Deep Science Publishing
https://doi.org/10.70593/978-93-49910-35-5_7

DeepScience
Open Access Books

Chapter 7: Interactive and personalized shopping

7.1. Introduction

Retailing has reached a high level of sophistication in its marketing and communication strategies. Development of brand image, segmentation studies determining the target clientele preferences and needs, advertising, as well as different selling techniques, from trustful salespeople to creative merchandising have long been applied to retailing by specialists in order to impact consumers' buying behavior. In addition to that, the persistent quest for differentiation through unique offering is still a key element for a successful long-term retail strategy. More recently, with the development of technology and the arrival of new distribution channels, new ways of defining the relationship with customers as well as new interfaces allowing them to communicate with retailers have emerged further enriching the retail landscape (Pantano & Timmermans, 2014; Lemon & Verhoef, 2016; Grewal et al., 2017). This chapter considers the influence of new technologies on the definition of the customer interface in retail. It first presents a rationale for the collection of consumer information in retailing, and discusses the influences of point of sales characteristics on consumer information processing. The presentation will emphasize the fact that the retailing interface, defining the relationship between the retailer and its customers, is a source of unique information and of strong influence on purchasing behavior. It will also underline the diversity of the points of sales and interfaces used by different retailers depending on their positioning, their target markets, and their competitive environment. Then we present the question of consumer information that can be extracted from the purchase, and its application to enhance customer satisfaction and to redefine the interface policy. The insights developed in this chapter lead to a general conclusion about the future of retailing in relationship with its customers, emphasizing the dual need for improving shopping enjoyment and for better merchandise selection and allocation (Piotrowicz & Cuthbertson, 2014; Verhoef et al., 2015).

7.2. The Evolution of Retail Interfaces

The traditional retail process can be separated into three components: the customer interface, the inventory interface and the logistics interface. The solution to nearly every problem in this process, over the ages, has been to invest in the inventory or the logistics interfaces to make them more efficient and convenient. For example, massive improvement in vertical and horizontal distribution made it possible to carry immense amounts of merchandise close to the point of sale. The optical scanner made it possible to check out great mobs of customers without employing a similarly large number of checkers. Successful retailers avoided the high cost of investing in advanced software to manage what was too often a chaotic hinterland, by concentrating on the customer interface. Improvements to this customer interface took the form of brightly-lit stores, with merchandising aids like flyers, displays, mannequins, and, in the case of supermarkets, special aisles for seasonal goodies and taste-testing. The purpose of all this was to draw customers to the store, distract them from their purpose, and induce impulse purchasing.

Technology is beginning to reverse this trend. Customer purchases are increasingly influenced by their experiences with non-retail services like banks and brokers. Planning software has brought more unpredictability to large retail or distribution centers, reducing the efficiency of instruments like optical scanners and simplifying the problems of retailers without extensive inventory and logistics enabling technologies, increasing their per-unit overhead costs. As a result, retail interfaces are changing. Some are going upscale making service and shopping a luxury. Others, like the express lanes in supermarkets, fast food chains and Costco have become ultra-efficient, virtual interfaces. At the same time, a number of low-overhead online channels have been established, largely for the purpose of off-loading excess capacity in traditional operations. These channels are now being extended to offer different value propositions in their own right.

7.3. Understanding Customer Behavior

Studying consumer behavior is about searching for the "why" of consumers. An accurate analysis of customers will help retailers understand how to define their offers of products and services. The concept of "consumer behavior" presupposes that the purchase of goods and services satisfies not only physical needs and desires but also emotional ones or that consumption influences the construction of their identity or social fusion with other individuals. Understanding consumers would ultimately allow retailers to predict how they will respond to various factors, influencing sales levels.

Consumer behavior can be influenced by three fundamental sets of factors: (1) psychological; (2) technological; and (3) social and cultural. From the interactive

marketing perspective, with a focus on the brand and the process, the most important psychological factors are perception, motivation, and beliefs and attitudes. The level of attention on the part of the consumer favors stimulus and brand positioning, while perception will condition the consumer's choice. From the interactive marketing approach, motivation is directly related to satisfying the needs created through advertising in order to create a desire for interaction that makes the consumer purchase a product/service. Motivation is closely linked to identity construction and eases the incursion into the realm of neuroeconomics and neural marketing. The knowledge and understanding of beliefs and attitudes on the part of the consumer also help the retailer know how to act in order to promote interaction between the consumer and the retailer.

It is also a fact that given the state of web technologies and systems, the experience of interaction with the information and communication technologies configured by the retailers allows technological influence by themselves.

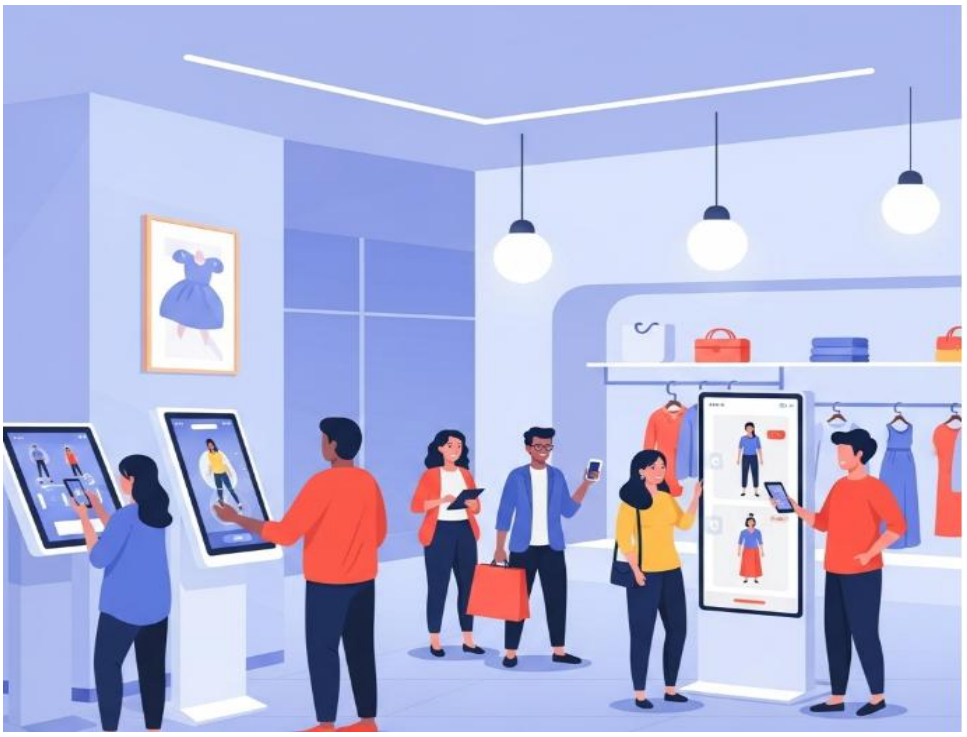

Fig:7.1 Interactive Shopping Experience in Retail

7.3.1. Psychological Factors

Psychological factors play an important role in determining the actions and decisions individuals make. Customers' observed actions and decisions are unpredictable and embrace random variables. Understanding how a customer thinks and behaves may play

