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Creating an Innovation Ecosystem in Urban Helsinki for Superior Customer Experiences

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Abstract: The aim of this paper was to contribute to the need for new ecosystems and click and collect delivery development for urban customers We conducted two pilots for evaluating new solutions to enhance customer experience. Robotics and greenhouse pilots created a positive customer and ecosystem participants feedback. Moreover, new click and collect delivery method with robotics increased our knowledge about robotics possibilities and challenges as a delivery service. Our attempt was to fulfill a recognized research gab in this named area. Our study contributed to the ecosystem and partner integration theme. The study underscored the need for a common digital interface for ecosystem actors to operate effectively. Moreover, when piloting new technologies, ecosystems' common aims and wants should be discussed profoundly to advance ecosystems' wellbeing.

Keywords: service ecosystems, urban development, click and collect, robotics, digitalization, shopping mall

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1 Introduction

Consumer behavior and the business environment are changing rapidly. Consumers have shifted their purchasing and other activities to digital platforms, and the COVID-19 pandemic has further accelerated change. Moreover, most consumers start their customer journey with "webrooming," which denotes a consumer researching products or services online before buying them in a brick-and-mortar outlet (Rosenbaum and Russell-Bennett, 2020). Due to this consumer behavior shift, shopping malls and other retail outlets have seen diminishing customer amounts, and this has affected urban city centers in a wider context.

Consequently, urban areas and shopping malls are facing these new challenges. To develop their attractiveness, the significance of ecosystems´ and innovation platforms is increasing. Correspondingly, we attempt to contribute to this defined problem area. In this research paper, the context is the consumer business innovation platform project PasilaHUB in Helsinki. The project aims to create and pilot 10 new concepts during 2020–2023 with local ecosystem partners. The concepts relate to new click-and-collect logistics systems and customer experience creation in a wider context. As examples of ecosystem operations, we are presenting here two pilots: robotic food deliveries to a mall´s hotel customers and urban farming on a shopping center´s green roof.

2. Changing retail environments in urban areas and shopping malls

Shopping malls have faced diminishing customer demand (Ameen, Tarhini, Shah, and Madichie, 2021). The reasons for that have been provided, for example, 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 is the fact that many customers have changed their buying behaviors from brick-and-mortar stores to digital platforms (Pantelimon, Georgescu, and Posedaru, 2020; Mäki and Toivola, 2021). We can conclude that recent years have been some of the most difficult in the industry's history, especially for traditional brick-and-mortar and mall-based retailers. Indeed, the term "retail apocalypse" reflects these dramatic changes. Traditional retail offerings may not be conducive to capturing consumers' attention and remaining competitive (see Childs, Blanchflower, Hur, and Matthews, 2020). The need to develop retail and mall shopping environments and practices is evident.

Shopping malls play a fundamental role in the retail ecosystem by bringing shoppers and retailers together (Ameen *et al.*, 2021). Malls have other meanings for customers; they can be environments for pleasurable experiences and stimulating the senses rather than an intent to purchase something (see Calvo-Porral and Lévy-Mangín, 2018). In a wider context, shopping malls influence urban centers' general attractiveness, and there is a great deal of research linking urban retail and local economic regeneration (Hoang, Barnes, and Munroe, 2019). Hence, brick-and-mortar retail outlets and malls are integral parts of an urban city structure; however, many companies have left city centers because of diminishing shopping visits and profitability problems.

To make mall visits more attractive, a customer experience must be as pleasant as possible. When a shopping visit is pleasant, it can lead to higher spending, greater repurchase intention, and more satisfied and loyal customers (Lucia-Palacios, Pérez-López, and Polo-Redondo, 2020). Several studies have focused on mall attractiveness among customers. Attributes like proximity to their homes, safety, communication, a lack of crowds, and accessibility have been mentioned (see Calvo-Porral and Lévy-Mangín, 2018). Moreover, attributes like entertainment, convenience, safety, leisure atmospherics, and other emotions related to hedonic customer groups were mentioned. In our case, robotic delivery could also affect the entertaining factor besides the more utilitarian delivery task. Moreover, robotic delivery can make the purchase and customer journey more convenient. In general, hedonic consumption includes aspects pleasure, fantasy and fun or feel other desired arousal experiences such as excitement and thrill, instead of the task being fulfilled (Wang, Wang, Wei & Chung, 2020).

