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Consumer Observation on Retail Digitalization: A Study on Retail Sector of Bangladesh

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A B S T R A C T

Digitalization highlights the retail industry's rapid evolution. We are now in the era of fourth industrial revolution, and most advanced countries are attempting to adapt to these changes by transforming their retail business platforms and providing retail services through a variety of digital platforms. However, in Bangladesh, the retail industry still traditional and only partially digitalized. In Bangladesh's retail sector, there are not enough digital components such as Digital vending machine, RFID, IoT, Chatbots, Artificial after sale service, Live tracking system, robot-based delivery etc. The study tries to incorporate all the perception of Bangladeshi Consumer about our current retail sector and identify a number of outputs to clarify the conditions of the retail sector of Bangladesh. The study found that all these digital components are very much necessary to make a retail industry digitalize. On the other hand, In Bangladesh almost all the retailers are not using these digital components and customer believe that if the retailers can incorporate these necessary items the retail sector of Bangladesh will be digitalized and also competent in the world. There is still a significant possibility to improve Bangladesh's retail industry by utilizing digitalized components to modify the country's economic structure.

Keywords: Retail Digitalization, 4th Industrial Revolution, Digital Vending Machine, RFID, IoT, Live Tracking Systems, Robot Based Delivery.

1. Introduction

Over the past two decades, retail expansion has accelerated and expanded to cover more and more countries in South America, East and Southeast Asia, and a few African nations. Recently, South Asia and other low-income parts of the world have become targets for the expansion of retailing chains (Altenburg et al., 2016), and this retail transformation process has been differentiated by four waves that have included various regions and countries (Reardon et al 2003; Monteiro, Farina and Nunes 2012; Dakora, 2012).

Similar to other developing nations in the world, Bangladesh's retail industry is dominated by neighborhood corner stores, small grocery stores in shop lots, and small grocery stores in rural and semi-urban areas (Ali and Faroque, 2017). But during the past ten years, Bangladesh's retail sector has experienced amazing growth (Siddiqui, Ahmed and Hasan, 2006; Arif, 2013, Shamser, 2014; Ahmed, 2017; Sarker and Ashrafi, 2018). Supermarkets' emergence (Shamsher, 2017; Datta, 2017; Sarker and Ashrafi, 2018; Farid et al., 2017), together with e-commerce and e-quick tailing's adoption (Islam and Eva, 2019; Karim and Qi, 2018; Sahel, Anwar and Nandi, 2018; Islam, 2018), and the expansion of multichannel retailing are just a few of the variations that have been conferred (The Daily Star, 2017; futurestartup.com, 2017).

The retail industry's digital environment is now being built around making the consumer experience better. The consumer experience has become more complicated because of digitalization, the presence of different technologies, and the use of different channels. Consumers want more integrated platforms where they can talk to retailers no matter where they are or what time it is. Due to the complexity of the consumer experience and the many factors that go into it, retailers can gain a competitive edge and more market share if they use digital channels and big data analysis well. Digitalization can also cause retailers to lose market share if they don't offer digital channels at all or if the channels, they do offer aren't very good.

1.1 Research Objective

Broad Objective

The main objective of the paper is to determine the Consumer observation on the Retail Digitalization in Bangladesh.

Specific Objective

- To identify necessary component for retail digitalization
- To analyze the impact of digital component on Retail digitalization

- To find out the current conditions of retail sector of Bangladesh

1.2 Rationale of the study

With the global growth of technology, more and more individuals are getting interested in conducting retail business online. As stated previously, internet buying in Bangladesh has seen a dramatic shift in the recent two decades. A number of the majority of retailers are currently offering online shopping in an effort to attract more clients. Here, Consumer happiness is a crucial concern for online retailers, as consumers will only visit online stores if they are happy with their purchases (Osio & Orubu, 2018)

To the best of the researcher's knowledge, however, no such research has been conducted in the Bangladesh like this where we will get the entire perspective of retail digitalization according to the consumer perception in Bangladesh. This is a substantial research gap that the current study intends to solve. On the other hands the retail sector of Bangladesh still could not use the necessary components of retail digitalization which is another big issue of this study.

1.3 Research questions

- What are the necessary components for retail digitalization?
- What is the impact of Digital components on Retail digitalization?
- What are the current conditions of retail sector of Bangladesh in terms of retails components?

2. Literature Review

2.1 Digitalization as a concept

Given its frequent usage and wide range of applications, the term "digitalization" may be challenging to understand. Since the focus of this thesis is digitization, understanding the notion is essential. Digitalization's main tenet is the transformation of actions and things into digital form (Ilmarinen & Koskela 2015, 22).

For many years, digitalization has shaped and influenced the business world. Some industries are more effective than others in exploiting digitalization through new methods. Retail is one of the industries that has yet to reach its full potential in this regard. Many digitization opportunities are widely understood but rarely used in practice (Stieninger, Mark, Auinger, 2019). Shopping apps, Digital vending Machine, Chatbots, RFID-based inventory management, digital loyalty programs, geofencing, smart phone-based in-store navigation, digital product location maps, intelligent dressing rooms, smart mirrors, digital signage, digital consumer touchpoints, smart shopping trolleys, and zero-touch checkout are just a few examples of possible retail point-of-sale applications (Kellermayr-Scheucher, Marike, 2021). One of the most important digital transformation technologies is the Internet of Things (IoT). While there is no single, uniform definition of IoT, it is generally recognized that IoT is creating innovation and new opportunities by embedding technology in every object and thing that allows them to sense, identify, network, and process each other (Balaji, Roy and Kumar, 2017).

