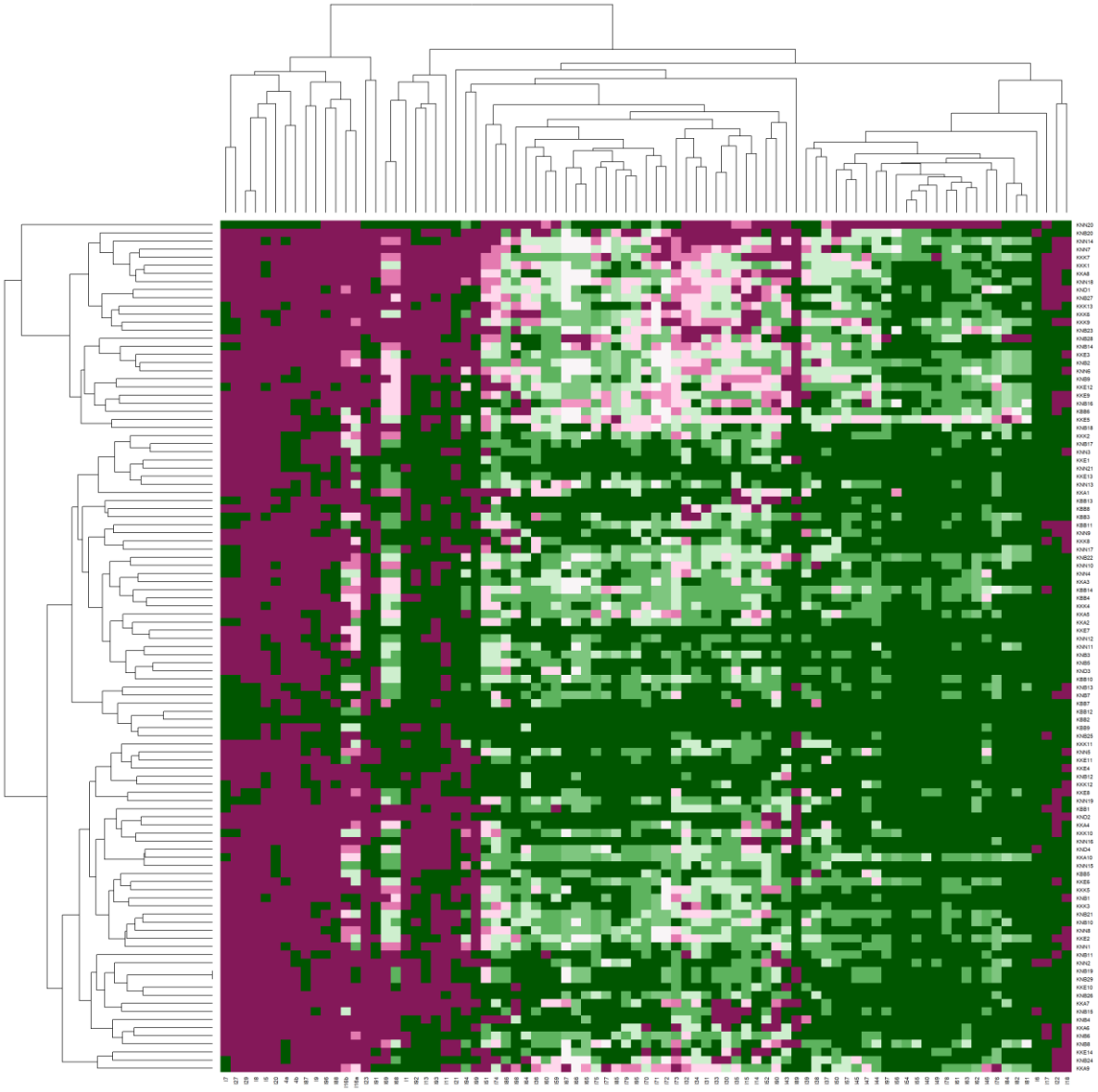


Fig. 2 Heat map of the normalized and seriated matrix

After seriation, two bigger homogeneous blocks can be identified based on **Fig. 2**. The block of the red cells on the left side *Fig. 2** indicates the top league, while the bigger green block, which indicates the remaining (lower) league.

Applying iBBiG on normalized data

Applying the iBBiG method on the original normalized data can specify the top league bi-clusters. First of all, the number of bi-clusters needed to be determined.

```
res <- iBBiG(binaryMatrix=binarize(mtx,threshold = 0.5),nModules = 1,alpha=0.3,pop_size = 100,mutation = 0.
3,stagnation = 50,selection_pressure = 1.2,max_sp = 15,success_ratio = 0.8)
```

```
## Module:  1 ... done
```

```
summary(res)
```

```
##

## An object of class iBBiG

##

## There was one cluster found with Score 4264.895 and

##   102 Rows and  65 columns
```

The results of the iBBiG algorithm can be seen above. The algorithm found one bi-cluster in which there are 102rows (hotels) and 65 columns (indicators). The following step is to calculate the F-tests to determine whether the bi-cluster is significant or not.

```
Obs.FStat <- NULL

for (i in c(1:res@Number)){

  Obs.FStat[[i]] <- computeObservedFstat(x=mtx,bicResult=res,number=i)

}

kable(Obs.FStat,caption = "**Table 2** The results of row and column effects for the top league")
```

Table 2 The results of row and column effects for the top league

	Fstat	PValue
Row Effect	17.91054	0
Column Effect	22.68236	0
Tukey test	258.16070	0

In Table 2 the results of the row and column effects (F-tests) can be read. Both the row and column effects are significant, so the top league bi-cluster is significant.

To see the differences between those hotels that are included in the top league and those that are not in the top league, one can plot the means, medians, variances, and median absolute deviations (MAD) for rows (respondents) (see **Fig. 3**). (The horizontal axis of **Fig. 3** shows the hotels, the vertical axis shows the tailor made service indicators on normalized (0-1) data of indicators.) On **Fig. 3** the red line indicates those hotels that are included in the top league, while the black line shows the remaining hotels. The hotels in the top league have higher means and medians, and have lower variances.

```
exploreBic(dset=mtx,bres=res,mname='biclust',pfor='all',gby='genes',bnum=1)
```

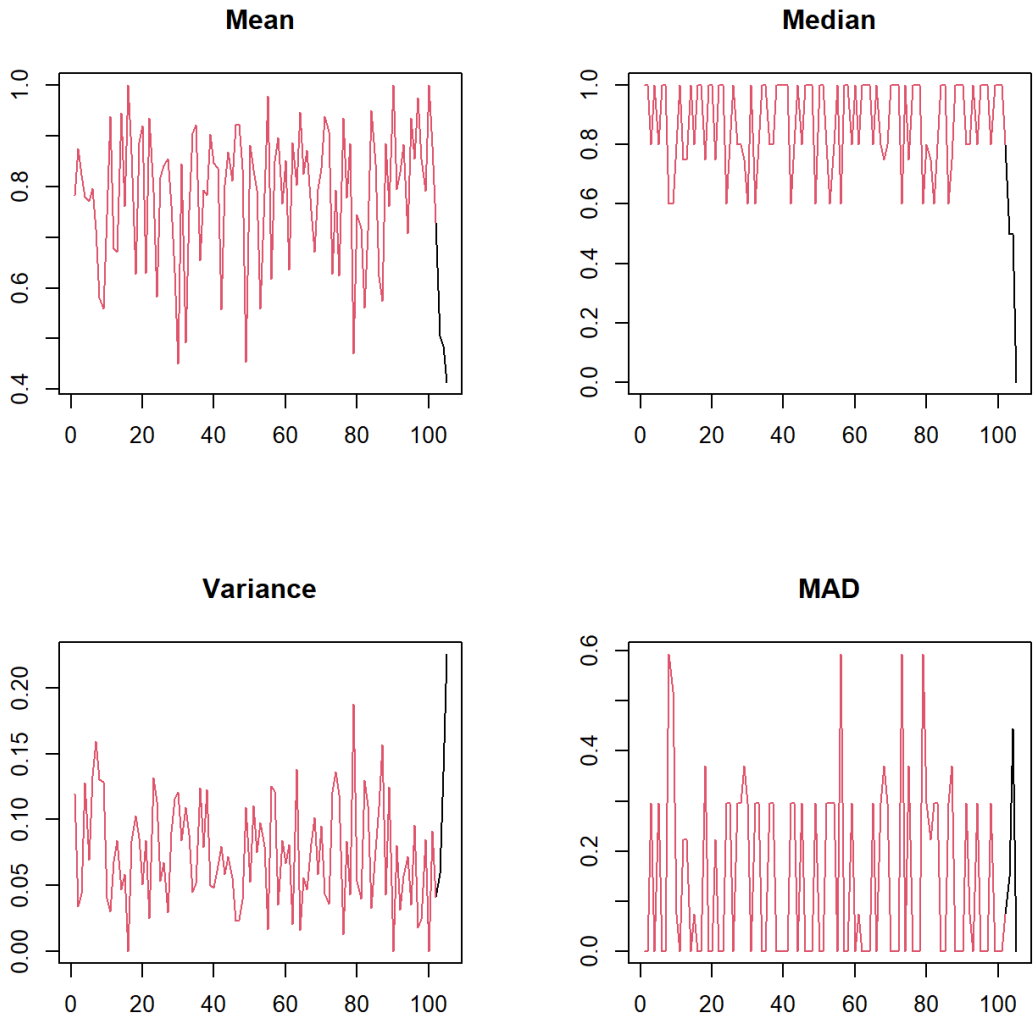


Fig. 3 Mean, median, variance and MAD for the top league respondents

As it can be seen form **Fig. 3**, most hotels belong to the top league.

The same can be done for the columns (indicators). **Fig. 4** shows the differences between the means, medians, variances, and median absolute deviations (MAD) for the indicators. (The horizontal axis of **Fig. 4** shows the tailor made service indicators, the vertical axis shows the hotels (0-1) data of respondents.) The red line indicates those indicators that are in the top league, while the black line shows the remaining indicators.

```
exploreBic(dset=mtx,bres=res,mname='biclust',pfor='all',gby='conditions',bnum=1)
```

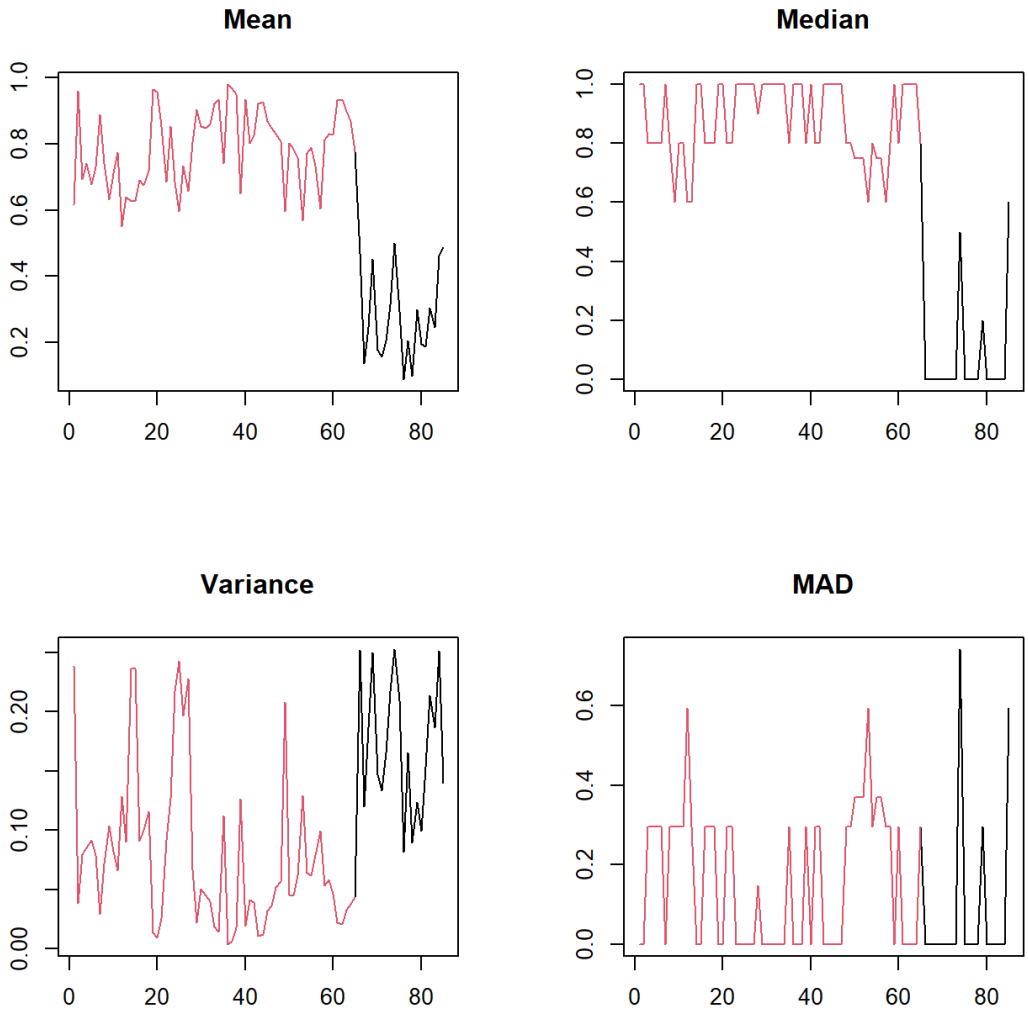


Fig. 4 Mean, median, variance and MAD for the top league indicators

Heat maps of the top league

Fig. 5 depicts the heat map of the top leagues. 102 hotels and 65 tailor mades searvice indicators. / 102 x 65 The red cells mean higher values in the case of indicators, while blue cells symbol lower values.

```
drawHeatmap(x=mtx,bicResult=res,number=1,beamercolor = TRUE,paleta=colorspace::diverging_hcl(100, "Red-Green",rev = FALSE))
```

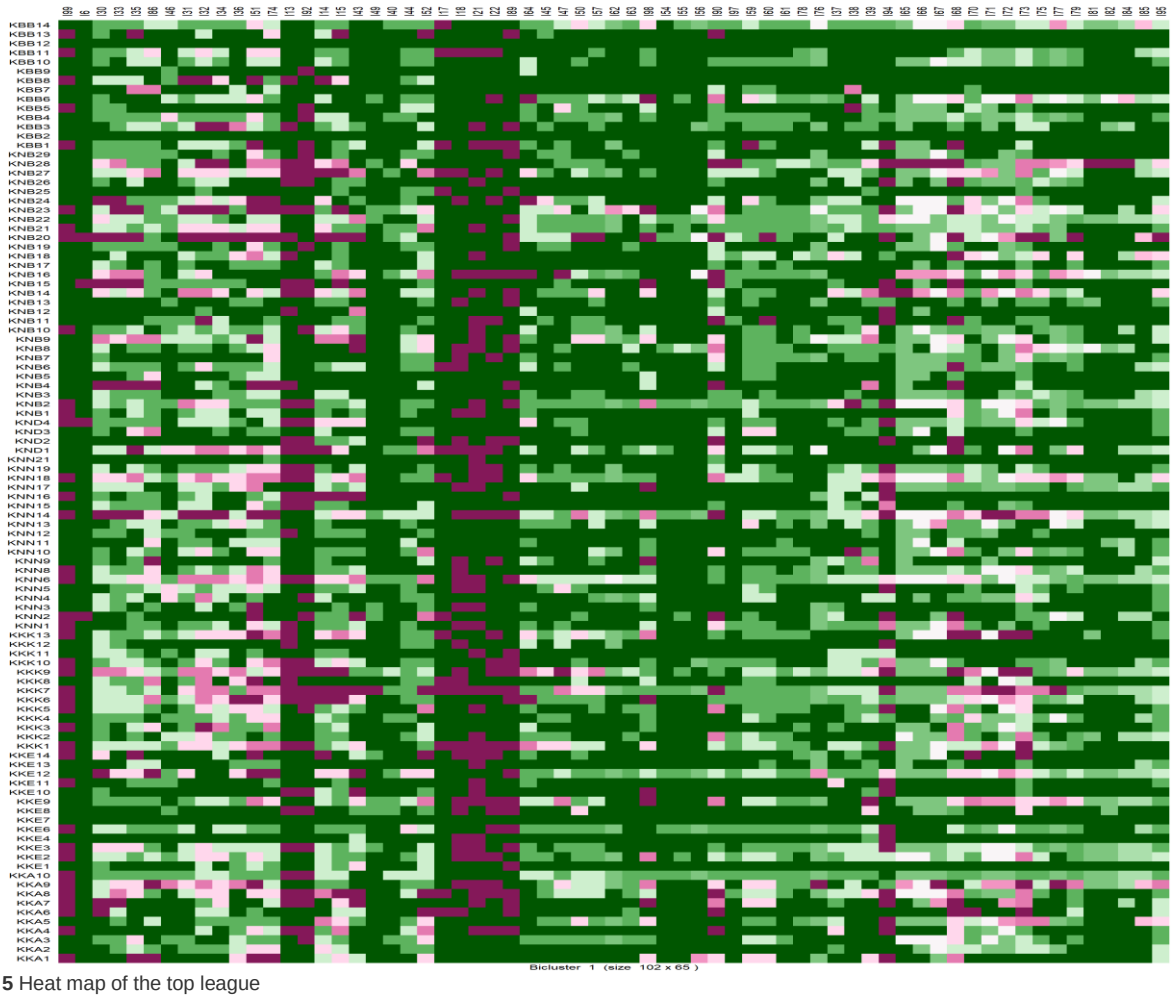


Fig. 5 Heat map of the top league

Fig. 6 shows the heat map of the results of iBBiG on normalized data. The top leagues can be seen in the upper left corner of **Fig. 6** which is enlarged on **Fig. 5**.

```
drawHeatmap(x=mtx,bicResult=res,local=FALSE,number=1,beamercolor = TRUE,paleta=colorspace::diverging_hcl(100, "Red-Green",rev = FALSE))
```

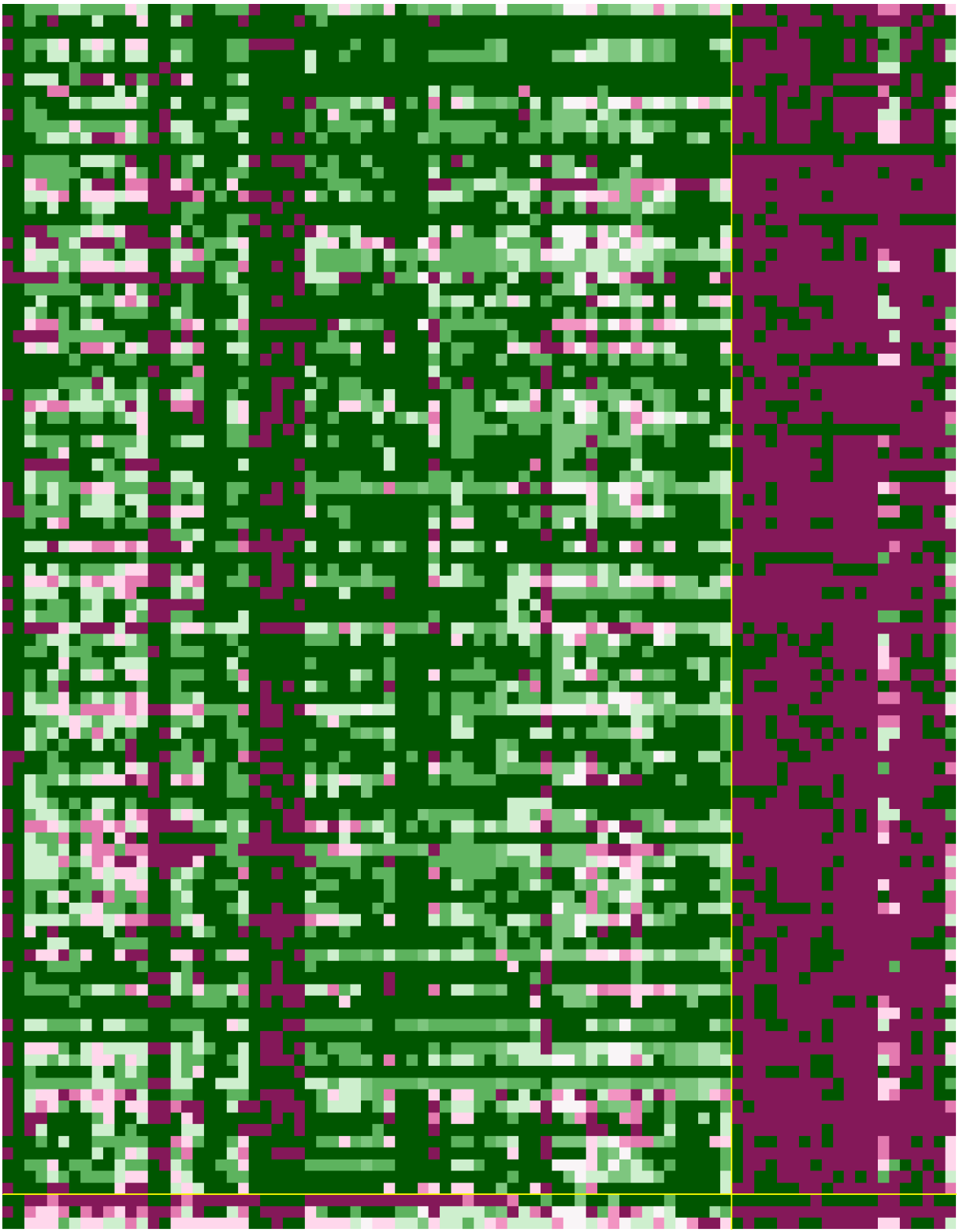


Fig. 6 Heat map of the output after applying iBBiG on normalized data

Checking stability of the top league bi-cluster

The next step is to check the stability of the top league bi-cluster. The results of the bootstrap can be seen below.

```
Bootstrap <- diagnoseColRow(x=as.matrix(ALL),bicResult=res,number=1,
  nResamplings=100,replace=TRUE)
Bootstrap
```

```
## $bootstrapFstats
##          fval.row  fval.col
##   [1,] 0.9225584 0.9552995
##   [2,] 1.1418651 1.0264269
##   [3,] 0.9375883 1.0061649
##   [4,] 0.7894688 1.2372532
##   [5,] 1.1767215 1.4181963
##   [6,] 1.0083275 1.1631368
##   [7,] 1.2147321 0.8148898
##   [8,] 0.9332726 1.2639620
##   [9,] 1.1262852 1.1811279
##  [10,] 1.0933614 0.9942315
##  [11,] 0.7620552 0.8782839
##  [12,] 0.8482622 1.3187170
##  [13,] 1.1948932 0.9162405
##  [14,] 0.8283685 1.1519111
##  [15,] 1.0112904 1.3223564
##  [16,] 1.1846849 1.2277892
##  [17,] 1.2748301 0.9491359
##  [18,] 1.0340907 1.2763834
##  [19,] 1.1037587 1.0524892
##  [20,] 1.1291045 0.6779772
##  [21,] 0.8768379 0.8472591
##  [22,] 1.1312403 0.8948565
##  [23,] 0.9210906 0.9321263
##  [24,] 0.7850358 1.0661050
##  [25,] 0.9282195 1.0427795
##  [26,] 0.8645419 1.0949342
##  [27,] 0.8562124 1.1177834
##  [28,] 1.0963186 0.9671201
##  [29,] 1.1692144 0.8820393
##  [30,] 1.1026925 0.9081665
##  [31,] 0.8529611 0.8895685
##  [32,] 0.8695603 0.8636718
##  [33,] 0.8028563 0.8471545
##  [34,] 0.8346639 0.8116467
##  [35,] 1.0612228 1.0080130
##  [36,] 0.9341189 1.1064472
##  [37,] 1.2035585 1.1577318
##  [38,] 0.9926527 0.9766250
##  [39,] 1.0297368 0.9299155
##  [40,] 0.8068311 0.7002058
##  [41,] 1.1389378 1.1926322
##  [42,] 1.1505642 1.1267828
##  [43,] 0.7885171 1.1047499
```

```
##  [44,] 0.9215358 0.8367462
##  [45,] 0.9738450 1.2608729
##  [46,] 1.0998310 1.0241923
##  [47,] 0.8405688 1.1815068
##  [48,] 1.0593918 0.8281954
##  [49,] 1.2267163 1.0262468
##  [50,] 0.8706343 1.1689524
##  [51,] 0.8820724 1.0609330
##  [52,] 0.7831564 0.9764616
##  [53,] 1.1345312 1.1110277
##  [54,] 1.1193222 0.9605120
##  [55,] 1.1612850 1.0033524
##  [56,] 0.8828885 1.0236426
##  [57,] 0.8325520 0.8539517
##  [58,] 0.9043432 0.8238577
##  [59,] 0.9823075 1.1062574
##  [60,] 1.0451050 1.0908684
##  [61,] 1.0143622 1.0020889
##  [62,] 1.0109612 1.1740001
##  [63,] 1.1594680 1.0424387
##  [64,] 1.0402374 0.8363279
##  [65,] 1.0940142 0.9085112
##  [66,] 1.0170565 0.9950686
##  [67,] 0.9937522 1.1177503
##  [68,] 1.1066285 0.7577263
##  [69,] 0.9788945 1.1189044
##  [70,] 1.1775756 0.7562612
##  [71,] 1.0224091 1.2803670
##  [72,] 1.1319540 0.8800954
##  [73,] 0.9991504 0.7504147
##  [74,] 0.8595844 1.2263055
##  [75,] 1.0754949 1.2821607
##  [76,] 0.8842500 0.8522732
##  [77,] 0.9230235 0.8986865
##  [78,] 0.7686827 0.9770639
##  [79,] 0.8709626 0.9815768
##  [80,] 1.0628421 0.9465728
##  [81,] 0.9740592 0.8407845
##  [82,] 1.0257800 1.0562443
##  [83,] 0.9670867 1.2036873
##  [84,] 0.8492096 0.9782759
##  [85,] 1.1773335 1.0219430
##  [86,] 0.9112631 1.1206836
##  [87,] 1.0195578 0.7660662
##  [88,] 1.0385827 0.9127700
```

```
##  [89,] 1.0837843 0.9926879
##  [90,] 1.2923912 0.9104105
##  [91,] 1.3382590 1.1929632
##  [92,] 0.9835221 1.2551689
##  [93,] 0.9895267 1.0506331
##  [94,] 1.1673553 1.3377433
##  [95,] 0.9045468 0.7354051
##  [96,] 0.9514301 1.2656205
##  [97,] 1.1870705 0.9336715
##  [98,] 0.9637273 1.1606133
##  [99,] 1.0349158 1.0419421
## [100,] 1.1641193 0.9780353
##
## $observedFstatRow
## [1] 21.31421
##
## $observedFstatCol
## [1] 180.8278
##
## $bootstrapPvalueRow
## [1] 0
##
## $bootstrapPvalueCol
## [1] 0
```

Since in the all cases the *bootstrapPvalueRow* and the *bootstrapPvalueCol* are lower than 0.01, bi-clusters are stable.