a significant role in a business's capacity to link with its target customers. Several factors can influence a customer's thought process and make them favour one company over others. For the purpose of this study, five of these factors have been classified as the need to belong, need for uniqueness, curiosity, time perception, and emotion. The study attempts to identify these correlations and understand how they can influence a customer's behaviour when it comes to retail shopping.

Belongingness is a basic and innate human need. Individuals have a desire to become part of, and to be accepted and socialized by, others. The need to belong can have a significant influence on consumer behaviours. One way consumers may fulfill their need for belongingness is through shopping. Shopping can provide them with the sense of community they desire. Shopping groups have been shown to influence in-store shopping behaviours. This sense of belongingness allows consumers to express their personalities, including group identification, social ties, emotional connection, and acceptance within the shopping group. Group-based routes to consumption create solidarity among members. These groups seek to differentiate themselves from the larger group. As such, group members look for brands with high social value and visibility. These type of brands reflect desirability. They act as a signal to others that the group can afford them, and thus the group is high in social status. How closely a brand is associated with a social group's identity will determine a person's willingness to spend money on such a product or brand.

7.3.2. Technological Influence

Too much playing with technology can numb the senses, so those in the interactive and personalized shopping business should work to position technology as a means to a pleasurable end.Technological influences have emerged in the past two decades, mainly due to the introduction of the Internet and mobile technologies that have disrupted traditional shopping experiences but have also created new retail opportunities. The global pandemic has created a shopping landscape where the transition from offline, or traditional physical store shopping, to online shopping supported by mobile devices has accelerated. Retailers have invested heavily in alternate shopping interfaces. Virtually every act of retail has been rewritten in digital code including communications, marketing, displays, merchandising, promotions, transactions, payments, shipping, delivery, and after-market service. The world of retailing has become highly transparent through the free exchange of information. Knowledge and power have shifted. Consumers know much more and demand much more from retailers than ever before. Retailers have found that long-standing strategies, such as low prices, convenience, wide selection, and new gimmicks are less effective.

Technologies and new shopping interfaces have transformed the shopping experience into one that is frightening and regrettable for many, and enjoyable and fun for others. The online shopping experience removes many of the physical cues consumers rely on to make a decision. In the absence of traditional sensory cues such as touch, smell, hearing, or taste, online shopping places a greater reliance on visual cues such as product images, color, and descriptions. Each visual cue can communicate a wealth of information that helps the consumer make a decision. New online interfaces that focus on risk reduction or decision support can enhance consumer confidence while decreasing anxiety and increasing enjoyment. New investment or product demonstration videos can showcase excitement, while virtual reality demos can allow consumers to test drive products from home.

7.4. Interactive Shopping Technologies

After incorporating productivity-enhancing web-based technologies in their interfaces with customers, online retailers are now focusing on the development of more interactive interfaces that can stimulate shopping experiences with enriched experiential value. Remarkably, many of the latest new technologies that have been developed or are currently being piloted utilize interactive dialogue within an online shopping web space. It is interesting to note that brick-and-mortar retailing has been the incubator for such conversational interface approaches to customer interaction from both a technological and physical standpoint. In fact, some multi-channel retailers are now integrating sensory-rich, multi-layered interactive experiences at their websites that are designed to replicate the same extrinsic and intrinsic values in consumers' minds created by actual product shopping experiences in the store. The innovations include augmented reality and virtual reality experiences that can stimulate a sense of presence in the website visitor, for example permitting users to virtually try-on a product offered by the retailer and mobile applications that gather data from external social platforms selected by the users to facilitate ideation of personalized shopping journeys on the web.

Augmented Reality Applications. AR technology bridges the gap between the online and offline experience by enabling the user to visualize products in the real world context using digital technology. And now, it is possible for retailers to provide customers with the ability to assess the scale, fit, and styling of merchandise such as furnishings, cosmetics and hair colorings, eyeglasses, and apparel, using three-dimensional models that generate AR visualizations that are displayed on the users' mobile devices, thus enhancing the potential for purchase conversion through branding, customer engagement, and customer trust. As a hallmark of experiential value, these technologies further serve to facilitate conversations between brands and customers along the shopping journey, by enticing product sourcing and engagement in-store, enabling post-

experience product assessment and ideation, product use reflection, and potential repurchase online.

7.4.1. Augmented Reality Applications

Augmented reality (AR) technologies are gaining momentum in making shopping interactive. In AR shopping applications, the real world becomes transparent and a digital visualization is projected on top. An app for smart phones and tablets presents digital overlay content over the real-world equivalent. It enables customers to discover pre-recorded videos from fashion influencers and uploaded by sellers while scanning in front of the garment. For example, purported luxury items uploaded by first and second hand sellers can be checked against visual discrepancy using the size and fitting presented in the video. Unlike the mostly virtual photorealistic model fitting, video information also provides the garment's dimensions and texture features in real-time. Other apps allow users to virtually try on garments, shoes and accessories in real-time by merging modeled avatars or 3D overlays on live video feed. While they currently mostly utilize 3D overlays and photo-realistic generic models, it is anticipated that more realistic combined virtual and real photo composites will be available to allow shoppers a more confident pre-purchase experience.

Beyond fashion, interior designers are offering apps to help customers envision how an item of furniture will look in their own home. A mobile app enables users to visualise how a piece of furniture would actually look, size up space and fit into their room settings, thus reducing prepurchase risk. Another experience, built in collaboration with a tech firm, allows users to design and customize their kitchens and bathrooms in virtual reality, factor in counter height and appliance selection, and walk inside using a headset for a fully immersive experience. The app can then generate photorealistic 3D plans and 2D blueprints for final construction.