Smart or intelligent shelves are one of the most promising retails IoT solutions of the next generation (Mohd, and Mansourkiaie, Fatemeh, 2020). Consumers and the organization both benefit from smart shelves (e.g., real-time inventory analysis, instantaneous pricing adjustments, theft and loss reduction, gathering of actionable consumer feedback), making it an indispensable tool (Kellermayr-Scheucher, Marike, 2021). Smart shelves are electrically linked retail shelves that automatically monitor stock levels. The shelves are outfitted with weight sensors, proximity sensors, 3D cameras, microphones, RFID tags, NFC, electronic printed tags, LED sensors, optical sensors, IOT sensors, robot-based delivery, live tracking systems of products, Digital supply chain module etc., in order to monitor shelf stock (Sudheer, and Harshavardhan, Vikramaditya, 2021). In the literature, the many technologies for effective management of on-shelf availability and inventory, planogram maintenance, and consumer behavior analysis are thoroughly documented (Santra, Bikash, and Mukherjee, Prasad, 2019). However, there is no article that provides a comprehensive analysis of the existing technologies. Only the suppliers' websites provide information, and even then, it is only available in a very general sense.

2.2 Digitalization in retail

Digital retail channels have grown rapidly over the past ten years (Luo, Ba & Zhang 2012, 1121). More and more customers are engaging with businesses through digital channels as opposed to traditional physical locations. More and more consumers choose to just use digital media. With digital channels, like a smartphone app, the customer can choose the place, time, and platform for interactions with the company. In this case, merchants' top priority is to provide a fully operational application that produces the greatest possible customer experience. 10 Because of digitization and the expansion of the digital world, consumers now have higher expectations for the quality of digital platforms and apps (Filenius 2015, 27).

The majority of retail activity is still conducted in physical locations, although online channels have significantly outpaced traditional stores in recent years in terms of volume growth. In the future, this trend makes internet commerce a potential challenge to traditional retailing (Corkery 2017). There are essentially three communication routes in retail. Traditional physical medium, mobile, and web channel. Some merchants view these three channels as alternatives to one another. Some merchants consider these channels to be separate channels. However, a current trend in retail appears to be the

merging of all three channels such that they can function as complimentary channels. Retailers are developing innovative methods to link various channels and offer a more sophisticated omnichannel experience, hence enhancing the consumer experience (Verhoef, Kannan & Inman 2015, 175–176).

2.3 Retail Development Waves

The retail transition process has occurred in four phases that have spanned many areas and nations (Reardon et al 2003; Monteiro, Farina and Nunes 2012; Dakora, 2012). In the early 1990s, nations from South America (Argentina and Brazil), East Asia (the Philippines, the Republic of Korea, Taiwan, and Thailand), Central Europe (the Czech Republic), and South Africa participated in the first wave. The second wave began in the middle of the 1990s and encompassed Southeast Asia (Indonesia), Latin America (Colombia and Guatemala), and South-Central Europe (Bulgaria), in addition to Mexico. In the early to mid-2000s, supermarkets extended to other regions of Central and South America (Bolivia, Nicaragua, and Peru) and Southeast Asia (Vietnam), as well as to some regions of China, India, and Russia. A few supermarkets were launched at this period in a number of African nations (Kenya, Zambia, and Zimbabwe), although supermarket penetration remains low in these nations. The fourth wave consists primarily of African nations (Angola, Mozambique, Tanzania, and Uganda) that received South African FDI in the middle of the 2000s but have not yet substantially restructured their traditional retail sectors, as well as poorer nations in South Asia, such as Bangladesh (Bachmann, 2008; Wrigley and Lowe, 2010; Dakora, 2012; Reardon, 2008; Reardon and Gulati 2008)

2.4 Retail sector in the era of 4th IR

The industrial revolution 4.0 will have a big impact on the retail business. People's shopping habits are changing. In the past, they went to many stores, but now they shop online. This is a big problem for retail businesses that only operate in stores. The number of marketplaces in Indonesia, like blibli.com, tokopedia, bukalapak, lazada, online shops run by their owners, and others, is growing. This is hurting the sales of retail stores. Recently, a lot of attention has been paid to the 4.0 industrial revolution by researchers and people who work in academia. Liao, et al. (2017) do an in-depth study of research on the industrial revolution 4.0 using a literature study approach. The results describe what the industrial revolution 4.0 was like in the past, what it is like now, and what it will be like in the future. Other researchers look at how the industrial revolution 4.0 affects companies and how companies plan to deal with it. Studies have been done up to this point on how the disruption era and industrial revolution 4.0 affect the continuity of business. Majeed and Rupasinghe (2017) and Glas and Kleemann (2016) did a study on how the supply chain works in preparation for the fourth industrial revolution. In his article from 2017, Eberhard, et. al. talk about the effects of the fourth industrial revolution on the job market. Idrus does a study in 2018 to find out how ready human resources are for the 4.0 industrial revolution.