Calculating partial rankings

The next step is to calculate partial rankings based on the indicators and hotels in the top league.

The final step is to compare the results of the partial rankings to the corresponding part of the original rankings. The results of the Spearman's rank correlation shows a strong positive relationship between the two rankings.

```
C<-biclust::bicluster(mtx,res,number=1)

B<-as.data.frame(C[[1]])

selectedweight<-weights[,colnames(B)]

cols <- colnames(B)

sw<-weights[,cols]

BR<-rowSums(B[,cols]*sw)/max(rowSums(B[,cols]*sw))

B$Overall_Score<-BR

B$Rank<-rank(-B$Overall_Score)



kable(B,caption = "**Table 2** League A1 by iBBiG",digits = 2)


cor(B$Rank,as.matrix(RANK_RESPONDENT[rownames(B),]),method="spearman")
##           [,1]
```

```
## [1,] 0.9610478
```

```
cor.test(B$Rank,as.matrix(RANK_RESPONDENT[rownames(B),]),method="spearman")
```

```
##
##  Spearman's rank correlation rho
##
## data:  B$Rank and as.matrix(RANK_RESPONDENT[rownames(B), ])
## S = 6888.7, p-value < 2.2e-16
## alternative hypothesis: true rho is not equal to 0
## sample estimates:
##       rho
## 0.9610478
```

```
weightst<-matrix(1/nrow(mtx),1,nrow(mtx))
colnames(weightst)<-rownames(mtx)
tRESP <- as.data.frame(mtx)
BRt<-colSums(tRESP*weightst)/max(colSums(tRESP*weightst))
RANK_RESPt<-as.matrix(rank(-BRt))


Bt<-as.data.frame(t(C[[1]]))
swt<-weightst[,colnames(Bt)]
colst <- colnames(Bt)
swt<-weightst[,colst]
BRt<-rowSums(Bt[,colst]*swt)/max(rowSums(Bt[,colst]*swt))
Bt$Overall_Score<-BRt
Bt$Rank<-rank(-Bt$Overall_Score)



cor.test(Bt$Rank,as.matrix(RANK_RESPt[rownames(Bt),]),method="spearman")
```

```
##
##  Spearman's rank correlation rho
##
## data:  Bt$Rank and as.matrix(RANK_RESPt[rownames(Bt), ])
## S = 78.515, p-value < 2.2e-16
## alternative hypothesis: true rho is not equal to 0
## sample estimates:
##       rho
## 0.9982842
```

The bi-cluster is relevant (high correlation between League's and the original data).

Applying iBBiG on reversed normalized data

To identify the lower league(s), the reverse data matrix is needed to be calculated firstly. Applying the iBBiG method on the reversed normalized data can specify the lower league bi-clusters.

```
rmtx <- 1-mtx

rres <- iBBiG(binaryMatrix=binarize(rmtx,threshold = 0.5),nModules = 1,alpha=0.3,pop_size = 100,mutation =
0.08,stagnation = 50,selection_pressure = 1.2,max_sp = 15,success_ratio = 0.8)
```

```
## Module:  1 ... done
```

```
summary(rres)
```

```
##
## An object of class iBBiG
##
## There was one cluster found with Score 953.7875 and
##   92 Rows and  21 columns
```

The results above show that the iBBiG algorithm found a bi-cluster on the reversed data. In this bi-cluster there are 92 rows (hotels) and 21 columns (indicators). The next step is to calculate F-tests to determine which bi-cluster is significant

```
Obs.FStat <- NULL

for (i in c(1:rres@Number)){

  Obs.FStat[[i]] <- computeObservedFstat(x=rmtx,bicResult=rres,number=i)

  }

kable(Obs.FStat,caption = "**Table 3** The results of row and column effects of the reversed data for the t
wo bi-clusters")
```

Table 3 The results of row and column effects of the reversed data for the two bi-clusters

	Fstat	PValue
Row Effect	2.655278	0
Column Effect	13.802997	0
Tukey test	58.395253	0

In **Table x** the results of the F-tests can be seen. For both bi-clusters, both the row and column effect are significant which are the lower league (League C).

To see the differences between those hotelss that are included in the lower league and those that are not in the lower league, one can plot the means, medians, variances, and median absolute deviations (MAD) for rows (respondents) (see **Fig. 7**). On **Fig. 7** the red line indicates those hotels that are included in the lower league, while the black line shows the remaining hotels. The respondents in the lower league have lower means, medians, and variances.

```
exploreBic(dset=mtx,bres=rres,mname='biclust',pfor='all',gby='genes',bnum=1)
```

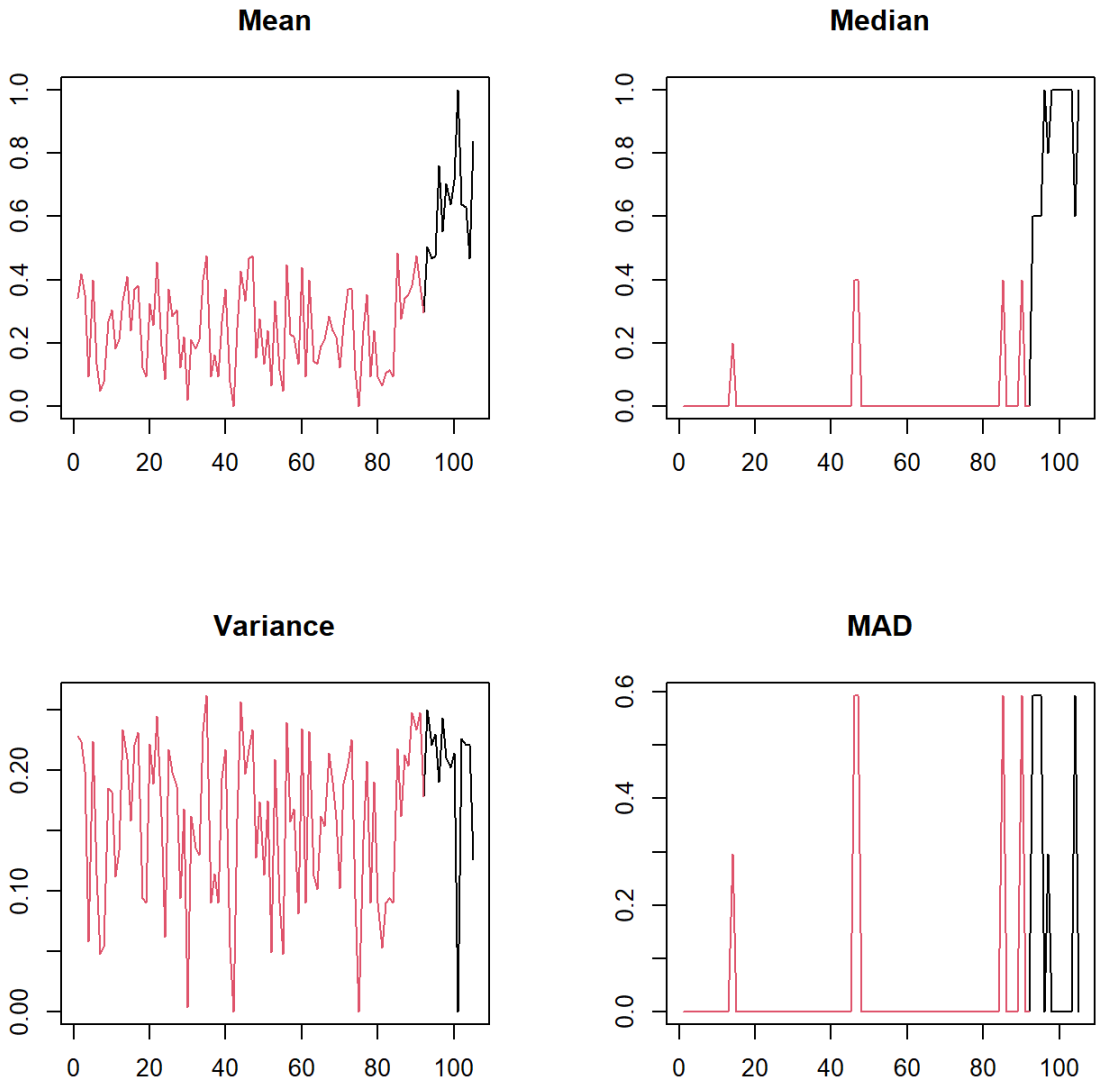


Fig. 7 Mean, median, variance and MAD for lower leauge respondents

One can do the same for the columns (TS-indicators). **Fig. 8** shows the differences between the means, medians, variances, and median absolute deviations (MAD) for the indicators. The red line indicates those indicators that are in the lower league, while the black line shows the remaining indicators.

```
exploreBic(dset=mtx,bres=rres,mname='biclust',pfor='all',gby='conditions',bnum=1)
```

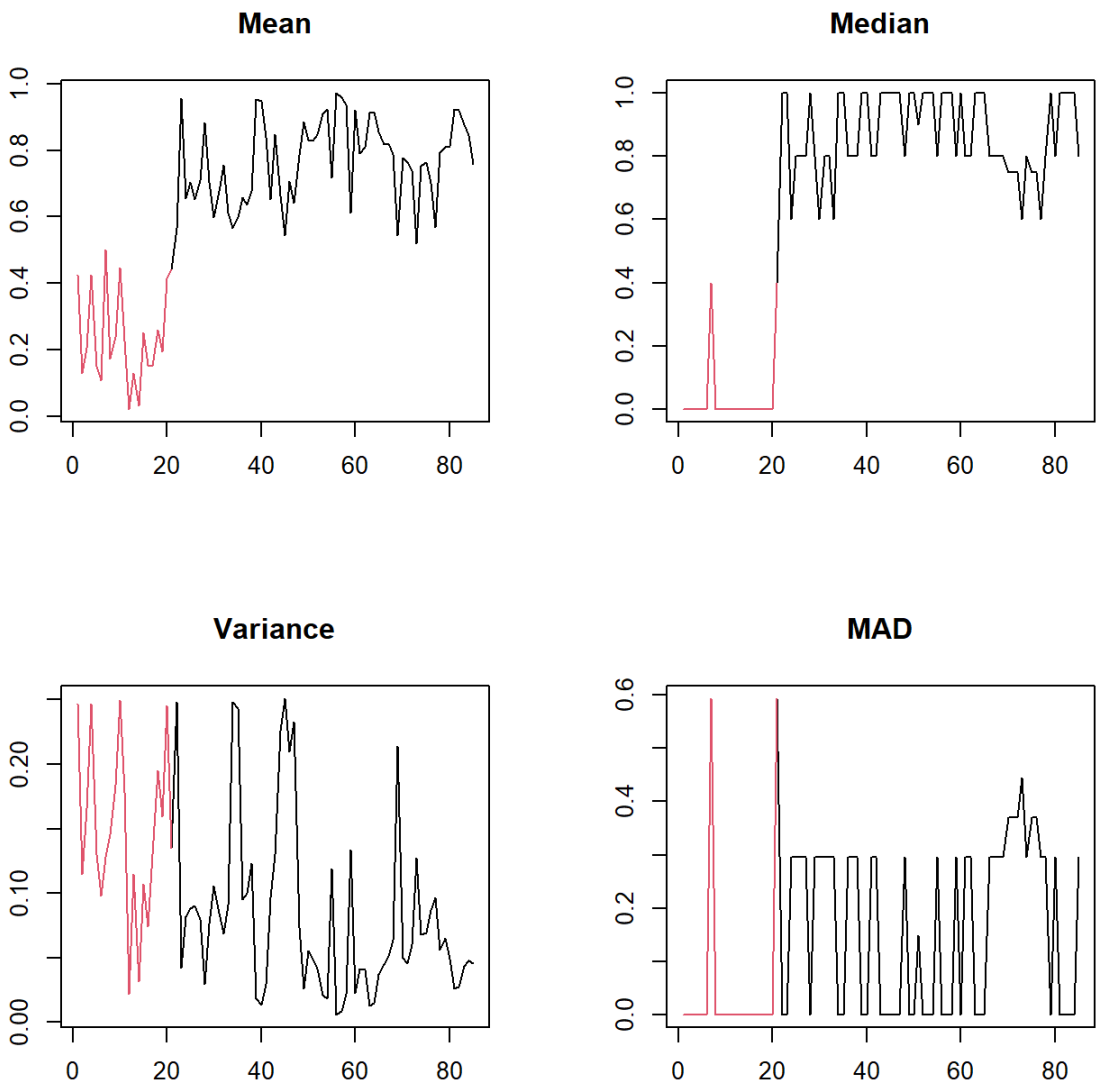


Fig. 8 Mean, median, variance and MAD for lower leauge indicators

Heat maps of the lower league

Fig. 9 depicts the heat map of the lower league.

```
drawHeatmap(x=mtx,bicResult=rres,number=1,paleta=colorspace::diverging_hcl(100, "Red-Green",rev = FALSE),be
amercolor = TRUE)
```

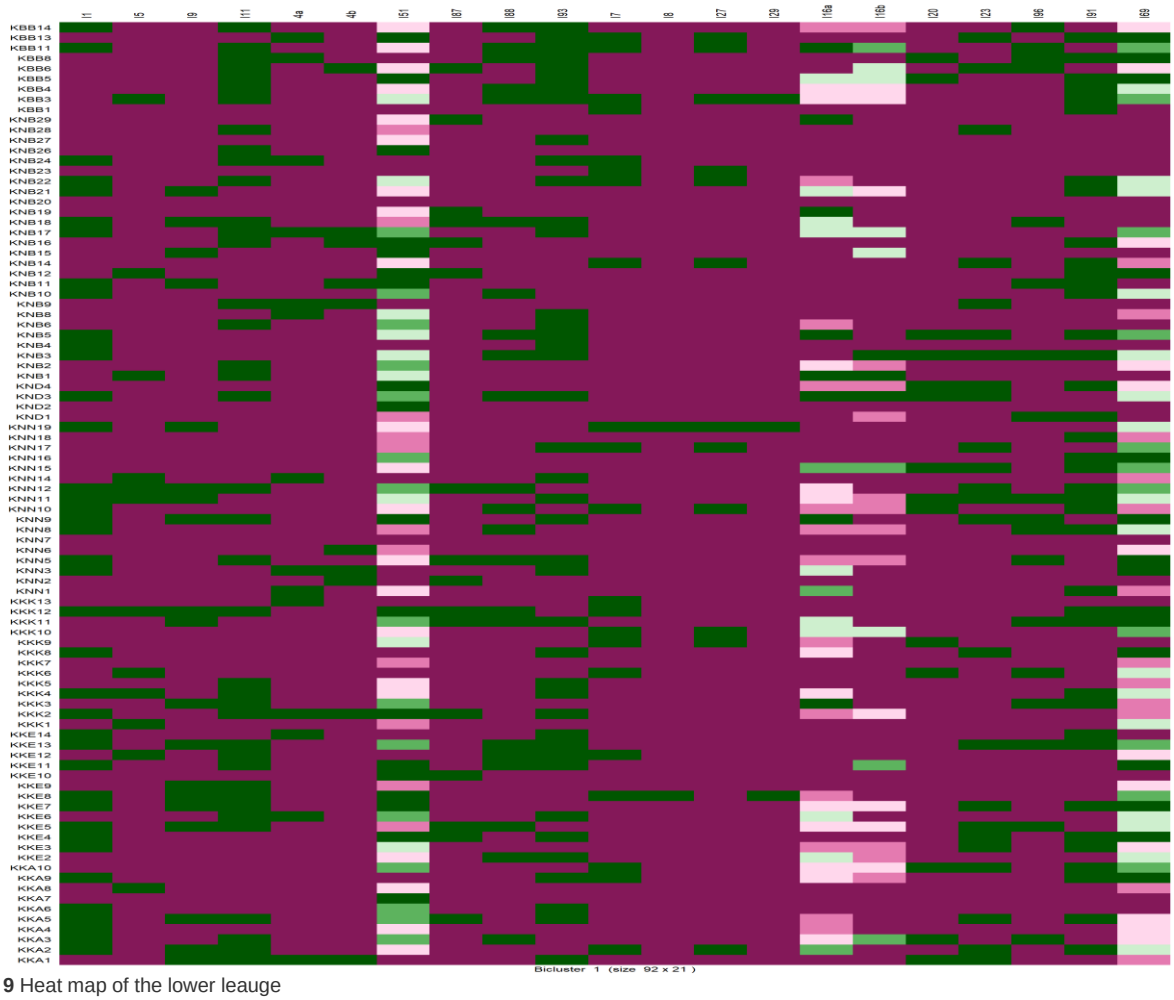


Fig. 9 Heat map of the lower leauge

Fig. 10 shows results of iBBiG on reversed normalized data. The lower league can be seen in the upper left side of **Fig. 10** which is enlarged on **Fig.9**.

```
drawHeatmap(x=mtx,bicResult=rres,local=FALSE,number=1,paleta=colorspace::diverging_hcl(100, "Red-Green",rev
= FALSE),beamercolor = TRUE)
```

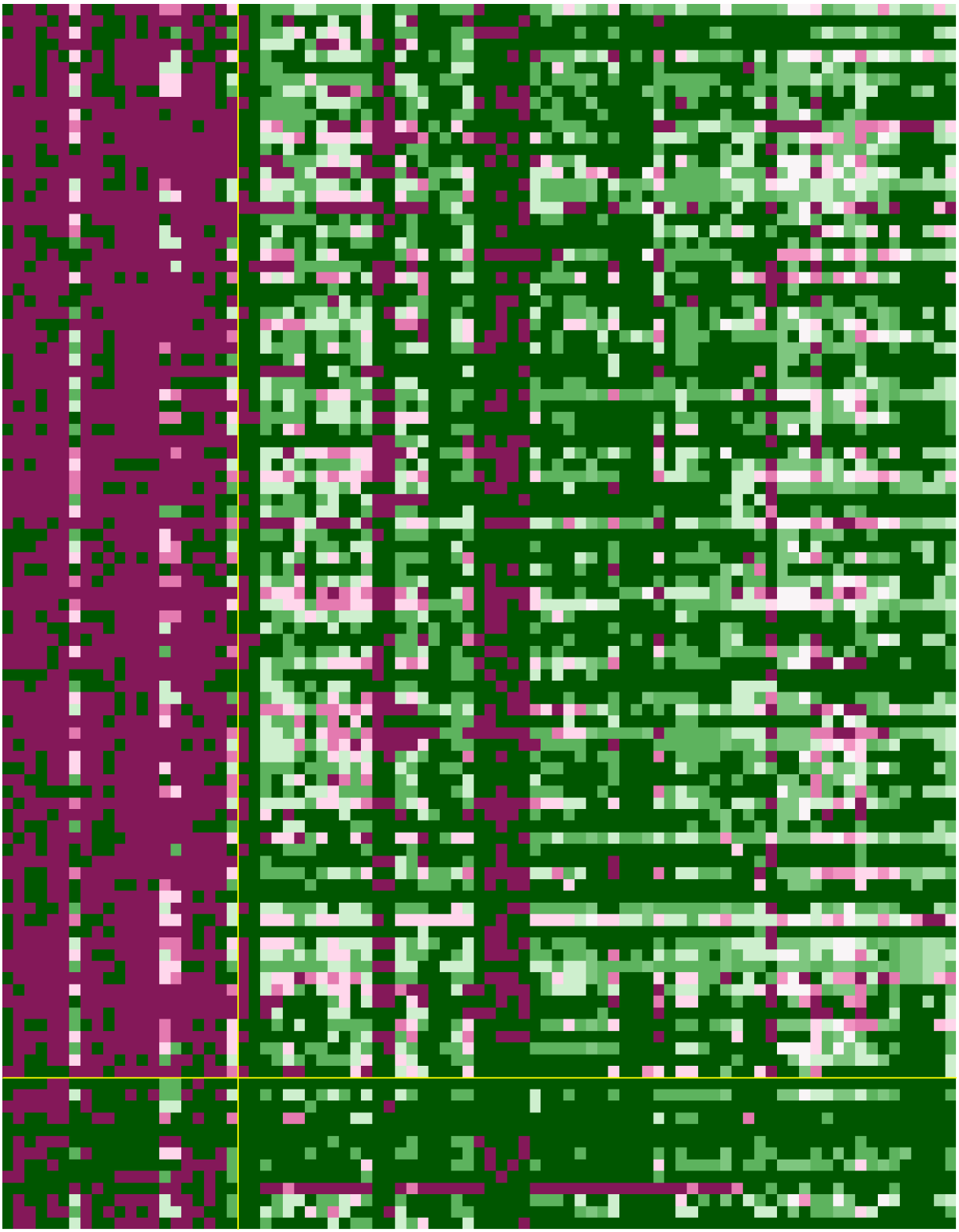


Fig. 10 Heat map of the output after applying iBBiG on reversed normalized data

Checking stability of the lower league bi-cluster

The next step is to check the stability of the lower league bi-cluster. The results of the bootstrap can be seen below.

```
Bootstrap <- diagnoseColRow(x=as.matrix(ALL),bicResult=rres,number=1,
  nResamplings=100,replace=TRUE)
Bootstrap
```

```
## $bootstrapFstats
##         fval.row  fval.col
##   [1,] 0.7979924 1.3067165
##   [2,] 0.9371383 0.9942259
##   [3,] 1.3189513 0.6734574
##   [4,] 0.6685478 0.6591466
##   [5,] 1.0928939 0.9026472
##   [6,] 0.8586742 1.1661762
##   [7,] 1.0870607 1.3856569
##   [8,] 0.9138639 0.3335514
##   [9,] 0.8979160 0.6992681
##  [10,] 1.1105104 0.9801674
##  [11,] 1.0116815 1.1937116
##  [12,] 0.7207323 0.7069512
##  [13,] 1.1164372 0.7295906
##  [14,] 0.7235431 1.1829847
##  [15,] 1.1726776 1.3950967
##  [16,] 0.8708495 0.9878527
##  [17,] 0.6838335 0.7581408
##  [18,] 0.9808295 0.8671910
##  [19,] 0.7344053 1.4375201
##  [20,] 0.9969654 0.9492906
##  [21,] 0.9359411 1.6588818
##  [22,] 0.9966493 1.0440624
##  [23,] 1.1500606 1.0675496
##  [24,] 1.2756531 0.8615686
##  [25,] 1.3529884 0.7956188
##  [26,] 0.8553642 1.0806680
##  [27,] 0.8984945 1.1660830
##  [28,] 0.9543000 1.5767438
##  [29,] 0.8556963 0.8397891
##  [30,] 0.8403124 0.5771115
##  [31,] 0.8293136 0.7609976
##  [32,] 0.9905076 0.7769686
##  [33,] 1.3664608 0.8043195
##  [34,] 0.9645596 0.8250876
##  [35,] 1.1957421 1.2412775
##  [36,] 0.8508767 0.9998368
##  [37,] 1.1467096 0.4193969
##  [38,] 0.9962381 0.6236250
##  [39,] 1.0062571 0.7761576
##  [40,] 0.8093331 0.8578899
##  [41,] 0.8423958 1.0375705
##  [42,] 0.9459499 0.6541495
##  [43,] 0.9297203 0.5963072
```

```
##  [44,] 1.2395114 1.0935881
##  [45,] 0.8579143 0.4942424
##  [46,] 1.0513815 0.8533810
##  [47,] 1.0438369 0.6561871
##  [48,] 0.6660457 0.9177076
##  [49,] 0.8919452 1.2168715
##  [50,] 1.1892155 1.0838033
##  [51,] 0.9362580 1.1563918
##  [52,] 1.1849307 1.2672165
##  [53,] 1.0291419 0.7593720
##  [54,] 0.8537797 0.9427708
##  [55,] 1.0384150 0.9159030
##  [56,] 1.3423507 1.1809180
##  [57,] 0.9498602 1.0961079
##  [58,] 1.2787334 1.2826109
##  [59,] 1.2425499 0.5897652
##  [60,] 0.8168722 0.7976641
##  [61,] 1.0136154 1.4557635
##  [62,] 1.0267356 0.7445731
##  [63,] 0.8813161 0.9153836
##  [64,] 0.5972872 0.9423047
##  [65,] 0.8909712 1.0352441
##  [66,] 1.0618709 1.0946541
##  [67,] 0.9926126 0.8549811
##  [68,] 0.7508952 0.6393160
##  [69,] 0.7824684 0.9307122
##  [70,] 0.9663524 0.7974397
##  [71,] 0.8071138 1.1534876
##  [72,] 1.0650915 0.5771168
##  [73,] 1.0536819 0.4709691
##  [74,] 1.1995114 0.8012491
##  [75,] 0.8938814 1.5713564
##  [76,] 1.2589669 0.8521530
##  [77,] 0.9405971 1.3200398
##  [78,] 0.9027593 1.1596057
##  [79,] 1.1505437 0.6030326
##  [80,] 0.9120038 0.9748330
##  [81,] 1.2813286 0.6551136
##  [82,] 0.7724978 0.8278658
##  [83,] 1.2266625 1.4107789
##  [84,] 0.9079792 1.3837436
##  [85,] 0.8795582 0.8149710
##  [86,] 1.0846615 0.9358754
##  [87,] 0.8896714 1.3566582
##  [88,] 0.8576593 0.8028971
```

```
##  [89,] 0.7972988 0.6975510
##  [90,] 1.0176857 1.0873559
##  [91,] 1.2978695 1.2067807
##  [92,] 0.8839910 0.7551015
##  [93,] 1.1735343 0.9006334
##  [94,] 1.0105710 1.4472670
##  [95,] 1.1215892 0.7969081
##  [96,] 1.1802885 0.7285614
##  [97,] 1.0406291 1.0653630
##  [98,] 1.1020577 1.6064133
##  [99,] 1.0438077 0.5099306
## [100,] 0.9533036 0.7201019
##
## $observedFstatRow
## [1] 2.534745
##
## $observedFstatCol
## [1] 69.22534
##
## $bootstrapPvalueRow
## [1] 0
##
## $bootstrapPvalueCol
## [1] 0
```

Bicluster is stable in 0.05 significance level

Calculating partial rankings

The next step is to calculate partial rankings based on the indicators and hotels in the lower league. The calculation of each score of each indicator of the hotels are done according to the method used in the original RESPONDENT ranking. The original weights of hotels' indicators are used, and the total scores for the hotels are calculated using the selected indicators in the given bi-cluster. **Table 6** shows the result of partial ranking in the case of the lower league.