3. Multi-channel Shopping and Robotics: Creating a Superior Customer Experience

Consumers are increasingly inclined to multi-channel shopping behavior, and customer journeys may consist of digital and conventional phases. Shopping malls have an important role as a sales environment, even though purchase decisions are not only based on the environment, itself, but also on the implicit judgments, preferences, beliefs, and feelings of the consumer (see Dalmoro, Isabella, Ordovás, and Pedro, 2019). In addition to carrying out their traditional shopping at the store, shoppers can now buy online, with home delivery or in-store pickup. This purchasing pattern is called “click and collect.” Our first piloting represents robotics delivery after consumer online purchases.

Our project’s aim was to make malls and shopping more attractive and, with that, affect the well-being of the wider urban ecosystem. Because customers want products delivered rapidly, cost effectively, and easily, we must develop last-mile delivery. The term “last mile” means the “last stretch” of the order fulfillment, aimed at delivering the products ordered online to the final consumer (see Mangiaracina, Perego, Seghezzi, and Tumino, 2019). This last part of the logistics process is typically the most expensive, inefficient, and polluting part of the supply chain (Ignat and Chankov, 2020). In our first pilot, we tested robotics delivery to hotel customers inside a mall environment. The term “last-mile” fits our pilot study well due to the relatively short distance from a restaurant to end customers.

Robotics has many roles and meanings in service delivery and as an ecosystem partner. According to Wirtz *et al.* (2018), service robots can have a physical or virtual representation with a humanoid or a non-humanoid feature, and they may have different types of tasks like cognitive−analytical or socioemotional. Our robot did not resample as human because its main task was food delivery, but because our aim was to strengthen the positive feelings and reactions among customers, human features were added, such as printed hands and eyes. In general, customer responses to a robot are typically a mix of excitement, wonder, curiosity, or disappointment (Kunz, Heinonen, and Jos, 2019).

To create value for ecosystem partners, participants must typically share and integrate resources. Business environments have faced radical transformations, while digital service environments and digital tools have become widespread in many industries (Mäki and Alamäki, 2019). Hence, today, resource integration may involve the digital dimension. Ecosystems become digital when their underlying interdependencies are propelled by digital technologies and their associated data connectivity. Data and technology play key roles when ecosystems include a digital dimension in their operations. As Yadav and Pavlou (2020) state, the driving changes in the marketplace were not just technology, but how technology-enabled interactions between the key marketplace entities of consumers and firms were being transformed by technology. In this multi-party, partly digital ecosystem structure, we are facing new challenges like digital interface equivalency or data utilization and handling procedures.

In the modern business environment, companies are becoming increasingly dependent on their external networks' crossing many disciplines and industries (Ketonen-Oksi and Valkokari, 2019). An "innovation ecosystem" is a network of individuals, entities, resources, and structures that join forces to catalyze new products, ideas, methods, and service systems. According to Adner´s most widely used definition, an "innovation ecosystem" consists of "the collaborative arrangements through which firms combine their individual offerings into a coherent, customer-facing solution" (Adner, 2006, p. 2).

Many companies have highlighted the importance of the customer experience. Ecosystems can act as an environment for customer actions. Hence, they play a central role in customer experience formation. Moreover, the ability to create value for ecosystem partners is one of the premises of the ecosystem (see Mustak and Plé, 2020). The experience, itself, is subjective by nature and linked with the value obtained as perceived by the individuals involved (see McColl-Kennedy, Gustafsson, Jaakkola, Klaus, and Radnor, 2015).

Research Question

In this study, our focus is the experience economy and ecosystem development. In addition, our task is to combine businesses´, cities´, and universities´ resources in creating and piloting new ways to advance the customer experience, new service innovations, and ecosystems' wellbeing more generally. Our study included the digital dimension and its integration into service ecosystems. The research questions are as follows:

1) How can actors and digital platforms be combined in ecosystems to develop new service offerings?

2) How can our two pilot experiments affect the customer experience, ecosystem operations, and wellbeing more generally?