In the revolution of industry 4.0, it is still hard to find research on the change of a retail business into an online store. This article is the last part of a study by Rohmah (2019) that looks at the role of digital media in the shift from traditional retail to online retail in the age of the revolution in industry. This is because there are many more benefits to shopping online than to shopping in stores. This article bridges the gap by describing the effects of the 4.0 industrial revolution on retail business in Indonesia and suggesting how retail business strategies could adapt to the changes. 4.0.

2.5 Managing the Retail Business Through the Digital Transformation

The emergence of technology has a significant impact on the retail industry, with the e-commerce trend having the most effects. According to recent research, brick and mortar stores are "on the verge of extinction" and that online commerce is "killing the brick-and-mortar shops" (Issa, 2017, p. 78). (Johnson, 2019, p. 8). Blockbuster is a prime example of a brick-and-mortar shop that failed to respond quickly enough to the digital shift and went out of business as a result (Matzler, Friedrich von den Eichen, Anschober, & Kohler, 2018). Retailers are embracing new technology as the retail sector undergoes a digital revolution in order to stay competitive, satisfy consumer expectations, and enhance their service delivery (Hagberg et al., 2017).

2.6 Retail Business in Bangladesh

Retailing is a traditional business in Bangladesh, with small grocery stores in rural areas, as well as small grocery shops in shop-lots and corner stores in neighborhoods in semi-urban and metropolitan areas, occupying the retail sector (Ali and Faroque, 2017) However, the retailing industry in Bangladesh has changed dramatically during the last decade (Siddiqui, Ahmed and Hasan, 2006; Arif, 2013, Shamser, 2014; Ahmed, 2017; Sarker and Ashrafi, 2018).

Supermarket growth (Shamsher, 2017; Datta, 2017; Sarker and Ashrafi, 2018; Farid et al, 2017), rapid e-commerce and e-tailing adoption (Islam and Eva, 2019; Karim and Qi, 2018; Sahel, Anwar, and Nandi, 2018; Islam, 2018), and multichannel retailing (Islam and Eva, 2019; Karim and Qi, 2018; Sahel, Anwar, and Nandi (The Daily Star, 2017; futurestartup.com, 2017). The retail sector is vital to the country's economy, generating taka 2798225 million in current market value in 2017-2018 and employing 8.7 million people, accounting for more than 14.3% of total employment (BBS. 2018). Thus, retail is an important economic sector in Bangladesh, and now is the time to be concerned about industry developments in order to compete on a global scale.

2.7 The Modern-Day Consumer

Understanding the needs and perception of the modern consumer is one of the main problems that retailers are currently facing. Digitalization has been a driving force behind recent changes in consumer behavior, including shifts in how individuals interact with businesses, make purchases, and set

expectations (Lemon & Verhoef, 2016). With the help of digital tools, today's retail shoppers are more "knowledgeable and empowered" than ever before (Nunes, Bellin, Lee, & Schunck, 2013, p. 48).

2.8 Consumer Expectations

The constantly changing expectations of consumers are one of the most obvious changes that have been recognized in the literature as the retail scene becomes increasingly digitalized (Hagberg et al., 2017; Huré et al., 2017, Priporas et al., 2017). Consumer expectations, as defined by (Priporas, 2017, p. 375), are the "wants and wishes of consumers," and they apply to both brick-and-mortar and online stores since consumers feel that businesses should always be willing to meet their expectations.

Modern consumers are "less loyal to merchants" as a result of the high expectations they place on businesses, according to Priporas et al. (2017, p. 376), which has forced retailers to reassess their service offerings and come up with creative solutions to keep consumers. Brick and mortar stores are under increasing pressure to compete due to the service levels provided when purchasing from Amazon and other pure plays. Amazon provides their consumers with a wide range of quick shipping alternatives, money-back guarantees on goods that are not delivered on time, and free shipping and entertainment streaming for consumers who sign up to become "Amazon Prime Members" (Lindi & da Silva, 2011). (Johnson, 2018, p. 2). Consumers expect retailers to provide them with a more digitalize shopping experience as a result of the spread of new digital technologies, especially when the consumer chooses to shop at the retailer's online store (Pappas, 2018).

2.9 Digital Technologies that Enhance the Consumer Experience

The phrase "consumer experience" can have several different meanings within the marketing literature. According to Verhoef et al. (2009, p. 32), the consumer experience is defined in this study as a multidimensional construct that "involves the consumer's cognitive, affective, emotional, social, and physical responses to the retailer." In addition, Lemon and Verhoef (2016, p. 69) stated that consumer experiences might include a number of little interactions between the store and the consumer and that they are "more social in nature." The evolution of the consumer experience is greatly influenced by technology, as seen by the widespread adoption of new ideas by shops both online and offline (Ladhari, Gonthier, & Lajante, 2019).

