

Citation

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DIGITAL TECHNOLOGIES AND SHOPPING: AN EXPLORATORY STUDY**Abstract**

This paper explores the impact of digital technologies on consumer shopping using a review of the current literature on this topic and an online survey-based study. We begin this paper by identifying and measuring the unique attributes of two current (Internet and Mobile Platform) and four emerging (Artificial Intelligence, Augmented, Mixed and Virtual Reality) digital technologies. Next, we test the differences in the scores for these attributes across all these digital technologies and the impact of these attributes and the participants' demographic and behavioral characteristics on their shopping experience, choice and usage of these technologies. Finally, we examine the impact of these attributes on the five stages of consumer decision-making (i.e., need recognition, information search, alternative evaluation, purchase and post-purchase) during shopping. We discuss the theoretical contribution and managerial implications of our findings along with some limitations of our study and useful directions for future research in this topic of growing importance.

Key Contributions

This paper extends the growing body of research on the adoption of new digital technologies by customers for shopping by focusing on their impact on the consumer decision-making process. We use an extensive review of the current literature on the impact of digital technologies on the consumers' attitudes, perceptions, and behaviors, to conceptualize the attributes of new digital technologies as a multidimensional construct and develop a conceptual model with specific hypotheses about the impact of these attributes on consumers' shopping experience, choice and usage of these new digital technologies. We also explore the impact of these unique attributes of six digital technologies on the five stages of consumer decision-making process (i.e., need recognition, information search, alternative evaluation, purchase and post-purchase). We then use an online survey as a baseline study to identify and categorize the unique attributes of six digital technologies, including two current (Internet and Mobile Platform) and four new (Artificial Intelligence, Augmented, Mixed and Virtual Reality) technologies. We also test the impact of these attributes and the participants' demographic and behavioral characteristics on important outcomes (shopping experience, choice, usage, and decision-making stages) and found many significant results, which provide useful insights on how consumers perceive all these digital technologies. Specifically, we find that the utilitarian, independence, performance, and versatility attributes of digital technologies coupled with the enjoyment dimension of customer experience and the need recognition and information search stages of the consumer decision-making process drive the usage of these digital technologies. Moreover, internet continues to be the most popular technology for shopping, with highest scores on information search, purchase behavior, familiarity, past usage and utilitarian attribute. In contrast, augmented reality shows highest scores on virtualization and human-like attributes, while mobile platform seems least popular. We discuss the implications of these results for academic researchers as well as marketers.

Introduction

Digital technologies and platforms, including computers, mobile devices and social media have changed in recent years the way consumers and businesses interact with each other (Moffett et al. 2020; Yadav and Pavlou 2014; 2020). Thus, it is not surprising to see more and more new technologies emerge and transform the way firms develop and deliver their products and services to consumers, and the way consumers interact with these firms to manage their relationships with each other (Grewal et al. 2020a, 2020b). Examples of these new digital technologies include, artificial intelligence (Davenport et al. 2020; Huang and Rust 2020; Rai 2020), augmented reality and mixed reality (Hilken et al. 2017, 2020), virtual reality (Burke 1997, 2002; Sample et al. 2020), Internet of things (Hoffman and Novak 2018), and robotics (Mende et al. 2019). These growing trends indicate that consumers are getting ready for an environment that is embedded and enriched with virtual content, and hence, firms need to integrate these new emerging technologies into their marketing strategies (Grewal et al. 2020a).

Despite such growing interest in the new digital technologies, most marketing studies have been either conceptual or descriptive in nature, with hardly any attempt to empirically examine the consumer perceptions, attitudes and behaviors towards all these new digital technologies and to examine the influence of the unique attributes of these technologies on the different stages in the consumer decision-making process. For example, many articles document the growing popularity of AI across a wide range of applications, such as customer service, healthcare, retailing, and transportation (e.g., Davenport and Kirby 2016; Davenport and Ronanki 2018). More recently, Davenport et al. (2020) introduce a framework to organize AI applications using their task automation timeframe and form (digital vs. robot) and suggest future research agenda to test the predictive ability of AI applications and the challenges in their adoption and usage by consumers (e.g., loss of autonomy, privacy, bias and ethics).