7.4.2. Virtual Reality Experiences

Virtual reality (VR) experiences digitally immerse users in an artificial environment, taking them to another place entirely. VR has had applications in special effects, construction, military, and medical uses. VR technologies have made their way into retail in some innovative ways. Here, the impact of VR shopping experiences is discussed. VR shopping enables consumers to be transported near or far from a store, following their interests and descriptions. They are able to walk along the aisles and browse through the products at their leisure. Consumers are able to turn products over to examine the back – a feature that is ignored in AR shopping experiences (or any other online shopping experience) – and zoom in on product details such as labels. Multi-sensory experiences

can include sound, touch, smell, wind, hydration, and temperature. These experiences can come from the entire shopping experience or just on a single product. Future stores can involve connecting consumer wearables that would facilitate advanced personalization and even provide feedback to the shopper. Many shoppers are yet to discover VR shopping or have only dip-dipped their toes using simple experiences that allow them to view a single product in a VR store.

The number of enhanced VR shopping experiences is growing, featuring showrooming and product exploration capabilities albeit still requiring consumers to leave the VR store to actually make their purchase. Companies offer specialized technological solutions for creating VR experiences, designers can create their stores without coding experience. VR developers can use more complex interfaces and can work with more data such as interactive navigation and advanced visual and functional customization. These technologies are being adopted by companies, enabling them to actually enter the Metaverse. The metaverse is a collective virtual shared space as described above except that it might not actually be interconnected in the traditional sense by the Internet. It could also have an economy that is a virtual economy, which means that surrendering real market cap value is required to have a presence there. Experiences that Gamers – both casual and serious – enjoy are examples of platforms that might be intrinsically metaversic.

7.4.3. Mobile Shopping Innovations

Mobile shopping is a multifaceted construct that encompasses various types of online shopping activity via handheld devices. Early research distinguished mobile shopping from traditional e-commerce due to the unique attributes of mobile devices, such as their portability, the urgency of decision making that location enables, and their interactivity and novelty. Using mobile apps instead of standard desktop navigation has been found to increase enjoyment and responsiveness, leading to higher task performance. With rapid advancements in mobile technology, top retailers have invested heavily in mobile apps, which can now track shopper locations through GPS, accommodating personalized mobile shopping experiences in-store. Furthermore, as smartphones evolve, they have now become important standby tools for searching for product, price, and promotion information while shopping in traditional retail environments.

Mobile commerce is the purchase of goods and services through wireless handheld devices such as cellular telephones and personal digital assistants. During its fourth quarter of 2020, a major retailer had a significant percentage of its total sales made through mobile, indicating a big push toward m-commerce. With advances in online shopping technology, it has transitioned from a predominantly browser-based experience from a personal computer, originally requiring heavy product research, comparison

shopping, and carting, to one reliant on mobile apps with product-specific notifications sent to consumers encouraging impulse shopping. The volume of m-commerce transactions will only grow as surprise delivery options available to consumers propel growth. M-commerce represents nearly 73 percent of total U.S. online retail dollar spending.

7.5. Personalization in Retail

Digitalization paved the way for scaling up personalized interactions in retail. The data generated through the pre-purchase browsing and post-purchase behavior of consumers allows retailers to develop dedicated e-commerce experiences for different customers, with the goal of increasing revenues by improving conversion rates and average basket size, while lowering logistics costs. Evidently, data-driven personalization will take retailing to a whole new level in the upcoming years. Within the field of e-commerce, personalization has been discussed as the new frontier of competition and as a necessary adjunct to similar knowledge-embedded sources of sustainable advantage, such as customer experience. But personalization is not just limited to the digital world – brick-and-mortar stores are also increasingly supplied with data-driven capabilities. The concept of an App Store for retail is gaining in importance, with many existing apps enabling retailers to alert employees when a customer is sensitive for timing reasons, display coupons, or provide information about the customer's direct family members.

Clearly, data-driven personalization can take many forms and can be applied at many levels, engines behind recommending a product to a customer are fed by numeric cores of existing knowhow to extend consumer relationships to a subsequent life cycle phase, track how our consumers perceived their experience over time, and, based on a formal inquiry of consumers, interview top-cut consumers for inputs concerning new layouts, new design propositions, etc. On top of these deeper consumer relationships and knowledge, consumer analytics tools can relate consumer profile household characteristics, to describe product category shopping scores of consumers, which have predictable preferences, in a specific area, for a period, and for selected categories within a store.

7.5.1. Data-Driven Personalization

The notion of personalization in retail has undergone substantial changes, from a generic strategy targeting several customer segments to the latest trend which aims at providing the individual customer with the most satisfying offer and shopping experience. The development of digital shopping outlets such as websites and mobile applications, the digitization of brick-and-mortar stores, and the increasing number of data collection

touch points in the store environment all contribute to the opportunity of acquiring data on customer behavior during their shopping journeys. Data-driven personalization leverages large amounts of data produced by customers as well as by the retailers themselves to enhance the shopping experience in such a way that single customers are recognized and responded to in real time based on their explicit and implicit needs.

Real-time retail personalization represents the highest level of personalization as activities are tailored to the needs of individual customers literally at the moment, if not before, when individual customers require them. This level of personalization has been technologically feasible for a while, for example, via the interaction of devices in physical stores and customers' mobile devices. It has also been successfully implemented by companies in different service sectors. But only few retailers managed to really get it to work and the adaptation of this innovation is still in its infancy. The reason for this is probably that it requires significant financial and human resources as well as state-of-the-art infrastructure and technologies. For example, communication among all stakeholders in the value chain and higher investments in algorithms are required for successful implementation. Furthermore, some customers may be uncomfortable with the level of data collection and use and feel spied on. Hence, the right balance must be found not only from a technological but also from a customer empathy perspective.

7.5.2. Customer Segmentation Strategies

Customer segmentation strategies are directed towards identifying and creating specific customer subgroups. In doing so, retailers can direct personalized offers and preferences to these subgroups, and by the uniqueness of these offers, stimulate customers to give up multi-brand purchasing and concentrate on their brand. The retention of multi-brand purchasers is essential since they will continue to represent large portions of a retailer's revenue, and their preferences will heavily influence their choice and connection with retailers.

Customer segmentation strategies can be divided according to two decision-making layers: the personalization strategy and the personalization framework. Within the personalization strategy layer, we recognize two traditional strategies available to retailers, namely customer segmentation and market segmentation. The personalization framework layer moves back to the after-market layer of available technology resources for the implementation of these strategies. Each category of available personalization framework resources will allow certain strategies and stores to operate, while it will leave out others. We refer to the framework as "available" not only to underline the fact that resources should not only be available, but sufficient as well, but also because the way in which retailers have stored these resources during the previous years of investing in technology assets, may largely limit the current possibility of moves. These

considerations lead us to expect that these two layers do not behave only independently but, also in conjunction with each other. These, in turn, lead both to individual store and collective many stores trends with emphasis on the right level of customization. In recent years, retailers have invested increasing amounts of money into technology and resources to personalize their marketing and customize the shopping experience.

