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Innovation and Digital-Driven Retail Business Models

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Abstract: Retailers are facing new challenges like changing customer behavior into digital channels. The aim of this paper was to contribute to the need for retail store business model development with digital innovations We conducted three experiments to advance retail store customer experience and boost customer – store personnel interaction. Current study revealed both theoretical and practical contributions. It improved our understanding of different store innovation paths and their implications for store stakeholders, such as customers and store personnel. While digital innovations in general were adopted well among store customers, study indicated that changes in established and familiar user interfaces can have negative consequences for customer experiences. Our study underlines value-related actions, innovations, and development processes executed at the store level, where customers are in contact with services and store personnel. While the lifespan of the retail business model is getting shorter, ongoing innovation activities are critical for successful retail operations.

Keywords: Retail store, digital innovations, customer experience, business model, digitalization, digital technology.

1. Introduction

Traditional retail stores, particularly brick-and-mortar establishments, face huge challenges. Even shopping malls are experiencing diminishing customer demand (Ameen et al., 2021). Some reasons for this include the relationship between retail and urban cycles and a manager's ability to adjust to change, an aging population, and saturation in

demand (Ameen et al., 2021; Das, 2015). One important reason for declining customer visits to physical stores is the fact that many customers have changed their buying behaviors to digital platforms like e-commerce. (Pantelimon, Georgescu and Posedaru, 2020; Mäki and Toivola, 2021). The growth of domestic and global e-commerce is gaining more market share and consumer acceptance. The pandemic has strengthened this trend, with advanced companies leveraging their capabilities and know-how to sell products and services online. Moreover, customers' willingness to buy online is a megatrend (see Mäki and Toivola, 2019). City centers have faced diminishing customer flows, partly due to the increased prevalence of distance work and the success of malls (Tena-Monferrer et al., 2022). When we add soaring inflation, energy costs, and diminishing consumer buying power, the challenges are even larger. All of these developments and trends have added pressure to traditional retail concepts.

The described trends underline the need for retail renewal and development. Although the scope of retail innovations is wide, there is a research gap with regard to the choices of different innovations and development alternatives (Lien et al., 2021). Relatively little is known about specific in-store digital innovations like augmented reality (AR) or virtual reality (VR), or how mobile applications affect shopping behavior (Castillo, Jose and Bigne, 2021). While digitalization disrupts retail business models and technological retail solutions (Deloitte, 2017), prior research indicates that retail is slow to adopt in-store technologies (Alexander and Kent, 2021), even though digitalization affects business models and purchasing processes (Hagberg, Sundstrom and Egels-Zandén, 2016).

To improve understanding and generate new knowledge about retail innovations and new retail business models, we defined the research questions as follows:

1) How do innovation experiments conducted in shop environments affect customer experience?

2) How do innovation experiments boost retail development?

Our aim is to focus on these identified research areas with both theoretical and practical contributions. The latter aim is derived from our experimental and action research study design, which focuses on developing brick-and-mortar retail competitiveness. Castillo et al. (2021) recommended that future studies be conducted in physical stores with customers using new technology.

Our study consists of both innovation development processes and experiments in retail stores. The innovation process is excluded from this paper, and the focus is on customer experience and adaptation. Digital tools and innovations seem to affect the in-store customer experience, and shopping enjoyment has a key role in influencing consumers' shopping buying behavior, as it has been shown that consumers in a positive mood demonstrate higher levels of shopping engagement (De Canio, Fuentes-Blasco and Martinelli, 2021).

2. Retail business models and customer experience

Digitalization is driving significant innovation in the retail industry. Retailers are the final stage in the supply chain and engage closely with final consumers. Enhanced customer

interaction through digitalization can lead to better sales and performance. Business model innovation involves reinventing elements in some or all dimensions of the business model. The ultimate aim of business model innovation is to secure a firm's growth and long-term viability (see Mostaghel et al., 2022). Our experiment's purpose is to create value by attracting new customers and enhancing the customer experience. Technology by itself has no single value, and companies commercialize new ideas and technologies through their business models (Chesbrough, 2010). Customer experience has attracted much interest in recent years among both academics and practitioners. According to Silva et al. (2021), customer experience can be defined as "a multidimensional construct focusing on the customer's cognitive, emotional, behavioral, sensorial, and social responses to all direct or indirect interactions with the firm during the customer journey." Our study and the experiments focused on customers' attributes and interactions during their retail store visits to gain knowledge of digital innovations and customer experience.

