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Smart Services and Customer Expectations

Smart services offer the opportunity to permanently stay in touch with customers. The acceptance and adoption of these services depend on customers' individual characteristics and expectations regarding the service. This paper offers a practical categorization of consumers regarding their acceptance of and resistance to smart services in the automotive sector.

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Over the last years the increasing influence of technologies on services (Bitner et al., 2010; Rust & Huang, 2014) has enabled major benefits to enhance the relationships with the customer (Paschou et al., 2018). During the last year, the COVID-19 pandemic has pushed the use of technologies such as mobile messaging and digital assistance more strongly than expected and has accelerated the digital revolution in different sectors such as banking (Yeates, 2020). This digital revolution is now paving the way for new service concepts such as smart services. Smart services offer the opportunity for real time interaction with and permanent connection to the customer.

The term smart service was first mentioned in the service literature by Allmendinger and Lombreglia (2005). Recent publications have clarified the concept of future services and defined and differentiated the major components (Hädecke & Zanger, 2019; Kabadayi et al., 2019). While Kabadayi et al. (2019) provided a first definition of smart services, there is no common understanding regarding the expectations of customers and their acceptance of smart service concepts. But the ability to fulfil expectations and to satisfy consumer needs is the basis for a successful implementation of smart services in everyday life.

Aim of the Study

Therefore, the aim of this study was to explore the perceptions, attitudes and concerns of the customer towards smart services using smart car workshops as an example. Furthermore, this study should provide recommendations for action to the management and investigate the following research questions:

- What does the customer expect and which needs should be fulfilled by smart services in the automotive sector?
- What are the obstacles that might endanger the acceptance as well as the actual use of the service?
- Are there commonalities and differences between the customers and which consumer categories exist?

Background

Against the backdrop of the growing importance of connectivity between products, users, manufacturers and other parties, recent publications have characterized the construct of smart services (Hädecke & Zanger, 2019;

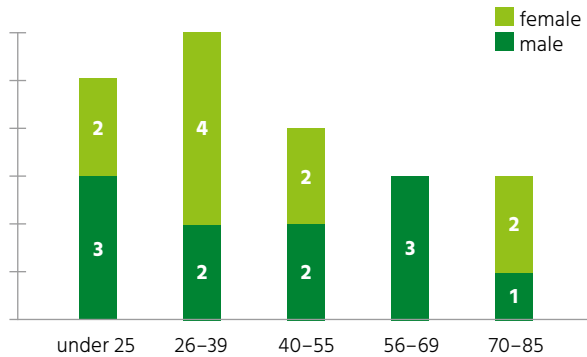
Kabadayi et al., 2019). Also, researchers have started to investigate the factors that influence the acceptance of and resistance to smart services and connected technologies such as self-tracking devices (Allmendinger & Lombreglia, 2005; Chouk & Mani, 2019; Huang, 2017; Paluch & Tuzovic, 2019). Kabadayi et al. (2019, p. 330) defined smart services as “... *personalized and pro-active services that are enabled by the integrated technology and intelligent use of data that can anticipate and fulfill customer needs at specific times and/or locations based on changing customer feedback and circumstances.*” In the literature, automotive services with a smart context have been defined as customer-driven services which are based on the connectivity of the product and the service provider (Hädecke & Zanger, 2019). Also, these services are automatic and integrated in the product (Hädecke & Zanger, 2019). Further publications found that ubiquitous mobility and self-image congruence diminish consumer resistance, while perceived security issues, perceived complexity, as well as perceived government supervision and general reluctance toward the Internet of Things reinforce consumer resistance to smart services (Chouk & Mani, 2019). Furthermore, assurance, transparency and controllability affect consumers’ perceptions of self-tracking technologies (Paluch & Tuzovic, 2019) which are included in a smart service construct with a connected car (Hädecke & Zanger, 2019). This leads to the assumption that assurance, transparency and controllability could also influence the perception of smart services which rely on trackable devices. Beyond that, research lists mainly non-technical barriers for smart services, such as negative service reputation, consumer concerns about losing control over their data or inadequate knowledge regarding customers’ needs (Klein et al., 2018).

