What if…? – How AI Chatbots Could Reconfigure Grocery Shopping In-store

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K E Y W O R D S

Digitalisation
Artificial Intelligence
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Practice Theory
Retailing
Focus Groups

A B S T R A C T

In the light of the rapid development of AI technology, this paper aims to explore how the integration of the novel application of an AI chatbot would reconfigure the practice of grocery shopping in brick-and-mortar stores contributing to the trend of self-service. Based on a hypothetical scenario discussed in focus groups and drawing on practice theory, the study points out that, by adding this new element, the links between the elements of the practice would change, inducing a change in meaning from purely functional to more inspirational. By addressing insufficiencies in the socio-material assemblage, an AI chatbot would enhance in-store navigation and information seeking, altering social interactions as well as disrupt shopping patterns by inspirational guidance. The findings contribute to literature on how the practice of grocery shopping is shaped by new elements and the literature on human-technology interaction.

1. Introduction

Artificial Intelligence (AI) is no longer science fiction as it has become indispensable in today's world (Puntoni et al., 2020). Besides bringing positive effects on the business side, e.g., operational effectiveness and predictive accuracy (Cao, 2021; Puntoni et al., 2020), AI technologies have also found their way into most consumers' everyday lives (Moore et al., 2022; Noble et al., 2022), whether being it the use of navigation applications or scrolling through social media feeds. Since the introduction of ChatGPT in autumn 2022, a language model based on AI technology, the public interest in AI has risen even more (Metz, 2023). It is clear that those technological innovations change the way we live and interact (Shove et al., 2012).

One of many areas characterised by an ongoing fundamental change empowered by digitalisation is the retailing sector (Del Vecchio et al., 2023; Guha et al., 2021; Roggeveen & Sethuraman, 2020). Here, innovation paves the way towards online retailing, a phenomenon that scholars and industry leaders sometimes refer to as "retail apocalypse" (Helm et al., 2020), diminishing the future outlook for brick-and-mortar stores. However, many consumers still value the specifics of physical retail stores, alongside their desire for innovations in the in-store experience (Helm et al., 2020; Mende & Noble, 2019).

That physical retail is not dead is particularly the case for grocery shopping. For instance, despite its accelerated growth driven by the COVID-19 pandemic, online grocery shopping in Sweden still accounted for only 4,5% of total sales in 2022 (Svensk Dagligvaruhandel, 2023). From 2017 to 2021, the number of physical grocery stores remained on the same level. The practice of grocery shopping is deeply embedded in consumers' everyday lives (Fuentes et al., 2019; Warde, 2005). Even though being a routinised task and a fairly stable practice, the way in-store grocery shopping is carried out has changed over time (Fuentes et al., 2017). The introduction of new elements such as shopping bags (Hagberg, 2016), self-scanning stations (Bulmer et al., 2018) and smartphones (Fuentes et al., 2017) has been found to change shoppers' practices, facilitating the development towards more self-service. Yet there are insufficiencies disrupting the practice, for instance, difficulties in obtaining information about products or how to find them in the store (Fuentes et al., 2017).

An application that has the potential to address these insufficiencies are AI chatbots which we introduce as a hypothetical scenario in this study. As the technological possibilities to integrate language models into corporate service applications already exist today (Kelly, 2023), we presume that it is only a matter of time before AI chatbots find their way into a retailer's app. However, in order to establish their usage, those applications need to be integrated in consumers'

practices (Fuentes et al., 2021). When uncovering the way new technological elements are integrated into practices, it is important to understand "the complex device-consumer practice interactions involved in the digitalization of everyday practices" (Fuentes et al., 2021, p. 8). With an AI chatbot as a new element in the practice of grocery shopping, it is therefore of importance to examine potential changes in the practice of grocery shopping. Consequently, our study is driven by the following research question: How would the integration of an AI chatbot in a grocery retailer's app reconfigure the practice of in-store grocery shopping?

The influence of smartphones on the practice of shopping in general (Fuentes et al., 2017) as well as of specific apps in particular (Fuentes et al., 2021; Fuentes & Sörum, 2019) has gained scholarly attention. We aim to expand this stream of research by exploring the potential influence of an AI chatbot in-store. To examine this, we conducted focus group discussions with Generation Y shoppers as they are known to be early adopters of technological innovations (Valentine & Powers, 2013). We found that the use of an AI chatbot would shift the practice to a more inspirational one by addressing common insufficiencies in-store such as navigation and information seeking as well as breaking regular shopping patterns.

The remainder of this article is structured as follows. First, we provide an overview of the practice-theoretical perspective, arguing for this lens to explain in-store shopping behaviour, namely the potential changes an AI chatbot would bring. This is followed by an introduction to AI as a technology and an AI chatbot as a particular application and object of this study. We will then introduce the scenario used in the focus group discussions. The choice for this method will be justified in the next section, including details regarding the conduction of the study and data analysis. The results and their analysis follow in a combined and threefold section, with the first one putting the lens on how grocery shopping is caried out today, and the second on how an AI chatbot would be used. This builds the base to compare and synthesise potential changes on a higher level which will be discussed in the last section. The final section will conclude and point on limitations and further research as well as give managerial implications.

2. Theoretical Framework

2.1. Practice Theory: A Way to Explain In-store Shopping Behaviour

To examine and explain the potential changes in how grocery shopping would differ when equipping shoppers with an AI chatbot, we draw on practice theory. Rather than intentions, the point of departure of this school of thought are activities and behaviours carried out (Fuentes & Svingstedt, 2017). While

previous research focused on symbolic meanings of consumption and its role in constructing consumers identities, ordinary consumption in everyday life increasingly became a topic of interest for scholars since the beginning of the 21st century (Bulmer et al., 2018). Practice theoretical approaches are commonly used to map in-store shopping behaviour (Moore et al., 2022). As this study revolves around shopping behaviour, a practice-theoretical lens is useful. Further, practice theory offers a way to construct images of changing interrelations within daily life practices when product innovations occur (Shove et al., 2012). In this particular case, the introduction of a chatbot utilising AI technology can be considered a product innovation.

2.2. Making Practice Theory Applicable

Influenced by philosophers of the late 20th century such as Bourdieu and Latour, theories of practice have in common that they "present a useful lens to frame – and integrate – the social world" (Elms et al., 2016, p. 235). The underlying idea is that practices structure everyday life (Warde, 2005). But what is a practice? Reckwitz (2002, p. 249), one of the most influential scholars within contemporary practice theory, defines it as "a routinized type of behaviour which consists of several elements, interconnected to one other: forms of bodily activities, forms of mental activities, 'things' and their use, a background knowledge in the form of understanding, know-how, states of emotion and motivational knowledge". While these explanations remain to be on an abstract level, there are several attempts to provide more graspable terms in order to make those theoretical constructs more applicable for empirical research (Fuentes & Svingstedt, 2017). However, there is no universally accepted taxonomy of terms (Southerton, 2013). Building upon Reckwitz' ideas, Shove et al. (2012) provide one approach to divide a practice into consisting of three elements: materials, meanings, and competences which are connected by interdependent links. In the retailing context, this framework is commonly applied to examine how elements shape practices, e.g. by Fuentes & Svingstedt (2017) and Hagberg (2016).