Although it's crucial to understand that the Retailer has some influence over and some limited control over some aspects of the experience. Products' prices, the environment in their store, and the company's service interface are all under their control; yet, it is more challenging to change the reasons why consumers choose to purchase there and their expectations (Verhoef et al., 2009). It's crucial to understand that a consumer's total relationship with a retailer is made up of a variety of experiences. The term "consumer journey" is used in marketing literature to describe all the experiences and interactions a consumer has with a store or brand when making a purchase (Halvorsrud, Kvale, & Flstad, 2016; Lemon & Verhoef, 2016; Rudkowski, Heney, Yu, Sedlezky, & Gunn, 2018).

As the retail world continues to be disrupted by digital technology, It is become harder for retailers to "produce, manage, and attempt to control the experience and journey of each consumer," according to Lemon and Verhoef (2016, p. 69).

Retailers want to include more immersive technology into their stores as a result of the digital transition so that consumers' "visual, aural, olfactory, and tactile faculties" are stimulated as they shop (Jones et al., 2010, p. 242). Essentially, the goal of these stores is to improve the physical retail experience, encourage consumers to interact with the retailer's products, and help them form an emotional bond with the brand (Peters & Thomas, 2017)..

3. Research Method

3.1 Research Design

It is a comprehensive quantitative study to gain an in-depth understanding of retail digitization, specifically the increase of customer observation on retailers' usage of digital abilities. The efforts to acquire data on consumers who frequently buy retail products. The data gathering was completed in 2022. Data collection began with the identification of various data sources, the establishment of an event database, and the preservation of a chain of evidence to support the results. The most essential secondary, publicly available data included all annual reports, analyst reports, SEC filings, prior academic studies, Harvard Business School cases, books, business newspaper stories, other industry reports, and retail websites.

3.2 Proposed Model

We identify numerous hypotheses after reviewing a number of empirical studies to determine the overall view on retailer digital skill adoption. These elements In terms of retailer skills, we use retailers' knowledge of Artificial Intelligence, retailers' knowledge of IT, retailers' knowledge of using business pages, web pages, social media, retailers' skill on digital supply chain modules, retailers' word of mouth as independent variables in the thesis, and retailers' digitalization, consumer reliability, and consumer purchase decisions as dependent variables.

3.3 Data Collection Method

It is original primary data collected for the purpose of a research work. We must use the following common research instruments or equipment for this assignment. The creation of a questionnaire is a critical component of primary data collection procedures. The majority of the questions used five-point Likert scales ranging from Strongly Agree to Strongly Disagree. The data was collected over the period of four weeks. Participants were informed of the scholarly nature of the study and the subject under inquiry at the start of the questionnaire. The survey was divided into three sections, which are outlined below. The initial questions included information about the respondents' ages, genders, locales, educational backgrounds, and occupations to establish their eligibility. The participants were then asked to rate their level of agreement/disagreement with statements about the model's proposed convenience dimensions. All constructs were examined using pre-calibrated 5-point Likert scales. The collected data was subsequently analyzed primarily by confirmatory factor analysis with the statistical software SPSS. The sample included 81 women and 125 males (N = 206). It was chosen to give only findings from locations with a higher frequency. Dhaka, Bangladesh, served as the research location.

4. Finding Analysis

The study tries to identify the relationship between the digital retail components and retail digitalization. Where the study measures 9 hypothesis and analyzing all the independent components with the dependent variable (Retail digitalization). In this hypothesis we also determine the impact, significance level and importance of those given components for the retail digitalization. For these hypotheses the study conduct regression analysis and the detail discussion with diagram on the result also include in the discussion chapter. sector digitalization.

Table 1: *Regression Analysis for digital retail component and retail digitalization*

Coefficients [a]						
Model	Unstandardized Coefficients Beta (b)	Std. Error	Standardized Coefficients Beta	t	*Sig.* *P value*	Hypotheses Supported
$1H_1$ There is a significant impact of automated robot-based delivery service on Retail sector digitalization.	*0.143*	0.068	0.146	2.106	*0.036*	Yes
$1H_2$ There is a significant impact of using vending machine on Retail sector digitalization.	*0.244*	0.081	0.206	3.016	*0.003*	Yes
$1H_3$ There is a significant impact of automated after sale service on Retail sector digitalization.	*0.207*	0.062	0.227	3.344	*0.001*	Yes
$1H_4$ There is a significant impact of real time update of retail products on Retail sector digitalization.	*0.136*	0.06	0.155	2.249	*0.026*	Yes
$1H_5$ There is a significant impact of providing RFID, QR code service on Retail sector digitalization.	*0.11*	0.054	0.141	2.034	*0.043*	Yes
$1H_6$ There is a significant impact of digital quality assurance testing on Retail sector digitalization.	*0.173*	0.059	0.2	2.921	*0.004*	Yes
$1H_7$ There is a significant impact of auto generated promotional adds on Retail sector digitalization.	*0.121*	0.055	0.153	2.212	*0.028*	Yes
$1H_8$ There is a significant impact of live tracking system of retail delivery on Retail sector digitalization.	*0.138*	0.058	0.162	2.355	*0.019*	Yes
$1H_9$ There is a significant impact of RFID based customer service on Retail sector digitalization.	*0.208*	0.082	0.175	2.539	*0.012*	Yes
a. Dependent Variable: Retail Sector Digitalize.						