7.6. User Experience Design

The happiness of people using your software directly determines the success of what you have created.

User Interface (UI) is a core component of any interactive system. With significant reliance on their UIs, software systems may become unattractive at best, and ineffective, annoying, or unusable at worst. Yet, the UI can only do so much: it can support general goals, may even express some of the higher concepts, and certainly provide some of the intended enjoyment. Increasingly, engineers have come to understand that user UIs are not merely vessels for delivering functions. Instead, UIs are active, dynamic, and expressive components, capable of conveying meanings, emotions, and experiences. From this viewpoint, UIs are User Experience (UX) facets of systems, links that connect users to the arduous tasks that are being accomplished, and channels that deliver satisfaction (or despair) as the software operates.

A goal of UX design is to create a positive emotional response. Good interface design helps a user perform tasks in an efficient and pleasant manner by marrying form and function; utilizing knowledge of human factors, ergonomics, and behavioral consistency in conjunction with the basic principles of visual design. Aesthetics and usability are thus inextricably intertwined. Visual design is often the most visible characteristic of interaction design. Regardless of the merits of functionality, without visual appeal, the product would be a failure. Visual design serves a number of purposes — aids in the usability of the interface; expresses the purpose of the application; conveys the brand identity; creates a feeling of pleasure and joy; creates an emotional connection with users. Aesthetics are important; they attract and seduce the users.

7.6.1. Interface Usability

Creating a prototype of interactive interfaces allows testing many design and usability aspects. First, the content, techniques, transitions, and so on can be tested with representative users through low- or medium-fidelity prototypes. If they observe usability problems at this early stage, it will be possible to modify the design and check it again easily. Then, the implementation of high-fidelity prototypes allows checking

more advanced usability aspects like the user's emotional reaction, expressiveness, and realism the user experiences, the motion quality and synchronization, and so on. They allow verifying and evaluating all usability and user experience aspects related to an interactive interface.

We first elaborate on usability aspects related to user interactions with interfaces and then on user interactions with information presentation technologies. Therefore, the exhibited content and the interaction design/development aspects must be taken into account in evaluating the usability and the user experience associated with an interactive interface. Evaluating aspects related to exhibited content is the same as with classical interfaces: usefulness, informative value, content comprehensibility, memorability, engagement, and delight if they are presented correctly. Evaluating aspects related to interaction design has its own specifics since interactive interfaces allow interactions through different modalities. Furthermore, they allow mutualizing interaction between different users. This enables providing new interaction solutions mainly based on the common functioning of our perception system.

7.6.2. Visual Design Principles

Shopping is a primary part of Customer-to-Business (C2B) e-commerce and hence it is important for retailers to consider how best to present their inventories to customers on-line. Whilst the principles of graphical design for the on-line discipline are similar to the off-line discipline, they do differ in some areas due to the different consumption experience present in the two disciplines. The core graphical design considerations in on-line marketing have been shown to be: (1) obtain visual humor; (2) be the scene most relevant to the information being conveyed; (3) be relevant to the target market; (4) be effective in attracting attention; (5) support the message being conveyed; and (6) create a sense of a company image. Potential design adjustments along these lines could lead to a more effective and image-enhancing visual on-line design. Some of these factors have been addressed in on-line design literature, but much is still unclear.

Applying specific compositional rules should ensure that both structure and clarity are acceptable. Homogeneity and coherence should be achieved by using a limited number of distinct components that do not distract attention from the image of the product. The retailer's web-page should help a product visually stand out. Efforts should also be made to facilitate the understanding of the content being conveyed. Given the particular nature of on-line marketing, flexibility and interaction should be headed to clarify or present the message. Therefore, on-line users should have control over the information they want to process. Dynamic images could help convey more information, and on trade-off should make customers' task easier and bargain for easier information processing. A

greater understanding of the visual issues is likely to help the retailer create a better message and help customers become more proficient in defining their own visual needs.

7.7. The Role of Artificial Intelligence

Developing the next generation of customer interfaces, and indeed much of the transformation underpinning the Intelligent Digital Enterprise, depends on a host of new innovations that are breaking out of the lab and becoming reality. This is particularly so with artificial intelligence, which is becoming the beating heart of the next wave of transformative applications and services.

A plethora of new customer engagement applications are harnessing AI to automate interaction or to take it to a new level of sophistication. The most obvious application of AI is in the ubiquitous chatbot technology that is coming to be expected in service-based applications. These customer-interaction ‘bots’ are based on the ability of a machine to interpret and generate human voice or text, resulting in increasingly fusion-like customer interfaces. The application of voice interface allows customers to interact totally naturally with technology, via the channel they are most familiar with, while natural language generation allows machines to converse as naturally as humans. Advances in AI are now delivering these capabilities not only via limited applications but enabling a wide range of functions to be supported by a bot across many areas.

Without these advances, the popular conception of conversational interfaces as delivered by various technologies that can respond to simple conversation in a limited way, might have remained a topical gimmick. However, recent developments have increased the easy accessibility of deep learning-based natural language processing solutions, which can interpret beyond 90% of open domain speech at least as well as professional human transcribers for many audio types; and advanced models that can write original text passages that mimic human writing style and characteristics. These developments cut the barrier to entry for businesses to invest in developing high-quality curated neural networks.

7.7.1. AI in Customer Interaction

Customers today are less patient than before and are also willing to engage only in experiences that are relevant to them. A retailer's ability to make AI-enabled virtual assistants available to their customers could be a deciding factor for organizations. AI-enabled virtual assistants have a wide range of capabilities that can be tailored according to a customer's preferences and choices. Retail is already applying AI to increasingly personalized customer service environments that have been growing in sophistication

and capability in both urgency and accuracy. AI helps enhance the presentation of retail offerings via popular digital channels like messaging. This is a vital service improvement because consumers are likely to share shopping-related questions through social or messaging channels rather than email or phone. Retailers that have falling or stagnant engagement on their branded mobile or desktop sites would benefit from the short, ad hoc nature of such requests. One-off questions on operating hours, product availability, and delivery timing can hopefully be quickly resolved. Plus, personalized messages help maintain interest and emotional involvement.An ecommerce giant has created an entirely new retail experience in its grocery stores. AI powers its conversations with customers and along with high-quality data about customers, it understands their past preferences. Then it creates a list of items that the customer needs in combination with those they are buying today. If a customer does not submit a shopping list ahead of going to the stores, the AI will recommend products based on their location and the time in the store. A significant number of shoppers will have their experience enhanced through cashier-less stores across major cities. Similarly, a company recently introduced a chatbot for various platforms. The chatbot has specific guidelines as to the topics it can discuss and has chat capabilities across various services.