Materials include "objects, infrastructures, tools, hardware and the body itself" (Shove et al., 2012, p. 23). Competences refer to the ability to understand the execution of a practice as well as the "know-how". The meaning of a practice is its "social and symbolic significance" for the practitioner (Shove et al., 2012, p. 23). These three elements are interconnected by links in various ways and characterized by interdependent relationships. Frequently, the totality of the elements and its links is also referred to as a socio-material assemblage, accounting for the human and non-human interrelations (Fuentes et al., 2017; Moore et al., 2022; Strengers et al., 2016).

Important to note here is that practices do not stand for themselves since they are linked to other related practices as part of a nexus of practices that are partly overlapping (Warde, 2005). When individuals, as carriers of practices, engage in a new practice or the practice evolves, bodily and mental activities shift (Fuentes et al., 2017), e.g., new competences need to be learned.

2.3. The Grocery Store: A Socio-material Assemblage in Constant Change

After introducing the practice-theoretical perspective and its applied framework by Shove et al. (2012), we now move towards the practice of grocery shopping which can be seen as "a highly skilful, complexly-gendered, socially-embedded and situated practice" (Elms et al., 2016, p. 236). It is carried out within a socio-material assemblage, also referred to as retailscape which is defined as the physical space of a store and all its human and non-human objects that are in direct and indirect interaction (Fuentes et al., 2017). To draw back on Shove et al. (2012), it can be argued that the practice's materials cover all human objects, i.e., shoppers, fellow shoppers (meaning other people that shop in the store), accompanying

shoppers (meaning people with whom the shopper shops together), in-store personnel as well as non-human objects such as aisles, shelves, signs, products, shopping carts and smartphones, which are interlinked. Competences (Shove et al., 2012) refer to knowing where products are located, what categories products belong to, what ingredients go together and how to use a smartphone, among other competences. According to Shove et al. (2012), the meaning of the grocery shopping practice is its social and symbolic significance for the shopper.

Practices change over time and thus, retailscapes are not static either (Fuentes et al., 2017). Their socio-material arrangement is subject to change, even though being fairly stable. Various materials have shaped the practice of grocery shopping over time. Table 1 shows selected materials in the order of their appearance in the assemblage, which have been studied from different practice-theoretical angles. Within this research stream, the focal point lies in examining the influence of different elements, some of which are new to the retailscape, on shaping the practice.

Table 1: Literature review of materials within retailing studied from a practice-theoretical perspective (sorted by the appearance of the material in the socio-material assemblage).

Author(s)	Main material studied	How the material has shaped the practice of shopping (towards more self-service)
Hagberg (2016)	Shopping bag	Shopping bags have enabled consumers to carry more products from the store and thus to buy more goods.
Cochoy (2008)	Shopping cart	Shopping carts have changed the way shoppers do groceries and modify their calculations (shifting from "budgetary" to "volumetric" constraints).
Bulmer et al. (2018)	Self-service checkout	Many grocery shoppers have incorporated the use of checkouts into their daily routines, and some of them feel a social obligation to use them to help others (e.g., because they think that fellow shoppers with small children should have priority at normal checkouts).
Fuentes et al. (2017)	Smartphone	The introduction of smartphones has led to a shift in agency, where tasks that were previously conducted by in-store personnel have now been taken over by shoppers, remaking the relationship between consumers and retailers.
Fuentes et al. (2019)	Package free products	Package free shopping has changed elements of the practice of grocery shopping. This includes making the practice meaningful in a new way, consumers developing new competences and a change of the material arrangement in the store.
Fuentes & Sörum (2019)	Ethical consumption apps	Ethical consumption apps have enabled shoppers to act ethically and develop a self-reflection with regards to their purchases.
Fuentes et al. (2021)	Sustainable food apps	An anti-food waste app failed to promote new ways of acquiring food. The inability resulted from app glitches but also conflicted with existing practices.
Moore et al. (2022)	In-store kiosk digital store greeter	AI digital humans as voice assistants can enhance social tensions in-store, namely the need of interaction with in-store personnel and its avoidance. Apart from its functional value, AI digital humans can increase the hedonic aspect of customer experience.

Overall, grocery shopping has developed more towards self-service whereby tasks traditionally performed by in-store personnel are increasingly carried out by shoppers themselves (Hagberg, 2016). Innovations such as the invention of the shopping bag (Hagberg, 2016) or the shopping cart (Cochoy, 2008) has changed the way grocery shopping is carried out as

larger volumes of products can be bought. Technological advancements such as the implementation of self-service checkouts have further changed the way we shop, empowering consumers to perform this final task if wanted (Bulmer et al., 2018). The advent of the smartphone influences what information is available to shoppers as well as who to

communicate with (Fuentes et al., 2017). In this vein, smartphone apps as materials within the smartphone further have the ability to change the information access (Fuentes et al., 2021; Fuentes & Sörum, 2019). Continuing this technology trend, AI-enabled service kiosks have the potential to influence consumers (Moore et al., 2022). Amidst the constant change, the question arises: What will be the next material to shape the practice of grocery shopping? In the wake of technological innovations such as smartphones, apps, and AI kiosks, along with the significance of AI, the subsequent chapter will introduce AI chatbots as a new potential material that could shape grocery shopping.

2.4. Artificial Intelligence and Chatbots: New Technical Material

After introducing the practice of grocery shopping and its practice-theoretical underpinnings, it is further important to shed more light on the main motivation for this research: Artificial Intelligence (AI). Dwivedi et al. (2021, p. 2) define AI as a "non-human intelligence programmed to perform specific tasks" that were traditionally assigned to humans. Such as with human intelligence, AI systems learn from previous experiences and tasks which build the base for a continuously improved performance (Wang et al., 2015). AI applications are progressively used in various industries, including the public sector, healthcare, banking, and retail (Dwivedi et al., 2021; Prentice & Nguyen, 2020). Beside common use within online retailing, AI applications are also increasingly used in physical retail (Guha et al., 2021). They range from interactive shelf displays (Guha et al., 2021) and service kiosks (Moore et al., 2022) to automated retail stores (Pillai et al., 2020) and autonomous checkout without scanning (Trigo, 2022).

