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# Influence of Technologically Enabled Retail Environments on Consumers' Perceived Benefits of Digital Technologies

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***Abstract***
*This research aims to examine the effect of Technological Retail Environment on Consumer Perceptions of the Benefits of Digital Technologies. The study reflects an increasing impact of new age technologies such as AI, AR and IoT that have transformed the way processes run and how a consumer behaves in retail. The research investigates how these technological developments enhance the customer shopping experience by enabling them to access more customizable and convenient options for their product selection and purchases (eg, digital wallet implementation, interactive browsing of a store). Using a combination of Exploratory Factor Analysis (EFA) and Structural Equation Modeling (SEM), the study identifies Perceptions of the Benefits of Digital Technologies (PB) and Technological Retail Environment (DRE) as two separate but correlated constructs which significantly impact consumer behavior. Findings show that consumer perceptions of the value and benefits of digital technology: perceived ease of use, perceived usefulness, and enjoyment have direct effect on their intentions to adopt digital tools in retail. This paper contributes to the existing literature by drawing attention on why it is important for retailers to adopt omnichannel retail strategies and some issues that need to be taken into account such as data protection or ethical considerations, when using digital technologies in the context of the shop floor environment.*

***Keywords****: Technological Retail Environment, Digital Technologies, Consumer Perception, AI, Omnichannel Retail*

## Introduction

Recent years have brought about a sea change in the world of retail, as digital technologies have advanced at breakneck speed. These new technologies have not only set new benchmarks in operational efficiencies, but they have also dramatically impacted consumer perception and behavior. In particular, the technological in-store space which includes technology of artificial intelligence (AI), augmented reality (AR), Internet of Things (IoT) devices and personalized digital interfaces has emerged as a key construct to influence consumers' perceptions of the benefits arising from digital technologies within their shopping experiences.View more 5 trends changing the future of retail and customer experience with the end of the fiscal year nearly upon us, it is a unique time for retailers. Their growing expectations are of smooth, tailored and painless interactions across the online-into-offline axis. This transformation requires detailed consideration of how retail innovation in technology influences consumers' perceptions, especially with relation to the perceived usefulness, ease of use and enjoyment of a digital technology. Research has indicated that perceived enjoyment, ease of use, usefulness are crucial factors directly influencing the behavioral intention to use websites.In addition, smart technology has enabled consumers to have that much more knowledge and control, which consequently increased their shopping experience. Studies show smart retail technology not only boost operations by giving them self-service tools, but they also enhance customer experience with personalized and interactive functionalities.
Although there is an increasing amount of literature focusing on digital retailing environments, a void exists concerning the understanding of how such technical advancement affects consumer perceptions regarding the utilities of digital developments. This paper aims to fill this research gap by exploring the effects of technological retail environments on consumer perceptions, more specifically, how different digital innovations configure their perception towards the benefits of digital technology in a retail environment.

## Technological Retail Environment

The retail market has changed over the last couple of decades, particularly due to technology changes. The intersection of digital technologies, data analytics and e-commerce platforms has transformed consumer conduct, operational processes and the entire retail experience. With the world more wired every day via the web, mobile phones and other digital technology, retailers are doing what they can to keep up. Technological retail landscape includes the tools, systems and state-of-the-art that commoditizes retailers to satisfy consumers demand, provide and upgrade shopping experience online/offline including operations (Brynjolfsson & McAfee, 2014).
E-commerce has been one of the most dramatic transformations in the retail business, creating digital-first companies being outpaced by traditional retailers. Today, retailers are turning to artificial intelligence (AI), machine learning (ML) big data and internet of things (loT) capabilities to enhance customer engagement, manage inventory more effectively and customise offerings (Berman, 2017). These changes have created a new type of retailer, one that competes and engages customers in the physical world as well as the digital. For instance, omnichannel retailing that integrates both on- and offline experience is considered an essential strategy to reinforce customer loyalty and increase market share for retailers (Verhoef et al., 2017).The advent of mobile commerce and the incorporation of social media have also changed the way customers shop, interact with brands, and make purchasing decisions. Consumers increasingly have their smartphones with them at all times and in locations enabling shopping on-the-go, which has a bigger influence on purchase decisions regarding convenience. This change has also seen the development of location-based services, mobile payment systems and AR applications to improve customer experience and stimulate sales (Chaffey, 2020).
The technological environment in retail also comes with disadvantages for retailers such as data privacy issues, cyber threats and the necessity to invest considerably into technological infrastructures. Therefore, retailers need to not only adopt technological changes, but they should do so in a way that is consistent with the expectations of their customers and related regulatory guidelines (Laudon & Traver, 2019). Retailers that are looking to succeed in an ever-digital marketplace need an understanding of the nuances of this dynamic space.