Fig:7.2 Personalized Shopping Experiences

7.7.2. Predictive Analytics for Personalization

Personalization becomes both possible and realistic only in a computer age, when development costs of personalized products are reduced to acceptable levels and the market potential is large enough to justify the investment costs. Predicted preferences are particularly important for partially personalized products, which become popular especially in digital format. In many cases, it is known in advance that consumers have different preferences for certain attributes or features of the product. Examples include: herbal teas and cigarettes asserting different effects on mood, size, shape, fragrance or preference of flowers or mass produced toys and electronic products or households.

In addition to passive preference prediction, it is possible to actively influence a consumer's preferences through collaborations with third parties, empirical data will be used more often. Several empirical approaches try to predict directly for specific personal traits, whereas others utilize worldwide wider concept products with qualitative preferences. Accurate predictions in the personalization field at an individual level require at least a hybrid model. Each of the prediction approaches mentioned earlier has certain limitations. It is especially the hybrid model, which appears to be an appealing alternative. This employs a statistical machine-learning technique based on neural networks or clustering and other optimizations, particularly for mass customization products which are highly preferred. Further improvements in the prediction rates for upcoming years are likely due to larger databases and also an increase in research interest from both academia and practice.

While research has produced a large number of empirical models of VVA and has identified a number of macro and micro factors that influence the timing of a consumer's entrance into a market, with rare exceptions, studies have focused almost exclusively on the predictive rather than prescriptive element of preference analytics and VVA. The acceleration of product innovation cycles and the rapid introduction of new VVA products suggest that at present, businesses may be more interested in actively managing the dynamics of consumer tastes than in simply modeling those dynamics.

7.8. Case Studies of Successful Implementations

Researching the best setups for interactive and personalized shopping, we discovered some implementations that stuck out. We chose to group the examples into two separate sections, convenience-driven Augmented Reality and personalized Retail as a Service. The first case example focuses on effective use of technology that drove a remarkable engagement for a campaign and a brand, who expected the AR experience to be simply fun to be with.

In 2022, a brand and an agency created a lightweight, yet rich Augmented Reality companion to its product. The branded experience was purposefully easy to use and share. The implementation allowed for quick installation of a Decentralized App in a few minutes and to maintain it at zero cost during the course of the campaign. This enables AR and VR experiences to be very powerful and interactive.

During the campaign, the brand decided to upscale its local activation in a high-footfall outlet and extended the duration of the AR Planning. As a result, over four out of ten shoppers decided to make an impulse purchase – an extraordinary conversion rate. We then focus on the second case study, where the implementation was about placing on the brand's website new technologies that offer to the customer an interactive comparison of phones in a world of frequent new smartphone updates. Customers can discover which products fit better their personal needs by asking questions, guiding them through product filtering, and providing personalized suggestions.

In 2021, a brand partnered with an expert and created a personalized shopper function that can be controlled via a brand website. The shopper is already available for the market, with the ambition to expand it soon in the rest of Europe. The experience works by letting customers answer a few questions that help the function understand their needs, which in turn can filter the products to display. Questions include type of usage, favorite functionalities, etc. The function will then filter a selection of products adapted to the personality of the customer. This technology creates and maintains an experience of choice that is engaging and easy to use as many times as the customer wants. The customer is then engaged and, what's more important, what is in front of him achieves this purpose: relevancy.

7.8.1. Brand A: Augmented Reality Success

Brand A illustrates how a leader brand in luxury fashion and cosmetics created a product discovery, description, and selection platform at the customer interface using augmented reality and avatar technology capable of syntonic personalized simulation and demonstrations in a virtual reality setting. Consumer interaction time increased dramatically, and the brand's share of the "affordable luxury" market increased significantly. As a solution to its limited interactive shopping platform, Brand A came to define the customer interface in retail digital storytelling design, as the immersive AR representation gained "time on brand" over traditional media. The augmentation contributed to increasing consumer engagement with smart devices. Brand A adopted the smart device in situ at its service centers as the interface to the mobile retail site.

Using advanced AR, Brand A positioned itself ahead of its competition: a reported 70% share of the AR-enabled facial cosmetics sector, a 60% share of the AR-enabled Italian

luxury fashion sector, and 37% more campaign interactions than its nearest two competitors. The AR partnership did for Brand A what the development of the brand management service did for the American Eagle. It created an exclusive, complete U.S. AR-based brand definition and created the commercial potential for all the other informations needed to do so. Brand A now needed to switch to retail fashion so that the current product offering could be supported by AR-animated digital storytelling before customers moved into its stores or the brand lost the interaction. The knowledge developed with the twice award-winning AR apps could now be used as the front end of a broader branded digital customer experience how-to interchange.

7.8.2. Brand B: Personalized Shopping Experience

The main digital trade route for retail is about having a store offering the digital mirror to a real-world store experience. Think of what a luxury department store or fashion brand experience is in a well-designed, sophisticated space, and we bring that all online. What we're striving to do digitally is defined by our in-store experience, of face-to-face customer service, product presentation, and our knowledge of our customers. Our website, mobile site, and social media have to give that level of customer experience. We have to offer a personalized shopping experience, primarily through social media and, for the mobile site, many drop-down menus and collections.

A site built to let us deliver our brand values is the priority of our digital investment. People who work in retail believe there's more to customer experience than just introducing design bells and whistles to an e-commerce platform. What's unique about in the digital world is knowing our customers, not just our buying habits, but our preferences, to deliver personalized content back to them at a site level, and through social media. At the base level of search, it's all about having something the customer wants, and at the top level, brand and product presentation makes the difference. From layout, fashion direction, and product presentation down to delivery and packaging, it's all part of the experience that we have to get right. The conventional rules of e-commerce - easy four-phase navigation from a landing page to checkout - are blurring; e-commerce is no longer just about product-focused search.