An AI application that assists consumers with their shopping, e.g. by guidance and information retrieval about product features, are AI chatbots which are particularly present within online retailing (Chen et al., 2021; Ruan & Mezei, 2022; Silva et al., 2022). Those are computer programs that can simulate conversations with humans. The underlying AI capability is natural language processing (NLP) that enables machines to interpret human language (Chen et al., 2021). An advancement within NLP are language models, which contain large amounts of textual training data (Teubner et al., 2023). AI chatbots can understand and process users' input in their natural language as well as generate appropriate responses (Suta et al., 2020). They are for example used to help consumers with information retrieval, navigational guidance and support for decision making as a way to replace human support agents (Chen et al., 2021). Interactions between AI chatbots and consumers occur in dialogues which requires AI chatbots not only to understand requests, but also to keep the consumer engaged through clarifying questions. People can interact with AI chatbots through writing, but they also exist on a voice basis, examples

of which are Apple's Siri voice assistant and Amazon's Alexa (Rai, 2020; Rana et al., 2022). In some cases, they deliver such good quality that it is not always clear to consumers whether they are interacting with AI or a real person (Chen et al., 2021).

2.5. Bridging Grocery Shopping and AI Chatbots: Introducing the Hypothetical Scenario for This Study

Although shoppers are exposed to a variety of information in grocery stores, it is common for them to use their smartphones (Fuentes et al., 2017). This is due to an insufficient assemblage, where shoppers are not provided with enough information and thus help themselves. Retailers have started to offer services to address these insufficiencies. For example, AI chatbots are common in e-commerce (Adamopoulou & Moussiades, 2020) and AI self-service kiosks have found their way into stores (Guha et al., 2021; Moore et al., 2022). A new way of obtaining information is the use of language models, which has gained widespread attention recently, most notably in the wake of the release of ChatGPT in November 2022 (Björkman, 2023).

While at the time of the study ChatGPT and similar language models stand on their own and are accessible on the developing companies' own websites, developers of these language models have begun to offer tools to businesses to create their own AI chatbots that can be implemented into various apps and services and connected to different data sources (Kelly, 2023; Weise & Grant, 2023). At the time of the study, none of the largest retailers in Sweden had a retailer's app that allowed users to interact textually with an AI chatbot.

As a new material in the retailscape which is supposed to counteract insufficiencies during shopping, we introduce AI chatbots in a retailer's app as a hypothetical scenario for this study. Especially regarding the already mentioned trend of self-service in retail, with new innovations that increasingly allow customers to shop more independently from in-store personnel, we conclude that the implementation of an AI chatbot in a retailer's app is a realistic scenario. For our scenario we define the capabilities of the AI chatbot as the seamless integration of both internal data sources (for instance stock availability data, locations of products, and store specific information) and the internet. This implies that shoppers can enter questions in text form which then results in textual output. Information would be served on a "silver plate".

3. Method

3.1. Focus Group Discussions: A Way to Capture Narratives of Daily Life

A more frequent use of qualitative methods is quested within the research of mundane practices such as grocery shopping (Fuentes et al., 2021). To capture the complexity of shopping practices, socio-cultural studies are an insightful way to account for the social interdependencies and to complement the vast amount of quantitative research within retail (Fuentes & Hagberg, 2013).

To examine the mundane practice of shopping, focus group discussions are a suitable tool. Within this research field, the method was employed for instance by Fuentes & Svingstedt (2017), examining mobile shopping and Fuentes et al. (2019), examining package free shopping. Focus group discussions are a technique "used to illuminate the construction of shared cultural understandings and narratives of everyday life" (Eriksson & Kovalainen, 2008, p. 4). As our study aims to capture the everyday practice of grocery shopping, the narratives are used to gain rich qualitative data for analysis. Further, focus groups can unpack how "various discourses [are] rooted in particular contexts" (Lunt & Livingstone, 1996, p. 96) and due to its characteristic of a natural conversation "reveal both the meanings that people read into the discussion topic and how they negotiate those meanings" (Lunt & Livingstone, 1996, p. 96). In exploratory settings, they are commonly used to test new product ideas (Fern, 1982). We expose participants to the product idea of an AI chatbot integration into a retailer's app, which is to the date of the study not implemented in any retailer's app on the Swedish market. Further, we use focus groups since this technique enables participants to create fantasies and analogies and to imagine the future (Eriksson & Kovalainen, 2008). By introducing the idea of an AI chatbot integration, we make use of the technique of a scenario, which is commonly used within social sciences (Kim, 2012), first being applied by Herskovits (1950).

3.2. Development of the Topic Guide

In preparation for the development of the topic guide for the focus group discussions (Eriksson & Kovalainen, 2008), two expert interviews were conducted with managers of two of Sweden's largest retailers (DLF, 2022). Expert interviews are commonly used to develop the main instrument of a study (Flick, 2009). The managers qualified as experts due to their experience within digitalisation of retail stores and in-store management respectively. In addition, an online focus group discussion with 5 participants was conducted as a pre-study to complement the expert opinions with the consumers' perspective. This discussion included brainstorming tasks (Eriksson & Kovalainen, 2008) to elicit thoughts on how their

current grocery shopping is performed and how they perceive the in-store environment. In a second part, participants shared their perspectives on how they would interact with an AI chatbot, i.e., which questions they would ask. The overarching aim of the pre-study was to make sure that the questions asked would lead to narratives of the participants that could then be analysed by applying the framework of Shove et al. (2012).

In general, by conducting both the expert interviews as well as the pre-study with focus group discussion with consumers, three main themes regarding the function that an AI chatbot could fulfil emerged. Those are information, navigation, and inspiration. Information covers questions the shoppers would ask the AI chatbot regarding product ingredients, quality, availability, and prices. Navigation refers to questions about finding products within the store, within a shelf and the quest for the fastest route within a grocery store. Inspiration refers in particular to proposals for certain products and meals based on different parameters that participants give the AI chatbot. Based on those three themes, the topic guide for the actual study was developed.

3.3. Conduction of the Study

Participants for the focus groups got recruited via the personal network of the authors and referrals (Eriksson & Kovalainen, 2008; Fuentes et al., 2017). They were partly familiar to each other and partly not. By that, we ensured a balance of natural conversations (Eriksson & Kovalainen, 2008). The participants' ages ranged from 21 to 30 as generation Y is likely to be familiar with technology applications such as AI chatbots (Valentine & Powers, 2013). Since grocery shopping is a practice that is shared by everyone, the groups were homogenous in this sense (Eriksson & Kovalainen, 2008). In total, 16 participants were recruited and split into 3 different groups (see table 2 for an overview).

Table 2: Participants of the focus groups.

Participant	Age	Gender	Participant	Age	Gender
1	23	male	9	25	female
2	25	female	10	23	female
3	23	female	11	21	female
4	25	female	12	23	male
5	30	male	13	22	female
6	25	female	14	22	male
7	25	female	15	21	male
8	23	female	16	22	male

The focus group discussions were conducted in March 2023 at the School of Business, Economics and Law at the University of Gothenburg, Sweden. Each session lasted around 90 minutes and after the three sessions, the generated themes for the purpose of this study were saturated (Eriksson &

Kovalainen, 2008). The two authors of this research served both as facilitators of the discussions whereas one was more active in facilitating and introducing tasks and starting questions while the other one took notes to support the analysis.