The final step is to compare the results of the partial rankings to the corresponding part of the original rankings. The results of the Spearman's rank correlation shows a strong positive relationship between the two ranking.

```
C<-biclust::bicluster(mtx,rres,number=1)

B<-as.data.frame(C[[1]])

selectedweight<-weights[,colnames(B)]

cols <- colnames(B)

sw<-weights[,cols]

BR<-rowSums(B[,cols]*sw)/max(rowSums(B[,cols]*sw))

B$Overall_Score<-BR

B$Rank<-rank(-B$Overall_Score)



kable(B,caption = "**Table xx** League C1 by iBBiG",digits = 2)


cor(B$Rank,as.matrix(RANK_RESPONDENT[rownames(B),]),method="spearman")
```

```
##           [,1]
## [1,] 0.7396763
```

```
cor.test(B$Rank,as.matrix(RANK_RESPONDENT[rownames(B),]),method="spearman")
```

```
##
##  Spearman's rank correlation rho
##
## data:  B$Rank and as.matrix(RANK_RESPONDENT[rownames(B), ])
## S = 33781, p-value < 2.2e-16
## alternative hypothesis: true rho is not equal to 0
## sample estimates:
##       rho
## 0.7396763
```

```
weightst<-matrix(1/nrow(mtx),1,nrow(mtx))
colnames(weightst)<-rownames(mtx)
tRESP <- as.data.frame(mtx)
BRt<-colSums(tRESP*weightst)/max(colSums(tRESP*weightst))
RANK_RESPt<-as.matrix(rank(-BRt))


Bt<-as.data.frame(t(C[[1]]))
swt<-weightst[,colnames(Bt)]
colst <- colnames(Bt)
swt<-weightst[,colst]
BRt<-rowSums(Bt[,colst]*swt)/max(rowSums(Bt[,colst]*swt))
Bt$Overall_Score<-BRt
Bt$Rank<-rank(-Bt$Overall_Score)
cor.test(Bt$Rank,as.matrix(RANK_RESPt[rownames(Bt),]),method="spearman")
```

```
##
##  Spearman's rank correlation rho
##
## data:  Bt$Rank and as.matrix(RANK_RESPt[rownames(Bt), ])
## S = 25.55, p-value = 1.505e-15
## alternative hypothesis: true rho is not equal to 0
## sample estimates:
##       rho
## 0.9834092
```

Both bi-cluster are relevant.

Applying BicARE on normalized data

In this step the BicARE algorithm determines the number of the bi-clusters.

```
BICARE_res <- FLOC(Data=ExpressionSet(mtx),k=1,pGene=1,pSample=1,r=1e-16,N=28,M=17,t=10000,blocGene=NULL,bl
ocSample=NULL)
bres <- bicare2biclust(BICARE_res)
summary(bres)
```

```
##
```

```
## An object of class Biclust

##

## call:

##  NULL

##

## There was one cluster found with

##   28 Rows and  17 columns
```

The results above show that the BiCARE algorithm found 1 bi-clusters. These bi-clusters contain the middle leagues respondents and indicators.

Calculating F-tests of the middle league bi-cluster

In **Table 5** the results of the row and column effects (F-tests) can be read. Both the row and column effects are significant, so the middle league bi-cluster is significant.

```
RObs.FStat <- NULL

for (i in c(1:bres@Number)){

  RObs.FStat[[i]] <- computeObservedFstat(x=mtx,bicResult=bres,number=i)

}

kable(RObs.FStat,caption = "**Table 5** The results of row and column effects of the middle league")
```

Table 5 The results of row and column effects of the middle league

	Fstat	PValue
Row Effect	5.241479	0
Column Effect	10.876409	0
Tukey test	100.275222	0

The bicluster is not significant

To see the differences between those respondents that are included in the middle league and those that are not in the middle league, one can plot the means, medians, variances, and median absolute deviations (MAD) for rows (respondents) (see **Fig. 11**). On **Fig. 11** the red line indicates those respondents that are included in the middle league, while the black line shows the remaining respondents. **Fig. 11.** shows that in the case of the respondents in the middle league the variances differ the most.

```
exploreBic(dset=mtx,bres=bres,mname='biclust',pfor='all',gby='genes',bnum=1)
```

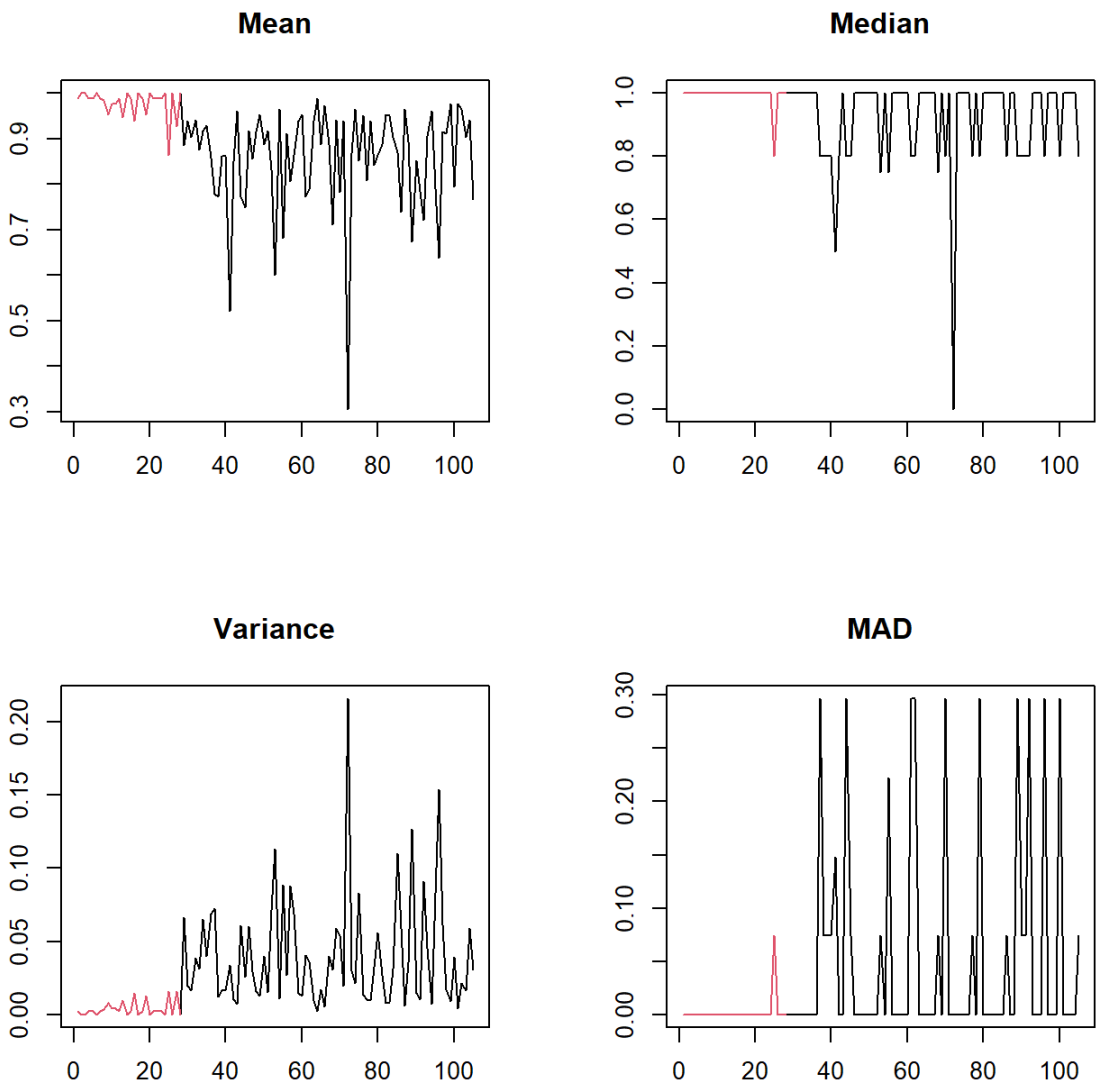


Fig. 11 Mean, median, variance and MAD for middle league respondents

One can do the same for the columns (indicators). **Fig. 12** shows the differences between the means, medians, variances, and median absolute deviations (MAD) for the indicators. The red line indicates those indicators that are in the middle league, while the black line shows the remaining indicators. In the case of the indicators in the middle league, all parameters are different.

```
exploreBic(dset=mtx,bres=bres,mname='biclust',pfor='all',gby='conditions',bnum=1)
```

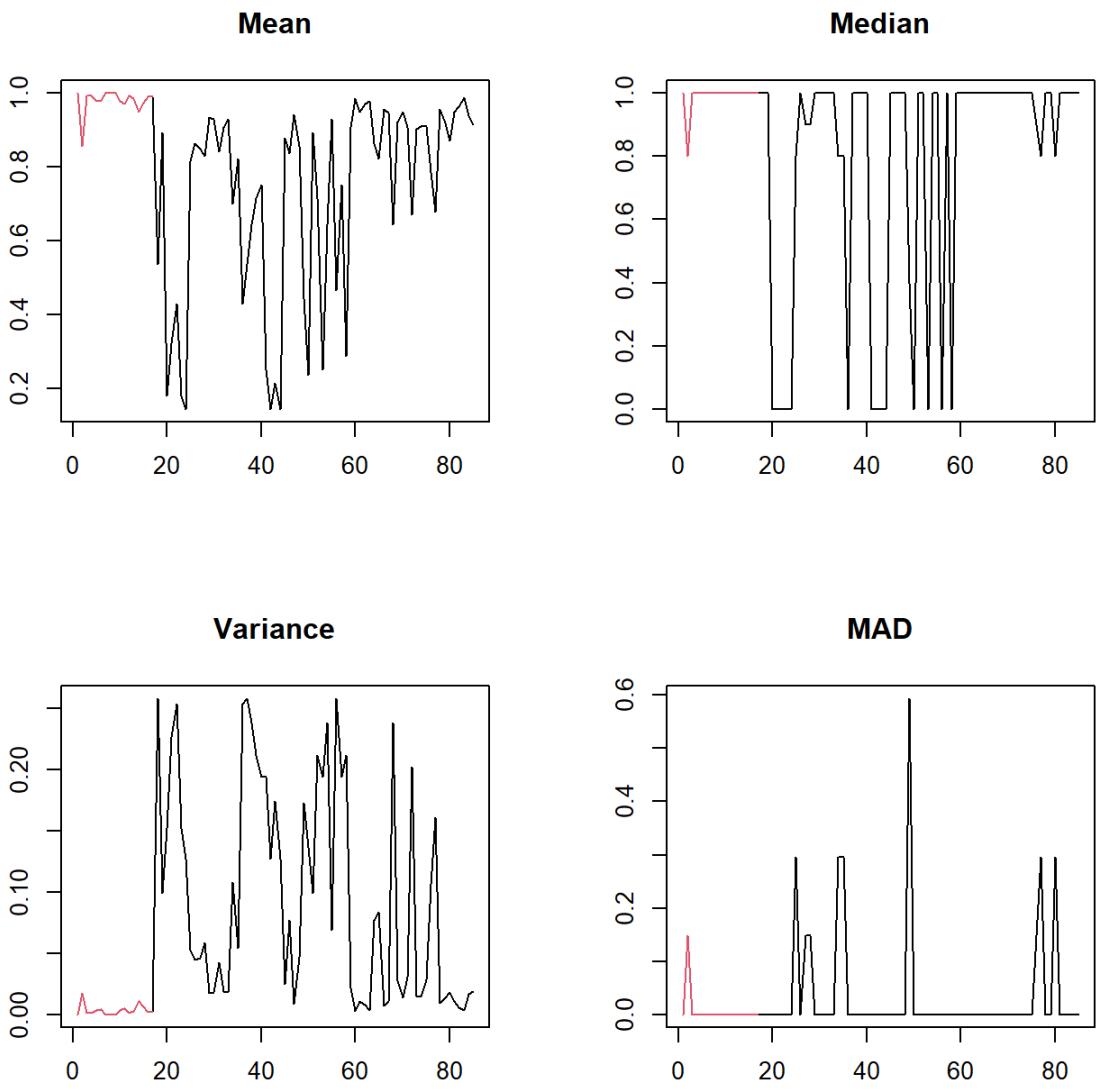


Fig. 12 Mean, median, variance and MAD for middle league indicators

Heat maps of the middle league

Fig. 13 depicts the heat map of the middle league.

```
drawHeatmap(x=mtx,bicResult=bres,number=1,paleta=colorspace::diverging_hcl(100, "Red-Green",rev = FALSE),be
amercolor = TRUE)
```

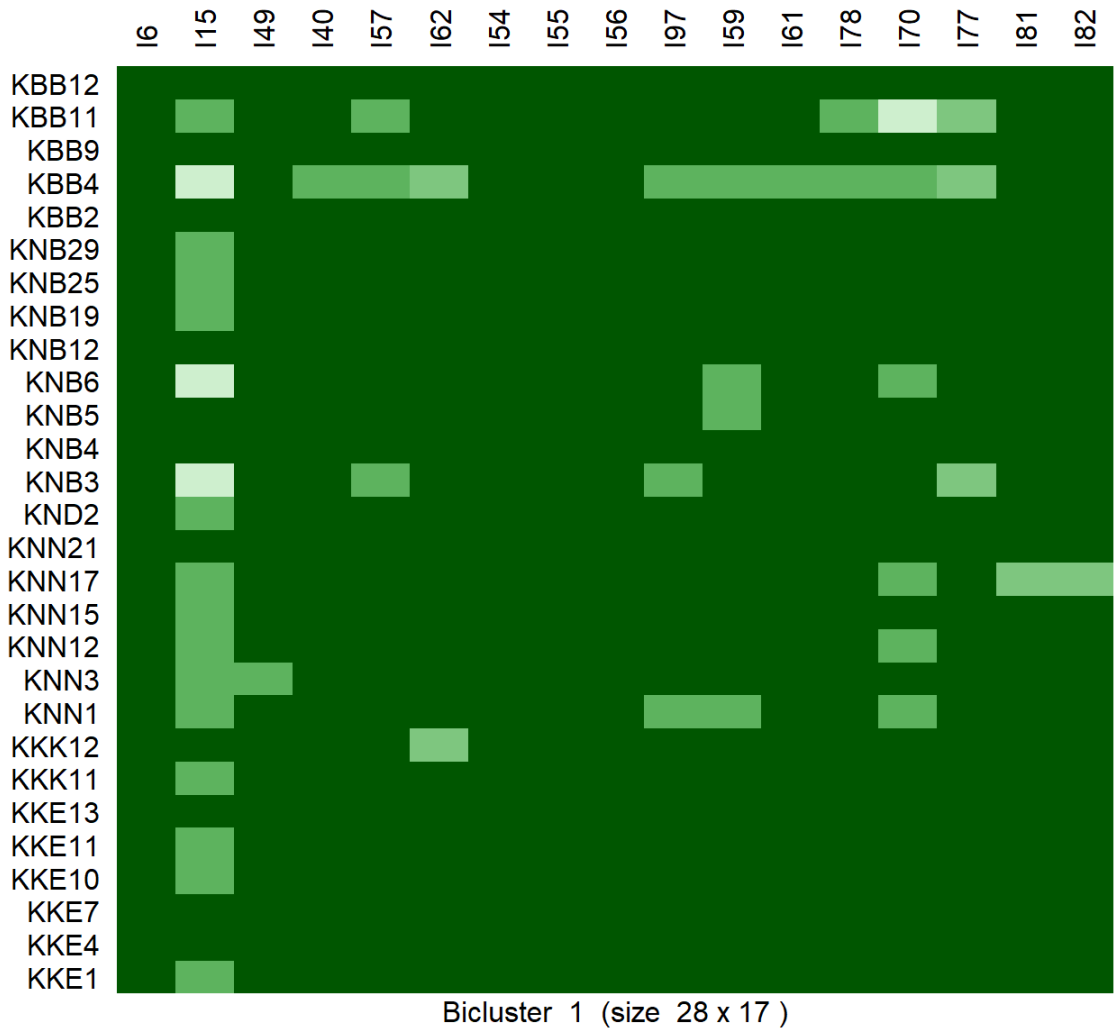


Fig. 13 Heat map of the middle league

Fig. 14 shows the results of BicARE on normalized data. The middle league can be seen in the upper left corner of **Fig. 14** which is enlarged on **Fig.13**.

```
drawHeatmap(x=mtx,bicResult=bres,local=FALSE,number=1,paleta=colorspace::diverging_hcl(100, "Red-Green",rev
= FALSE),beamercolor = TRUE)
```

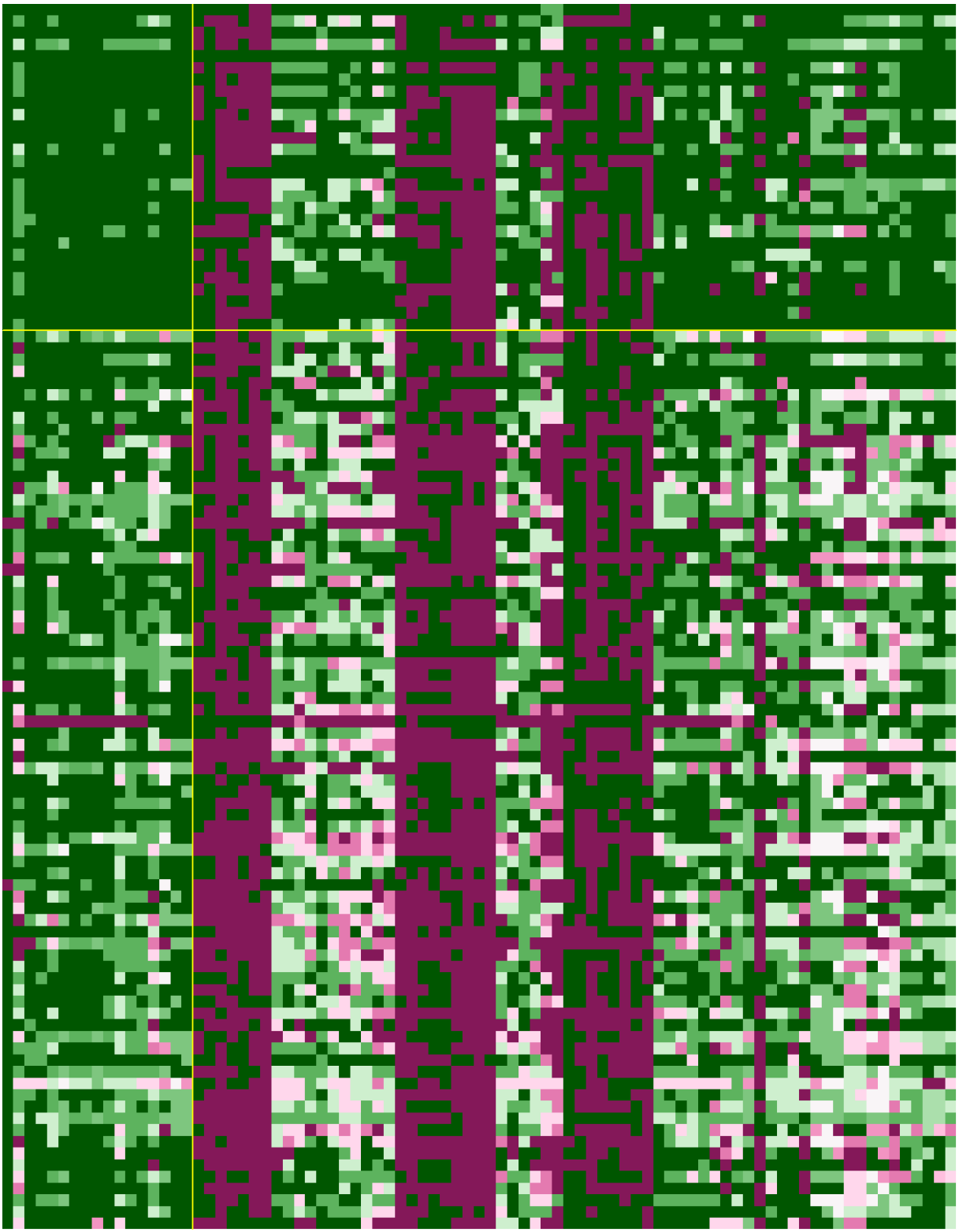


Fig. 14 Heat map of the output after applying BicARE on normalized data

Checking stability of the middle league bi-cluster

The next step is to check the stability of the middle league bi-cluster. The results of the bootstrap can be seen below.

```
Bootstrap <- diagnoseColRow(x=as.matrix(ALL),bicResult=bres,number=1,
  nResamplings=100,replace=TRUE)
Bootstrap
```

```
## $bootstrapFstats
##          fval.row  fval.col
##   [1,] 1.2372643 0.9398736
##   [2,] 0.7966668 1.6363204
##   [3,] 1.2150612 0.6743676
##   [4,] 0.8326536 1.2333247
##   [5,] 1.3578935 0.6324518
##   [6,] 1.5596022 1.0816034
##   [7,] 0.9768597 1.3612872
##   [8,] 0.4616161 0.6123576
##   [9,] 0.6771241 1.1211221
##  [10,] 0.4321018 1.9584605
##  [11,] 0.8798075 0.7398167
##  [12,] 0.9398806 0.9225002
##  [13,] 1.0532344 1.4709916
##  [14,] 0.9787878 0.7540362
##  [15,] 1.1929687 0.7304497
##  [16,] 1.0418386 0.5975351
##  [17,] 0.9367838 1.5436317
##  [18,] 0.7685037 0.8809758
##  [19,] 0.6257943 0.9050208
##  [20,] 1.1407917 0.7769195
##  [21,] 0.9652991 0.6799730
##  [22,] 1.0408983 0.8199904
##  [23,] 0.9790771 0.8822895
##  [24,] 0.9457270 0.9760608
##  [25,] 1.0541606 1.3288264
##  [26,] 0.8585500 1.3410531
##  [27,] 0.9007124 0.6674529
##  [28,] 1.4718454 0.8816912
##  [29,] 1.1548557 0.5798621
##  [30,] 1.0809000 1.0744185
##  [31,] 0.9632667 1.2045730
##  [32,] 1.1125005 1.4131277
##  [33,] 1.2730290 1.2645470
##  [34,] 1.0671535 1.1122656
##  [35,] 1.1611513 0.9703727
##  [36,] 0.5612804 1.1346249
##  [37,] 0.7152775 0.8037693
##  [38,] 0.6446214 0.3850821
##  [39,] 1.2268647 1.4183697
##  [40,] 1.3554544 0.7189231
##  [41,] 0.7831861 1.0197379
##  [42,] 0.5127188 1.3492719
##  [43,] 1.3976394 1.2932162
```

```
##  [44,] 0.8619249 1.1054350
##  [45,] 1.0175805 0.5893859
##  [46,] 0.6192207 1.0817036
##  [47,] 1.0758143 0.8374679
##  [48,] 1.5307772 0.4616302
##  [49,] 1.0211109 0.6615351
##  [50,] 1.0857099 1.3433589
##  [51,] 1.2904999 0.8278908
##  [52,] 0.4628453 0.9417100
##  [53,] 0.6237107 0.8630831
##  [54,] 0.8161806 1.9897914
##  [55,] 1.2689119 1.1093852
##  [56,] 0.9896825 0.9735958
##  [57,] 1.1533292 1.5506720
##  [58,] 1.2441414 1.0767162
##  [59,] 1.4397998 1.2051361
##  [60,] 0.5188497 0.5170770
##  [61,] 1.2257055 0.9688323
##  [62,] 0.7335396 1.3179141
##  [63,] 0.9572170 0.8421890
##  [64,] 0.9050841 0.9647919
##  [65,] 0.8710163 1.4373565
##  [66,] 0.7262337 1.0018124
##  [67,] 1.9103038 1.4185061
##  [68,] 0.8701762 1.2106525
##  [69,] 0.8272628 1.0295601
##  [70,] 0.7344216 1.3732825
##  [71,] 0.8738019 1.0195792
##  [72,] 1.0933571 0.5758876
##  [73,] 1.2977994 1.6337116
##  [74,] 1.0223107 1.1207796
##  [75,] 0.8658449 1.2656260
##  [76,] 0.9437217 0.5867406
##  [77,] 1.0643573 1.2122840
##  [78,] 1.1426833 1.0350213
##  [79,] 1.1079656 1.0111815
##  [80,] 0.7219213 0.8431807
##  [81,] 1.5920716 0.6496426
##  [82,] 1.4519102 0.9313644
##  [83,] 1.3311585 1.2395775
##  [84,] 0.9976744 0.8070176
##  [85,] 1.0189387 0.7730730
##  [86,] 1.2354924 0.9474299
##  [87,] 0.6798059 1.1088483
##  [88,] 1.0580587 0.9171816
```

```
##  [89,] 0.8351070 0.7735122
##  [90,] 1.5446860 0.8940182
##  [91,] 1.0218961 0.6467883
##  [92,] 0.5316515 0.9256341
##  [93,] 0.7380992 1.0160085
##  [94,] 0.5633343 1.6127216
##  [95,] 0.9454145 1.2887464
##  [96,] 0.8759506 0.9775602
##  [97,] 0.9748814 1.3184113
##  [98,] 0.8850629 1.9019981
##  [99,] 1.2282472 1.3183637
## [100,] 1.2563046 2.1704741
##
## $observedFstatRow
## [1] 5.232971
##
## $observedFstatCol
## [1] 378.4791
##
## $bootstrapPvalueRow
## [1] 0
##
## $bootstrapPvalueCol
## [1] 0
```

First bi-cluster is stable.