Tong et al. (2020, p.66) develop a framework for personalized mobile marketing incorporating five Ps (product, price, place, promotion, and prediction) to help marketers customize their offers using hyper contextual information about their customers, including “physical location, temporal information, cross-channel behaviors, surrounding environment, shopping companion, and market competition”. They also propose many ideas for future research, such as a comparison of how customers use the different new technologies and how do these influence customer engagement and purchase behaviors. Researchers have also called for more research on the differences in the unique features of different technologies in the shopping context (Tong et al. 2020) and the factors that may hinder the customers’ journey to adopt the new digital technologies for their shopping (Blut and Wang 2020).

In this paper, we extend this growing body of research on the adoption of new digital technologies by the businesses and customers by focusing on the impact of these new digital technologies on consumer decision-making process. We begin with a review of the current literature on the impact of new digital technologies on the consumers’ attitudes, perceptions, and behaviors. Next, we conceptualize the attributes of new digital technologies as a multidimensional construct and develop a conceptual model with specific hypotheses about the impact of these attributes on consumers’ shopping experience, choice and usage of these new digital technologies as well as the five stages of consumer decision-making process (i.e., need recognition, information search, alternative evaluation, purchase and post-purchase). We then use an online survey as a baseline study to identify and categorize the unique attributes of six digital technologies, including two current (Internet and Mobile Platform) and four new (Artificial Intelligence, Augmented, Mixed and Virtual Reality) technologies. We also test the

impact of these attributes and the participants' demographic and behavioral characteristics on important outcomes (shopping experience, choice, usage, and decision-making stages) and found many significant results, which provide useful insights on how consumers perceive these digital technologies. To summarize, we address the following specific research objectives:

1. Identify the unique attributes of various digital technologies (both current and new) and categorize them based on their common characteristics and explore the differences in the scores for these attributes across all the digital technologies
2. Investigate the impact of these attributes of digital technologies and the consumers' demographic and behavioral characteristics on their shopping experience, choice and usage as well as on the five stages of consumer decision-making process (i.e., need recognition, information search, alternative evaluation, purchase and post-purchase).

Literature Review and Theoretical Background

Digital Technologies

Yadav and Pavlou (2014) introduced an integrative framework to organize the current research and guide future research on the impact of technologies, such as internet, devices, and infrastructure related to computer-mediated environments, on marketing. One of their key insights was that it is not the technologies that are so important but the transformation of interactions between the consumers and firms by technology (Yadav and Pavlou 2020). A recent special issue of the Journal of the Academy of Marketing Science (Vol. 48) with the theme, "The future of technology and marketing: a multidisciplinary perspective", edited by Grewal et al. (2020a), consists of nine articles that examine the impact of various emerging technologies (e.g., artificial intelligence, dark web, personalized mobile marketing, social media, and in-store technology) and technology-enable interactions on the consumers and marketers in a digital ecosystem. In this section, we review the current research on the most popular digital technologies and use it to develop our conceptual framework for this paper.

Artificial Intelligence (AI)

Artificial intelligence includes programs, algorithms, systems and machines that mimic many aspects of human intelligence and it includes four types of intelligence - mechanical, analytical, intuitive, and empathetic (Huang and Rust 2018; Shankar 2018). AI uses tools such as, deep learning, machine learning, natural language processing, neural networks, robotic process automation, and rule-based expert systems (Davenport et al. 2020). These tools help AI to not only collect and interpret a vast amount of data but also learn from such data and adapt marketing and business applications, such as business process automation, marketing research, customer engagement and relationship management, new product development, and service delivery innovation (Davenport and Ronanki 2018). Applications of AI include Amazon.com's Prime Air that uses drones for shipping and delivery, Domino's pizza that is exploring use of autonomous cars and robots to deliver pizzas, RedBalloon's AI platform that helps identify new customers, Macy's On Call that serves as an in-store personal assistant using natural language processing, Affectiva that studies consumers' emotions when watching advertisements using affective analytics, Replika that uses a machine learning-based Chabot to mimic customers' styles of communication, Stitch Fix that uses AI to match their clothing styles with different customers, Conversica AI bot that moves customer transactions through the marketing pipeline, and 1-800-Flowers AI bot that offers sales and customer service support (Davenport et al. 2020; Huang and Rust 2020).