As in the pre-study, the focus group discussions started with a warm-up (Flick, 2009) where respondents were also informed about that the discussion will be recorded and that anonymity was granted. In the first part, participants were asked to describe one recent grocery shopping experience in-store. This had two reasons: First, the participants' thoughts should be stimulated as realistically as possible (Kim, 2012) for the introduction of the AI chatbot. Second, by that, we wanted to capture the whole assemblage. In the next part, participants were asked to discuss problems they experience and how to solve them. This was included to detect potential insufficiencies in the assemblage. In the last part, the AI chatbot got introduced to the participants which were then asked to come up with some spontaneous thoughts regarding how to make use of it.[1] To illustrate the scenario, a projection showcased a picture depicting the interior of a grocery store, alongside with the prototype of an AI chatbot (see figure 1).
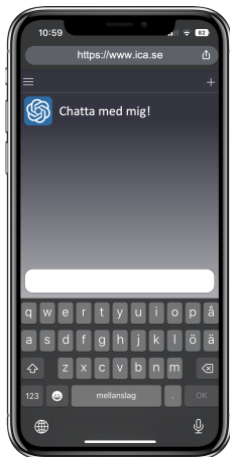

Figure 1: Picture of an AI chatbot prototype used during the focus group discussions.

The focus group discussions got recorded and transcribed by a software. Besides being present throughout all discussions, after each session, the transcript was read by both researchers while the details were still vivid in mind (Eriksson & Kovalainen, 2008). In addition, the audio file and the notes from the discussions were used to ensure understanding. Slight adaptions in the topic guide were made after the first session to cover the main themes in the given timeframe of 90 minutes.

An overview about the study procedure can be found in figure 2.

Figure 2: Study procedure.

3.4. Data Analysis

Similar to Fuentes & Svingstedt (2017), we analysed the data in different phases. First, by applying content analysis (Eriksson & Kovalainen, 2008; Mayring, 2014), we identified broad themes and patterns that were emerging in regards to the research question.[2] Statements were grouped together into common themes whereby unnecessary data was left out (Mayring, 2014). The participants' narratives were split into the part on the current grocery shopping practice and the part on the introduction of the AI chatbot. In the second stage, we checked the retrieved statements for translation into the three elements materials, meanings, and competences by Shove et al. (2012). In the third stage, based on the retrieved themes, both researchers discussed and interpreted the differences in the meanings of the themes in regards to the elements and its links (Fuentes & Svingstedt, 2017).

4. Results and Analysis

The following section is threefold, combining results and analysis. First, to build common ground, the current practice of grocery shopping is captured with a specific lens on insufficiencies in the socio-material assemblage. In the second part, the participants' imaginations of interactions with the AI chatbot are presented. Here, four main themes emerged. The third part then analyses and discusses the overall changes in the elements and its links that would occur by the introduction of the AI chatbot.

4.1. Capturing Grocery Shopping Today

In the following part, the current practice of grocery shopping will be presented with illustrating quotes. The overall meaning of the practice is analysed, before moving on to specifics of the in-store assemblage and its insufficiencies.

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[1] The participants were familiar with language models such as ChatGPT and therefore had experience with using AI chatbots. The hypothetical scenario of implementing AI chatbots in a retailer's app was explained to them. The participants were asked to imagine that they were shopping in their regular grocery store, that they had

installed the app of the respective retailer, and were using the AI chatbot functionality within this app.

[2] We analysed the data of all three focus groups together, thus, there was no cross-comparison between the groups made since they were homogenous.

4.1.1. Doing the Groceries: Most Often a Necessary Evil

Overall, our study showed that the participants go for grocery shopping on a regular basis, i.e., several times a week, which confirms that grocery shopping is a well-established practice (Fuentes et al., 2019). In most of the cases, shoppers in-store want their grocery shopping to be as quick, cheap, and convenient as possible with the overarching goal to fulfil the basic need for food:

> "[I have] a ready-made shopping list [and try to] get through as quickly as possible so that [I] can also get home as quickly as possible."

However, depending on the choice of store, the participants sometime seek for a more explorative experience which in turn implicates a different meaning of the practice of shopping:

> "At ICA MAXI [a supermarket], you can have some of these sort of tasting bases on the way and things like that, where you can stop and test a little bit and then move on."

The meaning assigned (Shove et al., 2012) varies, depending on different circumstances. It can be broadly differentiated into shopping with a more functional meaning and a more inspirational meaning where exploration and inspiration are in the centre. However, the functional meaning predominates.

Not everything always runs smoothly when shopping in-store and insufficiencies can occur, disrupting the shopping practice. It can be the (bad) quality of products that changes prior-planned purchases, or problems with the store environment such as congestion in small hallways or by the cashier and issues when using self-checkout services. Since this study addresses the potential changes an AI chatbot would cause in the in-store shopping practice, in the further analysis we consider only those insufficiencies that an AI chatbot could address.

At first glance, the practice of grocery shopping may appear simple and unsophisticated, as participants often describe the practice as not given too much attention:

> "[…] I tend to listen to music or a podcast often when I'm shopping so that it gets done as quickly as possible."

However, from a practice-theoretical perspective, grocery shopping is highly skilful and complex (Elms et al., 2016) and we want to dive deeper into why participants perform certain actions within the practice and how they are constituted. As the research goal is to examine how the integration of a new material, the AI chatbot, would influence the elements and links of the practice of grocery shopping, we have to synthesize the current practice in order to understand the changes that

might occur. Therefore, we unpack the in-store assemblage in the subsequent section.

4.1.2. Unpacking the In-Store Assemblage

During the focus group discussions, the in-store assemblage, i.e., the retailscape, got captured as consisting of these main materials (Shove et al., 2012): shoppers, in-store personnel, accompanying shoppers, fellow shoppers, products and their packaging, price tags, shelves, special offer and tasting bases, and cashiers. Also, smartphones were commonly mentioned as materials used during grocery shopping, not only to read shopping lists, but also for listening to music and looking up information, which is in line with the findings of Fuentes et al. (2017). They are all interlinked in a fragile assemblage (Fuentes et al., 2019) and shoppers interact with them in different ways. Participants use to shop with accompanying shoppers or alone, prepared or unprepared and generally avoid talking to in-store personnel.