## Consumer Perceptions of the Benefits of Digital Technologies

The proliferation of digital technologies has greatly impacted a number of industries and consumer habits in recent times. But whether for e-commerce or online banking, mobile apps or smart home products, digital know-how is transforming how consumers engage with brands, and shop for products and use those products. With advancements in digital mediums and tools, it becomes increasingly important for businesses that are looking to capitalise on innovation as part of strategy to improve customer satisfaction, loyalty and engagement by understanding how customers perceive value from the new technologies.
Consumer acceptance of digital technologies is influenced by several factors such as convenience, accessibility, customization and security (Liu et al., 2020). Such perceptions are quite instrumental in determining the manner of acceptance and utilization of new technologies by people in their regular lives. Given the increasing diffusion of digital technologies, these perceptions offer an important perspective for marketers and policy makers on the ways consumers think when making decisions and developing attitudes toward adoption of digital tools (Venkatesh et al., 2012).The increasing dependence on digital technologies and products, including computer-based technology or other electronic systems is exacerbating the situation particularly with the COVID-19 pandemic; therefore, understanding how consumers perceive benefits of new innovations has become more crucial. Demand-side Digital solutions roles included those that led digital acceleration in individual firms, and in new entrants (as a result of accelerated innovation). Digital's potential to transform business interactions during the COVID19 pandemic. The COVID19 crisis had dramatically hastened this transformation across multiple domains

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as consumers increasingly used online platforms for shopping, communication, work and leisure (Bauer & Riedl, 2020). Thus, the consumer acceptability and believe in digital technologies have gained an importance like never before for the success of digital products and services. The purpose of this study is to investigate the drivers that can impact the consumer perception for digital technologies. In particular, it will consider the effects of user friendliness, trust and perceived usefulness on consumer attitudes towards digital innovation. Furthermore, the paper will examine how demographic correlates such as age, income and education influence these perceptions. Through a review of literature and an empirical study, this paper aims to provide additional insights into consumers' attitudes and behaviors in the digital age.

**Review of literature**

Now and then Digital age is disrupting the retail space, rewiring customer expectations and perceptions. With the rise of new technologies like AI, AR and IoT being increasingly integrated by retailers the need for understanding how these innovations affect customers' attitudes and behaviors is becoming increasingly important. This review of literature attempts to aggregate recent research looking at how technological retailing environments impact consumers' attitudes towards digital technologies.

Retail has come a long way and technological advances in the space have given rise to smart stores that use AI, IoT and AR for elevating customer experience. These solutions enable one-on-one shopping, efficient backend operations, and immersive experiences. The literature show that use of such technology can be influenced by factors (perceived usefulness, perceived ease of use and enjoyment) affecting consumers attitude towards it. As an example perceives entertainment, perceived ease of use and perceived usefulness significantly affect the user experience on websites which leads to online impulse purchase behavior (Grewal et al., 2023).

AI solutions in the form of chatbots, recommendation systems and predictive analytics significantly influence consumer attitudes. Previous studies have shown that trust and perceived usefulness are the most important factors influencing consumers' intention to adopt AI in online shopping. According to Nagy and Hajdu (2022), trust in relation to both webshops and the airlines is important when consumers are deciding whether or not to use AI-based services, but perceived usefulness was more important than perceived ease-of-use.

The use of AR technologies in creating interactive and immersive shopping experiences has also been growing in retail. Since AR enables customers to see products in their home environments, it consequently increases product engagement and satisfaction with purchases. Research studies have shown that AR applications within retail can result in raised consumer engagement, better brand perception and higher purchase intentions. Such effects can be even stronger when the AR is part of a shopping experience (Quinones, Díaz-Martín and Gómez-Suárez 2023).The IoT allows for building connected retail spaces where the devices can communicate and create personal customer experiences. Studies have shown that IoT services such as smart shelves and personalized promotions, can improve customer satisfaction and loyalty. Nevertheless, unresolved issues like the ones related with data privacy or security concerns could impact consumer confidence and adoption of IoT-enabled retail technologies (Roe et al., 2022; Spanaki et al.