Calculating partial rankings

The next step is to calculate partial rankings based on the indicators and respondents in the middle league. The calculation of each score of each indicator of the respondents are done according to the method used in the original RESPONDENT ranking. The original weights of RESPONDENT's indicators are used, and the total scores for the respondents are calculated using the selected indicators in the given bi-cluster. **Table 6** shows the result of partial ranking in the case of the middle league.

```
C<-biclust::bicluster(mtx,bres,number=1)
B<-as.data.frame(C[[1]])
selectedweight<-weights[,colnames(B)]
cols <- colnames(B)
sw<-weights[,cols]
BR<-rowSums(B[,cols]*sw)/max(rowSums(B[,cols]*sw))
B$Overall_Score<-BR
B$Rank<-rank(-B$Overall_Score)



kable(B,caption = "**Table 6** League B1 by iBBiG",digits = 2)


cor(B$Rank,as.matrix(RANK_RESPONDENT[rownames(B),]),method="spearman")
##           [,1]
```

```
## [1,] 0.5052628
```

```
cor.test(B$Rank,as.matrix(RANK_RESPONDENT[rownames(B),]),method="spearman")
```

```
##
##  Spearman's rank correlation rho
##
## data:  B$Rank and as.matrix(RANK_RESPONDENT[rownames(B), ])
## S = 1807.8, p-value = 0.006097
## alternative hypothesis: true rho is not equal to 0
## sample estimates:
##       rho
## 0.5052628
```

```
weightst<-matrix(1/nrow(mtx),1,nrow(mtx))
colnames(weightst)<-rownames(mtx)
tRESP <- as.data.frame(mtx)
BRt<-colSums(tRESP*weightst)/max(colSums(tRESP*weightst))
RANK_RESPt<-as.matrix(rank(-BRt))


Bt<-as.data.frame(t(C[[1]]))
swt<-weightst[,colnames(Bt)]
colst <- colnames(Bt)
swt<-weightst[,colst]
BRt<-rowSums(Bt[,colst]*swt)/max(rowSums(Bt[,colst]*swt))
Bt$Overall_Score<-BRt
Bt$Rank<-rank(-Bt$Overall_Score)



cor.test(Bt$Rank,as.matrix(RANK_RESPt[rownames(Bt),]),method="spearman")
```

```
##
##  Spearman's rank correlation rho
##
## data:  Bt$Rank and as.matrix(RANK_RESPt[rownames(Bt), ])
## S = 71.21, p-value = 3.237e-07
## alternative hypothesis: true rho is not equal to 0
## sample estimates:
##       rho
## 0.9127329
```

The first bi-cluster is relevant

Specifying overlaps

Bi-cluster might (or might not) overlap. Analyzing the overlaps can give a subtler picture of respondents and indicators.

Venn diagram of indicators for first leagues

Fig. 15 shows the Venn diagram of the indicators. The red circle contains those indicators that are in the upper league (League A1), in the the blue circle those indicators can be found that are in the lower league (League C1). The green circle indicates the middle league's (League B1) indicators. OLV

```
T<-biclust::bicluster(orig_mtx,res,number = 1)

League_A<-T[[1]]

R<-biclust::bicluster(orig_mtx,rres,number = 1)

League_C<-R[[1]]

B<-biclust::bicluster(orig_mtx,bres,number = 1)

League_B<-B[[1]]

draw.triple.venn(area1=nrow(as.matrix(colnames(League_A))),area2=nrow(as.matrix(colnames(League_B))),area3=
nrow(as.matrix(colnames(League_C))),n12=nrow(as.matrix(intersect(colnames(League_A),colnames(League_B)))),n
13=nrow(as.matrix(intersect(colnames(League_A),colnames(League_C)))),n23=nrow(as.matrix(intersect(colnames(
League_B),colnames(League_C)))),n123=nrow(as.matrix(intersect(intersect(colnames(League_A),colnames(League_
B)),colnames(League_C)))),fill=c("red","green","blue"),category=c("League A","League B","League C"),main="V
enn Diagram of indicators")
```

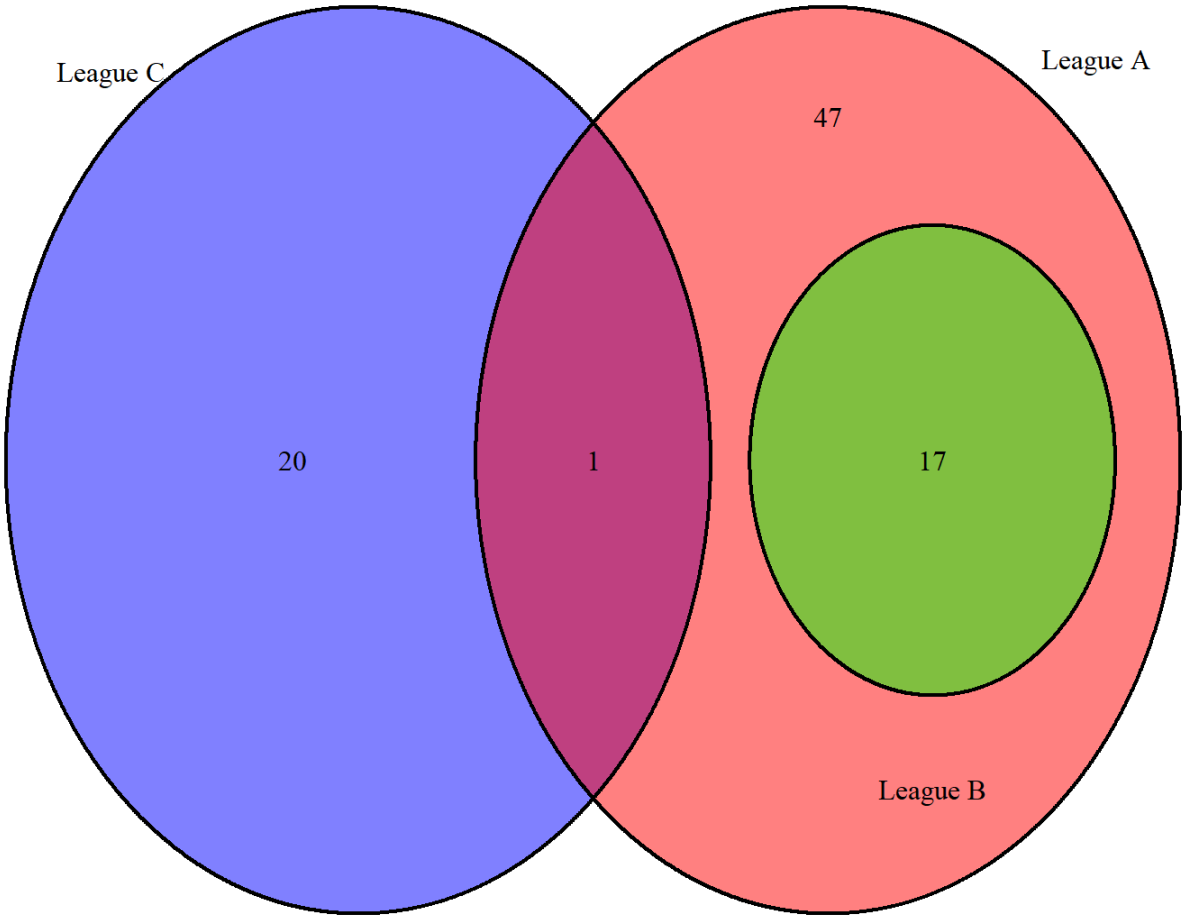


Fig. 15 Venn diagram of the indicators

```
## (polygon[GRID.polygon.17], polygon[GRID.polygon.18], polygon[GRID.polygon.19], polygon[GRID.polygon.20],
polygon[GRID.polygon.21], polygon[GRID.polygon.22], text[GRID.text.23], text[GRID.text.24], text[GRID.text.
25], text[GRID.text.26], text[GRID.text.27], text[GRID.text.28], text[GRID.text.29])
```

One interesting finding is, that all of the indicators in the middle league are part of the lower league's indicators.

Venn diagram of respondents for first leagues

Fig. 16 shows the Venn diagram of the respondents. The red circle contains those respondents that are in the upper league (League A1), in the the blue circle those respondents can be found that are in the lower league (League C1). The green circle indicates the middle league's (League B1) respondents.

```
draw.triple.venn(area1=nrow(as.matrix(rownames(League_A))),area2=nrow(as.matrix(rownames(League_B))),area3=
nrow(as.matrix(rownames(League_C))),n12=nrow(as.matrix(intersect(rownames(League_A),rownames(League_B)))),n
13=nrow(as.matrix(intersect(rownames(League_A),rownames(League_C)))),n23=nrow(as.matrix(intersect(rownames(
League_B),rownames(League_C)))),n123=nrow(as.matrix(intersect(intersect(rownames(League_A),rownames(League_
B)),rownames(League_C)))),fill=c("red","green","blue"),category=c("League A","League B","League C"),main="V
enn Diagram of respondents")
```

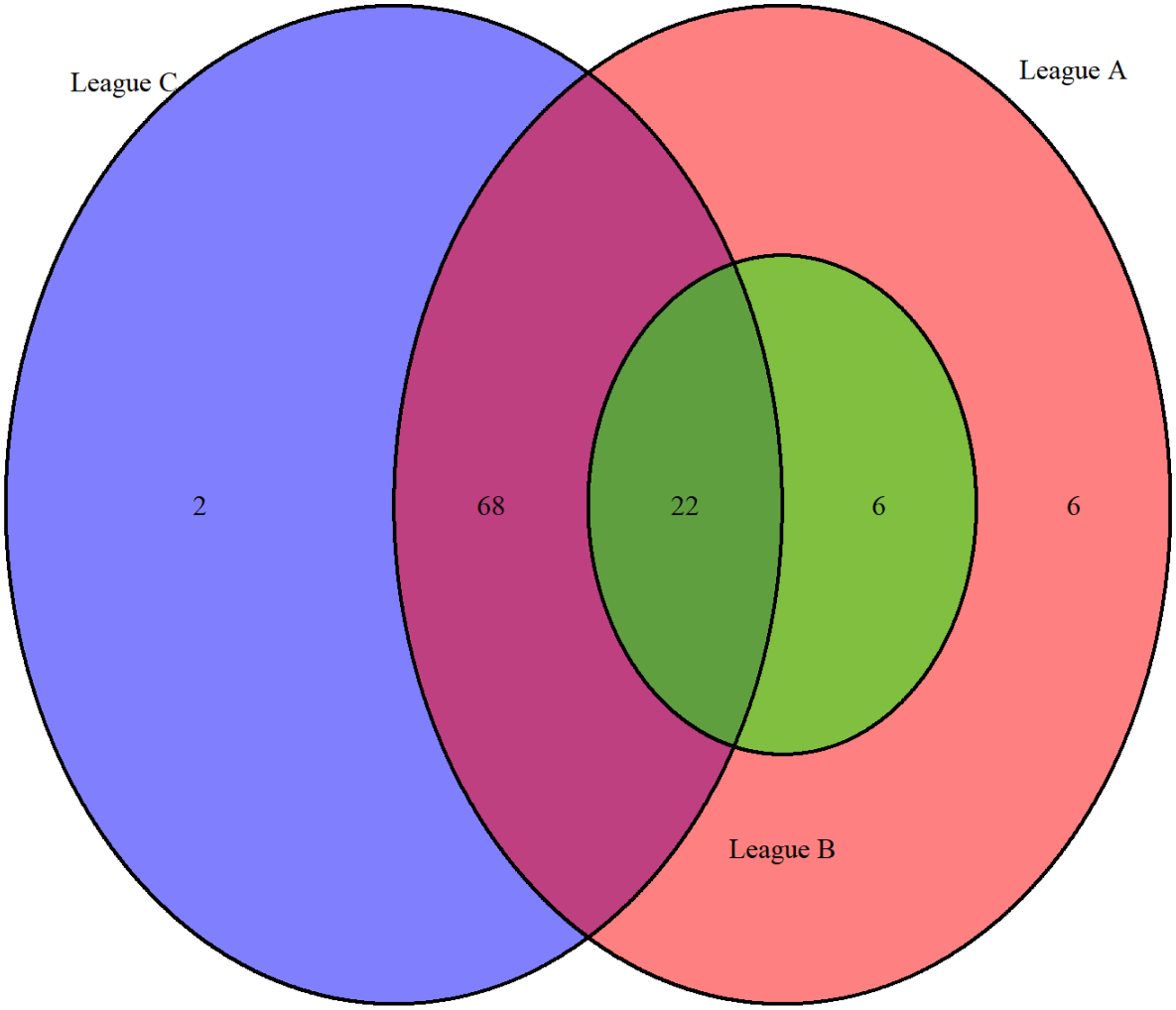


Fig. 16 Venn diagram of the respondents

```
## (polygon[GRID.polygon.30], polygon[GRID.polygon.31], polygon[GRID.polygon.32], polygon[GRID.polygon.33],
polygon[GRID.polygon.34], polygon[GRID.polygon.35], text[GRID.text.36], text[GRID.text.37], text[GRID.text.
38], text[GRID.text.39], text[GRID.text.40], text[GRID.text.41], text[GRID.text.42], text[GRID.text.43])
```

Write results to DataFrame

```
RESULT<-ALL

RESULT$League_A<-0

RESULT$League_B<-0

RESULT$League_C<-0

rownames(RESULT)<-rownames(ALL)

RESULT[rownames(League_A),"League_A"]<-1
```

```
rownames(RESULT)<-rownames(ALL)
RESULT[rownames(League_B),"League_B"]<-1
rownames(RESULT)<-rownames(ALL)
RESULT[rownames(League_C),"League_C"]<-1
rownames(RESULT)<-rownames(ALL)
RESULT[nrow(RESULT)+1,]<-0
RESULT[nrow(RESULT)+1,]<-0
RESULT[nrow(RESULT)+1,]<-0
rownames(RESULT)<-c(rownames(ALL),"League_A","League_B","League_C")
RESULT["League_A",colnames(League_A)]<-1
rownames(RESULT)<-c(rownames(ALL),"League_A","League_B","League_C")
RESULT["League_B",colnames(League_B)]<-1
rownames(RESULT)<-c(rownames(ALL),"League_A","League_B","League_C")
RESULT["League_C",colnames(League_C)]<-1
rownames(RESULT)<-c(rownames(ALL),"League_A","League_B","League_C")
names(dimnames(RESULT)) <- c("RESPONDENT", "")
```

Export the results to an Excel file

```
write.xlsx(RESULT,"RESPONDENT_BICRES_50Bsig.xlsx")
```

Summing up the conclusions

The above proposed bi-clustering method can help to identify which respondents can be compared based on which indicators in university rankings. With the iBBiG method the upper and lower league(s) (*League(s) A and League(s) C*) can be determined and the BicARE method can specify the middle league(s) (*League(s) B*).

(Source: R-Studio Output)

60. Appendix - R-Studio output threshold 0.5

```
library(seriation) #For seriate a matrix
library(biclust) #General biclustering functions
## Loading required package: MASS
## Loading required package: grid
## Loading required package: colorspace
## Loading required package: lattice
##
## Attaching package: 'lattice'
## The following object is masked from 'package:seriation':
##
##     panel.lines
library(BiocManager)
library(iBBiG) #iBBiG biclustering
library(BicARE) #BicARE biclustering
## Loading required package: Biobase
## Loading required package: BiocGenerics
```

```
##
## Attaching package: 'BiocGenerics'
## The following objects are masked from 'package:stats':
##
##     IQR, mad, sd, var, xtabs
## The following objects are masked from 'package:base':
##
##     anyDuplicated, aperm, append, as.data.frame, basename, cbind,
##     colnames, dirname, do.call, duplicated, eval, evalq, Filter, Find,
##     get, grep, grepl, intersect, is.unsorted, lapply, Map, mapply,
##     match, mget, order, paste, pmax, pmax.int, pmin, pmin.int,
##     Position, rank, rbind, Reduce, rownames, sapply, setdiff, sort,
##     table, tapply, union, unique, unsplit, which.max, which.min
## Welcome to Bioconductor
##
##     Vignettes contain introductory material; view with
##     'browseVignettes()'. To cite Bioconductor, see
##     'citation("Biobase")', and for packages 'citation("pkgname")'.
## Loading required package: multtest
## Loading required package: GSEABase
## Loading required package: annotate
## Loading required package: AnnotationDbi
## Loading required package: stats4
## Loading required package: IRanges
## Loading required package: S4Vectors
##
## Attaching package: 'S4Vectors'
## The following objects are masked from 'package:base':
##
##     expand.grid, I, unname
##
## Attaching package: 'IRanges'
## The following object is masked from 'package:grDevices':
##
##     windows
##
## Attaching package: 'AnnotationDbi'
## The following object is masked from 'package:MASS':
##
##     select
## Loading required package: XML
## Loading required package: graph
##
## Attaching package: 'graph'
## The following object is masked from 'package:XML':
```

```
##
##     addNode
##
## Attaching package: 'BicARE'
## The following object is masked from 'package:biclust':
##
##     bicluster
library(BcDiag) #Diagnostics of biclusters
## Citation: S. Hochreiter et al.,
## FABIA: Factor Analysis for Bicluster Acquisition,
## Bioinformatics 26(12):1520-1527, 2010.
## BibTex: enter 'toBibtex(citation("fabia"))'
##
## Homepage: http://www.bioinf.jku.at/software/fabia/fabia.html
##
## FABIA Package Version 2.44.0
#Additional statistic packages
library(ggplot2)
library(factoextra) #Additional distance functions
## Welcome! Want to learn more? See two factoextra-related books at https://goo.gl/ve3WBa
library(corrgram) #Correlation diagram
##
## Attaching package: 'corrgram'
## The following object is masked from 'package:lattice':
##
##     panel.fill
library(futile.logger)
library(VennDiagram) #VennDiagram
library(rJava)
library(venneuler) #VennDiagram


#For formatted and interactive tables and figures
library(knitr) #Formatted tables, figures


#For manipulating Excel files
library(readxl) #Read Excel file
library(xlsx) #Write Excel file
normalize <- function(x) {
return ((x - min(x)) / (max(x) - min(x)))
}
NA2mean <- function(x) replace(x, is.na(x), mean(x, na.rm = TRUE))
bicare2biclust <- function(x){
    if(class(x)=="Biclust"){
        return(x)
    } else if(class(x)=="biclustering"){
```

```
        Parameters <- list(numberofbicluster=x$param[1,2],residuthreshold=x$param[2,2],genesinitialprobabili
ty=x$param[3,2],samplesinitialprobability=x$param[4,2],numberofiterations=x$param[5,2],date=x$param[6,2])

        RowxNumber <- t(x$bicRow==1)

        NumberxCol <- x$bicCol==1

        Number <- as.numeric(dim(RowxNumber)[2])

        info <- list()

        return(new("Biclust",Parameters=Parameters,RowxNumber=RowxNumber,NumberxCol=NumberxCol,Number=Numbe
r,info=info))

    }

}

DATA<-read_excel("phdbiclust.xlsx")

DATA[is.na(DATA)] <- 0

ALL<-DATA[,-1]

rownames(ALL)<-as.matrix(DATA[,1])

remove(DATA)

orig_mtx<-as.matrix(ALL)

orig_mtx[is.na(orig_mtx)]<-0


mtx<-orig_mtx

RESPONDENT<-ALL


for (i in 1:ncol(mtx)){

  mtx[,i]<-normalize(mtx[,i])

}

for (i in 1:ncol(RESPONDENT)){

  RESPONDENT[,i]<-normalize(RESPONDENT[,i])

}

RESPONDENT[is.na(RESPONDENT)] <- 0

mtx[is.na(mtx)] <- 0


weights<-matrix(1/ncol(RESPONDENT),1,ncol(RESPONDENT))

colnames(weights)<-colnames(RESPONDENT)

BR<-rowSums(RESPONDENT*weights)/max(rowSums(RESPONDENT*weights))

RANK_RESPONDENT<-as.matrix(rank(-BR))

rownames(RESPONDENT)<-rownames(mtx)

rownames(ALL)<-rownames(mtx)

rownames(RANK_RESPONDENT)<-rownames(RESPONDENT)
```

Firstly, to obtain a preliminary picture of the possible bi-clusters, the seriation of the original data is done.

```
ORIG_SER <- c(seriate(get_dist(orig_mtx,"euclidean"),method="HC_COMPLETE"),seriate(get_dist(t(orig_mtx),"spe
arman"),method="HC_COMPLETE"))

ORIG_ORDERED<-orig_mtx[get_order(ORIG_SER,dim=1),get_order(ORIG_SER,dim=2)]

rownames(ORIG_ORDERED) <- rownames(mtx[get_order(ORIG_SER,dim=1),get_order(ORIG_SER,dim=2)])
```

After seriation, plotting the heat map of the original data (see **Fig. 1**) can help to detect the possible bi-clusters. On **Fig. 1** blue cells indicate a lower value of the indicators, and red cells mean a higher value of the indicators.

```
hmap(as.matrix(ORIG_ORDERED),col=colorspace::diverging_hcl(100, "Red-Green",rev = FALSE),showdist="both")
```

Fig. 1 Heat map of the original matrix after seriation

Seriation of normalized data

After the normalization of the original data, seriation is done on the normalized data.

```
ALL_SER <- c(seriate(get_dist(mtx,"euclidean"),method="HC_COMPLETE"),seriate(get_dist(t(mtx),"spearman"),met
hod="HC_COMPLETE"))

ALL_ORDERED<-mtx[get_order(ALL_SER,dim=1),get_order(ALL_SER,dim=2)]

rownames(ALL_ORDERED) <- rownames(mtx[get_order(ALL_SER,dim=1),get_order(ALL_SER,dim=2)])
```

Estimating the number of bi-clusters

After seriation, plotting the heat map of the normalized original data (see **Fig. 2**) can help to detect the possible bi-clusters.

```
hmap(as.matrix(ALL_ORDERED),col=colorspace::diverging_hcl(100, "Red-Green",rev = FALSE),showdist="both")
```

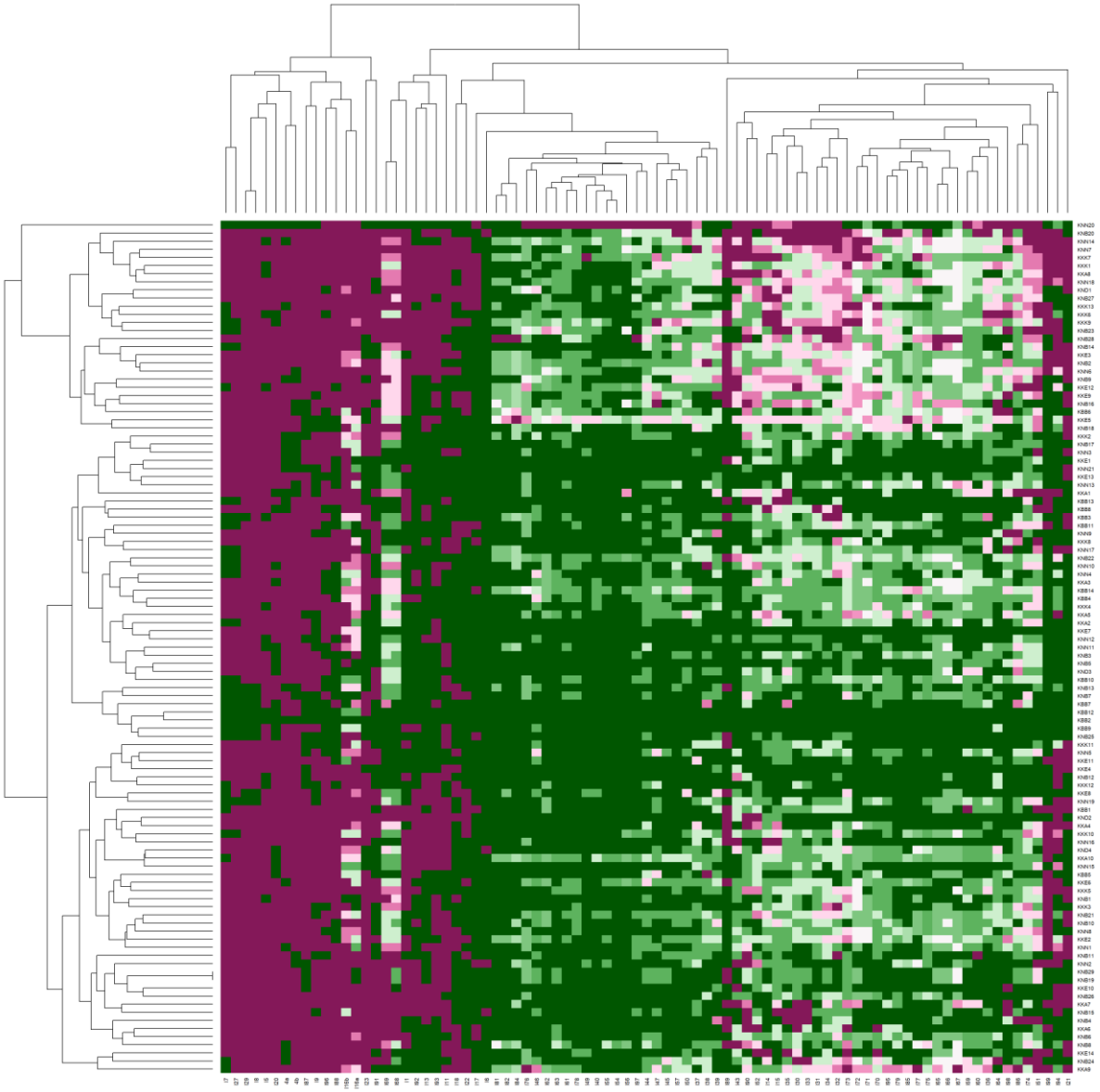


Fig. 2 Heat map of the normalized and seriated matrix

After seriation, two bigger homogeneous blocks can be identified based on **Fig. 2**. The block of the red cells on the left side *Fig. 2** indicates the top league, while the bigger green block, which indicates the remaining (lower) league.