The core of all retail businesses is to offer value to customers. Value has many forms, such as low prices, great customer service, or convenience. Lien et al. (2021) defined two main benefit types that retailers can attempt to offer: convenience, which means consumer time and effort perceptions, and engagement, which reflects customers' emotional reactions and involvement.

3. Digitalization and retail innovations

Retailers have many types of innovations that they can apply to retail concepts. Examples such as shops-in-shops, in-store technologies, checkout-free stores, alternative delivery or payment methods, and personalized promotions are sources of innovative development (see Lien et al., 2021). Many innovations are partly or entirely digital in nature. Digitalization offers companies attractive strategic opportunities (see Abaidi and Vernette, 2018). This may mean a new type of channel to reach customers, like the direct-to-consumer (DTC) type of e-commerce business model in which companies are able to reach customers without intermediaries, like retail. This scenario may pose a threat to the traditional retail format. However, current multi- or omnichannel retail designs support the idea of multichannel service and delivery structures to serve customers and create additional revenue compared to the pure e-com business model (Berman and Thelen, 2004; Singh and Srivastava, 2019). The competitive advantage of a multichannel operator may come from possible channel synergy (see Frasquet and Maria-José, 2017). Sometimes, brick-and-mortar shops may add credibility and brand value for digital channels. Overall, brick-and-mortar concepts are an important part of channel structure, along with digital channel alternatives.

There are several digital innovation alternatives that can be applied in stores. Digital in-store solutions, like self-service kiosks/automated check-outs, may improve physical retail shops' attractiveness (see Devanesan and Venkatesh, 2021) or even offer a competitive advantage (see Kaushik and Rahman, 2015). Some of these solutions aim to enhance customer's convenience, while others target more hedonic and emotional themes to improve customer engagement. One widely used digital technology inside retail stores is digital signage. Digital signage refers to digital screens in retail stores displaying informative, advertising, or entertaining content (Roux, Mahlangu and Manetje, 2020).

Digital signage may offer functional information, or it may be targeted at hedonic responses, such as enjoyment. Digital signage technology is a growing technology that boosts retail sales, but very limited research has been conducted on its influence on customers and sales (Roux et al., 2020). Virtual fitting rooms aim to overcome the problem of customers inability to try on an item before making a purchase in store (Lee, Xu and Porterfield, 2021)

Mobile games have gained popularity in several areas of business. Gamification influences customer interaction with the mobile interface, and its efficacy is related to customer relationship metrics. Games may include the experiential aspects of engagement, enjoyment, and flow (De Canio et al., 2021). Key types of game mechanics include status, rewards, competition, and achievement (Insley and Nunan, 2014). These mechanics were included in our game experiment and game design.

Technology usage in physical stores has been studied from the perspectives of consumers' acceptance of innovative technologies, retail management, and shopping experience (Alexander and Kent, 2021). Consumer adoption of online technologies focuses on customers' perceived ease of use, usefulness, and attitude toward the technologies, typically through the technology acceptance model and sometimes combined with one or more other theories of adoption (Yadav and Pavlou, 2020). The retail management stream of research has focused on the merging of online and offline technologies to examine their transformative effects on retail and, in particular, their effects on omnichannel retailing (Alexander and Kent, 2021). Artusi and Bellini (2021) described the research stream on technology epiphanies related to the types of innovation strategies that combine technological breakthroughs with radical innovation. This led to the definition of two different innovation types: innovation of meaning and innovation of solution. The latter focuses on how customers do and buy things, for example.

The current study has a strong customer experience focus. Our aim is to investigate how digital retail technologies affect the customer experience. Our experiments partly focused on how customers do things at the store level. Because retail technology may change customer interactions with front-line personnel (Dhruv et al., 2020), our analysis also consists of store personnel experience.