- **Interpretation of hypothesis results**

1.1H_1 There is a significant impact of automated robot-based delivery service on Retail sector digitalization.

The hypothesis analysis if automated robot-based delivery service represents a significant impact on Retail sector digitalization. The dependent variable Retail sector digitalization was degenerated on predicting variable automated robot-based delivery service to analyze hypothesis. automated robot-based delivery service significantly predicted Retail sector digitalization, Where Sig value (p)= *0.036*, $p < 0.05$, which indicates that the automated robot-based

delivery can play a significant role in determining Retail sector digitalization (b = *0.143*, *p* < .05). These results clearly indicate the positive relation between automated robot-based delivery service and Retail sector digitalization.

1.1H_2 There is a significant impact of using vending machine on Retail sector digitalization.

The hypothesis analysis if using vending machine represents a significant impact on Retail sector digitalization. The dependent variable Retail sector digitalization was degenerated on predicting variable using vending machine to analyze hypothesis. using vending machine significantly predicted Retail sector digitalization, Sig value (p)= *0.003*, p < 0.05, which indicates that the using vending machine can play a significant role in shaping Retail sector digitalization (b = *0.244*, *p* < .05). These results clearly direct the positive relation between using vending machine and Retail sector digitalization.

1.1H_3 There is a significant impact of automated after sale service on Retail sector digitalization.

The hypothesis analysis if automated after sale service represents a significant impact on Retail sector digitalization. The dependent variable Retail sector digitalization was degenerated on predicting variable automated after sale service to analyze hypothesis. automated after sale service significantly predicted Retail sector digitalization, Sig value (p)= *0.001*, p < 0.05, which indicates that the automated after sale service can play a significant role in shaping Retail sector digitalization (b = *0.207*, *p* < .05). These results clearly indicate the positive relation between automated after sale service and Retail sector digitalization.

1.1H_4 There is a significant impact of real time update facility of retail products on Retail sector digitalization.

The hypothesis analysis if real time update facility of retail products represents a significant impact on Retail sector digitalization. The dependent variable Retail sector digitalization was degenerated on predicting variable real time update facility of retail products to analyze hypothesis. automated after sale service significantly predicted Retail sector digitalization, Sig value (p)= *0.026*, p < 0.05, which indicates that the automated after sale service can play a significant role in shaping Retail sector digitalization (b = *0.136*, *p* < .05). These results clearly indicate the positive relation between automated after sale service and Retail sector digitalization.

1.1H_5 There is a significant impact of using QR code service on Retail sector digitalization.

The hypothesis analysis if using QR code service represents a significant impact on Retail sector digitalization. The dependent variable Retail sector digitalization was degenerated on predicting variable using QR code service to analyze hypothesis. using QR code service significantly predicted Retail sector digitalization, Sig value (p)= *0.043*, p < 0.05, which indicates that the using QR code can play a significant role in shaping Retail sector digitalization (b = *0.11*, *p* < .05). These results clearly indicate the positive relation between using QR code service and Retail sector digitalization.

1.1H_6 There is a significant impact of digital quality assurance testing on Retail sector digitalization.

The hypothesis analysis if digital quality assurance testing represents a significant impact on Retail sector digitalization. The dependent variable Retail sector digitalization was degenerated on predicting variable automated after sale service to analyze hypothesis. digital quality assurance testing significantly predicted Retail sector digitalization, Sig value (p)= *0.004*, p < 0.05, which indicates that the digital quality assurance testing can play a significant role in shaping Retail sector digitalization (b = *0.173*, *p* < .05). These results clearly indicate the positive relation between digital quality assurance testing service and Retail sector digitalization.

1.1H_7 There is a significant impact of auto generated promotional adds on Retail sector digitalization.

The hypothesis analysis if auto generated promotional adds represents a significant impact on Retail sector digitalization. The dependent variable Retail sector digitalization was degenerated on predicting variable auto generated promotional adds to analyze hypothesis. auto generated promotional adds significantly predicted Retail sector digitalization, Sig value (p)= *0.028*, p < 0.05, which indicates that the auto generated promotional adds can play a significant role in shaping Retail sector digitalization (b = *0.121*, *p* < .05). These results clearly indicate the positive relation between auto generated promotional adds and Retail sector digitalization.

1.1H_8 There is a significant impact of live tracking system for retail delivery on Retail sector digitalization.

The hypothesis analysis if live tracking system for retail delivery represents a significant impact on Retail sector digitalization. The dependent variable Retail sector digitalization was degenerated on predicting variable live tracking system for retail delivery to analyze hypothesis. live tracking system for retail delivery significantly predicted Retail sector digitalization, Sig value (p)= *0.019*, p < 0.05, which indicates that the live tracking system for retail delivery can play a significant role in shaping Retail sector digitalization (b = *0.138*, *p* < .05). These results clearly indicate the positive relation between live tracking system for retail delivery service and Retail sector digitalization.

1.1H_9 There is a significant impact of RFID based customer service on Retail sector digitalization.