Applying iBBiG on normalized data

Applying the iBBiG method on the original normalized data can specify the top league bi-clusters. First of all, the number of bi-clusters needed to be determined.

```
res <- iBBiG(binaryMatrix=binarize(mtx,threshold = 0.75),nModules = 1,alpha=0.3,pop_size = 100,mutation = 0.
3,stagnation = 50,selection_pressure = 1.2,max_sp = 15,success_ratio = 0.8)
```

```
## Module:  1 ... done
```

```
summary(res)
```

```
##
## An object of class iBBiG
##
## There was one cluster found with Score 2746.318 and
##   80 Rows and  65 columns
```

The results above show that the iBBiG algorithm found a bi-cluster. In the first bi-cluster there are 102 rows (hotels) and 65 columns (indicators), in the second bi-cluster there are 43 rows (hotels) and 7 columns (indicators). The next step is to calculate F-tests to determine which bi-cluster is significant.

```
Obs.FStat <- NULL

for (i in c(1:res@Number)){

  Obs.FStat[[i]] <- computeObservedFstat(x=mtx,bicResult=res,number=i)

}

kable(Obs.FStat,caption = "**Table 1** The results of row and column effects for two bi-clusters")
```

Table 1 The results of row and column effects for two bi-clusters

	Fstat	PValue
Row Effect	7.001303	0
Column Effect	15.843641	0
Tukey test	151.441960	0

In **Table 1** the results of the F-tests can be seen. In the case of the 1 bi-cluster, both the row and column effects are significant (Leagues A) but in the case of the second bi-cluster the row effect is not significant; thus the second bi-cluster is not significant. Therefore I will only use the first bi-cluster.

Calculating top league bi-cluster

The next step is to identify the top league bi-cluster.

```
res <- iBBiG(binaryMatrix=binarize(mtx,threshold = 0.75),nModules = 1,alpha=0.3,pop_size = 100,mutation = 0.
3,stagnation = 50,selection_pressure = 1.2,max_sp = 15,success_ratio = 0.8)
```

```
## Module:  1 ... done
```

```
summary(res)
```

```
##

## An object of class iBBiG

##

## There was one cluster found with Score 2746.318 and

##   80 Rows and  65 columns
```

The results of the iBBiG algorithm can be seen above. The algorithm found one bi-cluster in which there are 98 rows (hotels) and 75 columns (indicators). The following step is to calculate the F-tests to determine whether the bi-cluster is significant or not.

```
Obs.FStat <- NULL

for (i in c(1:res@Number)){

  Obs.FStat[[i]] <- computeObservedFstat(x=mtx,bicResult=res,number=i)

}

kable(Obs.FStat,caption = "**Table 2** The results of row and column effects for the top league")
```

Table 2 The results of row and column effects for the top league

	Fstat	PValue
Row Effect	7.001303	0

Column Effect	15.843641	0
Tukey test	151.441960	0

In Table 2 the results of the row and column effects (F-tests) can be read. Both the row and column effects are significant, so the top league bi-cluster is significant.

To see the differences between those hotels that are included in the top league and those that are not in the top league, one can plot the means, medians, variances, and median absolute deviations (MAD) for rows (respondents) (see **Fig. 3**). (The horizontal axis of **Fig. 3** shows the hotels, the vertical axis shows the tailor made service indicators on normalized (0-1) data of indicators.) On **Fig. 3** the red line indicates those hotels that are included in the top league, while the black line shows the remaining hotels. The hotels in the top league have higher means and medians, and have lower variances.

```
exploreBic(dset=mtx,bres=res,mname='biclust',pfor='all',gby='genes',bnum=1)
```

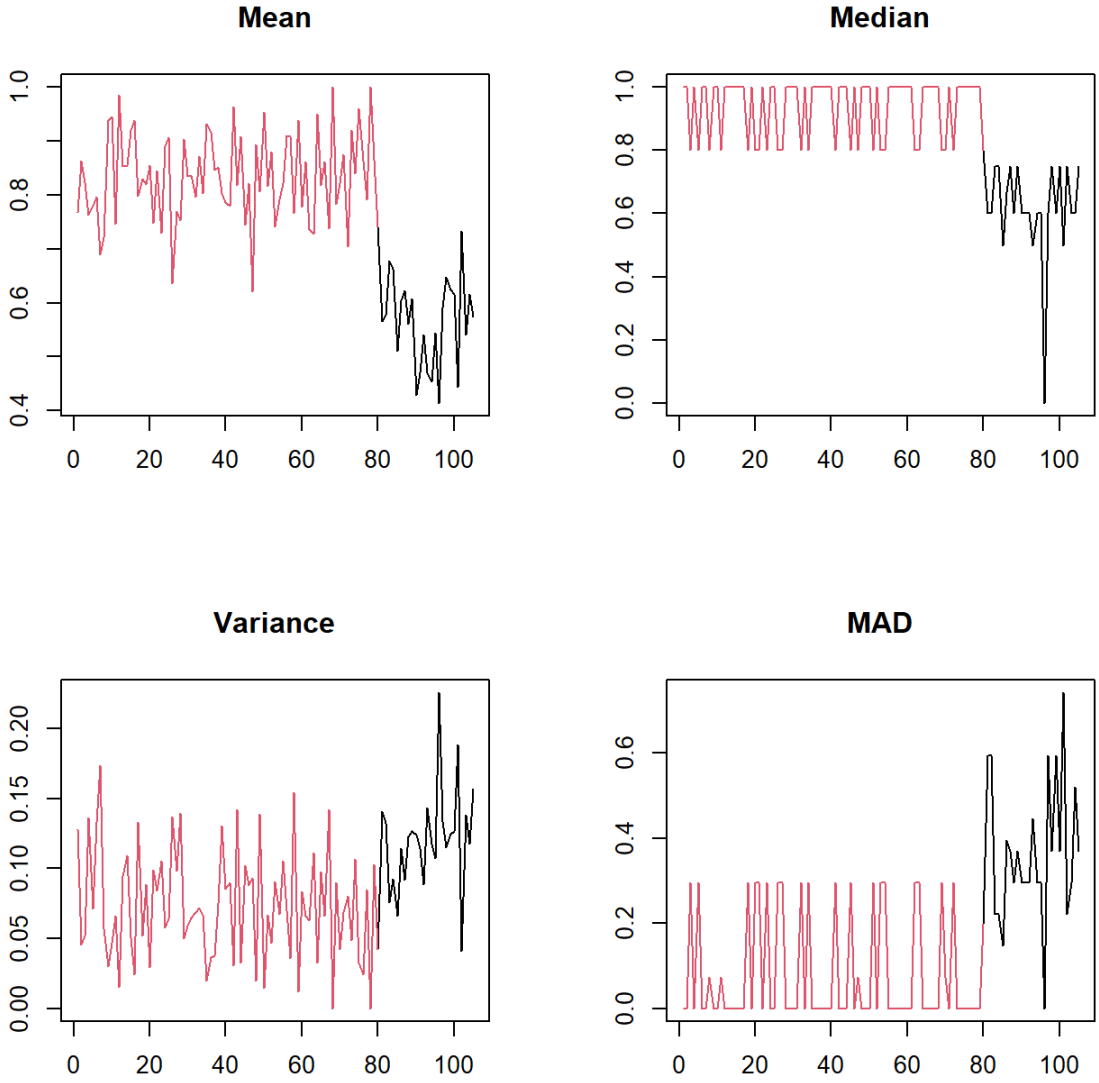


Fig. 3 Mean, median, variance and MAD for the top league respondents

As it can be seen form **Fig. 3**, most hotels belong to the top league.

The same can be done for the columns (indicators). **Fig. 4** shows the differences between the means, medians, variances, and median absolute deviations (MAD) for the indicators. (The horizontal axis of **Fig. 4** shows the tailor made service indicators, the vertical axis shows the hotels (0-1) data of respondents.) The red line indicates those indicators that are in the top league, while the black line shows the remaining indicators.

```
exploreBic(dset=mtx,bres=res,mname='biclust',pfor='all',gby='conditions',bnum=1)
```

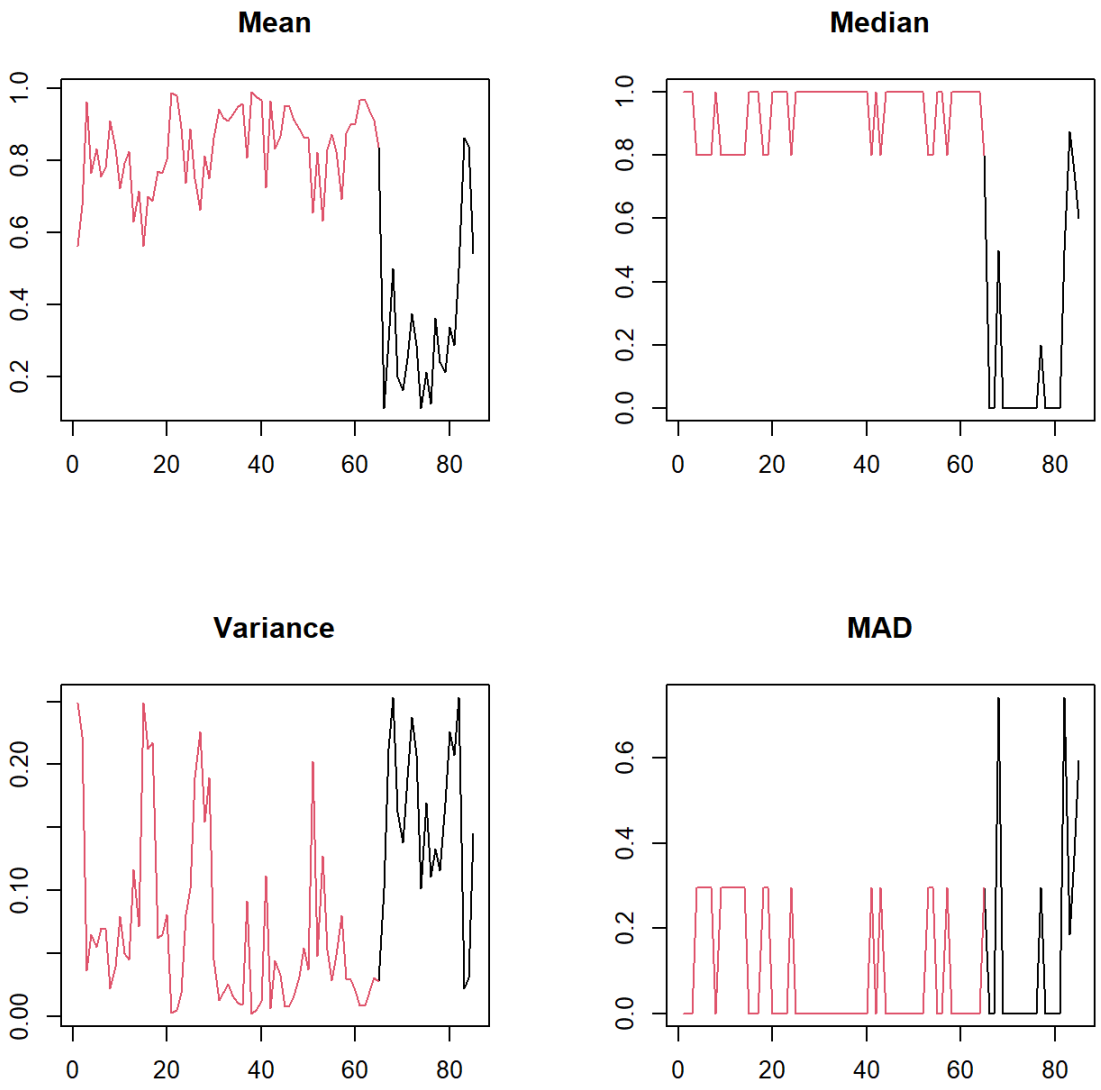


Fig. 4 Mean, median, variance and MAD for the top league indicators

Heat maps of the top league

Fig. 5 depicts the heat map of the top leagues. 98 hotels and 75 tailor mades searvice indicators. / 102 x 65 The red cells mean higher values in the case of indicators, while blue cells symbol lower values.

```
drawHeatmap(x=mtx,bicResult=res,number=1,beamercolor = TRUE,paleta=colorspace::diverging_hcl(100, "Red-Green
",rev = FALSE))
```

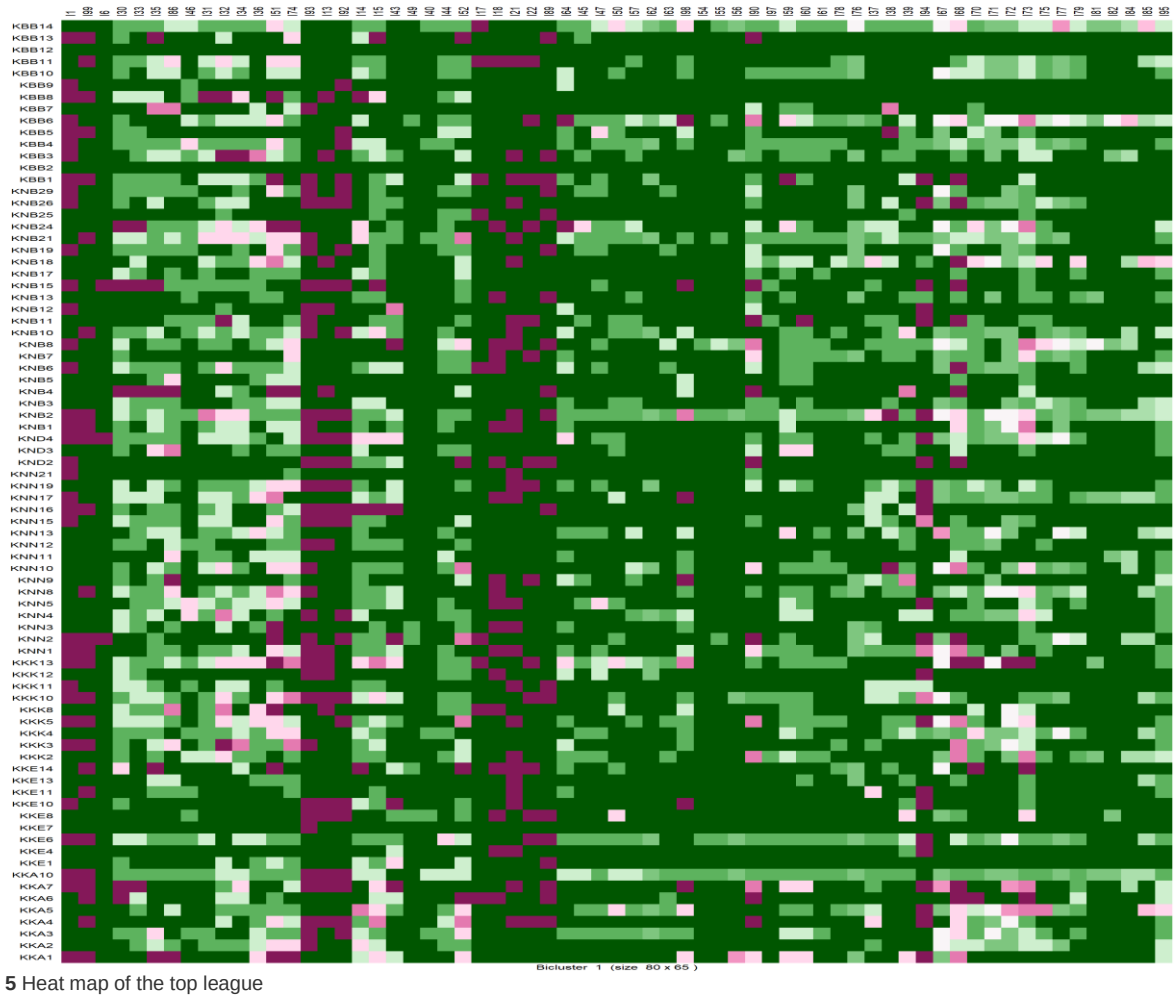


Fig. 5 Heat map of the top league

Fig. 6 shows the heat map of the results of iBBiG on normalized data. The top leagues can be seen in the upper left corner of **Fig. 6** which is enlarged on **Fig. 5**.

```
drawHeatmap(x=mtx,bicResult=res,local=FALSE,number=1,beamercolor = TRUE,paleta=colorspace::diverging_hcl(100
, "Red-Green",rev = FALSE))
```

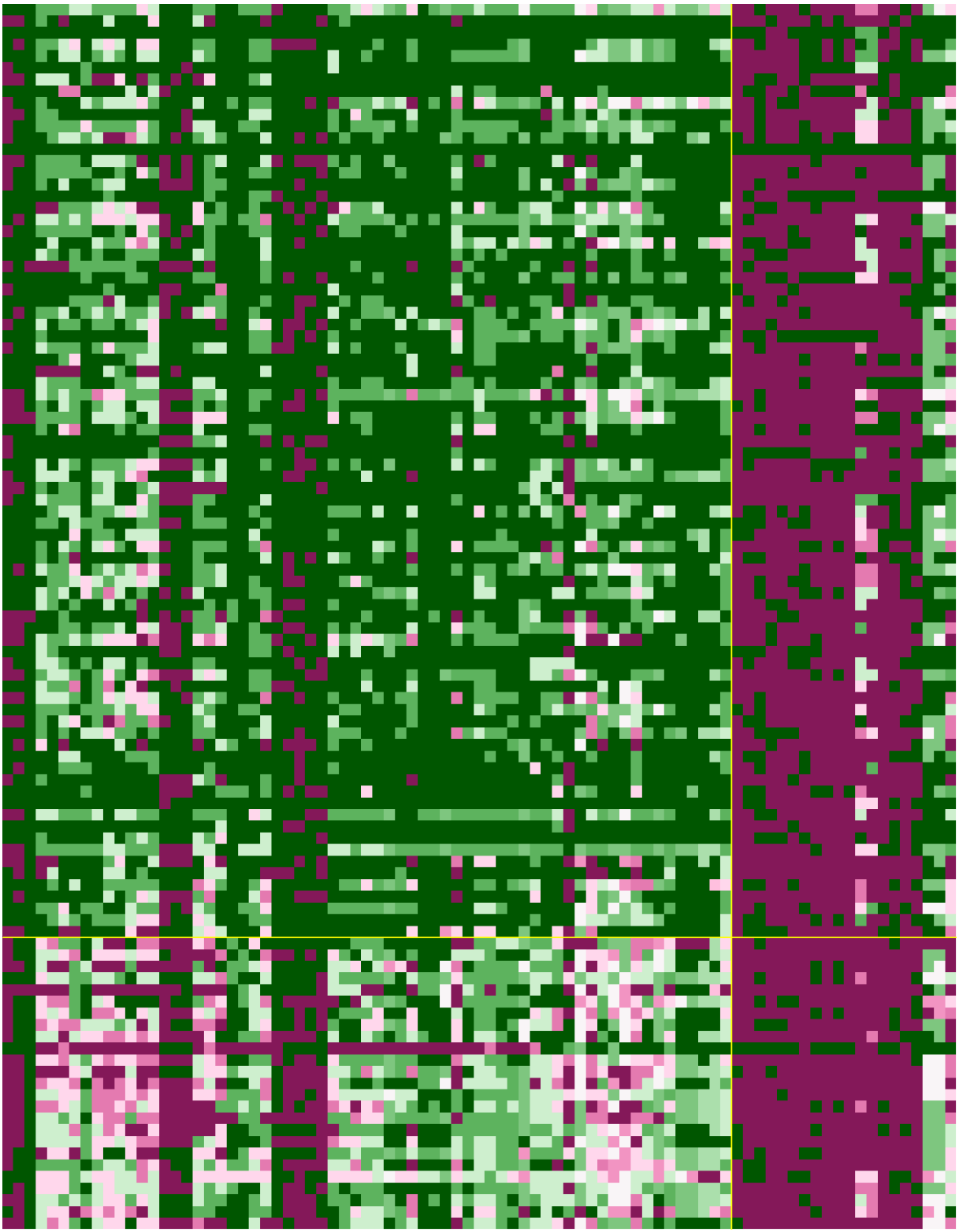


Fig. 6 Heat map of the output after applying iBBiG on normalized data

Checking stability of the top league bi-cluster

The next step is to check the stability of the top league bi-cluster. The results of the bootstrap can be seen below.

```
Bootstrap <- diagnoseColRow(x=as.matrix(ALL),bicResult=res,number=1,
  nResamplings=100,replace=TRUE)
Bootstrap
```

```
## $bootstrapFstats
##         fval.row  fval.col
##   [1,] 1.0032936 0.8909371
##   [2,] 1.3599904 0.8960604
##   [3,] 0.7749982 1.0906881
##   [4,] 0.9047688 0.8839854
##   [5,] 0.9339491 0.9755094
##   [6,] 0.7981740 1.2658746
##   [7,] 0.8915498 0.9943219
##   [8,] 0.9314943 1.0535673
##   [9,] 1.1060351 1.0318411
##  [10,] 0.9218519 0.8900481
##  [11,] 1.3368708 0.7778398
##  [12,] 1.2172101 1.0040981
##  [13,] 0.8431194 0.8354212
##  [14,] 1.1648117 0.9053631
##  [15,] 0.9268347 1.0718837
##  [16,] 0.7925683 0.8891032
##  [17,] 0.7493746 0.8896050
##  [18,] 1.0822644 1.0423896
##  [19,] 0.7762592 0.8790245
##  [20,] 1.0019499 0.8952791
##  [21,] 0.7172687 0.6565491
##  [22,] 1.0750392 1.1704056
##  [23,] 1.0231927 1.0296910
##  [24,] 1.1801680 0.9084834
##  [25,] 0.8942262 1.0199915
##  [26,] 0.7590264 1.0201459
##  [27,] 0.7657675 1.1138406
##  [28,] 0.9858176 1.2103009
##  [29,] 0.9528895 1.0729427
##  [30,] 0.8613904 0.6504768
##  [31,] 1.0195845 1.0998195
##  [32,] 1.2017162 0.9978724
##  [33,] 0.8178218 0.9000524
##  [34,] 0.7341276 1.0183055
##  [35,] 0.9287387 1.2771010
##  [36,] 1.1784145 0.9315938
##  [37,] 1.0496411 1.2271749
##  [38,] 1.2180199 1.2757220
##  [39,] 0.9193782 1.3787973
##  [40,] 1.0024991 1.0837647
##  [41,] 1.2060201 0.8365455
##  [42,] 1.0493553 1.1065505
##  [43,] 0.8492367 1.2226010
```

```
##  [44,] 1.1063871 0.8486693
##  [45,] 0.8972990 1.1456877
##  [46,] 1.2158094 1.1441582
##  [47,] 1.4605398 0.5459131
##  [48,] 0.8770060 1.2523915
##  [49,] 1.1076381 0.8110693
##  [50,] 1.2994194 1.0321411
##  [51,] 1.0663284 1.3017469
##  [52,] 1.1741104 1.0732115
##  [53,] 1.3340234 1.0282644
##  [54,] 0.9118315 1.0424002
##  [55,] 1.3846816 1.1725623
##  [56,] 0.8453803 0.7844418
##  [57,] 0.9089076 1.2266001
##  [58,] 0.9309909 0.9029161
##  [59,] 0.8648052 1.3113790
##  [60,] 0.6773307 0.6845915
##  [61,] 0.9303115 0.6803349
##  [62,] 1.0749239 0.8292111
##  [63,] 0.7044221 1.1156755
##  [64,] 0.9647417 0.9714261
##  [65,] 1.1808739 1.1634716
##  [66,] 0.9888044 1.1932517
##  [67,] 1.0704497 1.0964396
##  [68,] 1.0394662 0.7086219
##  [69,] 0.9289336 1.0822641
##  [70,] 1.1309894 1.0123063
##  [71,] 0.9697355 0.8942081
##  [72,] 0.7925392 0.9610491
##  [73,] 1.6954102 1.0233227
##  [74,] 1.1393905 1.2200824
##  [75,] 1.0013861 1.1965404
##  [76,] 0.9362486 0.7984677
##  [77,] 1.0512820 0.9616209
##  [78,] 0.9941288 0.8861353
##  [79,] 0.8691268 1.0190735
##  [80,] 0.9015281 0.8495362
##  [81,] 0.7895956 0.9894194
##  [82,] 1.0146174 1.0058354
##  [83,] 1.3437785 0.8948845
##  [84,] 1.0893469 1.2829228
##  [85,] 1.0636843 0.9795823
##  [86,] 0.8864367 1.1888006
##  [87,] 1.4229579 0.7686917
##  [88,] 0.9151615 1.1145470
```

```
##  [89,] 0.9235697 1.0297039
##  [90,] 0.8016480 1.1773782
##  [91,] 1.1022057 0.8673288
##  [92,] 0.8854238 1.0937053
##  [93,] 1.2626641 1.0378155
##  [94,] 1.0830149 1.0909282
##  [95,] 0.9482588 1.0308541
##  [96,] 0.9582702 1.1351891
##  [97,] 0.8460810 1.4271054
##  [98,] 1.2921310 1.3413548
##  [99,] 1.2031302 0.8905902
## [100,] 0.9175270 0.8078985
##
## $observedFstatRow
## [1] 8.771488
##
## $observedFstatCol
## [1] 201.7428
##
## $bootstrapPvalueRow
## [1] 0
##
## $bootstrapPvalueCol
## [1] 0
```

Since in the all cases the *bootstrapPvalueRow* and the *bootstrapPvalueCol* are lower than 0.01, bi-clusters are stable.