And as digital solutions continue to proliferate in retail, ethical concerns related to data privacy and fairness have come into the spotlight. According to research, consumers remain worried about the quantity of personal data gathered by AI-fueled retail applications and fear that bias in the algorithms they rely upon might occur. To gain consumer trust and acceptance of digital technologies in retail, there is a need for transparency, fairness, and strong data protection (Adanyin, 2024).

**Technological Retail Environment**

The technological landscape for retail is changing so fast, and advancement Artificial Intelligence (AI), Internet of Things (IoT), Augmented Reality (AR) and robotics are driving a big change in the industry. AI increases the user experience by recommending products and predictive analytics (Chandani, Upadhyay, & Banerjee, 2024) and IoT boosts operating efficiency with smart shelves and automatic checkouts (Ingram, 2016). AR closes the chasm between physical and digital shopping through virtual try-ons and interactive product displays (Rajesh & Mary, 2025), while robotics facilitates inventory management as well as customer service (Quinones, Díaz-Martín, & Gómez-Suárez, 2023). These developments also include supply chain management, in which blockchain and AI demand forecasting have delivered better stock control and transparency (Ingram, 2016; Rajesh & Mary, 2025). Yet, obstacles such as data privacy and algorithmic bias persist with consumers calling for ethical norms in AI (Rajesh & Mary, 2025). The future of retail technology is the confluence of AI and IoT by delivering frictionless personalized shopping experience and sustain safeguards through effective operations (Quinones et al., 2023; Rajesh & Mary, 2025).

**Consumer Perceptions about the Benefits of Digital Technologies**

There are various factors influencing consumers' perceptions of the benefits that digital technologies can bring to them, and at top of these factors are convenience and availability as a result from the fact that using any digital platform enables consumers to shop or get service anytime from anywhere (Eroglu et al., 2001). AI / Machine-learning-driven Individual experiences are positively seen due to the engagement and relevance for marketing they deliver. With vast amount of digital information resources, such as online reviews and product comparisons, consumers are more informed and perceptions of risks decline while satisfaction levels increase. Furthermore, such factors as trust and transparency (generated by e.g. customer reviews or ratings) boost up consumer confidence in digital technologies (Tavares et al., 2023). The greater feeling of empowerment in the hands of consumers can produce a more favorable view because shoppers are able to 'compare prices and transmit orders at their own convenience. Engagement with brands and peer attitudes and recommendation also significantly impact consumer attitudes on purchasing through socialization in the digital platforms. Finally, the consideration of these perceptions is important for companies that want to improve customers' experiences and loyalty in a highly digitalized world.

**Research Methodology**

The methodological approach adopted in this research takes a form of quantitative research that seeks to understand the effect of the digital retail environment on consumer experiences with digital technology. The simple random sampling method has been used to collected the data from 299 retail consumers. The survey was filled with consumers after being recruited and sent a structure questionnaire asking for their experience, beliefs related to digital technologies towards retail including: AI, AR and IoT applications. It was composed of Likert-type items and closed questionnaires that aimed to measure respondent attitudes towards perceived usefulness, ease of use, and enjoyment for digital innovations in retail. The data was analytically analyzed, first by EFA to identify the factors that underpin consumer perceptions and then followed up with CFA and a SEM examination of the relationship between technological retail environment and consumer perception using digital technology. Fit indices (CMIN/DF, RMSEA and CFI) were used to test the validity of the model, and reliability was established based on Cronbach's Alpha and Composite Reliability. This approach provides us with a better knowledge of the impact that innovating technologies have on shopping attitudes and behaviors.

**Data Analysis**

**Table 1 KMO and Bartlett's Test**

| | | |
|---|---|---|
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy. | | .875 |
| Bartlett's Test of Sphericity | Approx. Chi-Square | 2249.357 |
| | df | 78 |
| | Sig. | .000 |

Source: Primary Data

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The KMO sample adequacy value for your responses is 0.875, which can be considered meritorious, suggesting that the dataset is sufficiently sampled and the variables intercorrelated enough to warrant factor analysis (Kaiser, 1974). Furthermore, Bartlett's Test of Sphericity indicated that the chi-square was 2249.357 with 78 degrees of freedom and p =. 000, indicating that it is strongly rejecting the null hypothesis that the correlation matrix is an identity matrix, and demonstrating that indeed variables are correlated and adequate for factor analysis (Bartlett 1954). This indicates your data is suitable for factor analysis, so you can proceed to further statistical analyses as Exploratory Factor Analysis (EFA) or Principal Component Analysis (PCA).