The hypothesis analysis if RFID based customer service represents a significant impact on Retail sector digitalization. The dependent variable Retail sector digitalization was degenerated on predicting variable RFID based customer service to analyze hypothesis. RFID based customer service significantly predicted Retail sector digitalization, Sig value (p)= *0.012*, p < 0.05, which indicates that the RFID based customer service can play a significant role in shaping Retail sector digitalization (b = *0.208*, *p* < .05). These results clearly indicate the positive relation between RFID based customer service and Retail sector digitalization.

From the hypothesis overall we can mention that there is a positive relation between digital components of retail sector and the retail digitalization. The retail digitalization depends on the digital components of retail sector and there is a significant impact. So, to make sure retail digitalization retailers need to ensure the uses of digital retail components.

In the second analysis, the study tries to find out the significant outcome from the components of retail digitalization to understand that the retail sector of Bangladesh is digitalize or not. To analyze the result here the study, use One sample T test and according to the 206 respondents here the study finds out the result of 9 one sample t-test. To make the study clearer and easier to understand here we interpret all 9 hypotheses together in a summarize box and discussion with diagram also include in the discussion chapters.

Table 2: *One sample T-test analysis for digital retail component*

One-Sample Statistics				
	N	Mean	Std. Deviation	Std. Error Mean
$2H_1$ Retailer are providing automated robot-based delivery service	207	2.16	.875	.061
$2H_2$ Now most of the Retailers are using vending machine	207	1.97	.723	.050
$2H_3$ Retailer Has automated after sale service	207	2.36	.945	.066
$2H_4$ Retailer provides real time update of retail products from the retail shops?	207	2.27	.982	.068
$2H_5$ Retailer provide QR code service to the customers	207	2.56	1.099	.076
$2H_6$ Retailers provide quality assurance testing facilities for their retail products.	207	2.36	.990	.069
$2H_7$ Retail shop provide auto generated promotional adds through social media platform (AI generated)	207	2.38	1.085	.075
$2H_8$ Retailer provide live tracking system during delivery of the product.	207	2.28	1.013	.070
$2H_9$ Did you see any RFID based customer service in the retail shop?	207	2.10	.720	.050

Table 3: *One sample T-test analysis for digital retail component*

One-Sample Test						
	Test Value = 3					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
$2H_1$ Retailer are providing automated robot-based delivery service	-13.821	206	.000	-.841	-.96	-.72
$2H_2$ Now most of the Retailers are using vending machine	-20.463	206	.000	-1.029	-1.13	-.93
$2H_3$ Retailer Has automated after sale service	-9.712	206	.000	-.638	-.77	-.51
$2H_4$ Retailer provides real time update of retail products from the retail shops?	-10.682	206	.000	-.729	-.86	-.59
$2H_5$ Retailer provide QR code service to the customers	-5.753	206	.000	-.440	-.59	-.29
$2H_6$ Retailers provide quality assurance testing facilities for their retail products.	-9.269	206	.000	-.638	-.77	-.50
$2H_7$ Retail shop provide auto generated promotional adds through social media platform (AI generated)	-8.262	206	.000	-.623	-.77	-.47
$2H_8$ Retailer provide live tracking system during delivery of the product.	-10.294	206	.000	-.725	-.86	-.59

2H$_9$ Did you see any RFID based customer service in the retail shop?	-17.949	206	.000	-.899	-1.00	-.80

- **Interpretation of hypothesis results**

1.2H$_0$ Retailer are providing automated robot-based delivery service

1.2H$_1$ Retailer are not providing automated robot-based delivery service

The t value is -13.821, Which is negative and not consider the standard value, which gives us a p-value (2-tailed significance value) of .000. This is going to be a significant result for any realistic alpha level. And here the mean value is 2.16 which is lower than the standard test value. Here the standard alpha level is .05, and .000 is smaller than .05, so we're going to reject the null hypothesis which emphasizes there is no significance difference. And we are accepting the alternative hypothesis and interpret that **Retailer are not providing automated robot-based delivery service** in Bangladesh

1.2H$_0$ Now most of the Retailers are using vending machine

1.2H$_2$ Now most of the Retailers are not using vending machine

The t value is -20.463, Which is negative and not consider the standard value, which gives us a p-value (2-tailed significance value) of .000. This is going to be a significant result for any realistic alpha level. And here the mean value is 1.97 which is lower than the standard test value. Here a standard alpha level is .05, and .000 is smaller than .05, so we're going to reject the null hypothesis which emphasizes there is no significance difference.And we are accepting the alternative hypothesis and interpret that **Now most of the Retailers are not using vending machine** in Bangladesh

1.2H$_0$ Retailer use automated after sale service

1.2H$_3$ Retailer does not use automated after sale service

The t value is -9.712, Which is negative and not consider the standard value, which gives us a p-value (2-tailed significance value) of .000. This is going to be a significant result for any realistic alpha level. And here the mean value is 2.36 which is lower than the standard test value. Here a standard alpha level is .05, and .000 is smaller than .05, so we're going to reject the null hypothesis which emphasizes there is no significance difference. And we are accepting the alternative hypothesis and interpret **Retailer does not use automated after sale service** in Bangladesh

1.2H$_0$ Retailer provides real time update of retail products from the retail shops

1.2H$_4$ Retailer does not provide real time update of retail products from the retail shops