All in all, there is no comprehensive understanding of the consumer’s perspective with regard to smart services

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Fig. 1: Age and Gender Distribution of the Study Participants



Source: Own illustration.

although there has been a growing interest in new service concepts throughout different industry sectors. Consequently, we need to explore in depth what customers expect and what is keeping them from using smart services.

Research Methodology

The setting of a smart car workshop was chosen as the research context. This sector was selected because there is a common understanding of car workshop services and it offers different possibilities regarding digitalization, automation and connectivity. We followed a two-stage research design. First, we conducted a focus group discussion (Morgan, 1997) with 11 car using consumers of different ages, levels of education and income. The recorded group discussion lasted 134 minutes and focused on the expectations and concerns regarding smart car workshop services. In a second step, interviews were used to explore the consumers' perceptions in more detail. We conducted semi-structured interviews (Silverman, 2006) that took place in April and May 2020. The interviews lasted from 20 to 56 minutes, with an average length of 32:13 minutes. After completing 21 interviews, a point of information saturation was reached and we could no longer expect to obtain new findings with further interviews (Strauss & Corbin, 1994).

The test subjects comprised eleven males and ten females, ranging from 19 to 82 years of age and living in 12 different states of Germany (see figure 1 for the age and gender distribution). All participants use cars regularly, even though four do not own a car. Also, the participants had dif-

ferent levels of education. All interviews as well as the focus group discussion were transcribed verbatim.

As this study is of an exploratory nature, a data-driven approach of coding, axial coding and selective coding according to the grounded theory (Strauss & Corbin, 1994) was used for analyzing the transcribed data. This approach requires a simultaneous process of gathering and analyzing data. We continually compared the data and theory throughout the whole process of collecting and analyzing (Strauss & Corbin, 1994). To organize the data, we set up provisional categories of statements that contain important beliefs. In summary, 1622 quotations from the transcripts of the interviews and focus group discussion were compared.

Consumer Categories

The overall result indicates three major consumer categories with large differences in their expectations and reservations, plus two intermediate categories. The three major categories reflect the categories suggested by the diffusion of innovation theory (Rogers, 1962).

The Innovators

In our sample, the subjects in this group are mainly men. This is consistent with previous research showing that the intention to use new services is higher among men than women (Lee, 2011; Liébana-Cabanillas et al., 2014). The most unexpected fact regarding this group is the average age of 54.75 years, which is in contrast to previous research studies (Laukkanen, 2016).

Innovators believe that digital and smart products as well as services offer a great added value and increase their individual mobility. Prior studies have shown a significant and positive relationship between individual mobility and the perceived usefulness of smart services (Schierz et al., 2010). Also, previous research has confirmed a higher impact of perceived usefulness on the intention to use a service among men than among women (Liébana-Cabanillas et al., 2014). Subjects in this group expect the smart car workshop to collect the data of all components of their car and also to receive their GPS data. To know that the car gets traced and analyzed makes them feel secure. As a 72-year-old woman from Lower Saxony said: "If I have an accident, I want to receive help very quickly." This feeling of security resulting from being tracked is also known from the smart health sector (Knorre et al., 2020). All in all, the people in this group are not worried about their data. They would like to have an

app for an overview of all their data as well as to communicate with the workshop and pay for repairs, which reflects their strong relationship with the service provider. Also, they would like to receive information via the app regarding preventive maintenance. In addition, they hope that the permanent connection between the car and the workshop will provide an opportunity for virtual updates and remote maintenance, presenting an easy way to take care of their car. “If they could fix the car from a distance, this would save a lot of time for me”, said a 63-year-old man from Bavaria.