**Table 2 Exploratory Factor Analysis**

| Item Code | Variable | Factor Loading | Communalities | Eigen Value | Variance Explained | Cronbach |
|---|---|---|---|---|---|---|
| **First Factor: Perceptions of the Benefits of Digital Technologies (PB)** | | | | | | |
| PB6 | More option of Digital Payment System. | .807 | .702 | 5.155 | 37.352 | .908 |
| PB17 | Interaction is easy with digital promotional mediums like social media and mobile marketing. | .797 | .661 | | | |
| PB8 | Intimation of offers through Digital database. | .788 | .655 | | | |
| PB3 | Provides knowledge about products and services. | .774 | .626 | | | |
| PB16 | Easy delivery to any locations in online shopping through websites. | .730 | .564 | | | |
| PB4 | Easy feedbacks and prompt improvements accordingly. | .715 | .590 | | | |
| PB5 | Online digital channels are more efficient than traditional channels. | .703 | .552 | | | |
| PB11 | Ease to shop online & tracking of transactions through websites. | .666 | .557 | | | |
| **Second Factor: Technological Retail Environment (DRE)** | | | | | | |
| DRE9 | Electronic Kiosk (touch screen, trackballs. computer keyboards) or Self Service Technologies for order. | .813 | .811 | 2.997 | 25.357 | .864 |
| DRE7 | Digital Payment System. | .767 | .732 | | | |
| DRE8 | Digital Customer Feedback System for Customer Relationship Management. | .764 | .768 | | | |
| DRE5 | Websites, Online Shopping Carts & Online Advertising. | .653 | .526 | | | |
| DRE2 | In-Store & Store Front Digital Signage (plug and play technology e.g LED screen). | .564 | .406 | | | |
| | | | | | 62.709 | .858 |

Source: Primary Data

The table shows the results of exploratory factor analysis. The total two factor were extracted from the total of 13 variables. The total variance explained by these two factors, PB (Perceptions of Benefits of Digital Technologies) and DRE (Technological Retail Environment), is 62.709% for all variables included in this model. This high variance indicates that the factor structure efficiently represents the most relevant dimensions of digital technology in the retail sector. The high factor loadings and communalities (all over 0.6) suggest that the items fit well on their corresponding factors, and the Cronbach's Alpha of both factors (0.908 for PB; 0.864 for DRE) support excellent to good internal consistency, signifying that they are reliable measures to represent the constructs as intended. Findings from the EFA confirm that perceived benefits of digital technologies and technological retail environment are two separate factors.

**Factor 1: Perceptions of the Benefits of Digital Technologies (PB)**

The first factor, Perceived Benefits to Digital Technologies (PB) includes eight variables; *More option of Digital Payment System, Interaction is easy with digital promotional mediums like social media and mobile marketing, Intimation of offers through Digital database, Provides knowledge about products and services, Easy delivery to any locations in online shopping through websites, Easy feedbacks and prompt improvements accordingly and Online digital channels are more efficient than traditional channels.* The factor loadings of items are from 0.666 to 0.807, which means the strong relationship between these items and latent factor (Fabrigar et al., 1999). The factor loading of the Item; *More option of Digital Payment System (PB6)* is 0.807, indicating that digital payment systems are one of the most important benefits of digital technology. Other items such as: Interaction is easy through digital marketing media (PB17), Intimation of offers by Digital data bank (PB8) had strong loadings, 0.797 and 0.788 respectively, indicating that digital technology has higher priority on informing consumers about their activity. Regarding the communalities, they ranged from 0.552 to 0.702 for the PB factor showing that the items explain high variance, where even here again PB6 had one of the highest values: 0.702. This suggests that PB explains a large portion of the variability in consumers' perceptions of digital technologies. PB has an eigenvalue of 5.155, meaning that the first factor accounts for 37.352% of the total variance (most) present in the data. The Cronbach's Alpha for PB is 0.908 which indicates that the items within this factor are highly reliable and consistently measure the same underlying construct (Tavakol & Dennick, 2011).