The t value is -10.682, Which is negative and not consider the standard value, which gives us a p-value (2-tailed significance value) of .000. This is going to be a significant result for any realistic alpha level. And here the mean value is 2.27 which is lower than the standard test value. Hers a standard alpha level is .05, and .000 is smaller than .05, so we're going to reject the null hypothesis which emphasizes there is no significance difference.And we are accepting the alternative hypothesis and interpret that **Retailer does not provide real time update of retail products from the retail shops** in Bangladesh

1.2H$_0$ Retailer provide QR code facility to the customers

1.2H$_5$ Retailer does not provide QR code facility to the customers

The t value is -5.753, Which is negative and not consider the standard value, which gives us a p-value (2-tailed significance value) of .000. This is going to be a significant result for any realistic alpha level. And here the mean value is 2.56 which is lower than the standard test value. Here the standard alpha level is .05, and .000 is smaller than .05, so we're going to reject the null hypothesis which emphasizes there is no significance difference. And we are accepting the alternative hypothesis and interpret that **Retailer does not provide QR code facility to the customers** in Bangladesh

1.2H$_0$ Retailers provide quality assurance testing facilities for their retail products

1.2H$_6$ Retailers does not provide quality assurance testing facilities for their retail products

The t value is -9.269, Which is negative and not consider the standard value, which gives us a p-value (2-tailed significance value) of .000. This is going to be a significant result for any realistic alpha level. And here the mean value is 2.36 which is lower than the standard test value. Here the standard alpha level is .05, and .000 is smaller than .05, so we're going to reject the null hypothesis which emphasizes there is no significance difference. And we are accepting the alternative hypothesis and interpret that **Retailers does not provide quality assurance testing facilities for their retail products** in Bangladesh

1.2H$_0$ Retail shop provide auto generated promotional adds through digital platform

1.2H$_7$ Retail shop does not provide auto generated promotional adds through digital platform

The t value is -8.262, Which is negative and not consider the standard value, which gives us a p-value (2-tailed significance value) of .000. This is going to be a significant result for any realistic alpha level. And here the mean value is 2.38 which is lower than the standard test value. Here the standard alpha

level is .05, and .000 is smaller than .05, so we're going to reject the null hypothesis which emphasizes there is no significance difference. And we are accepting the alternative hypothesis and interpret that **Retail shop does not provide auto generated promotional adds through digital platform** in Bangladesh.

1.2H_0 Retailer provide live tracking system during delivery of the product

1.2H_8 Retailer does not provide live tracking system during delivery of the product

The t value is -10.294, Which is negative and not consider the standard value, which gives us a p-value (2-tailed significance value) of .000. This is going to be a significant result for any realistic alpha level. And here the mean value is 2.28 which is lower than the standard test value. Here the standard alpha level is .05, and .000 is smaller than .05, so we're going to reject the null hypothesis which emphasizes there is no significance difference. And we are accepting the alternative hypothesis and interpret that **Now most of the Retailers are not using vending machine** in Bangladesh

1.2H_0 Retailer use RFID based customer service in the retail shop

1.2H_9 Retailer does not use RFID based customer service in the retail shop

The t value is -17.949, Which is negative and not consider the standard value, which gives us a p-value (2-tailed significance value) of .000. This is going to be a significant result for any realistic alpha level. And here the mean value is 2.10 which is lower than the standard test value. Here the standard alpha level is .05, and .000 is smaller than .05, so we're going to reject the null hypothesis which emphasizes there is no significance difference. And we are accepting the alternative hypothesis and interpret that **Retailer does not use RFID based customer service in the retail shop** in Bangladesh

After analyzing the components, we can mention that our retail sector is not digitalize yet. There is a huge lacking in terms of implementing digital components.

Discussion

The study is all about the consumer observation on retail digitalization. In the study we try to find out the overall prospect of retail digitalization. Where we conduct a number of hypothesis and survey analysis to know the actual perception of the consumer in Bangladesh. And from the interpretation we get our retail sector is not still digitalizing. We need to work more and adjust with the current trend to digitalize our retail sector. In the previous chapter we conduct a number of hypotheses for the better understating of the study. The study basically tries to find out the relation between retail digitalization components and retail digitalization. My respondents support all the given components and result show that all the components have positive and significant impact on the retail digitalization. My respondents believe that all those retail components are important to make our retail sector digitalize.