Augmented Reality (AR)

AR is an ‘immersive technology’, which “blurs the boundary between the physical and virtual worlds and enables users to experience a sense of immersion” (Suh and Prophet 2018, p. 77). AR is also a ‘smart’ technology that helps enhance the customers’ online service experiences by providing them an intuitive and context-sensitive interface to process information in a natural manner, which in turn can improve service quality and make online shopping more effective and enjoyable for the customers (Marinova et al. 2017). AR tools such as Facebook's innovative lenses and filters, Google's ARCore, Apple's ARKit, and cloud-based platforms have led the rapid development of AR content (Petrock 2018). Given the prospects of AR as a transforming and potentially disruptive technology (Rauschnabel et al. 2019), marketers have become increasingly interested in using AR in their campaigns. AR is used to enhance customer experience by providing them simulated physical control and environmental embedding at the same time (Hilken 2017). AR applications such as the Ikea app, virtual make-up trials, and ‘Pokémon Go’ are a few examples of how firms increase customer engagement and excitement through AR (Hinsch et al. 2020). AR relies on devices, such as smartphones, tablets, or headsets, which impose a virtual overlay over the physical world. Depending on the device, this virtual overlay provides the user with minimal (e.g., smartphones), partial (e.g., Google Glass) or total (e.g., Oculus Rift) immersion in AR. By giving shoppers the ability to augment the physical world with context-specific information at or near the purchase decision, AR stands to revolutionize the retail sector and shopping experience (Heller et al. 2019; Hilken et al. 2020; Jessen et al. 2020).

Virtual Reality (VR)

VR is a computer-generated environment that simulates an immersive, lifelike experience grounded in reality (Burke 1997, 2002). VR allows people to experience the feeling of actually being in ‘another place’ (e.g., a retail store, restaurant, hotel room, or tourist destination) above and beyond the information made available by the computer (Boyd and Koles 2019). VR is different from AR as it uses devices such as 3-D glasses, headsets and gloves to simulate the real-life like experience for the customers, whereas AR can be employed using normal devices such as computers and smartphones (Wedel et al. 2020). VR also mainly relies on virtual stimuli to create a realistic experience but AR uses additional computer-generated content to enhance the customers’ perceptions of reality (Wedel et al. 2020). VR holds great potential for marketers by engaging the customers and helping them visualize, interact with, and experience the products or services, and thus increase their likelihood to purchase and use the product (Flavián et al. 2019; Sample et al. 2020). VR has been used to develop applications in a wide range of industries, including gaming, medicine, education, travel, entertainment, and marketing (Wedel et al. 2020).

Mixed Reality (MR)

MR combines the features of augmented and virtual reality to create integrated physical and virtual experiences, which offers enhanced customer experience and greater potential for physical stores to improve their service offers (Dekimpe et al. 2020). MR applications include Sephora’s ‘Magic Mirror’, which uses a smart engine to not only help its customers visualize different make-up treatments but to also recommend makeup, skincare, and fragrances with accuracy. Similarly, an RFID-enabled interactive touch-screen mirror developed by Oaks Labs can identify all the items taken by a consumer into a fitting room, and act as a (digital) sales

assistant to allow customers to request other sizes, colors, or matching items from a (human) salesperson. All these applications help create frictionless experiences for the customers, reducing their effort and discomfort, and thus, result in higher levels of customer satisfaction and store loyalty (Dekimpe et al. 2020).

In view of the above unique features and benefits from the new digital technologies, marketing firms, particularly retailers, are rapidly adopting these to improve customer experience and interactivity (Grewal et al. 2017, 2018). With such growing popularity, it is not surprising to see an increase in academic research on the role of these new digital technologies in the marketing discipline. However, many of these articles focus on either the specific technical aspects of these technologies used to solve marketing problems or other managerial and strategic issues related to their use, such as their impact on jobs and society, with relatively little attention to the customers' psychological reactions to these technologies (Grewal et al. 2020a, 2020b). We address this research gap by identifying the unique attributes of these new technologies and exploring their impact on all the stages in the consumer decision-making process and on important customer outcomes.

New Digital Technologies and Shopping

Past research used AIDMA (Hall 1924) to study consumer decision-making (CDM) process to show that consumers go through different stages. However, this model assume CDM to be a linear process and did not account for the changes in CDM due to the advent of new technologies like Internet and Mobile platforms. Dentsu (Sugiyama and Andree 2011) addressed this gap with their AISAS model that extended the AIDMA model to be able to study CDM in the online and mobile environments. In this research, we aim to further extend this line of research by exploring the need to adapt, modify or extend the AISAS model to account for the recent digital technologies e.g., AR, VR and MR. Digital technologies have lowered the threshold for shopping, and stimulated repeat purchase; hence, skips information search and evaluation of alternative stage. Impulse buying means consumers make a purchase purely based on their impulses and emotions, and attractive presentation of products is said to be the one of the causes of impulse buying. Digital technologies has enabled a presentation of products in real life setting (e.g., IKEA furniture, Dulux paint, L'Oreal test beauty product at home), hence may have contributed more impulse buying.