7.9. Challenges in Redefining Customer Interfaces

Technological innovation, user acceptance and privacy concerns are the key barriers against the personalization of the shopping experience. The technological barriers can be seen at different levels. The start-up costs are high, even though the popularity of 3D graphics and the availability of more advanced mobile devices will help to lower the costs over time. The pay-offs may also not be immediate. 3D scans of products are costly

and often contradictory information about customers is stored in databases. The creation of realistic 3D avatars of online customers and of product variants as well as the linking of online and offline modular systems require investments. User acceptance, on the other hand, is partly dependent on these technology costs, as expensive product positioning equipment and expensive specialized 3D scanners may make the acceptance of in-store personalized services harder. In any case, acceptance or rejection will depend on the ease of use of the user interface and its nature.

It is, however, privacy concerns especially in the collecting and storing of highly personal user-friend data and its security, that may inhibit personal data collection for personalized services, unless users have an ongoing collaborative relationship with the service provider. This raises the question as to how any personalized service can create an ongoing collaboration and what a retailer must do to convince users to trust them with their private data. To take these needs seriously, retailers must go to great lengths to show customers the benefits while making the collection and storage of sensitive data highly secure. These concerns are particularly prevalent in a multi-channel retailing context.

7.9.1. Technological Barriers

Forward-looking approaches to technological barriers will alleviate two concerns currently tying retail's hands behind its back: concern one is that brands still talk through carriers, not to consumers, and that they behave macroeconomically, not locally. Most retailers lack the capability of collecting and analyzing data on buying behavior at the consumer level or, if they do collect such information, cannot match it to connections with specific customers. The most advanced retail databases hold data on several hundred thousand customers, not data on tens or hundreds of millions of shoppers, their buying habits, and their ability to pay different prices for similar bikes at different times. Because such systems– a few hundred thousand vs. hundreds of millions consumer records– are hypothetical discussions for many retailers, it is understandable that only a handful of retailers have attempted to fully exploit the capability of the available matching and profiling systems.

Concern two is that the latest generation of data matching, interactive and profiling technologies available to retailers do not cover the full range of choices that are available to shoppers. Much of the technology needed to implement the consumer interfaces extensively is still under development or will become available only when perusal of several competing channels– online, offline, plus print and broadcast advertising– becomes as natural and automatic as zapping between channels on a player. Current offering-related limitations of existing interface-building technologies include difficulty deploying consistently impressive samples of merchandise through as broad a variety of

media as possible; difficulty employing advertising triggerants other than price-level differences that have been defined or established most recently; and difficulty advertising consumers' most recent shopping experiences through local channels, to fellow local consumers who are most likely to share each specific tourist's attraction for that retailer.

7.9.2. Privacy Concerns

The privacy implications of contextual advertising introduce serious ethical questions. The concerns exist both on the premises how user data are acquired and utilized for advertising as well as how informative or deceptive those recommendations are. In reality, users clandestinely agree to popular websites' terms of use, which grant those sites the authority to track them, share that data with third parties, and use it for advertisement purposes. At the same time, the original user-observer negotiation, though expectable to occur when signing a contract in terms of service, is rare in practice. People tend to observe whatsoever mandates the moment when accessing an online resource. Once this precedent is established, both parties tend to accept that as carrying through respective social commitments: advertisement technology vendors deliver useful ads, and users grant them access to considerable amounts of personal information. The fact remains that businesses can exploit to their advantage the law of large numbers.

ICTs might inherently enable bias detection but may also create increasing difficulties to build user trust. Smart online agents are made to improve recommendations, allowing vendors to gradually learn user preferences and affinities based on projective appraisal and direct feedback methods. Yet, the manipulation of long-term behavioral changes is a critical ethical issue as well. The widespread use of algorithmic techniques that sort information introduces prejudice concerns. It is almost trivial to use them and sophisticated statistical techniques to selectively position paid search links in organic search results. Because the longevity of choices is directly related to query terms, companies have been accused of endorsing a particular agenda by the means of unreasonable monetization of organic search listing placement. Furthermore, the paradox states that users prefer the opposite strategies when it comes to algorithmic information sorting; they tend to converge to the same small number of informational sources, irrespective of inevitable interest diversity.

7.10. Future Trends in Retail Interfaces

While this book has focused on what is happening now, we close by looking at what may be coming in the future. A neo-futurist perspective is all the more appropriate here since the retail sector sits on the edge of major turbulence, with impacting technologies

coming to fruition from many decades of miniaturization in computing, bandwidth increases, and processing power improvements. Emerging technologies will offer opportunities to create new interfaces for consumers participating in the shopping experience for both physical and online retail. Aspects of all these technologies are already being experimented with in some limited forms. In addition to emerging technologies, the change in consumer buying patterns and expectations is clearly moving to greater personal experience and need and social connection fulfillment, whether for status or belonging. Consumer expectations are thus favoring niche selling, whether it is small local physical retail outlets, online retailers offering smaller volumes of exclusivity, or curative selling of curated channels. New business models will emerge on the Web to take further advantage of these changing consumer dynamics.

Mobile contactless technologies work by allowing consumers to direct their smart mobile devices toward a screen or other signaling device in a store, allowing custom content to be received from the retailer. Mobile contactless payments have found a foothold and are gaining traction. Both forms speed up and personalize the shopping experience. Augmented and virtual reality applications are still in their infancy, with promotion and product decision applications currently generating the maximum attention. Technology will also come from combining biometric and location-based services with mobile capabilities.

As in many sectors, e-commerce has had a tremendous impact on customer expectations in retail over the past two decades. The higher quality and convenience consumer experiences offered by large e-retail players and other specialized vendors have driven customers to even higher levels of loyalty to their chosen online retailers. Since the introduction of one-click ordering, frictionless shopping has become the norm.

7.10.1. Emerging Technologies

Over the past 20 years, traditional retail has embraced and integrated numerous digital technologies, including point-of-sale systems, mobile payments, and RFID tags for inventory tracking. More recently, retailers have adopted, and in many ways, pioneered new innovative technologies, including mobile apps, online and mobile purchasing channels, and electronic loyalty programs. However, there is still ample room for advancement. With rapidly advancing technology, retailers still have the opportunity to redefine the customer shopping interface through the use of emerging technologies, including augmented reality, artificial intelligence, virtual reality, and robotics.