These results confirm those obtained in previous studies, which found that the simpler the handling of a service, the higher the usefulness perceived by men (Ha et al., 2007; Liébana-Cabanillas et al., 2014). Furthermore, they would prefer

The transparency of smart services will make the difference between keeping customer's trust and loyalty or losing them.

to receive videos and have the opportunity to see damaged car components via augmented reality, which again reflects ease of use. Characteristically, these consumers do not care where the data are actually hosted and the dissemination of data to the manufacturer would be okay for them. All subjects in this group exhibited a strong relationship with and trust in the car

workshop and the manufacturer. That seems to be the reason for their low level of privacy concerns and their openness to smart services. Previous studies have shown a strong impact of privacy concerns on resistance to innovation (Mani & Chouk, 2017), which means the lower the level of privacy concerns, the lower the resistance to service innovation. Overall, these participants would like to have a long-term service contract with the workshop, because it reinforces their trust in the service provider.

The Majority

Consumers of the second major category are more cautious towards the use of digital or smart services. In our sample, 66% of the participants belonging to this group are women. Data security is one of their main concerns and they want all data for these kinds of smart services to be hosted in their home country or at least in the European Union, otherwise they would not trust in the service. We also found that the lower the involvement and knowledge about cars and their service requirements, the lower the trust in the smart service and the provider. Previous research has stated that the influence of trust on the attitude is significantly stronger among women (Hasan, 2010; Liébana-Cabanillas et al., 2014) and increases their intention to use the service (Neil et al., 2009). In our case, less trust was the reason for caution with regard to the smart service. Due to trust and data security issues they expect total transparency regarding which data are collected, who has access to their data and which techniques are used to encrypt the data. Because of their lack of understanding of the

Management Summary

Using a two-stage exploratory research, this paper aims to develop a practical categorization of consumers in relation to their acceptance of and resistance to smart services using the automotive sector as an example. The five categories (innovators, intermediate category I, majority, intermediate category II, and laggards) reflect the influence of demographic differences and disclose major concerns of the customers. The findings show many differences between the categories and give a first overview of customer expectations and the major obstacles to the adoption of smart services.

Main Propositions

1. The acceptance and adoption of smart services depend on individual characteristics as well as expectations of the customers.
2. Customers expect a modular service system which they can customize according to their individual needs and concerns.
3. Perceived data security and privacy concerns are the main obstacles to the adoption of smart services.
4. The more complex the device or product, the greater the desire for the option of human support.

car and despite the digital character of these services, they prefer to interact with a human if they have questions or need support. This supports the results of prior studies, which found that the option of vendor advice increases trust (Obal & Kunz, 2013). Also, these consumers are used to having total control over their individual property and like to have the flexibility to choose whatever fits their needs best. “Trust exists if I can reject whatever I do not like”, explained a 33-year-old man from Schleswig-Holstein. All in all, this category of consumers is really cautious about their data and that is why they do not want their data to be collected indiscriminately.

Intermediate Category I

Between these first two segments we can find consumers of an intermediate category. They are highly interested in the opportunities offered by smart services but they have more doubts than the innovators. They have strong reservations against handing over their GPS data and being tracked. Previous research shows that tracking constitutes a privacy risk for consumers (Becker et al., 2017; Malhotra et al., 2004). All subjects of this group stated that they would feel uncomfortable being monitored. As a 50-year-old Hessian man said about the GPS data: “This means that I would be transparent and [this] would disturb me.” They explained that videos and photos of the repair processes would give them a feeling of being in control and that would enhance their confidence and trust.

Lessons Learned

1. Companies should find ways to make their services transparent and to be certificated by a neutral instance to eliminate the main obstacles to the adoption of smart services.
2. Smart services should have a modular design and give the customer the opportunity to choose from different options depending on their needs and concerns.
3. All data and customer information should be hosted on national servers to cover all data concerns of the different customer categories and enhance trust in the service.
4. To simplify the use of the service and the associated app, videos should be used to explain the service and the options available.