Once buyers acknowledge a problem or a need, they are likely to search for information regard with the problem or the need. It is expected that these new digital technologies are likely to change information searches and product trials (Javornik 2016), and ultimately to facilitate purchasing decisions (Boletsis and Karahasanvic 2018). The most effective source of information tends to be word of mouth (Chen and Xie 2008). Recent research on digital technologies confirmed that product recommendations through social augmented reality contribute to other's purchase decisions (Hilken et al. 2019). Therefore, use of digital technologies enables information search and sharing information easier and speedier, and which in turn result in faster buying decision marking. Research on online shopping shows a positive relationship between each stage of consumer decision making process and volume of online purchase. For example, consumers who used the internet more also purchased more online (Comegys et al. 2006). Buyers' satisfaction with the purchase is determined by a comparison of the consumer's expectations and the product's perceived performance. When the perceived performance falls below expectations, then, the consumer is dissatisfied, and which in turn may lead to cognitive dissonance. However, as customers are able to test a product before buying, digital technologies make users feel happier and more confident with

their buying decision, and experience less cognitive dissonance (Hilken et al. 2017).

Due to unique characteristics of services, these cannot be easily displayed or communicated to customers (Wilson et al. 2021, p.16). Thus, services with no tangible elements cannot be seen, touched, tested or inspected before buying the same way as products. Lack of demonstration increases the uncertainty when evaluating among alternative service offers (Palmer 2014). Digital technologies allow consumers to inspect and try the products before buying (Javornik 2016). Hence, digital technologies provide ‘a pre-purchase service for customers’ or ‘a complementary service to the existing products’ (Boletsis and Karahasanvić 2018, p. 52). Therefore, digital technologies seem to have changed the consumer decision making process of product purchase, but may not have influenced the consumer decision making process of service purchase. Thus, to fully understand the effect of digital technologies on consumer decision making process, different contexts for shopping (e.g., service vs. product, tangible vs. intangible) need to be considered as moderators (Darley et al. 2010; Suh and Prophet 2018).

Empirical research on digital technologies typically involves young participants, namely, 18-35 years old comprising mainly university students (e.g., Hilken et al. 2017; Pantano et al. 2017; Heller et al. 2019; Hilken et al. 2019) as this part of the population is often extensive internet users, and regarded as a reliable segment for testing new technologies in retail businesses (Pantano, Rese, and Baier 2017). Although there are some distinctive characteristics which divide younger consumers from older cohort, for example, older consumers tend to search less information, and consider less alternative choices for decision making (von Helversen et al. 2018), digital technologies effect on consumer decision-making process for older cohorts are under researched. Older cohort such as baby boomers (born between 1946 and 1964) are declared to be the wealthiest generations (Woolard 2019). Moreover, global aging population and improvement in their technological literacy make this generation very attractive hidden market (Vaportzis et al. 2017; Ma et al. 2020). In fact, research shows (e.g., Lian and Yen 2014; Kuoppamäki et al. 2017) that online purchase of both products and services has already been escalating rapidly among baby boomers since several years ago. Hence, there is a call in the literature to investigate the effect of digital technologies on a broader cross-section of older consumers with different socio-demographic characteristics, such as age, gender, education and income levels (Loureiro et al. 2019).

We address the above research gaps by identifying the major attributes of six digital technologies, including two current (Internet and Mobile Platform) and four new (Artificial Intelligence, Augmented, Mixed and Virtual Reality) technologies. We then test the impact of these attributes and the participants’ demographic and behavioral characteristics on their shopping experience, choice and usage of these new digital technologies and on the five stages of consumer decision-making process (need recognition, information search, alternative evaluation, purchase and post-purchase) in Study one.