Calculating partial rankings

The next step is to calculate partial rankings based on the TS -indicators and hotels in the top league. (

The final step is to compare the results of the partial rankings to the corresponding part of the original rankings. The results of the Spearman's rank correlation shows a strong positive relationship between the two rankings.

```
C<-biclust::bicluster(mtx,res,number=1)

B<-as.data.frame(C[[1]])

selectedweight<-weights[,colnames(B)]

cols <- colnames(B)

sw<-weights[,cols]

BR<-rowSums(B[,cols]*sw)/max(rowSums(B[,cols]*sw))

B$Overall_Score<-BR

B$Rank<-rank(-B$Overall_Score)



kable(B,caption = "**Table 2** League A1 by iBBiG",digits = 2)


cor(B$Rank,as.matrix(RANK_RESPONDENT[rownames(B),]),method="spearman")
##           [,1]
```

```
## [1,] 0.9510526
```

```
cor.test(B$Rank,as.matrix(RANK_RESPONDENT[rownames(B),]),method="spearman")
```

```
##
##  Spearman's rank correlation rho
##
## data:  B$Rank and as.matrix(RANK_RESPONDENT[rownames(B), ])
## S = 4176.2, p-value < 2.2e-16
## alternative hypothesis: true rho is not equal to 0
## sample estimates:
##       rho
## 0.9510526
```

```
weightst<-matrix(1/nrow(mtx),1,nrow(mtx))
colnames(weightst)<-rownames(mtx)
tRESP <- as.data.frame(mtx)
BRt<-colSums(tRESP*weightst)/max(colSums(tRESP*weightst))
RANK_RESPt<-as.matrix(rank(-BRt))


Bt<-as.data.frame(t(C[[1]]))
swt<-weightst[,colnames(Bt)]
colst <- colnames(Bt)
swt<-weightst[,colst]
BRt<-rowSums(Bt[,colst]*swt)/max(rowSums(Bt[,colst]*swt))
Bt$Overall_Score<-BRt
Bt$Rank<-rank(-Bt$Overall_Score)



cor.test(Bt$Rank,as.matrix(RANK_RESPt[rownames(Bt),]),method="spearman")
```

```
##
##  Spearman's rank correlation rho
##
## data:  Bt$Rank and as.matrix(RANK_RESPt[rownames(Bt), ])
## S = 484.12, p-value < 2.2e-16
## alternative hypothesis: true rho is not equal to 0
## sample estimates:
##       rho
## 0.9894204
```

Only the first bi-cluster is relevant (high correlation between League's and the original data).

Applying iBBiG on reversed normalized data

To identify the lower league(s), the reverse data matrix is needed to be calculated firstly. Applying the iBBiG method on the reversed normalized data can specify the lower league bi-clusters.

```
rmtx <- 1-mtx

rres <- iBBiG(binaryMatrix=binarize(rmtx,threshold = 0.75),nModules = 1,alpha=0.3,pop_size = 100,mutation =
0.08,stagnation = 50,selection_pressure = 1.2,max_sp = 15,success_ratio = 0.8)
```

```
## Module:  1 ... done
```

```
summary(rres)
```

```
##

## An object of class iBBiG

##

## There was one cluster found with Score 910.0099 and

##   95 Rows and  19 columns
```

The results above show that the iBBiG algorithm found a bi-cluster on the reversed data. In this bi-cluster there are 92 rows (hotels) and 21 columns (indicators). The next step is to calculate F-tests to determine which bi-cluster is significant

```
Obs.FStat <- NULL

for (i in c(1:rres@Number)){

  Obs.FStat[[i]] <- computeObservedFstat(x=rmtx,bicResult=rres,number=i)

  }

kable(Obs.FStat,caption = "**Table 3** The results of row and column effects of the reversed data for the tw
o bi-clusters")
```

Table 3 The results of row and column effects of the reversed data for the two bi-clusters

	Fstat	PValue
Row Effect	2.386876	0
Column Effect	12.046800	0
Tukey test	79.502265	0

In **Table x** the results of the F-tests can be seen. For both bi-clusters, both the row and column effect are significant which are the lower league (League C).

To see the differences between those hotelss that are included in the lower league and those that are not in the lower league, one can plot the means, medians, variances, and median absolute deviations (MAD) for rows (respondents) (see **Fig. 7**). On **Fig. 7** the red line indicates those hotels that are included in the lower league, while the black line shows the remaining hotels. The respondents in the lower league have lower means, medians, and variances.

```
exploreBic(dset=mtx,bres=rres,mname='biclust',pfor='all',gby='genes',bnum=1)
```

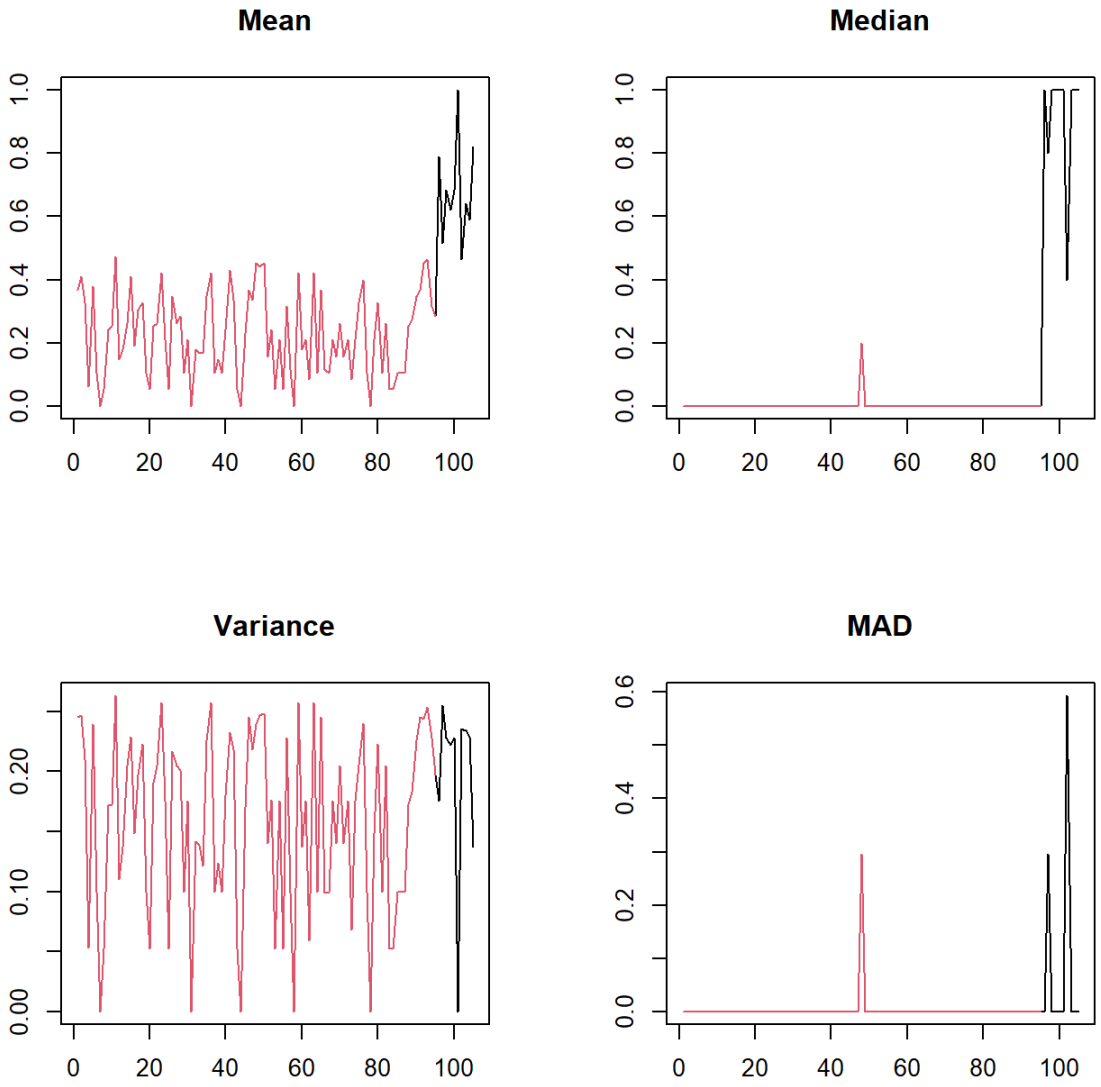


Fig. 7 Mean, median, variance and MAD for lower leauge respondents

One can do the same for the columns (TS-indicators). **Fig. 8** shows the differences between the means, medians, variances, and median absolute deviations (MAD) for the indicators. The red line indicates those indicators that are in the lower league, while the black line shows the remaining indicators.

```
exploreBic(dset=mtx,bres=rres,mname='biclust',pfor='all',gby='conditions',bnum=1)
```

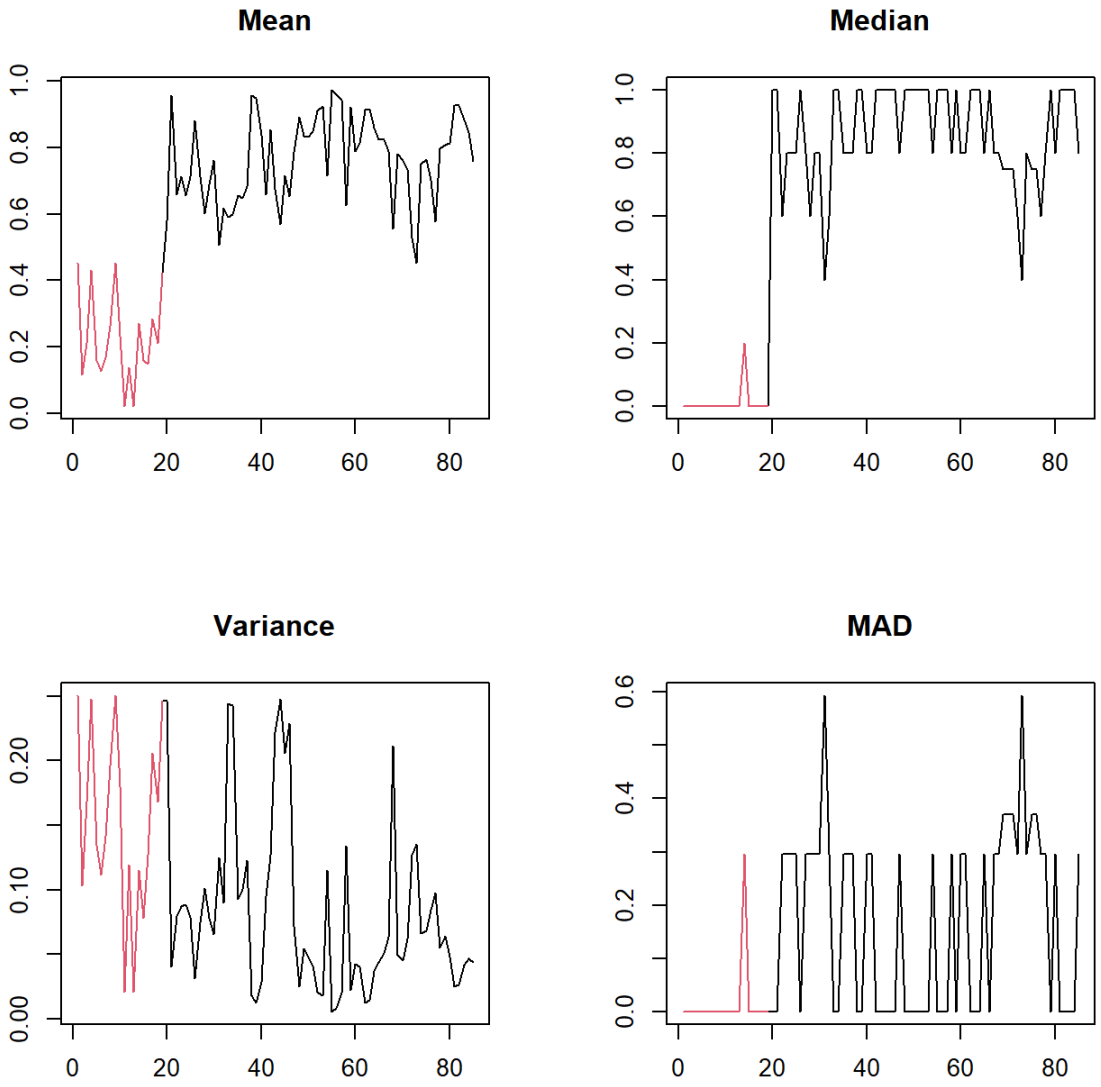


Fig. 8 Mean, median, variance and MAD for lower leauge indicators

Heat maps of the lower league

Fig. 9 depicts the heat map of the lower league.

```
drawHeatmap(x=mtx,bicResult=rres,number=1,paleta=colorspace::diverging_hcl(100, "Red-Green",rev = FALSE),bea
mercolor = TRUE)
```

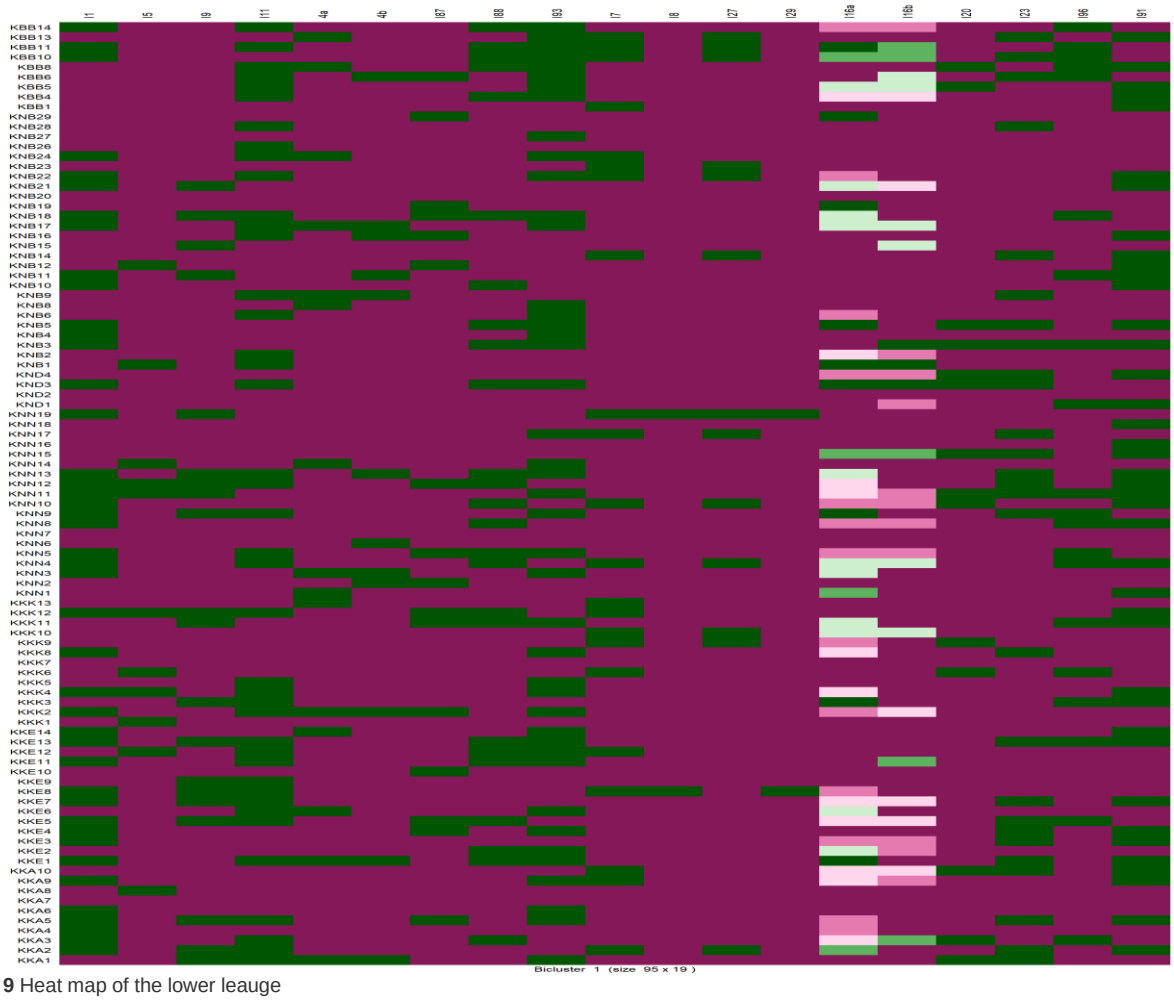


Fig. 9 Heat map of the lower leauge

Fig. 10 shows results of iBBiG on reversed normalized data. The lower league can be seen in the upper left side of **Fig. 10** which is enlarged on **Fig.9**.

```
drawHeatmap(x=mtx,bicResult=rres,local=FALSE,number=1,paleta=colorspace::diverging_hcl(100,  "Red-Green",rev
= FALSE),beamercolor = TRUE)
```

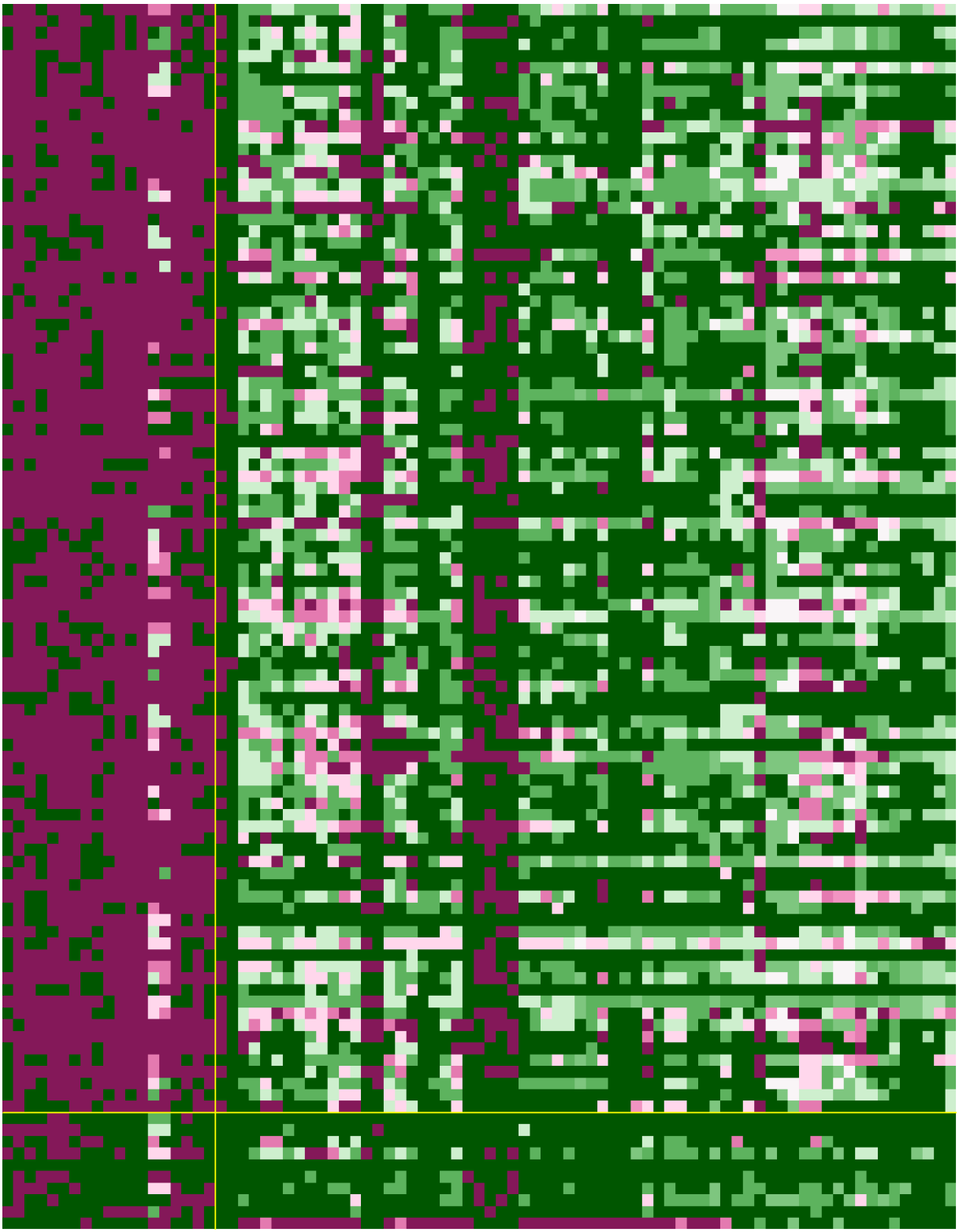


Fig. 10 Heat map of the output after applying iBBiG on reversed normalized data

Checking stability of the lower league bi-cluster

The next step is to check the stability of the lower league bi-cluster. The results of the bootstrap can be seen below.

```
Bootstrap <- diagnoseColRow(x=as.matrix(ALL),bicResult=rres,number=1,
  nResamplings=100,replace=TRUE)
Bootstrap
```

```
## $bootstrapFstats
##          fval.row  fval.col
##   [1,] 0.9105844 0.7443845
##   [2,] 0.8106191 0.8138712
##   [3,] 1.0636271 0.7200977
##   [4,] 0.7568091 1.0359099
##   [5,] 0.7969692 0.8243660
##   [6,] 1.0153297 0.5459157
##   [7,] 1.1591302 1.8433832
##   [8,] 1.2489023 1.5723957
##   [9,] 1.3055588 1.6300523
##  [10,] 1.0482314 0.9952876
##  [11,] 1.1047012 0.8036024
##  [12,] 0.9249586 1.0957588
##  [13,] 1.0589824 0.8191531
##  [14,] 0.9979269 1.1134073
##  [15,] 0.7797861 0.8711018
##  [16,] 0.8071083 1.0378216
##  [17,] 0.9307187 0.7089053
##  [18,] 1.0977679 1.0988016
##  [19,] 1.1894632 1.2058204
##  [20,] 1.1165695 0.4900240
##  [21,] 1.0227487 0.7366352
##  [22,] 0.8129235 0.6461384
##  [23,] 1.0377593 1.3679337
##  [24,] 0.9874074 1.6005524
##  [25,] 1.1277224 0.6393527
##  [26,] 1.4083684 1.0652060
##  [27,] 1.1078947 1.3300237
##  [28,] 0.7691946 1.2557816
##  [29,] 0.7817469 1.0418745
##  [30,] 0.9461896 0.8101648
##  [31,] 1.1667754 0.4739317
##  [32,] 1.0951114 0.5851638
##  [33,] 0.9539856 0.9323196
##  [34,] 1.0800828 1.0161207
##  [35,] 1.1205433 0.6286497
##  [36,] 1.0335883 1.3363676
##  [37,] 0.7963634 1.0056612
##  [38,] 0.8599216 0.5628950
##  [39,] 1.0419767 0.9521873
##  [40,] 1.0193978 0.9610082
##  [41,] 0.9971228 1.0168681
##  [42,] 1.2312899 1.4622024
##  [43,] 0.9200425 0.6663407
```

```
##  [44,] 0.9674810 1.6760757
##  [45,] 1.0934923 1.2345544
##  [46,] 0.8773210 1.0673442
##  [47,] 1.1005418 0.8899635
##  [48,] 0.9184205 0.7395107
##  [49,] 0.8451959 0.9542585
##  [50,] 0.8833908 0.3719418
##  [51,] 0.8292915 0.8772129
##  [52,] 1.0875342 0.4317113
##  [53,] 0.9770654 0.9390771
##  [54,] 0.9468636 1.1656191
##  [55,] 0.9993506 0.5636811
##  [56,] 1.1172135 1.1610245
##  [57,] 1.1719089 1.4640846
##  [58,] 1.1154343 0.5524030
##  [59,] 1.4072010 1.7403697
##  [60,] 0.9020940 0.9493854
##  [61,] 1.0768996 0.9016828
##  [62,] 0.8167999 0.7528806
##  [63,] 1.0101828 1.3213956
##  [64,] 0.8041034 1.0151526
##  [65,] 1.0446507 0.9748744
##  [66,] 1.0392945 1.4333480
##  [67,] 0.8252579 0.7638493
##  [68,] 1.1152314 1.3028925
##  [69,] 0.9279290 0.7053305
##  [70,] 0.9007253 0.9920345
##  [71,] 1.2134306 0.9742889
##  [72,] 1.1224056 0.9358365
##  [73,] 1.0922602 0.9099585
##  [74,] 0.8359934 1.1002534
##  [75,] 0.9561081 0.9276235
##  [76,] 0.9054589 0.9017305
##  [77,] 0.8373469 0.7806516
##  [78,] 1.0358240 1.1090685
##  [79,] 1.0327674 1.4672388
##  [80,] 0.8861843 1.2979770
##  [81,] 1.2177284 2.3937038
##  [82,] 0.7952627 0.5165684
##  [83,] 0.9728606 1.4362626
##  [84,] 1.2744788 1.3378279
##  [85,] 0.9780916 0.5547737
##  [86,] 1.0021209 1.2229096
##  [87,] 1.1111527 0.9423257
##  [88,] 0.7410826 0.8791166
```

```
##  [89,] 1.0001222 0.8028160
##  [90,] 1.2709069 1.2409555
##  [91,] 1.2377470 0.6952090
##  [92,] 1.0723245 1.3943325
##  [93,] 0.7336251 1.0059171
##  [94,] 1.0057601 0.9555684
##  [95,] 1.0564760 0.6774736
##  [96,] 0.8469719 1.4687488
##  [97,] 1.0484342 0.7875387
##  [98,] 1.1681651 1.0653091
##  [99,] 0.9090051 0.4962142
## [100,] 1.0927081 0.4854928
##
## $observedFstatRow
## [1] 2.200026
##
## $observedFstatCol
## [1] 25.15327
##
## $bootstrapPvalueRow
## [1] 0
##
## $bootstrapPvalueCol
## [1] 0
```

Bicluster is stable in 0.05 significance level

Calculating partial rankings

The next step is to calculate partial rankings based on the TS-indicators and hotels in the lower league. The calculation of each score of each TS-indicator of the hotels are done according to the method used in the original RESPONDENT ranking. The original weights of hotels' indicators are used, and the total scores for the hotels are calculated using the selected indicators in the given bi-cluster. **Table 6** shows the result of partial ranking in the case of the lower league.