The Laggards

The last major category of consumers is characterized by a complete rejection of digitalization and automation. In the case sample, these participants could see positive effects of smart services such as time savings and better long-term planning but did not trust in digital services (or products) of any kind. This group has the highest average age of 67.6 years, is characterized by traditional views and strong scepticism, which is confirmed by the literature (Rogers, 1962). They look for human interaction in every situation and prefer physically tangible objects instead of digitalized versions. An 80-year-old man from Saxony-Anhalt as well as a 62-year-old man from Lower Saxony said: “I want a paper invoice which I can file in my folder.” They are scared of data theft and do not want to hand over any data or knowledge about themselves.

Intermediate Category II

A second intermediate category of consumers is located between the majority and the laggards. The participants belonging to this category prefer analog services but are open-minded enough to try out smart services if there are many positive reviews. Most unexpected is the average age of 25.8 years in this group, which is in contrast to previous research (Laukkanen, 2016). Before using new technologies, these participants search for information, descriptions and personal experiences of people they know to reduce privacy risks. Word-of-mouth has previously been observed as a factor for reducing privacy risks (Featherman et al., 2010). The subjects voiced concerns about being manipulated and becoming transparent. A 27-year-old participant from North Rhine-Westphalia declared: “... maybe they are going to manipulate my car so that I need to take it to the workshop more often.” This and other quotes from this group reflect their distrust of smart systems. At the same time, these participants cite many advantages of a smart service setting such as automatic date proposals, emergency GPS data transmission or cost transparency if the smart system generates a fixed package price for a repair. In summary, these consumers are very concerned about their privacy and scared of the risks of data collection.

Consumer Expectations

All in all, the participants expect the smart car workshop service to be data-driven and automatized, except for the repair of physical car components. They prefer an automatic debit and the possibility to decide whether charges are made via



PayPal, SEPA debit, Klarna or other payment service providers such as Google Pay. Some of them would like to authorize the payment before the actual debit and – with the exception of the laggards –, they prefer digital payment. Most of the subjects expect faster services when using a smart system, which confirms the findings of previous research (Kabadayi et al., 2019). Furthermore, the subjects are interested in digital and automatic communication, with the possibility to contact service staff if they need further information, as has also been seen in prior studies (De Keyser et al., 2019). Almost all participants want the option of contacting the mechanic while a repair is carried out. Videos as well as the opportunity to see damaged components of the car via augmented reality could reduce human interaction with service staff. Also, remote maintenance captivates most of the test subjects and they expect to save money with this kind of service. Regarding the potential costs, most consumers anticipate no price changes or just minimally higher prices. Almost all participants would pay for extended services such as virtual updates if this leads to lower repair costs. They would also be willing to pay for express or overnight services. If there are positive incentives such as faster service or sensor repairs free of charge, many of the participants would enter into a service contract with monthly costs. In conclusion, many customer needs and expectations could be identified which can possibly inspire smart service settings.

Obstacles to the Adoption of Smart Services


Except for the innovators and the intermediate category I, all consumers are concerned about data theft and about becoming transparent. These aspects of perceived security have also been explored by previous research (Chouk & Mani, 2019). Besides, many participants are afraid of untimely repairs and manipulations, which also confirms prior research (Margulis, 2003). Furthermore, it can be an obstacle if the service of the workshop forces the customer to use a specific app and does not offer any alternatives. Therefore, customers should be able to choose which organizations they will share personal information with and which components of the service or app are activated and used.

The last big challenge is the expected transparency of the service and of the system itself. Especially the option to decide who will have access to the data has also been considered in prior studies (Norberg et al., 2007; Poddar et al., 2009; White, 2004). Consumers want to know in detail where their data are hosted, which people have access to the data and especially which data are collected.

Conclusion

Despite its preliminary character, the present study not only characterizes the different categories of consumers, their

expectations and worries but builds the foundation for further research. Based on the consumers' concerns, companies should find ways to present their services in a transparent way and to be certificated by a neutral instance to eliminate the obstacles to the adoption of smart services.

The COVID-19 pandemic is an accelerator for digitalization and companies should take advantage of the current attitude towards digital services to position themselves and their smart service solutions. 

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