Methodology

We conducted an online survey with a sample of MTurk panel members in the US (N=300) using a between-subjects design with 50 participants and a structured questionnaire with the level of familiarity, usage, and satisfaction as well as the perceived attributes, benefits, choice, and usage of six digital technologies (Internet, Mobile, AI, AR, VR, MR). We also collected their demographic data to classify their responses. All the items were adapted from the existing well-established scales drawn from our extensive literature review (Table 1). Our sample has more males (71%) and younger (Under 44 years, 77%), Full-time employees (89%), White

Collar workers (61%), well educated (bachelors and above, 91%), higher income (above \$25,000 per annum, 84%), frequent internet users (4 hours and above every day, 72%), and those using a desktop or laptop as their primary device to access internet (88%). Next, our exploratory factor analysis (EFA) revealed eight dimensions of the digital technology attributes (utilitarian, hedonic, entertainment, performance, perceived risk, versatility, virtualization, and human-like) using 69 items identified from our extensive literature review. In addition, we measured the five stages of consumer decision-making (need recognition, information search, alternative evaluation, purchase and post-purchase) using two items each. Finally, we also measured three important customer outcomes, including customer experience (efficiency and enjoyment), customer choice and future usage. All the items have high factor loadings ($> .70$) that load significantly on their respective factors, which shows convergent validity (Table 1).

Data Analysis and Results

All the scales exhibit adequate discriminant validity as the square-roots of the AVE for all the constructs are higher than their correlations with all the other constructs included in the model. Finally, our regression analysis revealed that the participants' future usage is mainly driven by the performance ($\beta = .22, p < .001$), versatility ($\beta = .14, p < .05$), and choice ($\beta = .37, p < .001$). In contrast, the first stage of CDM, need recognition is only influenced by the utilitarian ($\beta = .37, p < .001$) attribute of the digital technologies, whereas the second stage, information search is affected by familiarity with the digital technologies ($\beta = .16, p < .001$), utilitarian attribute ($\beta = .38, p < .001$) of the digital technologies and need recognition ($\beta = .12, p < .05$). Similarly, alternative evaluation is influenced by performance attribute ($\beta = .36, p < .001$) of the digital technologies and need recognition ($\beta = .13, p < .05$), whereas purchase behavior is driven by independence ($\beta = .27, p < .001$), information search ($\beta = .15, p < .05$) and alternative evaluation ($\beta = .17, p < .01$). Finally, post-purchase behavior is influenced by many attributes of digital technologies, including utilitarian ($\beta = .33, p < .001$), independence ($\beta = .24, p < .01$), performance ($\beta = .20, p < .05$), and versatility ($\beta = .17, p < .05$), enjoyment dimension of customer experience ($\beta = .37, p < .001$) as well as need recognition ($\beta = .19, p < .001$) and information search ($\beta = .20, p < .001$). A comparison of the values of all the variables across the six digital technologies included in this study shows that internet is the most popular technology with highest scores on information search, purchase behavior, familiarity, past usage and utilitarian attribute. In contrast, augmented reality shows highest scores on virtualization and human-like attributes. Interestingly, mobile platform shows the lowest scores on many attributes and CDM stages as well as customer outcomes, which seems in line with the lower use of mobile phones as primary internet device in this sample (12%).

Limitations and future research

Overall this study provides many useful insights about the consumers' perceptions about the digital technologies. However, this study had a few limitations. First, it included many participants who were not quite familiar with all the digital technologies. Second, we did not focus on any specific product or service category. We did this to cover a broad cross-section of consumers and their perceptions about these digital technologies in general. However, all this may limit the generalizability of its findings. Finally, we had a relatively smaller sample size ($N=50$) for each of the six digital technologies, hence we could not test the impact of all the attributes of the digital technologies as well as the demographic and behavioral characteristics of the participants on the customers outcomes and the five CDM stages.

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Table 1. Scale items and descriptives (Study 1)

Scale items	λ	M	SD
Need Recognition			
Realize that I need something	0.73	5.18	1.27
Remind me about something I need	0.73	5.34	1.25
Information Search			
Browse for things that I may need	0.74	5.43	1.22
Search for information to fulfil my need	0.72	5.58	1.11
Alternative Evaluation			
Compare different options based on relevant features	0.71	5.47	1.20
Decide my order of preference for different options	0.75	5.33	1.21
Purchase			
Make my choice from various options	0.60	5.35	1.26
Make my purchase decision	0.70	5.35	1.29
Post-purchase			
Share my purchase experience with others	0.62	5.30	1.31
Make the same purchase decision again	0.68	5.33	1.25
Utilitarian			
Quick to access	0.79	5.41	1.30
Easy to access	0.80	5.48	1.26
Ease of use	0.79	5.47	1.23
Portable	0.76	5.41	1.23
Informative	0.62	5.55	1.21
Increase knowledge	0.79	5.45	1.20
Inexpensive	0.72	5.05	1.42
Hedonic			
Creative	0.74	5.34	1.30
Engaging	0.66	5.56	1.20
Interactive in real time	0.62	5.46	1.14
Independent	0.75	5.47	1.22
Impersonal	0.63	5.14	1.36
Do the unthinkable	0.66	5.03	1.46
Entertainment			
Entertainment (audio, video)	0.63	5.39	1.25
Entertaining	0.66	5.54	1.10
Fun	0.72	5.35	1.25
Playing games	0.78	5.34	1.43
Self-learning system	0.67	5.30	1.16