The final step is to compare the results of the partial rankings to the corresponding part of the original rankings. The results of the Spearman's rank correlation shows a strong positive relationship between the two ranking.

```
C<-biclust::bicluster(mtx,rres,number=1)

B<-as.data.frame(C[[1]])

selectedweight<-weights[,colnames(B)]

cols <- colnames(B)

sw<-weights[,cols]

BR<-rowSums(B[,cols]*sw)/max(rowSums(B[,cols]*sw))

B$Overall_Score<-BR

B$Rank<-rank(-B$Overall_Score)



kable(B,caption = "**Table xx** League C1 by iBBiG",digits = 2)


cor(B$Rank,as.matrix(RANK_RESPONDENT[rownames(B),]),method="spearman")
```

```
##           [,1]
## [1,] 0.7048406
```

```
cor.test(B$Rank,as.matrix(RANK_RESPONDENT[rownames(B),]),method="spearman")
```

```
##
##  Spearman's rank correlation rho
##
## data:  B$Rank and as.matrix(RANK_RESPONDENT[rownames(B), ])
## S = 42172, p-value = 1.566e-15
## alternative hypothesis: true rho is not equal to 0
## sample estimates:
##       rho
## 0.7048406
```

```
weightst<-matrix(1/nrow(mtx),1,nrow(mtx))
colnames(weightst)<-rownames(mtx)
tRESP <- as.data.frame(mtx)
BRt<-colSums(tRESP*weightst)/max(colSums(tRESP*weightst))
RANK_RESPt<-as.matrix(rank(-BRt))


Bt<-as.data.frame(t(C[[1]]))
swt<-weightst[,colnames(Bt)]
colst <- colnames(Bt)
swt<-weightst[,colst]
BRt<-rowSums(Bt[,colst]*swt)/max(rowSums(Bt[,colst]*swt))
Bt$Overall_Score<-BRt
Bt$Rank<-rank(-Bt$Overall_Score)
cor.test(Bt$Rank,as.matrix(RANK_RESPt[rownames(Bt),]),method="spearman")
```

```
##
##  Spearman's rank correlation rho
##
## data:  Bt$Rank and as.matrix(RANK_RESPt[rownames(Bt), ])
## S = 21.055, p-value = 1.194e-13
## alternative hypothesis: true rho is not equal to 0
## sample estimates:
##       rho
## 0.9815303
```

Both bi-cluster are relevant.

Applying BicARE on normalized data

In this step the BicARE algorithm determines the number of the bi-clusters.

```
BICARE_res <- FLOC(Data=ExpressionSet(mtx),k=1,pGene=1,pSample=1,r=1e-16,N=28,M=17,t=10000,blocGene=NULL,blocSample=NULL)
bres <- bicare2biclust(BICARE_res)
summary(bres)
```

```
##
```

```
## An object of class Biclust

##

## call:

##  NULL

##

## There was one cluster found with

##   28 Rows and  17 columns
```

The results above show that the BiCARE algorithm found 1 bi-clusters. These bi-clusters contain the middle leagues respondents and indicators.

Calculating F-tests of the middle league bi-cluster

In **Table 5** the results of the row and column effects (F-tests) can be read. Both the row and column effects are significant, so the middle league bi-cluster is significant.

```
RObs.FStat <- NULL

for (i in c(1:bres@Number)){

  RObs.FStat[[i]] <- computeObservedFstat(x=mtx,bicResult=bres,number=i)

}

kable(RObs.FStat,caption = "**Table 5** The results of row and column effects of the middle league")
```

Table 5 The results of row and column effects of the middle league

	Fstat	PValue
Row Effect	5.241479	0
Column Effect	10.876409	0
Tukey test	100.275222	0

The bicluster is not significant

To see the differences between those respondents that are included in the middle league and those that are not in the middle league, one can plot the means, medians, variances, and median absolute deviations (MAD) for rows (respondents) (see **Fig. 11**). On **Fig. 11** the red line indicates those respondents that are included in the middle league, while the black line shows the remaining respondents. **Fig. 11.** shows that in the case of the respondents in the middle league the variances differ the most.

```
exploreBic(dset=mtx,bres=bres,mname='biclust',pfor='all',gby='genes',bnum=1)
```

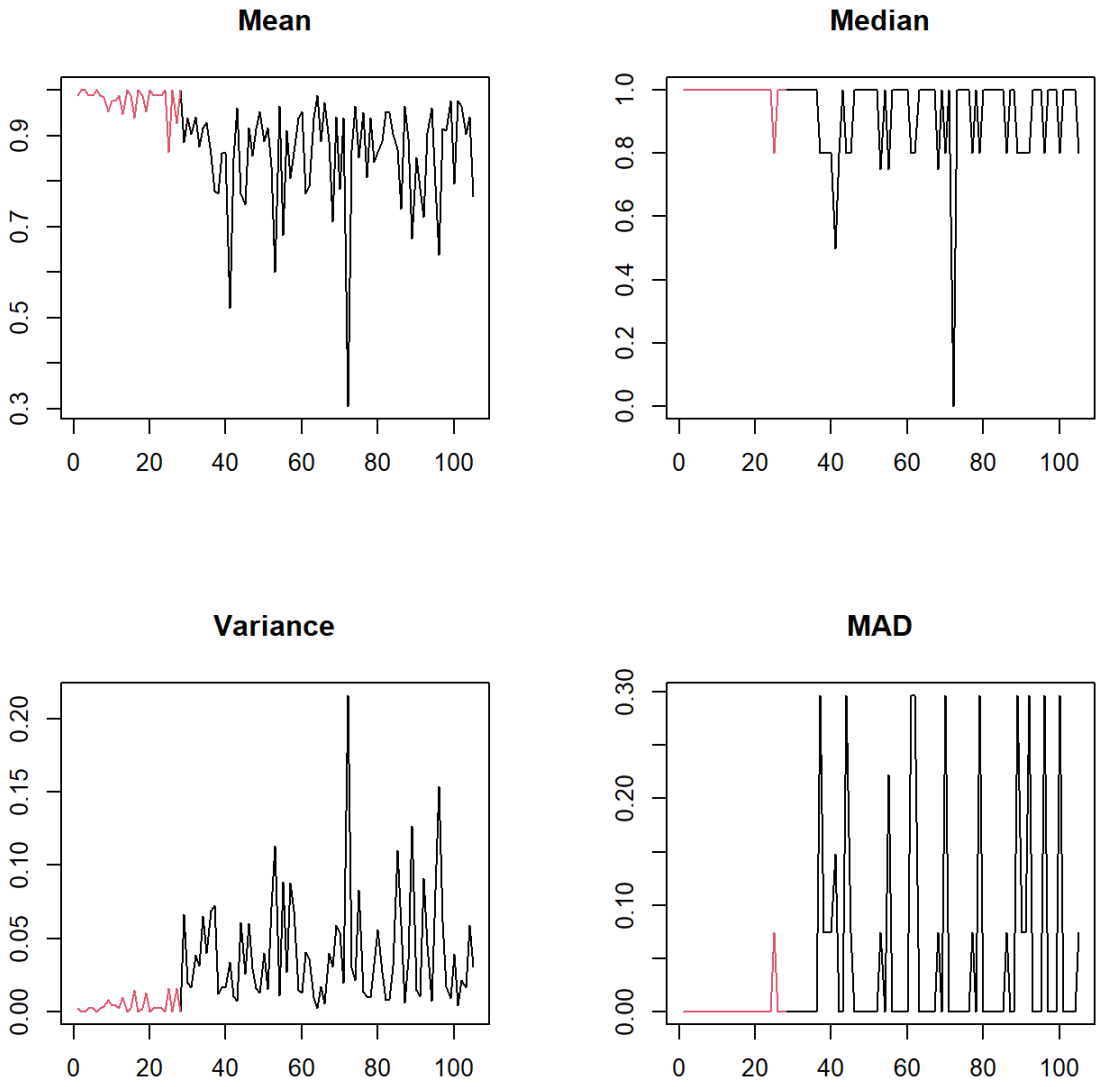


Fig. 11 Mean, median, variance and MAD for middle league respondents

One can do the same for the columns (indicators). **Fig. 12** shows the differences between the means, medians, variances, and median absolute deviations (MAD) for the indicators. The red line indicates those indicators that are in the middle league, while the black line shows the remaining indicators. In the case of the indicators in the middle league, all parameters are different.

```
exploreBic(dset=mtx,bres=bres,mname='biclust',pfor='all',gby='conditions',bnum=1)
```

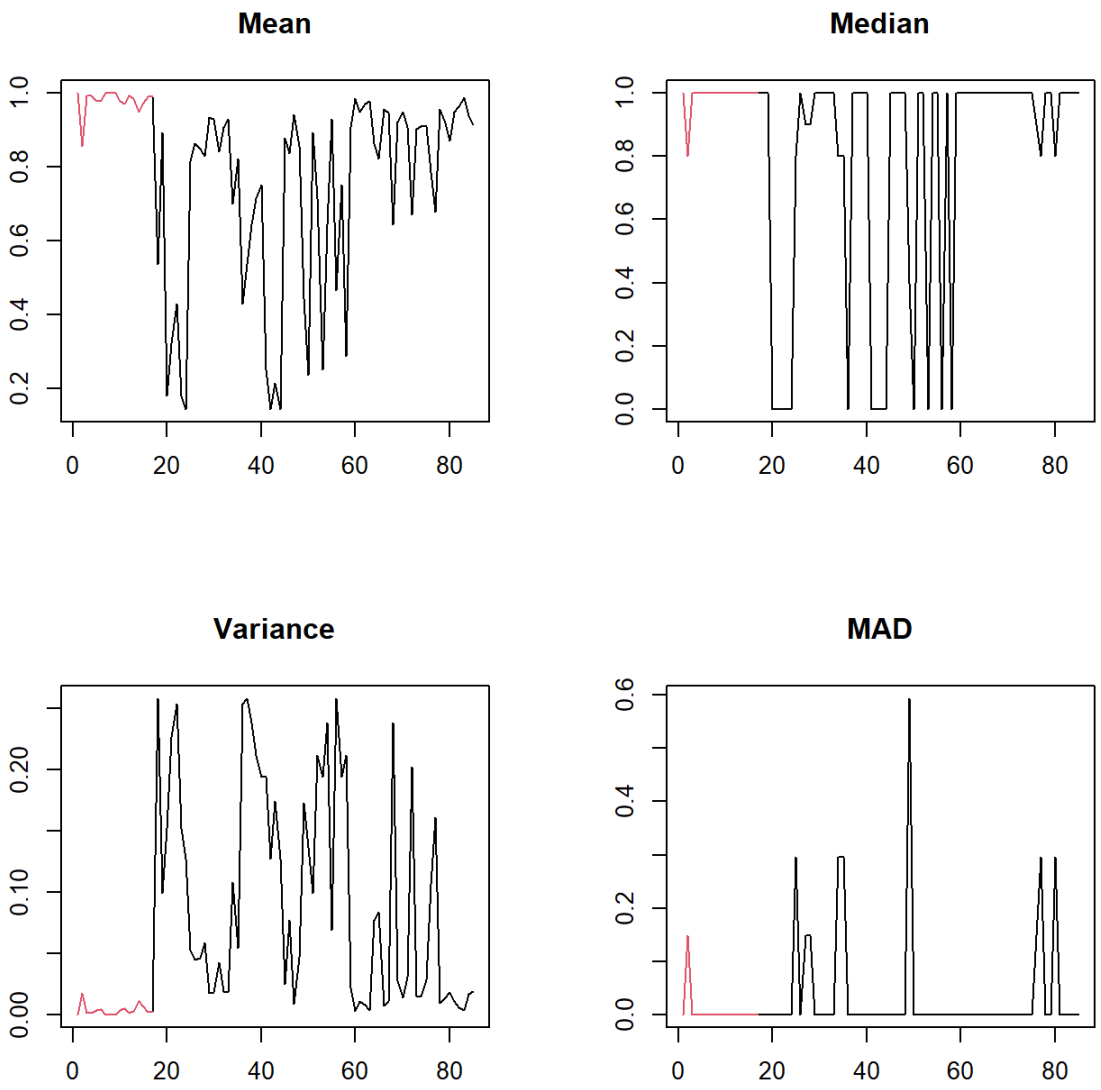


Fig. 12 Mean, median, variance and MAD for middle league indicators

Heat maps of the middle league

Fig. 13 depicts the heat map of the middle league.

```
drawHeatmap(x=mtx,bicResult=bres,number=1,paleta=colorspace::diverging_hcl(100, "Red-Green",rev = FALSE),bea
mercolor = TRUE)
```

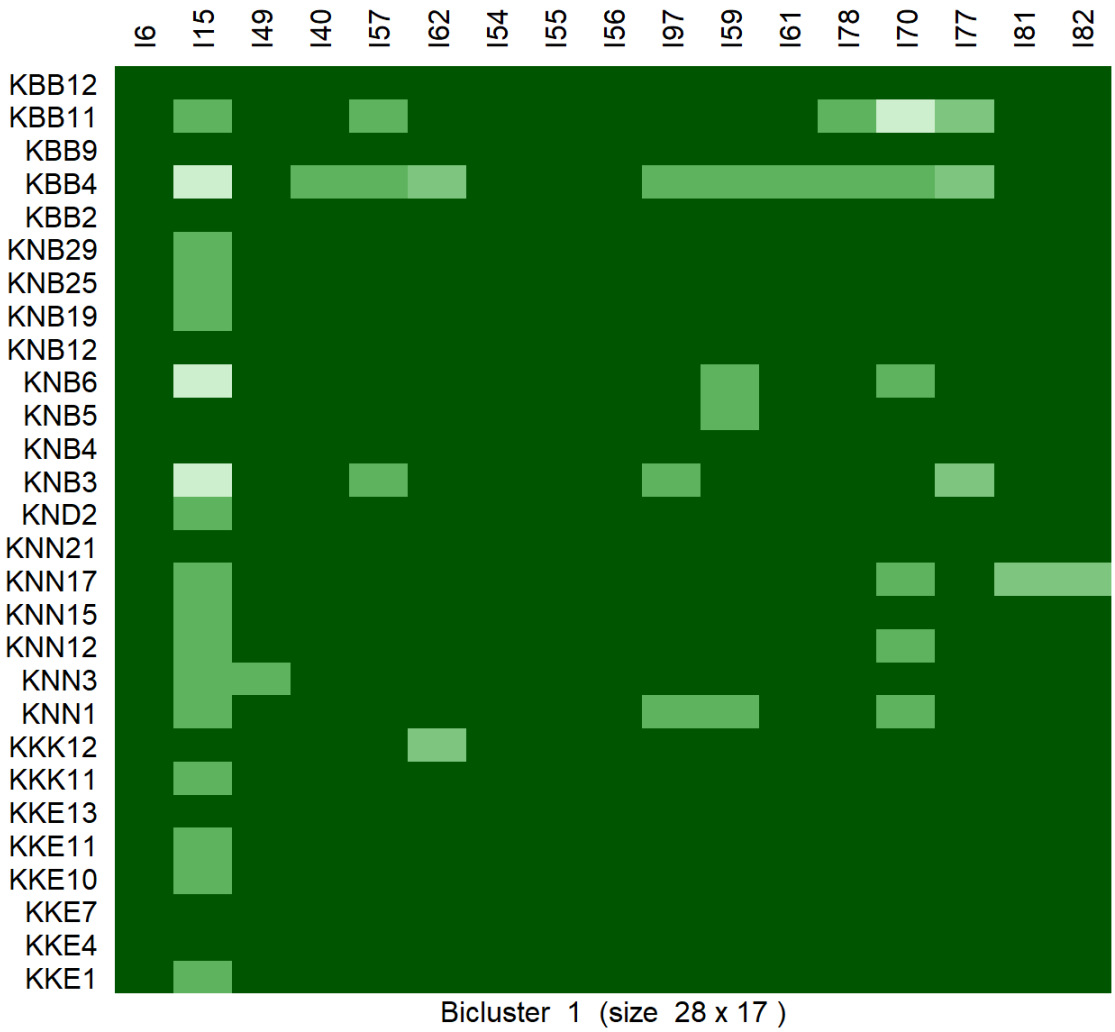


Fig. 13 Heat map of the middle league

Fig. 14 shows the results of BicARE on normalized data. The middle league can be seen in the upper left corner of **Fig. 14** which is enlarged on **Fig.13**.

```
drawHeatmap(x=mtx,bicResult=bres,local=FALSE,number=1,paleta=colorspace::diverging_hcl(100,  "Red-Green",rev
= FALSE),beamercolor = TRUE)
```

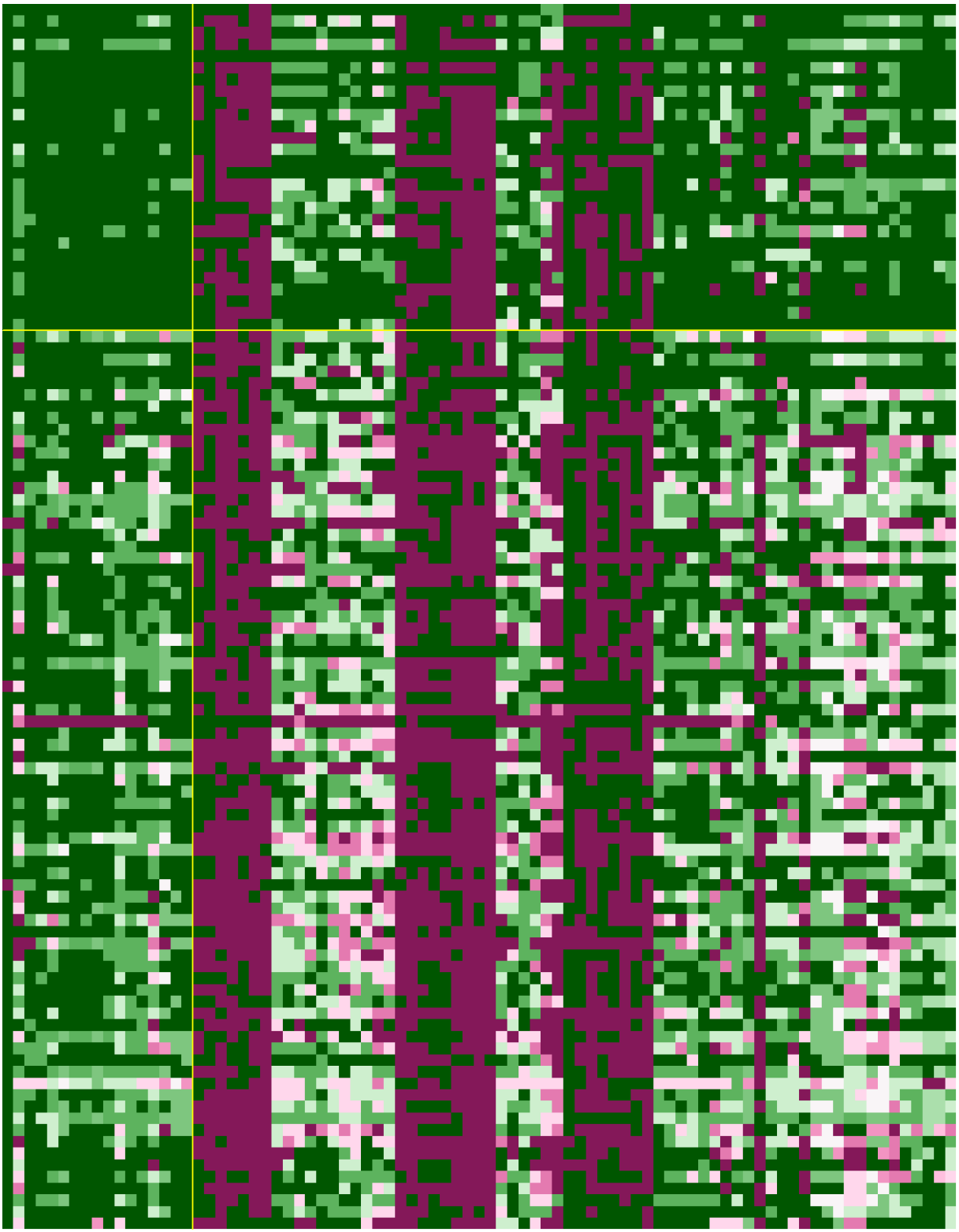


Fig. 14 Heat map of the output after applying BicARE on normalized data

Checking stability of the middle league bi-cluster

The next step is to check the stability of the middle league bi-cluster. The results of the bootstrap can be seen below.

```
Bootstrap <- diagnoseColRow(x=as.matrix(ALL),bicResult=bres,number=1,
  nResamplings=100,replace=TRUE)
Bootstrap
```

```
## $bootstrapFstats
##         fval.row  fval.col
##   [1,] 0.8150614 0.8869565
##   [2,] 1.0513657 1.1696599
##   [3,] 0.8403434 2.1217144
##   [4,] 0.8021018 0.4633447
##   [5,] 1.1032367 1.2665076
##   [6,] 1.2448726 1.3104797
##   [7,] 0.8463165 0.9340563
##   [8,] 1.0219603 0.5507429
##   [9,] 1.2549539 0.7011766
##  [10,] 1.0973299 0.8341549
##  [11,] 1.0098047 1.3668981
##  [12,] 0.9955032 0.9057647
##  [13,] 0.4625661 0.8810096
##  [14,] 1.5336674 0.5963725
##  [15,] 1.1937820 1.3226861
##  [16,] 0.5718277 0.7231589
##  [17,] 0.8614770 1.2836960
##  [18,] 1.0347923 0.5624611
##  [19,] 1.1406730 0.9407656
##  [20,] 0.6255532 0.7567669
##  [21,] 1.1866197 0.5823699
##  [22,] 0.8244211 1.0691567
##  [23,] 1.3112046 0.3977731
##  [24,] 1.0663835 1.1363902
##  [25,] 1.4444325 1.1804000
##  [26,] 0.8475963 0.8279833
##  [27,] 0.7538629 1.2233246
##  [28,] 1.1204204 1.0141964
##  [29,] 1.3781593 1.6448159
##  [30,] 0.8186578 0.5780441
##  [31,] 1.2281212 0.9447342
##  [32,] 1.7525258 1.4614297
##  [33,] 0.8796708 1.6203648
##  [34,] 1.1760714 1.2634632
##  [35,] 0.6867509 0.7339529
##  [36,] 0.5864695 0.4882334
##  [37,] 0.9301850 0.8530540
##  [38,] 1.1239721 0.7783773
##  [39,] 1.3636064 0.7125370
##  [40,] 1.3917051 1.2813811
##  [41,] 1.0654177 0.8610992
##  [42,] 1.4483786 0.9119827
##  [43,] 1.4086676 0.9152044
```

```
##  [44,] 0.7796003 0.5079195
##  [45,] 0.8322494 0.5351256
##  [46,] 0.9895273 1.5083474
##  [47,] 1.0671185 1.0289418
##  [48,] 0.7925730 1.3556350
##  [49,] 0.7379071 0.5450592
##  [50,] 0.5118641 0.6110279
##  [51,] 0.9042320 0.7670469
##  [52,] 0.7372122 1.0583781
##  [53,] 0.8960596 1.0890475
##  [54,] 1.6094898 0.8151725
##  [55,] 1.1563990 1.4588451
##  [56,] 0.9387492 1.2102025
##  [57,] 1.2683795 1.5397074
##  [58,] 0.8633855 0.9745621
##  [59,] 1.5858585 0.7686923
##  [60,] 0.8823107 0.6128318
##  [61,] 1.1379532 1.1309767
##  [62,] 0.6667969 0.9047381
##  [63,] 0.9807107 0.3645249
##  [64,] 1.1811376 0.4959628
##  [65,] 0.9204444 0.4525957
##  [66,] 0.7377432 1.3878089
##  [67,] 0.5404818 0.9700990
##  [68,] 0.8803593 1.3522556
##  [69,] 1.0609572 1.1414478
##  [70,] 0.9111692 2.3433882
##  [71,] 0.9850141 0.6415994
##  [72,] 0.8540661 0.9284901
##  [73,] 0.8275035 0.8493949
##  [74,] 0.8080066 0.6563501
##  [75,] 1.0957515 1.5142420
##  [76,] 1.3966269 1.3433687
##  [77,] 1.2327275 1.3400631
##  [78,] 0.8882041 0.5001052
##  [79,] 1.0490012 1.0508708
##  [80,] 0.8796697 0.9544207
##  [81,] 1.2351776 0.7761724
##  [82,] 1.4773880 1.2595547
##  [83,] 1.0361867 1.3473195
##  [84,] 1.0700872 1.0270026
##  [85,] 0.7322536 1.4111954
##  [86,] 0.7132522 0.9992508
##  [87,] 0.6031365 1.4956164
##  [88,] 0.6699530 1.6127919
```

```
##  [89,] 0.8824876 0.7022310
##  [90,] 0.9256323 1.2859815
##  [91,] 0.7905741 1.0986841
##  [92,] 1.0196651 0.6677883
##  [93,] 0.7495724 1.5973688
##  [94,] 0.7151849 0.9182542
##  [95,] 0.9155768 0.8434821
##  [96,] 0.8063847 1.2877209
##  [97,] 1.1362991 1.0241616
##  [98,] 0.6332294 1.2108594
##  [99,] 1.4575576 1.4569906
## [100,] 1.3568504 0.6311869
##
## $observedFstatRow
## [1] 5.232971
##
## $observedFstatCol
## [1] 378.4791
##
## $bootstrapPvalueRow
## [1] 0
##
## $bootstrapPvalueCol
## [1] 0
```

First bi-cluster is stable.