Augmented reality technologies overlay digital data onto the physical environment in real time. For example, companies allow consumers to preview how furniture looks in their home. In one case, a company has even partnered with another to offer consumers

virtual displays in the home using a voice assistant. Others have introduced augmented reality tools that allow customers to visualize makeup before purchase. Front-facing cameras on smartphones track facial features to apply the selected cosmetics in real time. Similarly, a retailer allows customers to virtually try on glasses using AR features. Other retailers are creating in-store experiences using augmented and virtual reality. For example, one company has created an in-store AR treasure hunt to encourage shopper engagement using an AR mobile app. VR has been used by retailers to help promote products, provide distracting experiences, and even stave off shoplifting. During the pandemic, consumers flocked to VR to socialize, shop, and travel. In an example of hybrid retail, there are marketing efforts to encourage in-store shopping for digital assets through VR.

7.10.2. Changing Consumer Expectations

Future interfaces in retail depend not only on emergent technologies, but also on the commercial and cultural contexts in which those technologies will be applied. Interfaces in retail exist within a framework of commercial and customer company strategies, and must therefore reflect policies designed to address existing and emergent consumer needs and desires. Changing customer expectations definitely will lead application of new technologies in the redesign of retail customer interfaces. The primary driver for interface changes is the newness seeking mix of consumer needs and expectations, created by the social and technological processes underlying the experience economy. An increasing array of choices across a growing number of domains has extended the variety of experiences available to consumers. As a result, consumers have developed higher expectations for the quality of any individual experience.

Triggering the purchase of a desired product has simply become too trivial. Retailers no longer differentiate their products on attributes, but rather seek to render each transaction a memorable experience. To accomplish this, they are utilizing experiences as tools with which to purposefully deliver individual emotional states of pleasure and happiness, and attempting to develop multi-sensory loyalty, as a strategy to increase the lifetime value of the customer pool. As retailers prepare for an economy in which consumers have access to an almost unlimited selection of products and commercial experiences, use as a ploy to differentiate their offers will increasingly become synonymous with price discounting. Retailers competing primarily on price are destined to become mere clearing houses for unwanted surplus, while shrinking a crucial element of their own cost structure: the labor spent on customer contact activities. To be successful, retailers must ensure that their customers believe they are delivering the most value, and quality of the customer's shopping experience – not just the best price.

7.11. Measuring the Impact of Interactive Interfaces

Integrating interactive interfaces into retail stores can be challenging because it is not easy to measure their impact on customers. The effective use of interactive interfaces should enhance customers' in-store shopping experience. Therefore, we need to keep track of specific key performance indicators as evidence that customers are finding value in the use of interactive interfaces. One measure of interest concerns dwell time, that is, the amount of time that customers spend examining the product or brand associated with the interactive interface. Data from customer loyalty programs should also be utilized to track the long-term effects of interactive interfaces on consumer behavior; specifically, the impact of interactive interfaces on purchase frequency and the amount of money spent in the store. Smart phone crew are particularly relevant because they allow the retailer to geolocate customers within the store and measure store specific sales data. Specific location-based retailing applications provide customers with rewards or promotional offers in exchange for interacting with the retailer's specific location-based advertisement. Such applications are highly useful in modeling the impact of the retailer's interactive interface.

Retailers can also try and solicit feedback from customers, either passively or actively, regarding their experiences during the interaction process for future reference. Another means of collecting in-store customer feedback is to use an on-demand survey system, where customers can send their responses to specific survey questions via their mobile app while shopping. However, unlike passive data collection of customer behavior metrics, actively soliciting feedback is characterized by sample selection bias as the willingness of customers to respond to surveys – usually only a small percentage of shoppers – depends on the nature of their interaction. As a result, this may skew the sample of customers with significant positive or negative experiences and may not provide a sufficiently representative sample.

7.11.1. Key Performance Indicators

The ultimate goal of enhancing the customer interface is to increase profits by making shopping a pleasant experience. However, this is a long-term objective that is difficult to measure. Shorter-term objectives, such as deriving a direct economic benefit from interactive or personalized services, are more straightforward to measure, even though the results may be ephemeral. For example, by adding thumbnail display pictures to text descriptors of the books, the firm reduced the perceived information overload and increased online conversion rates: the percentage of visitors to the site who end up buying.

The effect of personalized recommendations can be measured through a number of e-business accounting parameters, such as the average order size, the number of items per order, and the overall conversion rate of expected monthly sales. Providing personalized recommendations or personalizing certain pages according to the declared preference profile of a user can change the behavior of clients who logon to a site for product comparison but do not buy. It can also improve the profitability of customers with a prior history of making large purchases and increase sales while stimulating consumer loyalty. Its impact can also be measured through a loyalty program. Likewise, attention-catching or phenomenal merchandising provide shortcuts through the shopping experience, increasing the "quitting" value of a site or an ability to withstand competing thrusts and increasing its bombarding power. A positive impact in turn can be observed through the loyalty switch or through switching or conversion costs.

7.11.2. Customer Feedback Mechanisms

While the potential of personalized visual shopping has been broadly acclaimed, little has been done so far to back up this sentiment with empirical evidence. Measuring its effectiveness will need to be part of the roll out of personalized visual web as it moves more from the boots of the early adaptive innovators, builders, and implementers into the hands of everyday users. Some suggest a "crawl, walk, and run" approach in which many ideas are trialed on small parts of traffic before selecting the best to ramp up. A simple but effective way to do that is to overlay an online experiment on top of the persistent web and adopt an A/B comparative approach. If a site is getting a good deal of traffic then it may be creating small amount of noise, but the average differences at a site level should still tell you a lot about the impact as you vary the design of interactive shopping interfaces. In virtually every new area of emerging class functionality, many different approaches to exploring interactive visual options. In practice, many design ideas will co-evolve as site owners innovate and iterate their spending.

Direct customer feedback is another effective way to assess customer attitudes particularly in emerging areas where established behaviors and benchmarks do not yet exist. This can be challenged with such data often being sparse or biased in ways that correlate with particular product types and customer segments. Simple qualitative feedback mechanisms may be added to typical product and service review widgets, as well as direct survey approaches at the end of specific shopping episodes. Email sent normally at the end of the browsing episode, or multiple emails sent in low engagement periods might be least distracting for the recipient. Simple questions could track engagement, shopping ease of use, enjoyment. Interest in finding new products or replenishing favorites could supplement this information.