4. Research Design

We conducted two piloting processes to study new approaches to creating positive customer experiences in shopping mall innovation ecosystems. The first pilot dealt with robotic food delivery to a mall's hotel customers, and the second focused on urban farming and how to utilize green roofs in shopping mall environments. The second pilot is ongoing, and in this paper, we present the results from the first year.

In both pilots, we applied a qualitative approach and used mixed methods to gather and analyze data. Our study was conducted following action research principles where companies, researchers, and students collaborate closely during the research process. Moreover, we underscore practical knowledge, results, and actions throughout the research project. Action research, in general, requires researchers to work with practitioners so research and practice create results together. The analysis and data collection of the first pilot, a new click-and-collect delivery mode with a robot, took place 5.6.2021 to 1.7.2021, and the latter robotics pilot took place 4.10.2021 to 5.11.2021. A trainee was hired for the first piloting phase, and he documented 54 delivery trips with the diary method. In addition, the pilot planning phase started in Autumn 2021. Weekly planning meetings were held with the robot manufacturer (Dimalog), robot operator (Telia Ltd.), Tripla Mall representatives, the Haaga−Helia research team, and occasionally, other ecosystem partners. More than 50 planning and operation phase meeting memos represented empirical material for the study. These materials and data were well in line with action research principles, because action research, in general, requires researchers to work with practitioners so research and practice create results together (see Reason and Bradbury, 2009).

In the second pilot, the greenhouse was built in May 2021, and its operations started in June. For the first summer, the aim was to get experience with the number of products one greenhouse could produce and to test different growing systems. Qualitative data were collected during the summer. One restaurant from the shopping mall was chosen as a piloting partner. They used the products for their lunch meals. In August and September 2021, shiitake mushrooms were produced for the same restaurant. We conducted an inquiry in January 2022 for all the restaurants in the shopping mall. We asked what herbs and other products they could use and if they were interested in participating in the pilots.

During the first summer, two trainees tended the plants and other everyday operations in the greenhouse. In addition, there was a small project team following the greenhouse pilot, and we met every two weeks. We also had a WhatsApp group where trainees could request help and answer questions.

Our analysis followed the aims and framework of the study. We followed Miles and Huberman's (1994) approach, and a loose coding and theme list were created and used as a basis for data analysis. The main themes of our analysis were as follows: general findings related to the robot delivery concept, specific robot-related attribute analyses, customer reaction findings, and the development issues confronted. The themes mentioned were derived from a theoretical discussion and were used to avoid data overload.

5. Findings

Findings, first pilot: Robot delivery as part of service ecosystems

Our analysis focused on two topics: first, robots' fit and actions as part of mall ecosystems and, second, how robots interacted with customers from a customer experience perspective. The interaction included high-level, technology-enabled phases and elements (see Yadav and Pavlou, 2020). In short, our robot required a digital ordering system. Restaurants' online ordering platforms were used for that purpose. Moreover, the robot needed to integrate elevators and the capability of ordering a lift for

its delivery journey to hotel customers. Subsequently, the Taika robot confronted other mall customers during its trip, and it was essential that it would not, for example, hit those mall visitors. From a customer experience point of view, fast and smooth deliveries were of the utmost importance. The actual delivery time took around 15 minutes, depending on the elevator status. The food preparation time had to be added to this delivery time.

Robots' operational findings

Robots' delivery journeys went relatively well. The Taika robot could avoid other mall customers, and it did not, for example, hit anyone. The robot had limited communication abilities; for example, it told some jokes and made some comments while waiting for the elevator. Frequently, however, comments were not suitable for the situation, and they were sometimes even inappropriate. The Taika robot faced some problems when entering the elevator. If someone passed the Taika robot when it was entering the elevator, it mistakenly reasoned that it was inside the elevator, which was not the case. Another challenge sometimes took place at the end of a delivery when a robot ordered a customer to open the delivery box with a pin code. The box sometimes jammed, and our trainee had to help release the delivery. In all, the actual delivery operations went well, except for occasional problems.