**Factor 2: Technical Retail Environment (DRE)**

The second factor, Technological Retail Environment (DRE), contains five variables: *Electronic Kiosk (touch screen, trackballs. computer keyboards) or Self Service Technologies for order, Digital Payment System, Digital Customer Feedback System for Customer Relationship Management, Websites, Online Shopping Carts & Online Advertising and In-Store & Store Front Digital Signage (plug and play technology e.g LED screen).* The loadings on DRE are in the range of 0.564 to 0.813 with Electronic Kiosk (DRE9) observing the maximum loading (0.813), indicating that self-service and digital kiosks play a significant role in contributing for shopping environment at retail stores. Other items such as DRE7 (Digital Payment System) and DRE8 (Digital Customer Feedback System) also have high loadings (0.767 and 0.764), showing the increasing dependence over digital payment system feedback in today's retailing environment. The communalities of DRE for items are between.406 and.811, and DRE9 has the highest communality (0.811) once again; thus this item shares most variance with DRE factor. DRE contributes 25.357% of the informal variance, and its eigenvalue is equal to 2.997, also significant but lower than that of PB factor. Cronbach's Alpha for DRE is 0.864 implying good internal consistency, which further means that the items of this factor are able to measure the construct (technological retail environment) consistently with reliability (Nunnally 1978).

Figure 1 Confirmatory Factor Analysis

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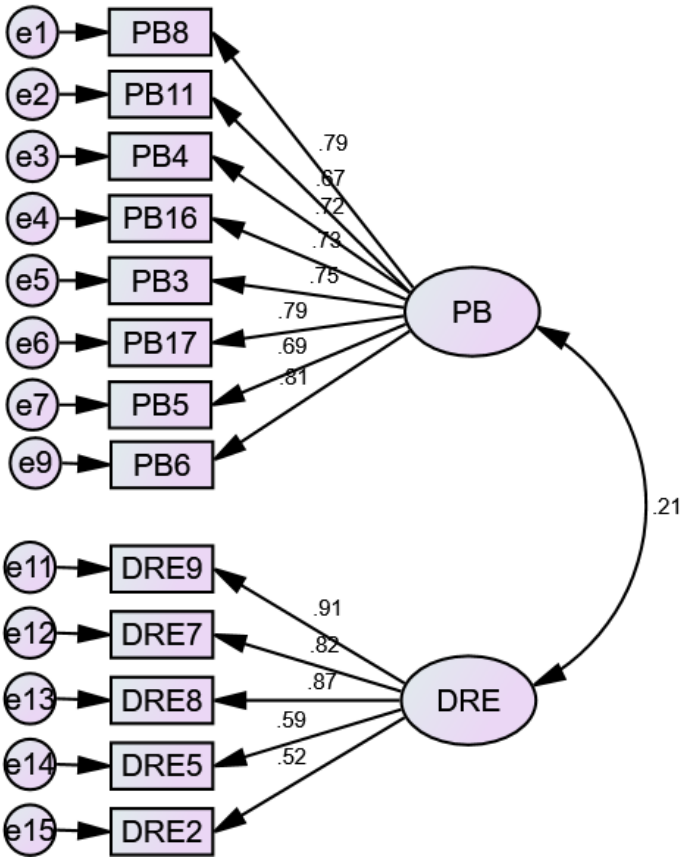


Source: Amos Output

Figure 1 represents a Confirmatory Factor Analysis (CFA) model to test the relationship between latent variables and their indicators. The two principal constructs included are DRE (Technological Retail Environment) and PB (Perceptions of the Benefits of Digital Technologies). Each latent variable is indicated by several indicators: DRE consists of the items such as DRE9, DRE7, DRE8, DRE5 and DRE2, while PB is measured by indicators like PB6, PB5, PB17mPB3ᵇPB16mPB4ᵇ ↰· The arrows from the latent variables to their observed items are factor loadings, representing the strength of relationship between each latent variable and their indicators. For instance, DRE9 has a factor loading of 0.91 representing a very strong association with the DRE factor and PB6 has a factor loading of 0.81 suggesting an equally significant ass an association with PB. We also see the inclusion of error terms (e.g., e1, e2, and e16) which is designed to capture unexplained variance in each manifest item.