As mentioned, shoppers seek to fulfil their basic need for food which often implies that they buy products that can be used to cook meals, which shows that the practice of grocery shopping is closely interlinked to the practice of cooking (Warde, 2005). We discovered a range of strategies used to fulfil the tasks of grocery shopping. Some participants follow a very structured approach, writing a list of all items they plan to shop in advance, often on their smartphones. This is especially the case for participants that strictly follow recipes. Here, the competence (Shove et al., 2012) of knowing what ingredients make up a good dish is not as developed and needs to be compensated by reading recipes and writing a list of ingredients. Other shoppers are more spontaneous, seeking for inspiration in the various products they encounter while perusing the aisles of a grocery store before making their purchase decisions:

> "[...] the few times that we go [grocery shopping] together, I can also add that it's a bit more like appreciating the store atmosphere and getting some inspiration."

Those shoppers have a higher level of competence when it comes to knowing how to combine ingredients. A more inspirational meaning is ascribed to the shopping practice in this case.

Another important theme discovered in the socio-material assemblage was the social aspect in how the shopping is carried out. The participants described two different shopping scenarios, shopping alone and shopping with accompanying shoppers. Unlike shopping alone, shopping with several people means that collective decisions need to be made which often results in trade-offs of how and what to shop:

"Now [when shopping with friends] it was more like this: What do you want, what do you want? And maybe we, or I, don't normally do that, but rather go in [the store] and have a clear goal."

However, participants could also benefit from different competences in the group, for instance from the knowledge of where certain products are located in a store, which allows the group to split up and shop more efficiently.
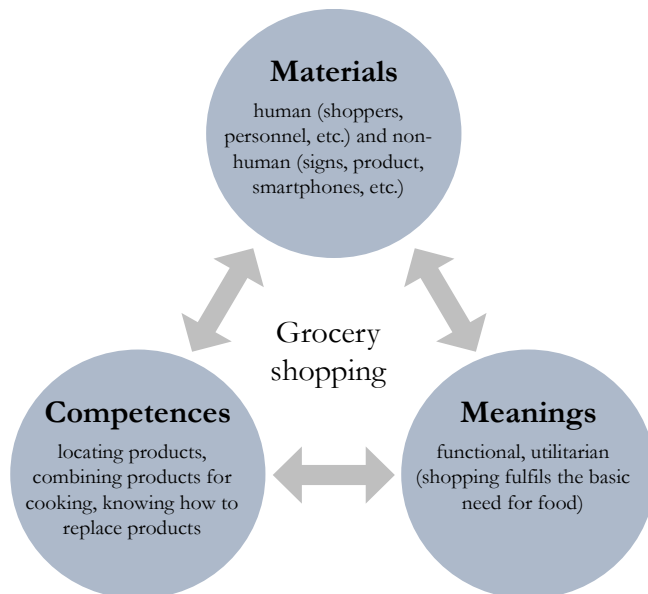

Figure 3: The elements of grocery shopping today, adapted from Fuentes & Svingstedt (2017), based on Shove et al. (2012).

Overall, the practice of grocery shopping is characterised by the human and non-human materials which are interlinked with competences of the shopper and the meaning of grocery shopping (see figure 3). The shoppers assign grocery shopping a functional and utilitarian meaning.

4.1.3. Putting the Lens on Insufficiencies

After earlier having touched upon insufficiencies in the assemblage that cannot be addressed by an AI chatbot, e.g., congestion, we now zoom into insufficiencies that could be addressed by an AI chatbot. Important to note here is that those were named by the participants before were introduced the scenario with the AI chatbot. Occurring main themes revolved around navigation, availability, and in-store personnel and will be highlighted in the subsequent sections. Also, insufficient information in the store environment was reported, e.g., confusing price tags.

4.1.3.1. Products Hard to Locate

Participants reported to often face difficulties navigating in stores to find specific products. This is not only the case in stores unfamiliar to the participants, but also in stores they

commonly visit. Confusion arises for example when products are placed in another location than previously. Some participants have difficulties understanding the logic of the store layout, perceive categories as being too broad, or products assigned to the wrong category:

"But then again, in some cases the signs are very general. It can be pasta, flour, bread and so on. But you don't know, the bean pasta or lentil pasta that I want to have, is it in close range as well?"

For the participants, it takes some time, i.e., several store visits, to build up the competence to locate products in the store. Any rearrangement induces a new learning, i.e., a new competence of where the products are located needs to be built up which often results in frustration and dissatisfaction. This is similar to the shift from "the familiar status of shopping mastery to an unaccustomed 'amateur level' shopper" (Moore et al., 2022, p. 3) when faced with new technologies in-store.

Finding the right products is a challenge even if signs at the beginning of the aisles are supposed to serve as an orientation:

"I forget to look at the signs sometimes or kind of forget that they exist and then even though they exist, you might not know what's coming next and then you might miss something anyway."

This shows that the proposition of the signs by the retailers to the shoppers is not sufficient and fails to fulfil the purpose of finding products.

4.1.3.2. Products Unavailable

Besides navigation, one of the most reported insufficiencies of the participants is related to products that are out-of-stock. It was described as frustrating when engaging in carefully planned shopping for specific recipe ingredients, only to discover that certain products are unavailable. This is frequently the case with products on sale, as well as with fruits and vegetables. To overcome this insufficiency, participants' solving strategies range from looking after substitute products and asking in-store personnel about re-stocking dates to going to other stores. However, coping strategies such as looking for substitutes can also be experienced as a fun challenge and meaningful:

"Otherwise, you can just rethink. I also think it's a bit of a sport in itself, like I go away from the recipe and so on, you just take what you have […], something can be fixed in any way, I think."

In this case, a level of competence (Shove et al., 2012) to improvise is needed.

4.1.3.3. Difficult to Find In-store Personnel

Both with regards to finding products and the issue of product availability, participants often try to consult the in-store personnel to compensate for their lack of competence. However, the nature of the relationship and interaction between in-store personnel and shoppers is characterised by social tensions (Moore et al., 2022). Participants often mention that it is difficult to locate in-store personnel when they need it, describing it as a time-consuming activity to actively search for them when walking through the store:

> "[…] Often I end up wandering around or I actually want to ask someone who is close by, but it can annoy me because sometimes there is nobody close by to ask a short question."

But even when finding in-store personnel, participants are partly hesitant to interact. Some participants avoid asking the in-store personnel to not disturb it:

> "No, we thought we could handle it by ourselves. We're not going to be annoying."

Others do not consult the in-store staff as they do not expect them to know where products are located:

> "[Asking fellow shoppers] can be a complement to what staff may also not really know […]."

This interaction avoidance does not solely come from the shoppers' side. Some participants, who themselves had experience working as in-store personnel, reported that they do not want to guide shoppers through the store and rather perform their working activities:

> "And I've also been working in a store, so I know that it's annoying when someone wants you to run to the other side of the store and show something."

Generally, the participants describe their grocery shopping as highly routinised, aiming to fulfil the basic need for food. The in store-assemblage is characterised by a range of insufficiencies which disrupt the practice.