4. Research design and methodology

The overall research project consisted of 10 experiments. In this paper, we focus on three of them. In these three experiments, different types of retail innovation were utilized. The original innovation ideas were generated from a hackathon, and then the best ideas were selected by a professional jury. The innovation development process description was excluded from this study. The theoretical framework guided the case experiment selection. The research was conducted following the action research principles (see Reason and Bradbury, 2009), and the main data sources were qualitative. Data also consist of analytics and quantitative data. The data analysis topics were derived from theoretical discussions, with an emphasis on customer experience and how retail operations are affected by innovations. Loose coding and analysis were conducted according to the theoretical framework (see Miles and Huberman, 1994). The research procedure and data collection were in line with action research principles because action

research requires researchers to work with practitioners so that research and practice create results together (see Reason and Bradbury, 2009). The methodology of the current study included various data types, so we utilized a mixed-methods approach. The selected data approach was suitable for the current study because mixed-methods research provides more evidence than a quantitative or a qualitative study, and it has a strong practice orientation (see Adil, Nunes and Peng, 2014).

Table 1 Data collection methods

Retail	Innovation type	Experiment time	Data	Other
Experiment 1. Game shop	Gamification, mobile game for customers, minigames	1.12.2022–15.1.2023	Interviews, 10 ppl Game analytics data (n=875) Observations (100)	Customers and retail personnel interviews
Experiment 2. Pet store	Interactive digital signage	1.2.2023–25.3.2023	Observations & interviews, 20 ppl (test group)	Test group interviews, store management interviews
Experiment 3. Women's underwear & swimsuits	Virtual fitting room	18.12.2022-12.1.2023	Interviews, 20 ppl; on campus and in-store at regular customer events	Prototype test group interviews & customer interviews at store

The first retail innovation was a mobile game that customers could play in-store or through a web link. In the game, the customer's task was to fly a dragon through a tunnel while collecting dice. After successfully completing a game, customers were asked to go to AR mode and take a screenshot of the results. When showing their results to store personnel, customers received a small gift. The aim of this experiment was to boost hedonic experiences for customers visiting a store.

The aim of Experiment 1 was to encourage more customers to enter the physical store. In this experiment, 875 mobile games were played (unique players) in four stores during the experiment period. In one store, a large carboard advertisement was placed with a QR code to attract customers to play the game during their visit. Altogether, 216 played the game inside the store, and of those, 110 finished it and reached the end of the game. To get a small gift, a screenshot in AR mode was taken upon completion. Of 110 players, 107 took a picture; hence, we can conclude that the store customers were involved in mobile game play while visiting the store.

Experiment 2 was designed and piloted in a dog daycare/dog food store environment. The aim of the experiment was to attract customers passing by into the store. The basic idea of the innovation was as follows: an animated dog is sleeping (in screen, facing a pedestrian street). When a potential customer passes by, the dog wakes up and asks with speech bubbles whether the customer is interested in dog daycare services or nutrition. The potential customer can communicate through the window with the dog by whipping the bubble questions. The user interface is based on haptic touch, defined as the use of an active movement of the hand to gain information (Riedel and Mulcahy 2019). The experiment was designed with movement sensory technology with multiple Passive

Infrareds Sensor (PIR) modules for hand movement and ultrasonic sensors for detecting customers passing by.

The aim of the third experiment was to attract more young customers and to advance the click-and-collect concept by introducing new technology. The shop was launching an online store, and the new virtual fitting room could be a feature of that. The shop was a traditional 100-year-old brick-and-mortar store.

In the application, the user can fit swimming suits to a virtual body whose figure can be modified in real time with sliders. The model can be viewed and shaped interactively within the application. The customer first chooses the swimsuit model and can then adjust the body to the dimensions of their own body. The body can be turned to see the swimsuit from different sides. When the customer has found the model they like, they can select it and send the shop owner a message with the selected models. After that, the shop owner and customer can agree on a time for the selected swimsuits to be ready at the store. The customer can try the models in the store and make sure they have the right size.

The application was first tested among students and other people on campus, and then some modifications were made to the customer interface and instructions. The second test group consisted of the shop's regular customers. This group was very different from the first one; they were all 40+ years of age, and they liked to have personal service in a physical store.

5. Findings

In summary, the in-store mobile game (Experiment 1) raised interest among store visitors.