**Table Model Fit Indices**

| Sr. No. | Model Fit Indices | Default Value | Minimum Acceptable Value | Interpretation | Recommended by |
|---|---|---|---|---|---|
| 1. | **CMIN** | 283.901 | - | - | Hu and Bentler, 1999<br>Browne and Cudek, 1993<br>Ho, 2006<br>Byrne, 2016<br>Moolla and Bisschoff, 2013 |
| 2. | **DF** | 64 | - | - | |
| 3. | **P** | .000 | <.05 | Acceptable | |
| 4. | **CMIN/DF** | 4.436 | <5 | Acceptable | |
| 5. | **GFI** | .844 | >.800 | Acceptable | |
| 6. | **NFI** | .876 | >.800 | Acceptable | |
| 7. | **IFI** | .901 | >.800 | Acceptable | |
| 8. | **TLI** | .879 | >.800 | Acceptable | |
| 9. | **CFI** | .901 | >.800 | Acceptable | |
| 10. | **RMSEA** | .073 | <.10 | Acceptable | |

*Source: Primary Data*

Table 1 depicts the various model fit indices designed to evaluate how well a hypothesized model accords with data, termed as the goodness-of-fit of a measurement model. These indices comprise multiple important factors, with specific criteria for interpretation. The overall goodness-of-fit of the model is indicated by a CMIN (Chi-Square) value 283.901. But by itself this figure doesn't tell the whole story as it is dependent on sample size and degrees of freedom. A p-value of 0.000 is the model not fitting data exactly, something that we often find, and especially so for larger sample sizes. Nevertheless, CMIN is one index and it should take with other fit indices into account to evaluate the model adequacy. The ratio of CMIN/DF 4.436 is the major indexes, it reflects the degree of difference comparing chi-square and degrees of freedom. For this ratio the threshold is generally lower than 5, indicating an acceptable model fit (Browne & Cudeck, 1993). In the current scenario, this ratio is within appropriate limits and it indicates that our model is better fit. Goodness of Fit Index (GFI) is 0.844 that is satisfactory greater than acceptable limit of 0.800. It suggests the model is accounting for a lot of variability in the data (Ho, 2006). Further, with the model fit statistics greater than.800 for NFI (NFI=.876), IFI (IFI=.901), TLI (TLI=.879) and CFI (CFI=.901), it can be considered that this measure fits better; Root Mean Square Error of Approximation (RMSEA) is one of the most important indices used to determine how well the population covariance matrix has been approximated by the model. The RMSEA of 0.073 is way below the cut-off of 0.10 meaning excellent fit. An RMSEA < 0.08 is good, less than 0.05 excellent (Hu & Bentler, 1999).

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Taken together, these fit indices suggest an overall acceptable fit to the model. The RMSEA and CMIN/DF are particularly strong indicators of model goodness, whereas the other indices (such as GFI, NFI, CFI) suggest that this model is fairly-fitting compared to the baseline model. Based on chi-squared test, such results indicate that the posited model is consistent with data albeit possibly optimizable.

**Table 3 Standardized Regression Weights**

| Items | Path | Latent Factors | Estimate | S.E. | C.R. | P |
|---|---|---|---|---|---|---|
| PB4 | <--- | PB | .715 | .068 | 13.032 | *** |
| PB16 | <--- | PB | .725 | .073 | 13.260 | *** |
| PB3 | <--- | PB | .749 | .065 | 13.786 | *** |
| PB17 | <--- | PB | .793 | .068 | 14.822 | *** |
| PB5 | <--- | PB | .688 | .066 | 12.431 | *** |
| DRE9 | <--- | DRE | .913 | - | - | - |
| DRE7 | <--- | DRE | .816 | .051 | 18.552 | *** |
| DRE8 | <--- | DRE | .870 | .047 | 20.661 | *** |
| DRE5 | <--- | DRE | .594 | .055 | 11.363 | *** |
| DRE2 | <--- | DRE | .520 | .049 | 9.585 | *** |
| PB8 | <--- | PB | .791 | - | - | - |
| PB11 | <--- | PB | .674 | .062 | 12.142 | *** |
| PB6 | <--- | PB | .809 | .063 | 15.179 | *** |

Table 3 shows the Standardized Regression Weights of different items in latent factors PB (Perceptions of the Benefits of Digital Technologies) and DRE (Technological Retail Environment). The values are the strength of correlation between each item and its latent factor. As for items of PB, estimates (regression weights) for all items are between 0.674 and 0.793 where the weight for the item PB17 is higher than others with value of 0.793 which shows even high association between this item and factor of PB. Standard Errors (S.E.) 0.047–0.073, and the Critical Ratios (C.R) –the ratio of the estimate derived from the regression divided by its S.E– indicates significant value all greater than 1.96. P-Values for all items are **highly significant (*p <. 001), indicating that these associations are statistically robust.