4.2. Grocery Shopping with an AI Chatbot

The following section will report on the main themes emerged from the narratives of the participants when introduced to the AI chatbot. According to our findings, AI chatbots would enhance navigation, streamline information seeking, act as inspirational guide and alter social interactions. Some themes are in close connection to the detected insufficiencies (enhancing navigation, streamlining information seeking, altering social interactions) whereas others add to the practice

of grocery shopping that were previously not attached to it (inspirational guidance).

4.2.1. How AI Chatbots Would Enhance Navigation

One of the main themes mentioned was that participants would interact with the AI chatbot in order to ask where products are located, addressing one of the biggest insufficiencies in-store currently. A common question participants would ask is in which aisle and category products are located:

> "But in any case, can you [the AI chatbot] tell me where this thing is? Which shelf?"

Moreover, apart from facilitating finding products, participants would also ask about the fastest route when providing the AI chatbot with a shopping list:

> "Depending on how well it knows the specific store and the layout there, it would be nice to have the fastest way to move through."

> "Yes, I immediately thought about where things are and can be found, if you can get a kind of map where everything is located and then if you can fix the shopping list so that it is in order."

But not only the location of materials such as products and shelves in the store is a desired feature, even in-store personnel would be a subject of potential tracking:

> "Then, I still get caught up with the staff, so I was wondering if you can somehow link this to a GPS signal on the staff's access card so that you get a small map or something?"

Overall, the AI chatbot would be used to reduce the time spent in-store as searching for products and even in-store personnel would become easier. The AI chatbot would replace in-store personnel when it comes to asking for the location of products.

4.2.2. How AI Chatbots Would Streamline Information Seeking

Within grocery stores, consumers are exposed to an extensive amount of information, on product packaging, advertisements, and information leaflets (Fuentes et al., 2017). The participants are aware of that this information exists, yet they perceive the large quantity and small font size as a hindrance. Especially with regards to special diet requirements, such as allergies, they find it difficult and time consuming to find out if one of the ingredients is potentially harmful and would take help of the AI chatbot:

> "I would have used the app to see the table of contents of products instead of going through the usually very small text. […] My best friend is allergic to a food additive and I, for example, am allergic to lactose, which is a bit easier to see on the product. But

with this food additive you often need to do further reading, so maybe you could have searched the app to see if the product contained it or not."

Furthermore, they could imagine asking for information with regards to health implications that goes beyond the nutrition table. Participants who had an interest in buying seasonal products also expressed a desire to know the periods during which vegetables and fruits were in season. Moreover, retrieving of information regarding sustainability aspects, such as the carbon footprint for products, was mentioned several times:

"[I would] scan a product and then ask how it affects the climate and if there is a better alternative instead […]."

Given that unavailability of products was one of the main insufficiencies for participants, the AI chatbot would be consulted to obtain information about stock status and availability dates for products that are out-of-stock. Both in the cases that a participant can't consume a product because of its ingredients or if a product is not available, a typical question would be which alternative or substitute products can be recommended by the AI chatbot.

Finally, the AI chatbot would also be used to obtain information about products' prices and especially price comparisons between products:

"If you may have thought that you should buy salmon, for example, and there are many different types of salmon. It can be hard to go around and check what we should choose. Or fish just in general, and then I might ask, can you give me the cheapest version of this product that is in stock?"

Overall, the information seeking in-store would be streamlined, i.e., facilitated and filtered. Large quantities of information that would otherwise have to be searched for manually e.g., through several Google search results or by comparing different price tags in store, would be presented in a clear way.

4.2.3. How AI Chatbots Would Act as Inspirational Guides

Apart from the more informative function, the AI chatbot would be further used for inspirational purposes. As grocery shopping is strongly interlinked with the practice of cooking (Warde, 2005), a significant part of the chatbot usage would refer to questions that combine different information regarding recipes, ingredients, nutritional value, and economic aspects.

The AI chatbot would for instance be used to get inspiration regarding what meals to cook, when no prior planning is made, combined with requests about how many products to buy based on the quantity:

"And it's exactly that, with getting support in generating a kind of shopping list when you don't have anything, and in that case you may want to buy a little more, but also to just type in [the chat] that I'm going to create a shopping list based on different factors, for example, that you want four veggie dishes and one fish dish and so on."

When shoppers already know what kind of dish they want to cook, the AI chatbot could fill in the shopping list according to a dish:

"[When the AI chatbot was capable to write the shopping list] it may be enough to write mashed potatoes [and then you get a basic recipe on how to make it]."

If prior planned purchases are not possible due to non-availability in-store, the AI chatbot would be used to check for alternatives depending on the recipe:

"It's also a bit like what we said before, about looking for complements to products. If this is not available, can this fit in this recipe instead?"

When it comes to economic aspects, the AI chatbot would be used to propose a combination of meals and respective ingredients:

"Mm, and I've written that you might be able to get suggestions for recipes based on the extra price products so that you might be able to combine them a little more, yes. And then maybe you could have different budgets, like yes, but today's budget might be a little higher based on the extra price or a little lower, or?"

Also, the AI chatbot would be used to get inspiration for nutritious implications:

"How can I choose, for example, proteins to be nutritious but also economical, like for example chickpeas, beans or any other animal protein?"

Consulting in how to handle the expiration date of certain fresh products is another question that would be asked:

"And then there's something else, it's expiration dates, because you often see the expiration date for when it's closed, but not often when it's opened."

When AI chatbots would fulfil this role as personalised inspirational guides, shoppers are helped to break out of their ever-repeating routines. By the active quest for different combinations and proposals for products, the shopping would become both more efficient, as less time would spend on thinking in-store and more varied as new products and recipes would be discovered.

4.2.4. How AI Chatbots Would Alter Social Interactions

The human elements of the assemblage were another reoccurring theme discovered. The participants had divergent perspectives regarding the potential impact of AI chatbots on human interactions with in-store personnel. Some repeatedly emphasised that they value social interaction:

> "But I can really appreciate [the contact with in-store personnel]. Like buying a nice steak, what should you have with it? And so on, so I probably wouldn't want to remove those parts."

> "[With an AI chatbot] you may lose this personal contact with the people who work there, it becomes very boring not to interact with the staff."

On the other hand, some participants reported that they would not need the interaction at all:

> "But how much do you really lose there [when removing staff from stores]? I mean, I don't feel that I get so much out of talking to them."

> "I would say that if I had gotten answers to all those questions from the AI, I probably wouldn't have needed to see the staff."

Given the fact that AI chatbots would be used to perform tasks that were traditionally assigned to in-store personnel (Dwivedi et al., 2021), participants would expect a higher and more specific level of expertise of the in-store personnel:

> "But personally, I think it is fantastic with the personal relationship and communication, but then it also requires that the people who work there, and perhaps also given that there is less staff, more technical development, and everything, that they are really experts, like in their field. Like if you have someone for each department or something, then I want to be able to consult with them […]."