Performance			
Personalized	0.63	5.37	1.16
Realistic	0.66	5.42	1.18
Trustworthy	0.69	5.35	1.19
Accuracy	0.67	5.50	1.15
Fast performance	0.80	5.38	1.24
Impartial	0.67	5.35	1.30
Perceived Risk			
Data security	0.62	5.21	1.33
Easy to hack	0.76	4.65	1.56
Damage mental health	0.86	4.61	1.68
Damage physical health	0.86	4.50	1.79
Lack of privacy	0.83	4.84	1.54
Virus prone	0.89	4.66	1.70
Versatility			
Ability to engage with others entities (e.g., humans, machines, objects)	0.71	5.18	1.30
Ability to perform a variety of tasks (e.g., play game, shop, communicate etc.)	0.89	5.31	1.23
Ability to mimic real-world responses	0.71	5.25	1.14
Ability to capture attention	0.76	5.43	1.29
Ability to create online content, e.g., website, blog, etc.	0.74	5.12	1.30
Ability to share online content, e.g., posts, photos, etc.	0.78	5.32	1.20
Ability to download information	0.79	5.46	1.14
Virtualization			
Combines real and virtual objects in a real environment	0.79	5.19	1.24
Incorporate social cues from computer-simulated avatars	0.69	5.17	1.23
Incorporates spatial environments	0.66	5.24	1.24
Matches real and virtual objects with each other	0.75	5.27	1.23
Use of a computer-generated 3D environment	0.75	5.35	1.17
Displaying in three dimensions	0.82	5.19	1.26
Humanlike			
Look like humans	0.80	5.01	1.45
Act like humans	0.82	4.94	1.45
Think like human	0.86	5.02	1.40
Act rationally	0.82	5.18	1.32
Think rationally	0.79	5.10	1.30
Intelligent	0.71	5.32	1.23
Work like a human brain	0.83	5.21	1.40

Efficiency			
Choose the right brand/product for me	0.69	5.35	1.29
Meet my expectations	0.46	5.44	1.14
Make the right choice	0.58	5.55	1.16
Process information	0.64	5.31	1.26
Search for value	0.75	5.53	1.16
Accomplish what I want	0.44	5.50	1.12
Find the item(s) I look for	0.80	5.43	1.29
Save my time	0.76	5.41	1.22
Make quick decisions	0.80	5.43	1.33
Easy to compare prices	0.75	5.32	1.31
Reduce my overall effort	0.69	5.51	1.16
Enjoyment			
Enjoy the shopping experience	0.64	5.37	1.22
Look fashionable	0.65	5.37	1.28
Seek new experiences	0.61	5.48	1.21
Search for variety	0.88	5.57	1.17
Buy on impulse	0.85	5.07	1.44
Match the experience of traditional shopping	0.84	5.42	1.19
Choice			
Complexity of shopping task	0.65	5.13	1.31
Duration of a shopping task	0.72	5.27	1.26
Number of stages to complete a shopping task	0.82	5.32	1.20
Accuracy of information to complete a shopping task	0.76	5.40	1.25
Quantity of information to complete a shopping task	0.72	5.35	1.14
Clarity of information to complete a shopping task	0.73	5.37	1.19
Time of the day carrying out a task	0.68	5.31	1.26
Time pressure for a task to complete	0.70	5.28	1.23
Usage			
Experience of using the technology	0.75	5.30	1.20
Shopping goals for using the technology	0.78	5.32	1.20
Knowledge of the technology	0.81	5.47	1.21
Memory of how to use the technology	0.79	5.39	1.20
Motivation to use the technology	0.79	5.36	1.18
Confidence in using the technology	0.81	5.56	1.19