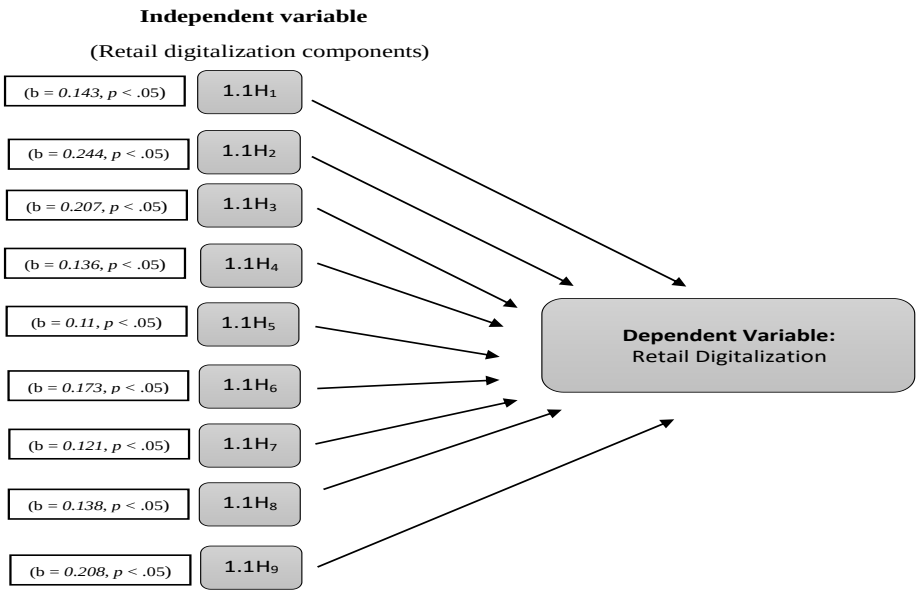

Figure 1: Relationship between digital retail component and retail digitalization

From the figure we can understand that all the Beta value is positive and P value is less than 0.05 so here we can interpret that all the given components have a positive relation with the retail sector digitalization. To make sure our retail sector all the components are impactful.

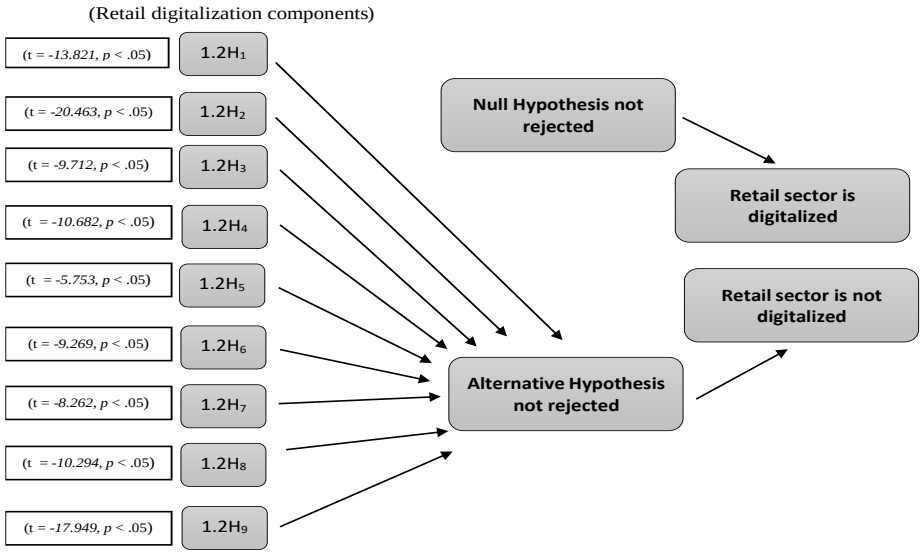

Figure 2: *Determining the condition of retail sector*

In the section 1.2 the study tries to understand our retail sector digitalize or not, we conduct analysis for this information. from the first Hypothesis analysis we get that there is a positive relationship between my given digital component and retail digitalization. so, to make sure our retail sector digitalize. But, according to my respondent most of them believe that the retail sector of Bangladesh still not digitalized and there is a huge opportunity to improve. The analysis shows that in terms of each component the result show significant differences with the standard. In terms of Automated robot using, using vending machine, online payment, using QR code, quality assurance testing, using RFID, providing (AI based) auto generated promotional add all the significant value is .000, which is less than .05. Here we also can mention the T value here all the T values is negative and far differ from standard value (1.633) which is approach the negative value that recommend, my respondents believe that the retail sector of Bangladesh is still fails to absorb all the required components of retail digitalization. And their observation is clear that our retail sector is growing but still they cannot take the full benefit from the era of Digitalization.

Though most of the digital components are not available in our retail shops, Online payment system is increasing and now retailers are providing the facilities of online payment the number is increasing. And only in this component the result is different where we get the t value positive and also the Confidence interval of the differences are also positive vale. So, in this component my respondents believe that our retail sector is doing online payment facilities now.

Conclusion

Retailing has changed dramatically in both developed and developing countries. A lot of academic papers analyze how corporate competition has evolved. Small grocery stores in rural areas, small grocery stores in shop lots, and corner stores in neighborhoods in semi-urban and metropolitan areas dominate the retail industry in Bangladesh, as in other developing countries throughout the world. Using digital platforms to improve the customer experience is a never-ending issue for the retail business as a whole. The study focuses on digitization of the retail industry, specifically the development of consumer observation on retail digitalization. In Bangladesh's retail sector, there are insufficient digital components. According to the findings, all of the digital components are critical to the digitalization of the retail industry. On the other hand, practically all shops in Bangladesh are not using necessary digital retail components, and customers believe that if retailers can combine all the necessary requirements, Bangladesh's retail sector will be digitalized and competitive in the world. So, there is a huge opportunity to improve our retail sector and also need to improve our retailers to ensure a Digitalize retail in Bangladesh. Authors including an appendix section should do so before References section. Multiple appendices should all have headings in the style used above. They will automatically be ordered A, B, C etc.

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