Customer experiences differed among end and other mall customers. While end customers' reaction was relatively neutral and they were in a hurry to get the food delivery, other mall customers were more interested in and excited about the Taika robot. Many mall customers wanted to take a selfie with the Taika robot, and a couple kids wanted to know its name. The robot seemed to strengthen the brand image of the mall. While the mall's brand is affected by several attributes like store brands and environment (see Das, 2015), customers and their experiences play a critical role in this phenomenon. End customers' experience seemed utilitarian, while other mall customers had a more hedonic experience, like excitement (see Wang et al., 2020).

Findings, second pilot: The greenhouse in the shopping mall ecosystem

The greenhouse pilot is ongoing. The first year, 2021, was more like starting the experiment, getting some social media publicity, integrating the first pilot companies, and getting feedback from the end users. The feedback was positive, both from the restaurant and from the local residents. However, there are also challenges, such as how much one greenhouse can produce and whether it is enough to create value for pilot restaurants and grocery shops. In other words, production capacity and demand fluctuations create a challenge for operations.

6. Contributions

The aim of this study was to investigate various ecosystem actors' actions in conventional and digital platforms and to analyze how our two pilot experiments affect ecosystem wellbeing in general.

The first pilot was robot food delivery to hotel customers, which revealed many findings. First, the robot seemed to function well as part of a service ecosystem. The

robot could navigate in a mall environment and was relatively autonomous. We faced some challenges in robots´ operations as part of an ecosystem. The robot sometimes had difficulties interacting (to order) an elevator, and some robots´ communication was not suitable for the situation. In general, robot delivery fulfilled its basic task: Customers obtained their food within a satisfactory time frame, and the customer experience was good.

The second pilot was a greenhouse on the shopping mall´s green roof. The starting point for the urban farming pilot was the previous work in one of our partner's urban lab environment. During the first summer, we had only one pilot restaurant using the products. The challenge was to estimate the number of herbs we could deliver every other week. In the beginning, there was a great deal of discussion about what to produce and what new technology to pilot in the greenhouse on the shopping mall´s green roof. Conversely, the shopping mall wanted to get positive publicity and new service offerings for the restaurants, and the university wanted to test new production systems. The pilot continues, and the next step is to scale up the production and to get more restaurants involved in the pilot.

From an ecosystem perspective, we found challenges in common goal definitions during the test period. Some ecosystem participants wanted to focus on technology testing and development, while some emphasized business-related targets. Moreover, we found that the digital interface form example in the customer ordering process was problematic. We even had to exclude some promising ecosystem members due to Interface incompatibility. In the greenhouse pilot, we also faced challenges in common goal definition, finding the right partners, and motivating all players to work toward business-related targets.

Our study contributed to the ecosystem and partner integration theme. Our study underscored the need for a common digital interface for ecosystem actors to operate effectively. Moreover, when piloting new technologies, ecosystems' common aims and wants should be discussed profoundly to advance ecosystems' wellbeing.

Practical Implications

The practical implications of our two pilots are numerous. Robotics piloting showed that the new click-and-collect delivery modes create interest not only among customers who ordered the delivery but also among other mall customers. These results are in line with Calvo-Porral and Lévy-Mangín (2018), who recommended that managers should try to design their malls to lead customers to perceive shopping malls as highly convenient and entertaining. The robotic last-mile delivery added mall functionality, but it also had an entertaining dimension regarding the customer experience. The green roof and greenhouse pilot indicated that local production in the city center and urban area also received publicity and interest among the people living in the area. In addition, restaurants and other service companies are ready to pilot and use local products to improve the customer experience. The more general finding was that new ecosystem structures refreshed the original concept and service environment. In other words, new shopping mall businesses and service models enhanced the customer experience. This, in a wider context, can help to tackle consumers' shift to digital platforms and boost cities' and shopping mall businesses' attractiveness.

One key factor affecting ecosystems' actions and wellbeing is their ability to share and integrate resources (see Mustak and Plé, 2020). According to our study, resource sharing may face challenges when digital service offerings and channels are included in the ecosystem structure. Digital interface mismatches may even exclude potential ecosystem members. We recommend identifying all shared resources, especially digital interface attributes, in the early ecosystem planning stage. In all, ecosystems should include a strong customer focus in their actions and activities.

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