In certain situations, even though the AI chatbot would be consulted frequently, in-store personnel would be assigned a higher level of expertise than AI chatbots in general:

> "Yes, I very strongly believe in this Systemet-model [the Swedish state-owned alcohol monopoly] that, as you mentioned before, you sort of specialise in competences and that you can get help from humans to shape preferences in the form of different recipes."

Thus, it seems that tasks would be allocated seamlessly between AI chatbots and the in-store personnel. This is exemplified by this narrative where a participant would like to give the order to the AI chatbot to call a shop assistant:

> "And that's when you move on to the human interaction. This is somewhere about where we draw the line for where we should eliminate human interaction exactly and that's exactly what it is."

Besides the in-store personnel, accompanying shoppers are human materials in the assemblage as well. As mentioned earlier, when shopping with accompanying shoppers, different social dynamics emerge. By the introduction of the AI chatbot, another dimension would be added. The participants had varying ideas how this would influence their shopping behaviour. On the one hand, the AI chatbot would be consulted to facilitate common decision making that might be problematic in a group:

> "I think it can be really hard when you go shopping with friends. And you just, well, what are we going to have for dinner tonight? Nobody wants to say anything - nobody says anything. It would have been really nice to just say yes, but we run a shuffle here [with the AI chatbot]."

On the other hand, the AI chatbot might not be consulted when shopping with accompanying shoppers as competences, especially in terms of navigating, are available within the group and different activities are performed while shopping:

> "I don't think the need is as strong when you're in a group, because there's always someone who is aware of something, and the other person is aware of something else. And then you collaborate."

Overall, when AI chatbots would be introduced, the role of in-store personnel would become less important to the shoppers. However, personal contact and guidance is still expected, with shoppers expecting an even higher level of expertise by the in-store personnel in some areas. Also, AI chatbots would in some cases be used to simplify joint purchasing decisions in groups.

4.3. Disrupting the Assemblage: How the AI Chatbot Would Change Meaning and Links

As emerged out of the four themes, the AI chatbot would address insufficiencies in the assemblage by assisting shoppers with navigational and informational tasks. Furthermore, shopping routines would be disrupted by inspirational guidance. Also, the AI chatbot would change social interactions, both with the in-store personnel and accompanying shoppers. It becomes clear that the practice of grocery shopping would change. More specifically, by the introduction of this new material, the interrelations between the elements would change (Shove et al., 2012). This supports the notion that retailscapes are not static (Fuentes et al., 2017). From a practice-theoretical point of view, this reconfiguration can be analysed on different levels, in particular regarding meanings, materials and its links as well as competences.

Building upon Shove et al. (2012), overall, the practice of grocery shopping showed to have a functional and utilitarian meaning, often associated with difficulties. However, when integrating an AI chatbot, the practice would be simplified.

This implies that the meaning of the practice would become more inspirational and associated with less difficulties (see figure 4).

This shift in meaning is induced by changes in the socio-material assemblage and in particular by the transformation of links between the elements of the practice (Shove et al., 2012 see figure 4). We found that the practice of grocery shopping is characterised by strong links between shoppers and in-store personnel, even though retailing moves towards more self-service. The reason for that lays in the lack of competence of shoppers, including not knowing where products are located and how to navigate in the store which are crucial competences (Shove et al., 2012) to perform the practice. In-store personnel often compensates for this lack of knowledge when being consulted by shoppers. Another strong link that we captured is between shoppers and smartphones since these devices are used to read shopping lists or to retrieve additional information. This is in line with the findings of Fuentes et al. (2017), acknowledging a weakening link between shoppers and in-store personnel. Similar to consulting in-store personnel, also in the case of smartphones, a lack of competences of shoppers is compensated, e.g., by looking for substitutes and recipes online. Additional links were captured between shoppers and signs as well as between shoppers and price tags which fulfil a guiding function.

However, when integrating the new material, the AI chatbot, into the assemblage, the captured links proved to partly be very fragile. The link between shoppers and in-store personnel is strong today as shoppers often consult in-store personnel in terms of finding products and navigating in the store, even though shoppers often are not satisfied with the assistance. When introduced as a new material, the AI chatbot would weaken the link between shoppers and in-store personnel and establish a new, strong link between the AI chatbot and the shoppers. The lack of competence would no longer be compensated by consulting the in-store personnel but rather by using the technology (see figure 4). Yet, the competence to use the AI chatbot would be needed to be developed (Fuentes et al., 2019).

On the first glance, it seems that any links to in-store materials would become weaker or fade away, but this needs to be considered more nuanced. For instance, category signs such as "Pasta", "Sauces" and "Baking Supplies" at the entry of each aisle could be linked stronger to the shopper and the AI chatbot. When a shopper asks the AI chatbot for directions on where to find a product, the AI chatbots' textual output would refer to the sign at the beginning of the aisle. Also, even though the links between shoppers and the in-store personnel might get weaker due to the diminishing need for minor tasks, they might get even stronger with regards to specific know-how and

guidance, e.g., in the fruits and vegetables and meat counter sections.

Regarding shopping with accompanying shoppers, we captured that the interrelations within the assemblage would become even more interwoven. Here, it is a permanent trade-off between talking to accompanying shoppers, using the AI chatbot to assist and discussing the AI chatbots' proposals together with accompanying shoppers.
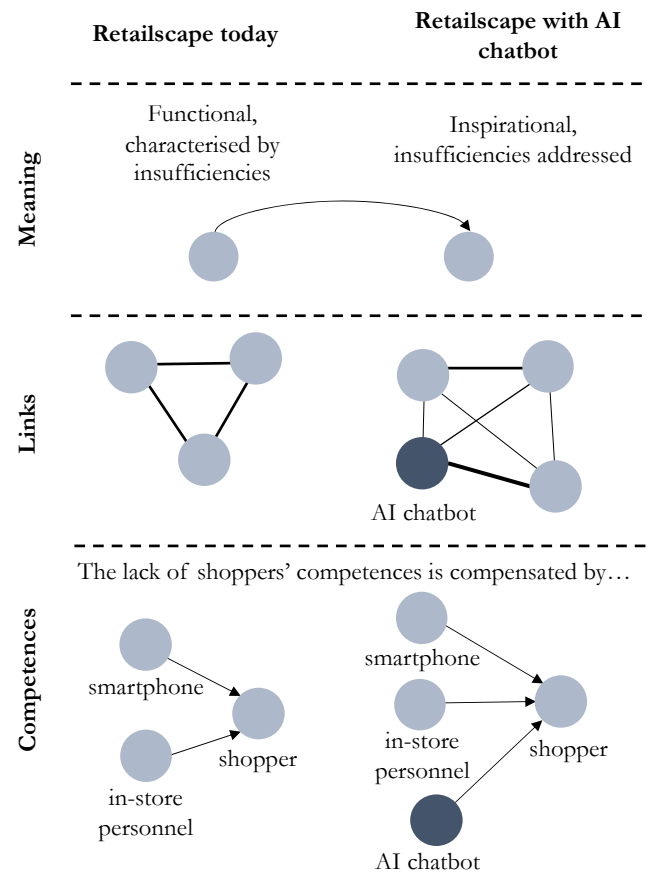

Figure 4: Potential changes in the elements of the practice of in-store grocery shopping by the introduction of an AI chatbot, based on Shove et al. (2012).