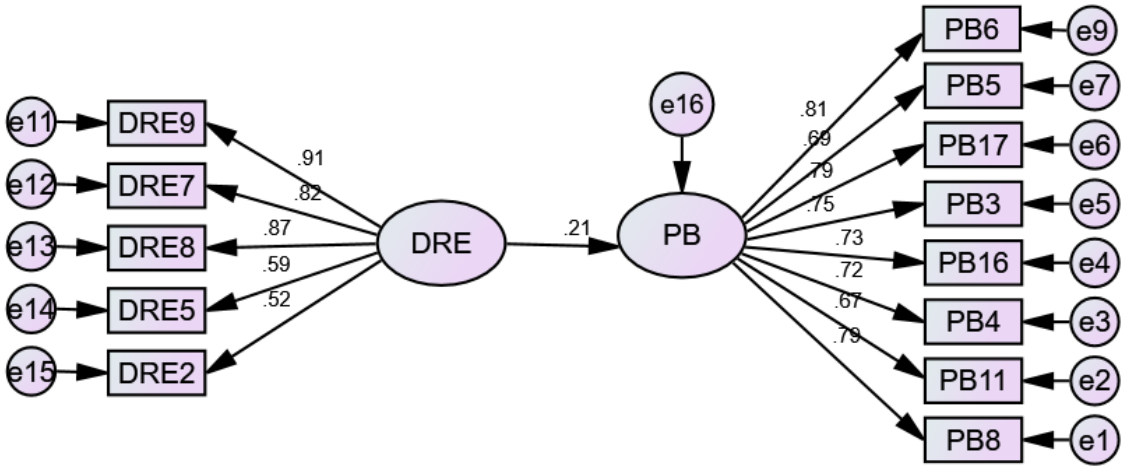
**Table 6 Model Validity Measures**

| Factors | CR | AVE | MaxR(H) | PB | DRE |
|---|---|---|---|---|---|
| **PB** | 0.908 | 0.554 | 0.912 | | 0.759 |
| **DRE** | 0.867 | 0.576 | 0.917 | 0.205 | |

Source: Primary Data

The Model Validity Measures in the table test the construct validity and reliability of both latent factors P B (Perceptions of the Benefits of Digital Technologies) and DRE (The Technological Retail Environment). Both the CR of PB (0.908) and that of DRE (0.867) were higher than 0.70, showing good internal consistency (Fornell & Larcker, 1981; Hair et al., 2010). The Average Variance Extracted (AVE) for PB (0.554) and DRE (0.576) are above the rule of thumb value of 0.50 maintaining that the latent variables account for more than half of the variances in their items (Fornell & Larcker, 1981). Moreover, the Maximal Reliability (MaxR(H)) estimates of 0.912 for PB and 0.917 for DRE are near 1.0 which lends further support on reliability of factors (Raykov, 1997). The path coefficient linking PB and DRE is 0.205, meaning that there exists a moderate positive relationship between the two. In general the model is reliable and has good validity, with both dimensions presenting a strong internal consistency and fair convergent validity. The correlation between the factors is small but significant which supports the stability of the model.

**Figure 2 : Structural Equation Modeling (SEM)**




Source: Amos Output

The figure is a Structural Equation Model (SEM) with two latent variables: Technological Retail Environment (DRE) as an independent variable and Perceptions of the Benefits of Digital Technologies (PB) as an dependent variable. Arrows (regressions were demonstrated) reflects the verbal representation of observed variable influences its latent space. For DRE, factors such as DRE9, DRE7, DRE8, DRE5 and DRE2 have high factor loading (DRE9 = 0.91), which means that they significantly correspond to the factor of the sample's level on the sub-scale of CFA. Likewise, in the case of PB, factors like PB6, PB5, PB17, PB3 and others display high classifications with a figure of 0.79 for the factor (PB17). The factor loading of DRE with PB is 0.21; therefore, the two latent variables are moderately correlated.