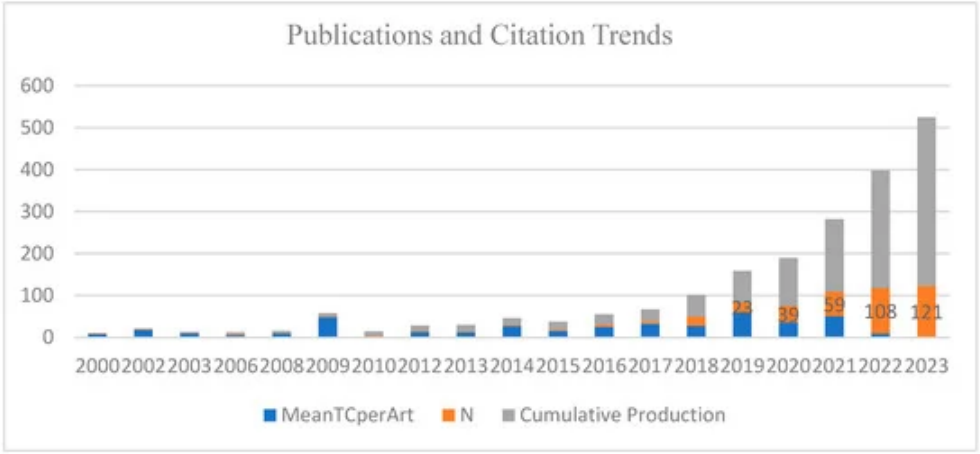

Fig : Artificial Intelligence in Retail Marketing

7.12. Best Practices for Retailers

Most retailers today still approach technology as another tool to reach and communicate with customers, or develop tools that are exclusively focused on a specific segment target group such as Gen Z. These tools usually provide features that address specific segments needs, such as providing product reviews from friends, virtual fitting capabilities, price comparison or couponing within store, without offering integrative functionalities that cover a full range of customer journey workstreams. However, if technology deepens the seamless blend between ecommerce and store environments, personalized interactive tools can address all customers across all store visit phases – pre-store, in-store, and post-store.

There are two key considerations that retailers should take into account when implementing interactive shopping. The first deals with usability and is critical for full adoption: technology has to be as simple as possible and adaptable to shoppers' habits, as well as smart so it can store relevant consumer data. Integrating and augmenting technology with contextual advice and layered capabilities enhances the shopping experience. The second consideration relates to providing the right level of engagement. Less is more; if shoppers are continuously bombarded with notifications, their privacy concern levels will rise rapidly – especially for less digitally-savvy consumers – potentially generating negative feelings toward the technology itself. It is important to ensure that the tools are not intrusive. For example, upon arrival only relevant notifications should pop up; if shoppers then accept further suggestions, for instance with virtual fit advice, it would be beneficial to increase the amount of notifications gradually.

7.12.1. Integrating Technology Seamlessly

Seamless and efficient integration of technology should occur at all points of interaction in the customer journey. While retailers are adopting enhanced technology for efficient customer service, the efficiency of operations and costs is also factored into service design. For example, in-store kiosks are used for self-checkout, finding items in the store, and for bill payments, which helps reduce cost of labor, although they sometimes add to customer frustration. Technology solutions for restaurants also enhance customer service and improve order accuracy. Technology integration at online points also improves service efficiency. It should be remembered that excess reliance on technology for basic interaction can be counterproductive. Modern customers also like the human touch, which enhances their experience. While basic retail shopping is an automatic purchase for essentials, shopping for fashion, electronics, and furnishings is often coupled with in-store experiences to try out new designs and items, as well as the ability to checkout instantly. Customers combine the convenience of online shopping with the experiential enjoyment of physical shopping. Retailers allow customers to view designs in detail, check their interest, browse through virtual catalogs, and compare prices, product features, suggestions on add-ons and options. Integration between the physical and virtual spaces can be thought of in terms of a roadmap. The retailer needs to work out the best route for their specific offerings. Emerging technology includes intuitive storefronts that provide dynamic displays actively engaging the customer. Smart mirrors in cosmetics and clothing stores provide testing and instantaneous feedback while aiding shopping. Customers armed with mobile digital devices can design their own shopping experience through augmented reality, allowing interaction with a smart storefront. Combining all of these capabilities can provide an enhanced customer engagement.

7.12.2. Enhancing Customer Engagement

Retailers should take great care not only to respond to the latest technology trends, but also make certain that the new capabilities they introduce increase customer satisfaction and loyalty, and provide a return on investment. It is vitally important that increases in sales revenues from technology-enhanced interactions with shoppers exceed the costs of providing these capabilities. Rather than rushing into the implementation of new shifts in technology, retailers need to develop a collaborative understanding of their objectives, capabilities and target markets to determine the right set of technology solutions. To ensure that new technology deployments will influence shopping behavior and improve customer loyalty, retailers should hold in-store interviews with food shoppers to find out how they perceive the shopping experience and the aspects that are most important to them, as well as assessing what they may wish could be added. This will allow retailers

to compare what shoppers say to what is actually measured regarding the current experience.

Key Performance Indicators related to store performance areas measureable in real-time while customers are shopping should include in-store product search (how it is done, how easy it is, how long it takes); service encountered during the trip, and how it enhances or detracts from the experience; shopping trip convenience, such as annoying obstacles or inconveniences that might create a negative impression; and shop-at-home convenience, including how long it takes, how enjoyable the experience is and planned frequency. In addition to periodic shopper interviews, while shopping customer KPIs should also routinely be monitored for analysis. These performance indicators can then be mapped to online technology experiences where common touchpoints may help improve customer engagement and increase the likelihood of shopper return. Such shopper behavioral mapping will help identify the retargeting of consumers who have made purchases in certain product categories, sending personalized mobile direct marketing messages and promotions into the store while they are making shopping trip decisions.

7.13. Conclusion

This chapter examined the concept of the customer interface in retailing and how it has evolved. Three dimensions were discussed: the interaction system, the customer interface experience, and the customer interface activity. Technology has enabled redefinition possibilities that have implications on each of these three dimensions.

The conclusion was reached that the integration of different interaction channels and/or experiences and activities has been intensified in digitalized interactive retailing. Different patterns of integration were identified, and these patterns influenced the nature of the redefinitions. Five managerial implications of the redefinitions were discussed.

The practical manifestation of the importance of the customer interface in retailing lies in increasing competition. With the ongoing digitalization of society, as well as growing importance of new technologies in retailing, consumers are becoming harder to please. These new technological advancements enable new forms of consumer interaction in a self-service environment. In turn, consumers expect flexibility, variety, novelty, efficiency, and competence from the retailers. This creates an ongoing pressure on retailers, especially stores, to invest in their customer interface in order to differentiate themselves from the competition. The digitalization of the interaction avenues accessible to retailers enables the mixing and matching of multiple avenues in order to develop a more fulfilling, more convenient, and a more engaging customer experience.

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