Calculating partial rankings

The next step is to calculate partial rankings based on the indicators and respondents in the middle league. The calculation of each score of each indicator of the respondents are done according to the method used in the original RESPONDENT ranking. The original weights of RESPONDENT's indicators are used, and the total scores for the respondents are calculated using the selected indicators in the given bi-cluster. **Table 6** shows the result of partial ranking in the case of the middle league.

```
C<-biclust::bicluster(mtx,bres,number=1)
B<-as.data.frame(C[[1]])
selectedweight<-weights[,colnames(B)]
cols <- colnames(B)
sw<-weights[,cols]
BR<-rowSums(B[,cols]*sw)/max(rowSums(B[,cols]*sw))
B$Overall_Score<-BR
B$Rank<-rank(-B$Overall_Score)



kable(B,caption = "**Table 6** League B1 by iBBiG",digits = 2)


cor(B$Rank,as.matrix(RANK_RESPONDENT[rownames(B),]),method="spearman")
##           [,1]
```

```
## [1,] 0.5052628
```

```
cor.test(B$Rank,as.matrix(RANK_RESPONDENT[rownames(B),]),method="spearman")
```

```
##
##  Spearman's rank correlation rho
##
## data:  B$Rank and as.matrix(RANK_RESPONDENT[rownames(B), ])
## S = 1807.8, p-value = 0.006097
## alternative hypothesis: true rho is not equal to 0
## sample estimates:
##       rho
## 0.5052628
```

```
weightst<-matrix(1/nrow(mtx),1,nrow(mtx))
colnames(weightst)<-rownames(mtx)
tRESP <- as.data.frame(mtx)
BRt<-colSums(tRESP*weightst)/max(colSums(tRESP*weightst))
RANK_RESPt<-as.matrix(rank(-BRt))


Bt<-as.data.frame(t(C[[1]]))
swt<-weightst[,colnames(Bt)]
colst <- colnames(Bt)
swt<-weightst[,colst]
BRt<-rowSums(Bt[,colst]*swt)/max(rowSums(Bt[,colst]*swt))
Bt$Overall_Score<-BRt
Bt$Rank<-rank(-Bt$Overall_Score)



cor.test(Bt$Rank,as.matrix(RANK_RESPt[rownames(Bt),]),method="spearman")
```

```
##
##  Spearman's rank correlation rho
##
## data:  Bt$Rank and as.matrix(RANK_RESPt[rownames(Bt), ])
## S = 71.21, p-value = 3.237e-07
## alternative hypothesis: true rho is not equal to 0
## sample estimates:
##       rho
## 0.9127329
```

The first bi-cluster is relevant

Specifying overlaps

Bi-cluster might (or might not) overlap. Analyzing the overlaps can give a subtler picture of respondents and indicators.

Venn diagram of indicators for first leagues

Fig. 15 shows the Venn diagram of the indicators. The red circle contains those indicators that are in the upper league (League A1), in the the blue circle those indicators can be found that are in the lower league (League C1). The green circle indicates the middle league's (League B1) indicators. OLV

```
T<-biclust::bicluster(orig_mtx,res,number = 1)

League_A<-T[[1]]

R<-biclust::bicluster(orig_mtx,rres,number = 1)

League_C<-R[[1]]

B<-biclust::bicluster(orig_mtx,bres,number = 1)

League_B<-B[[1]]

draw.triple.venn(area1=nrow(as.matrix(colnames(League_A))),area2=nrow(as.matrix(colnames(League_B))),area3=
nrow(as.matrix(colnames(League_C))),n12=nrow(as.matrix(intersect(colnames(League_A),colnames(League_B)))),n
13=nrow(as.matrix(intersect(colnames(League_A),colnames(League_C)))),n23=nrow(as.matrix(intersect(colnames(
League_B),colnames(League_C)))),n123=nrow(as.matrix(intersect(intersect(colnames(League_A),colnames(League_
B)),colnames(League_C)))),fill=c("red","green","blue"),category=c("League A","League B","League C"),main="Ve
nn Diagram of indicators")
```

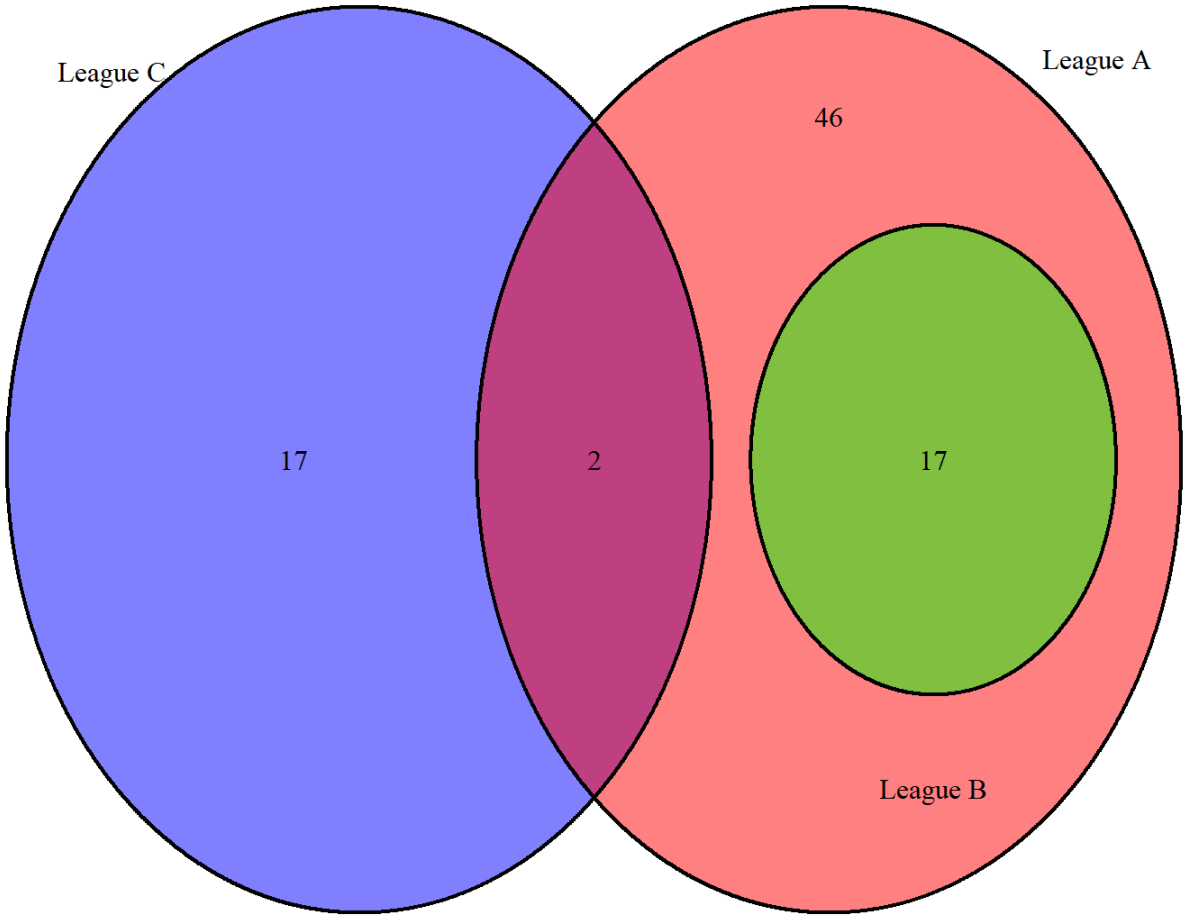


Fig. 15 Venn diagram of the indicators

```
## (polygon[GRID.polygon.17], polygon[GRID.polygon.18], polygon[GRID.polygon.19], polygon[GRID.polygon.20],
polygon[GRID.polygon.21], polygon[GRID.polygon.22], text[GRID.text.23], text[GRID.text.24], text[GRID.text.2
5], text[GRID.text.26], text[GRID.text.27], text[GRID.text.28], text[GRID.text.29])
```

One interesting finding is, that all of the indicators in the middle league are part of the lower league's indicators.

Venn diagram of respondents for first leagues

Fig. 16 shows the Venn diagram of the respondents. The red circle contains those respondents that are in the upper league (League A1), in the the blue circle those respondents can be found that are in the lower league (League C1). The green circle indicates the middle league's (League B1) respondents.

```
draw.triple.venn(area1=nrow(as.matrix(rownames(League_A))),area2=nrow(as.matrix(rownames(League_B))),area3=
nrow(as.matrix(rownames(League_C))),n12=nrow(as.matrix(intersect(rownames(League_A),rownames(League_B)))),n
13=nrow(as.matrix(intersect(rownames(League_A),rownames(League_C)))),n23=nrow(as.matrix(intersect(rownames(
League_B),rownames(League_C)))),n123=nrow(as.matrix(intersect(intersect(rownames(League_A),rownames(League_
B)),rownames(League_C)))),fill=c("red","green","blue"),category=c("League A","League B","League C"),main="Ve
nn Diagram of respondents")
```

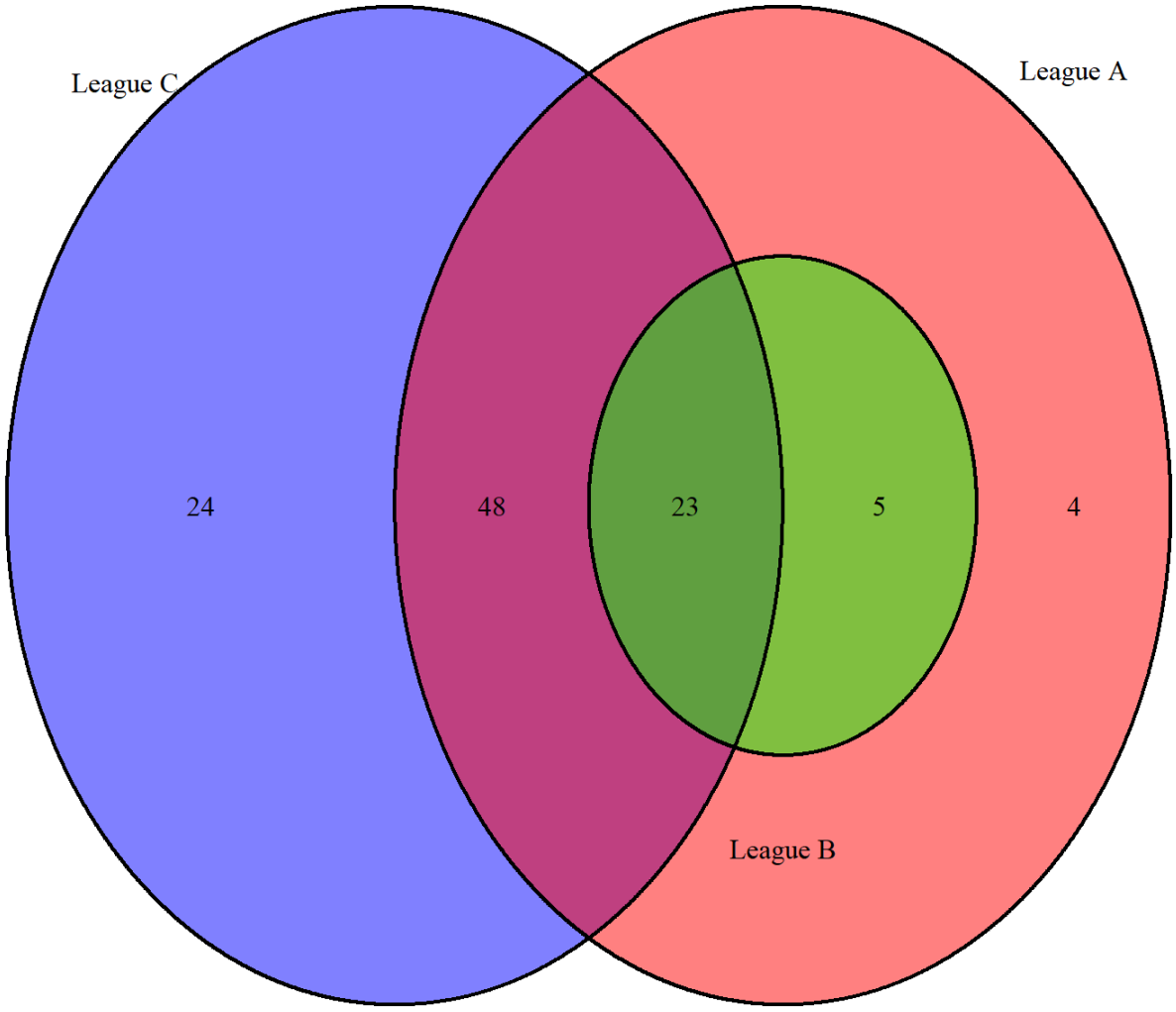


Fig. 16 Venn diagram of the respondents

```
## (polygon[GRID.polygon.30], polygon[GRID.polygon.31], polygon[GRID.polygon.32], polygon[GRID.polygon.33],
polygon[GRID.polygon.34], polygon[GRID.polygon.35], text[GRID.text.36], text[GRID.text.37], text[GRID.text.3
8], text[GRID.text.39], text[GRID.text.40], text[GRID.text.41], text[GRID.text.42], text[GRID.text.43])
```

Write results to DataFrame

```
RESULT<-ALL

RESULT$League_A<-0

RESULT$League_B<-0

RESULT$League_C<-0

rownames(RESULT)<-rownames(ALL)

RESULT[rownames(League_A),"League_A"]<-1

rownames(RESULT)<-rownames(ALL)

RESULT[rownames(League_B),"League_B"]<-1
```

```
rownames(RESULT)<-rownames(ALL)
RESULT[rownames(League_C),"League_C"]<-1
rownames(RESULT)<-rownames(ALL)
RESULT[nrow(RESULT)+1,]<-0
RESULT[nrow(RESULT)+1,]<-0
RESULT[nrow(RESULT)+1,]<-0
rownames(RESULT)<-c(rownames(ALL),"League_A","League_B","League_C")
RESULT["League_A",colnames(League_A)]<-1
rownames(RESULT)<-c(rownames(ALL),"League_A","League_B","League_C")
RESULT["League_B",colnames(League_B)]<-1
rownames(RESULT)<-c(rownames(ALL),"League_A","League_B","League_C")
RESULT["League_C",colnames(League_C)]<-1
rownames(RESULT)<-c(rownames(ALL),"League_A","League_B","League_C")
names(dimnames(RESULT)) <- c("RESPONDENT", "")
```

Export the results to an Excel file

```
write.xlsx(RESULT,"RESPONDENT_BICRES_75Bsig.xlsx")
```

Summing up the conclusions

The above proposed bi-clustering method can help to identify which respondents can be compared based on which indicators in university rankings. With the iBBiG method the upper and lower league(s) (*League(s) A and League(s) C*) can be determined and the BicARE method can specify the middle league(s) (*League(s) B*).

(Source: R-Studio Output)

61. Appendix - Indicator clusters on r=0.5 and r=0.75

A - r=0.5		**A - r=0.75**	
I99	I47	I99	I64
I30	I50	I30	I45
I33	I63	I33	I47
I35	I98	I35	I50
I86	I90	I86	I63
I46	I60	I46	I98
I31	I76	I31	I90
I32	I37	I32	I60
I34	I38	I34	I76
I36	I39	I36	I37
I74	I94	I51	I38
I13	I65	I74	I39
I92	I66	I13	I94
I14	I67	I92	I67
I43	I68	I14	I68
I44	I71	I43	I71
I52	I72	I44	I72

I17	I73	I52	I73
I18	I75	I17	I75
I21	I79	I18	I79
I22	I84	I21	I84
I89	I85	I22	I85
I64	I95	I89	I95
I45			
AB - r=0.5		AB - r=0.75	
I6	I61	I6	I61
I15	I78	I15	I78
I49	I70	I49	I70
I40	I77	I40	I77
I57	I81	I57	I81
I62	I82	I62	I82
I54		I54	
I55		I55	
I56		I56	
I97		I97	
I59		I59	
CA - r=0.5		CA - r=0.75	
I51		I1	
		I93	
C - r=0.5		C - r=0.75	
I1	I8	I5	I27
I5	I27	I9	I29
I9	I29	I11	I16a
I11	I16a	4a	I16b
4a	I16b	4b	I20
4b	I20	I87	I23
I87	I23	I88	I96
I88	I96	I7	I91
I93	I91	I8	
I7	I69		
		Does not fit either of the leagues with threshold	
		I65	I69
		I66	

(Source: Own Edit)

62. Appendix - League A***** Indicators

Indicator ID	Indicator	Placement
I14	Our hotel makes sure that we provide information and products according to our guests' preferences.	Functional, Pre-arrival, communication

I30	Communication by our hotel brand provides our customers with product and service recommendations that are tailormade for them	Functional, Pre-arrival, communication
I31	We recommend products and services that are personalized to our customer's interest based on our communication with that customer. (Before their arrival to the hotel)	Functional, Pre-arrival, communication
I32	We recommend products and services that are personalized to our customer's interest based on of the basis of preferences of similar-minded consumers. (Before their arrival to the hotel)	Functional, Pre-arrival, communication
I33	We aim to use personalized communication so our brand can make the guest feel that they are a unique customer	Functional, Pre-arrival, communication
I34	We aim to give personalized recommendation in a timely way.	Functional, Pre-arrival, communication
I35	We aim to adjust our communication style (either on phone on in written channels) based on the guest type and characteristics (age, gender, interest, etc)	Functional, Pre-arrival, communication
I50	We give a warm "good bye" after checking out at the counter	Functional, Service phase,checkout
I51	Based on previous conversation with the guest we are recommending them with activities for the last day	Functional, Service phase,checkout
I43	We place different welcome gifts in the guestroom (of VIP guest)	Functional, Service phase, In - room
I44	The hotel operates working hours to be appropriate to all its customers.	Functional, Service phase, In - room
I45	We pay attention to the special requirements of our guests while staying in a hotel	Functional, Service phase, In - room
I46	We respond immediately to all guest requests	Functional, Service phase, In - room
I47	We make sure, that there are appropriate meals for all guest (religion, allergies, dietary restrictions)	Functional, Service phase, In - room
I36	Our hotel adjusts the response to the specific problem of the guest.	Functional, Post stay, Post communication
I37	We are proactive in encouraging feedback, guest is invited to interact with us.	Functional, Post stay, Post communication
I38	Our hotel / employee knows or aims to find exactly to whose review it responds	Functional, Post stay, Post communication
I39	Our hotel / employee gives an individual response to all guest reviews and comments.	Functional, Post stay, Post communication
I52	The hotel staff helps with the luggage	Functional Stage - Service Perioud

I60	Our employee changes their behavior to suit the needs of the situation	Functional
I63	When our employee promise to do something by a certain time, they do so	Functional
I64	We make sure that our information is accurate and update our records frequently. (during the stay)	Functional
I67	Our employee aims to exceed guest expectation	Functional
I68	Our employee / hotel personalizes goods and services that are based on information that the guest has voluntarily given out (such as age range, salary range, Zip Code) but cannot identify them as an individual.	Functional
I72	During the stay Our employee / hotel offers customers products and services that satisfy they specific needs	Functional
I74	Our employee / hotel recommends products of the basis of preferences of similar-minded consumers.	Functional
I76	Our hotel / employee considers the best interest of the guest our / their top priority	Functional
I84	Our employee is friendly with all guests.	Functional
I86	We allow / encourage our employee to move to a familiar (informal) talk with the guest who needs that	Functional
I94	We send out guest satisfactory survey after the guest checked out. For instance Medallia.	Functional
I98	Fast check out and check in is granted for regulars.	Functional
I71	Our employee / hotel makes sure to take the time and understand the specific demands	Functional
I73	Our employee / hotel anticipates what the guest wants before they ask.	Functional
I75	We make sure that the hospitable behaviour from our employee seems to be motivated by genuine needs to please and care for their guests as an extension of their characteristic	Functional
I79	Our employee aims to give guests individual attention while they are in the hotel.	Functional
I85	It is important that the guest feels that building good relationship rather than making money seemed to be the most important drive of the hotel.	Functional
I90	There are employee trainings for the employee so they can provide the level of quality service the hotel aims to provide	Functional
I95	Our employees are proactive and take the initiative to get to know the guest better.	Functional

(Source: Own Edit)

63. Appendix - Middle League Indicators

Indicator ID	Indicator	Placement
I6	Our website is automorphically fits to the device (e.g. computer, mobile phone etc.), browser (e.g. Netscape, Internet explorer) and operating system (e.g. Windows, Unix) that the guest uses.	Technical, Pre-Arravial, Website
I57	We are doing everything to understand the special requirements of the guest while staying the hotel	Service Perioud – Functional Stage
I54	We encourage the employees to display personal warmth in their behaviour.	Service Perioud – Functional Stage
I55	We encourage the employees to be approachable.	Service Perioud – Functional Stage
I56	We encourage the employees to make eye contact with the guest during conversation.	Service Perioud – Functional Stage

I15	We aim to advertise our hotel in a way that it feels personalized for our potential guests, even based on the previous searches or interests.	Functional, Pre-arrival, communication
I49	We make sure that all aspects of the room are in good condition and suitable for the guest.	Functional, Service phase, In - room
I40	We aim to provide an authentic warm welcome to the guest	Functional, Service phase, Arrival
I62	The employee responds immediately to guest requests	Functional
I97	We aim to choose employee who are motivated in guest service.	Functional
I59	Our employee changes their behaviour to suit the needs of the guest	Functional
I61	The employee is empathetic towards the guest when they have a problem	Functional
I78	Our employee always tries to help solve guests' problems, even coming up with unique solutions	Functional
I70	Our employee can customize the service offering to the needs of the customer. (example: food allergies etc)	Functional
I77	Our hotel / our employee aims to make the guest feel like an important person	Functional
I81	The hotel employee treats guests with full respect.	Functional
I82	Our employees are polite with all guests.	Functional

(Source: Own Edit)

64. Appendix - Hypothesis 6 Paired Samples Test

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Service_Phase & Pre_Arrival_Phase	,08257	,15692	,01531	,05220	,11293	5,392	104	,000
Pair 2	Service_Phase & Post_Service_Phase	-,04470	,14715	,01436	-,07318	-,01623	-3,113	104	,002
Pair 3	Pre_Arrival Phase & Post_Service_Phase	-,12727	,17519	,01710	-,16117	-,09337	-7,444	104	,000

(Source: SPSS Output)