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**Table 4: Standardized Regression Weights**

| Items | Path | Latent Factors | Estimate | S.E. | C.R. | P |
|---|---|---|---|---|---|---|
| PB | <--- | DRE | .205 | .046 | 3.255 | .001 |
| PB4 | <--- | PB | .715 | .068 | 13.032 | *** |
| PB16 | <--- | PB | .725 | .073 | 13.260 | *** |
| PB3 | <--- | PB | .749 | .065 | 13.786 | *** |
| PB17 | <--- | PB | .793 | .068 | 14.822 | *** |
| PB5 | <--- | PB | .688 | .066 | 12.431 | *** |
| DRE9 | <--- | DRE | .913 | - | - | - |
| DRE7 | <--- | DRE | .816 | .051 | 18.552 | *** |
| DRE8 | <--- | DRE | .870 | .047 | 20.661 | *** |
| DRE5 | <--- | DRE | .594 | .055 | 11.363 | *** |
| DRE2 | <--- | DRE | .520 | .049 | 9.585 | *** |
| PB8 | <--- | PB | .791 | - | - | - |
| PB11 | <--- | PB | .674 | .062 | 12.142 | *** |
| PB6 | <--- | PB | .809 | .063 | 15.179 | *** |

Source: Primary Data

Table 4 shows the model Standardized Regression Weights obtained with a Structural Equation Model, which depict the effect of Technological Retail Environment on Perceptions of the Benefits of Digital Technologies, as well as those from each factor and their consequent terms. The standardized weight of Technological Retail Environment on Perceptions of the Benefits of Digital Technologies is 0.205; t = 3.255, p = 0.001, suggesting a statistically significant and positive effect of Technological Retail Environment on Perceptions of the Benefits of Digital Technologies. Taken together, this table presents the latent variables are well represented by their indicators and DRE has positive effect on PB, while indicating support for the model hypothesized relationships.

The study investigates how techno retail environments influence consumers' perceived benefits of digital technologies, and in particular, the extent to which these digital innovations such as AI, AR and IoT shape consumer disposition towards digital technology use in a store context. The research therein suggests that consumers' technology advances significantly affect their perceptions, especially in the forms of convenience, customization and usability which boost engagement and satisfaction. The paper established consumer confidence and perceived ease of use as determinants of DCT adoption and the way customers perceive digital tools in retail (Venkatesh et al., 2012). The results of the EFA reveal that while DRE (Technological Retail Environment) and PB (Perceptions of the Benefits of Digital Technologies) are two different, albeit interrelated, constructs, they account in a significant way for variance in consumer behaviour. The research also advocates the increasing significance of omnichannel retailing, where an integrated online and offline channel positions to enhance customer lock-in and expand its market size (Verhoef et al., 2017). Notwithstanding these strides, insight reveals that certain obstacles are still affecting confidence of the consumer and adoption like Data privacy or security concerns (Rajesh & Mary, 2025). In summary, with consumer perception in mind and technology focused on to what is right for them, retailers can continue to be part of a transforming digital economy.

**Practical Implications:**

The findings advance our understanding on how retailers can better manage digital technology and engage customers. The research highlights the significance of technology-led retail environments, throughout which emerging technologies such as AI, AR and IOT play a leading role in elevating customer experiences. Retailers need to be using them to find new ways to provide personalized and easy shopping experiences, as more shoppers are adjusting their app experience based on convenience. For example, using AI recommendation systems or Augmented Reality (AR) virtual try-ons could enhance product engagement and increase purchase intentions, as shown in the results (Quinones et al., 2023).

Moreover, this study reiterates the importance of trust-building and evidencing (the usefulness) of digital technologies for retailers. Consumer confidence in technology and with respect to data privacy and security specifically will continue to influence uptake. Retailers need to offer clear data policies and secure their digital platforms to mitigate consumer privacy concerns (Adanyin, 2024).

It also underscores the increasing importance of omnichannel retail, which fuses bricks-and-mortar and digital touchpoints to offer shoppers a seamless journey. To address the challenge, retailers are encouraged to actively develop their online-offline strategy in order to better integrate customers' experience between these channels, as it contributes to loyalty and higher market share (Verhoef et al., 2017).

Finally, as with any technology adoption, significant benefits come hand-in-hand with challenges most notably, ethical issues surrounding the use of AI and data privacy. Companies in the retail sector should take a more active role in developing codes of conduct for digital technology that promote consumer trust and long-lasting relationships. Proactive innovation and customer trust At a time when the proliferation of e-commerce makes the retail world more competitive than ever, this kind of proactive innovation and consumer confidence can be a big boost to the overall shopping experience.

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