5. Conclusion and Contribution

The motivation for this research was driven by the rapid development of AI technology. The interplay between humans and machines is becoming increasingly intertwined (Noble et al., 2022). Retail is characterised by a trend towards self-service where shoppers are equipped with tools to perform more tasks on their own which in turn reshapes the practice (Hagberg, 2016). In the vein of integrating digital tools into brick-and-mortar stores (Del Vecchio et al., 2023), technological innovations such as the smartphone change the way grocery shopping is carried out (Fuentes et al., 2017).

With this development as a point of departure, we were driven by the question of how the integration of an AI chatbot, based on AI technology, would reconfigure the practice of grocery shopping, which to a large extent is still performed in physical stores. Therefore, we have captured the retailscape in a grocery store to date, depicted by generation Y shoppers. Further, we introduced the hypothetical scenario of the integration of an AI chatbot to be used in-store. By drawing on practice theory and applying the elements proposed by Shove et al. (2012), materials, meanings, and competences, we were able to shed light on the potential changes of the constituting elements and their links through the introduction of an AI chatbot.

Our findings reveal that the meaning of the practice of grocery shopping would change. As the AI chatbot has the potential to address existing insufficiencies in the assemblage, the meaning could change from purely functional to more inspirational, leading to a better customer experience. Shopping becomes easier as less competences (e.g., knowing where products are located, what categories products belong to, what ingredients go together) would be required by the shopper due to the partial compensation by the reliable AI chatbot. It would serve as a companion by helping shoppers with obtaining information, navigating in the store, and serving as a source for inspiration. However, a new competence of how to use the AI chatbot would have to be developed. Old links between materials would be weakened (e.g., between shoppers and in-store personnel), or even strengthened (e.g., between category signs and shoppers). New links would be established (e.g., between shoppers and the AI chatbot). To summarise, by the change of one element, namely the integration of the AI chatbot, the interrelations between different elements in the assemblage would change.

The findings of this study add to the literature of practice theory applied within the field of shopping and expand previous findings. Shoppers use smartphones to retrieve information in-store (Fuentes et al., 2017). The AI chatbot would act as an extension of the smartphone, helping shoppers in a more targeted way, especially when it comes to navigation. While shopping bags (Hagberg, 2016) and shopping carts (Cochoy, 2008) enable the consumer to purchase a greater quantity of products, the AI chatbot would, especially by its inspirational character, influence which products are placed within the respective bag and cart. When apps can promote sustainable consumption (Fuentes & Sörum, 2019), a retailer's app with an AI chatbot could promote more varied consumption by breaking shopping patterns. Similar to self-service checkouts (Bulmer et al., 2018), the AI chatbot would further minimise shoppers' needs for in-store assistance, not only at the checkout counter but also at various other locations within the store. Like package-free shopping, which requires the development of competences (Fuentes et al., 2019), the AI chatbot would require the competence to use it in the most

valuable way. Similar to Moore et al. (2022), the AI chatbot would also contribute to a more hedonic shopping experience.

The findings also contribute to the literature on human-technology interaction, in particular in terms of consumers' preferences for interactions with humans and AI technology in different situations (Blut et al., 2021; He & Zhang, 2022; Mende & Noble, 2019).

6. Managerial Implications

As the findings of this study reveal, shoppers would consider the implementation of an AI chatbot in a retailers' app to be useful and see many potential use cases. Hence, we suggest retailers to invest in the development of an AI chatbot as a novel functionality within a retailer's app, as the technical solutions for such an implementation already exist (Kelly, 2023).

Even though the meaning of the practice of grocery shopping would change by using an AI chatbot, it is important not to focus solely on the development of the AI chatbot application. It is important to consider the environment in which the AI chatbot is embedded, e.g., how it is connected to store systems, how sufficient the internet reception is, and how aware shoppers are of its existence as well as their competence to use it (Fuentes et al., 2021; Shove et al., 2012).

Given the finding that shoppers would still value the presence of in-store personnel and expect a high level of expertise, it is recommended to concentrate the training of in-store personnel rather on deeper product-based knowledge than on helping shoppers with simpler tasks. Since the AI chatbot would assist with navigation and product information, for example, it is less important to train in-store personnel for those situations which frees up resources. When it comes to specific expert advice such as in the fruit and vegetable section or at the meat counter, in-store personnel should be trained in particular since shoppers would expect a high level of service here. The freed resources could consequently be invested here.

From a business perspective, the use of AI chatbots would also have implications for the collection of customer data. Questions that were previously asked verbally to in-store personnel and thus difficult to track would become quantifiable. For example, if customers frequently ask the same question about where to find a particular product, retailers could track patterns and adapt the store layout or signages.

It could be argued that it is the retailers' intention to make shoppers wandering around the aisles to discover and buy new products. However, by providing shoppers with a tool to navigate smoothly and to retrieve information on demand, the

customer experience could be enriched which in turn could increase customer loyalty.

7. Limitations and Further Research

This study does not come without limitations. First, it is important to note that the findings are based on a hypothetical scenario without having tested a prototype in a real setting, i.e., a grocery store. While the findings regarding the changing links between the elements provide valuable explorative insights for both scholars and retailers, they need to be studied in a real scenario when such an application is implemented to be validated. As this research remains to be on a high level of analysis, specifics such as the extent to which the AI chatbot would interfere with other smartphone apps (e.g., notes, messaging, etc.) or more detailed user experience aspects could be examined. Moreover, we expect different results depending on the type of retailer. There are different types of retail stores, ranging from discount stores to supermarkets to specialty stores. In this study, participants reported on their shopping experiences, which were not limited to a specific type of store. Further, this research is limited to the Swedish context. The study could be replicated and applied to other countries and cultural contexts. The same applies to the limitation to the age group of generation Y. In this study, we have focused on the in-store scenario. However, retailer apps can be used at any time and thus the AI chatbot would also be available outside a shop. Therefore, it would be interesting to investigate how customers would use an AI chatbot before and after their grocery shopping and what influence this would have on existing practices. As practice theory makes clear, practices are part of a nexus of practices (Warde, 2005). It would be interesting to investigate interlinkages of the reconfigured practice of grocery shopping with other practices, such as to the practice of cooking.

Given the fact that it was a hypothetical scenario, the adoption of such a technology in real life is often associated with privacy and trust issues which are concepts commonly discussed within AI technology adoption literature (Grewal et al., 2021). Future research should therefore examine these aspects more closely to identify possible challenges during the implementation of AI chatbots.

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