> -"Visual lay-out of the game is great." (customer)
> -"I like the dragon. I play quite a lot, but this is rather difficult to get to the end." (customer)
> -"Sometimes, when a bigger customer group is visiting a store and some (young ones) become tired of looking at the store selection, others may advise him to play the mobile game while we look at the store selection." (sales personnel)

Observational data indicated that in-store advertisements awareness conversation was around 5%, and about 2% of store visitors played the game. Playing a game had a positive customer experience effect; it increased interactions between store personnel and customers (gift pick-up). However, only 22% of all unique players picked up the gift from the store, which was the primary goal of the experiment. This indicates that the mobile game was used without actual store visits quite often and only for entertainment reasons. The findings were in line with the general idea that digital innovations may enhance more general customer experiences, such as positive memories (Artusi and Bellini, 2021). Overall, the experiment had positive customer and personnel feedback, increased customer–store personnel interactions, and boosted the general hedonic store experience.

Mini games and gamification also seem to have positive effects on employee experiences.

-“We have had many competitions among store personnel with this game.” (sales personnel)

Experiment 2, interactive digital signage, also raised interest among the target group, even though the communication technology did not operate well in all cases.

> “The overall idea is a creative and nice-looking page. Even if the product or the services are not interesting, people will still stay and want to interact with it.” (test customer)
> “It is different from the existing promotion method, and it can attract people from Generation Z.”

While the haptic touch concept is familiar to consumers due to the smartphone touch screen interface, our experiment operated with active movement without touch. This may have caused some embarrassment among customers. The adaptation to this experiment and technology was not as fast as in the previous experiment.

> “I prefer touchscreen…” (customer)
> “Pointing (wiping) the speech bubble did not work all the time if it was pointed too quickly.”

The virtual fitting room application (Experiment 3) received generally positive feedback, and most of the pilot customers said they would use it if the application became available to them. However, the application should be part of the company’s future online store. Availability and price information were needed, information that would be available in the online store. The customers felt that the opportunity to get to know the collection in advance was of great benefit, and many felt that it would make it easier to make a buying decision. Customers raised the possibility of combining online and physical store services.

> “Yes, the idea of the app is good because it allows you to look at the product before going to the store, in advance. Through interaction, the entire shopping experience could be improved.”
> “Yes, the application could help in making a buying decision.”
> “Yes, I would try it.”

In all, our experiments raised interest and positive customer experience among store customers. However, some areas of digital innovations, like user interface, required more development. In general, traditional retailers must tolerate initial failures and course correction in business development (see Hokkanen, Walker and Donnelly 2020)

6. Conclusions and managerial implications

Retail stores are facing many challenges but also opportunities. A development mindset and innovative approach to concept development are needed for brick-and-mortar renewal. Our current study revealed both theoretical and practical contributions. It improved our understanding of different store innovation paths and their implications for store stakeholders, such as customers and store personnel. Ease of use is a critical factor in all service technology applications (Riedel and Mulcahy, 2019) as well convenience in customer journeys at a more general level (Lien et al., 2021) Our study indicated that

changes in established and familiar user interfaces can have negative consequences for customer experiences; hence, especially in the case of the "innovation of meaning" type of digital development in which innovation changes the way customers act in purchase-related contexts (Artusi and Bellini, 2021), user interface design should be given attention.

We found positive developments in both customer and employee experiences. Besides mainly positive customer reactions, employees and store owners also demonstrated interest in digital innovation experiments. According to Silvan et al. (2021), customer and employee experiences are connected, and if employees are satisfied, customers will get better service. The practical implications of our three pilots are clear. Business model, as a term, has many meanings, but most business model definitions include proposing, creating, and capturing value (see Hokkanen et al. 2020). Our study underlines value-related actions, innovations, and development processes executed at the store level, where customers are in contact with services and store personnel.

While retail is generally slow to adopt digital innovations (Alexander and Kent, 2021), the current study found favorable attitudes and willingness to implement experiments at the store level among retailers. Study findings encourage management to speed up digital innovations at the store level. Successful digital innovation adaptation will refresh retail business models, improve employee experiences, increase customer–front-line personnel interaction, and advance sales development. We suggest that further studies on in-store digital innovations be investigated from an innovation diffusion model perspective. Are the late majority or laggers, for example, willing to adopt digital store innovations? Our study has a couple of limitations. Parts of the experiments were analyzed with test customers to whom the digital prototype was presented. The reactions probably did not represent the responses of actual store customers. All the retail companies that participated in the current study were invited to take part in a larger research project. This may have caused more favorable responses to digital innovations from store owners. We assume that this fact did not affect store personnel responses.

While the lifespan of the retail business model is getting shorter, ongoing innovation activities are critical for successful retail operations.

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