



Exploring the Role of Livestream Shopping and M-Commerce in Enhancing Humanitarian Logistics

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ABSTRACT

The purpose of this study is to examine the Livestream Shopping (Livestreaming) and M-Commerce adoption and their feasibility for enhancing Humanitarian Logistics in Pakistan. The research combines the Technology Acceptance model (TAM) and the Stimulus Organism Response model to understand consumer behavior, the digital engagement and the long term adoption trends understanding. Pakistani consumers engaged in digital transactions were surveyed using a quantitative, cross sectional design. The key factors influencing M Commerce adoption were analyzed in terms of key factors using SPSS and Partial Least Squares Structural Equation Modeling (PLS-SEM). These findings indicate how the perceived usefulness and social presence have a huge impact on consumers attitudes towards the use of the digital platforms. However, without trust or security concerns, merely ease to use does not equate adoption. Although there are many who express a hesitance in retail fraud, this agreement also shows the importance that more cybersecurity measures and trust building initiatives are underway. Additionally, digital engagement is even more influenced by behavioral intention of M-Commerce adoption as habit formation works only as a singular predictor of sustained engagement. The study serves as a call to develop regulatory frameworks as well as digital security measures and personalized consumer engagement strategies by governments and developers to create the ground to build that confidence in M-Commerce transactions. Moreover, M-commerce can also help the humanitarian logistics to provide a more efficient way of disaster response and region resource allocation. Further research should be conducted in longitudinal studies to investigate how future the transaction role of trust and habitual usage will play out. (219 WORDS)

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1. Introduction

The TAM explains the reasons behind the adoption of M-commerce in Pakistan as due to perceived ease of use, perceived usefulness, and social presence (Chowdhury et al., 2017; Edwards et al., 2024). In e-commerce usage, attitudes and habits have an influence in the consumer behavioral intention (Edwards et al., 2024). However, due to mobile payment systems and the rapid adoption; smartphone, widespread utilization of M-commerce is being slowed due to infrastructural constraints, digital illiteracy, and security concerns (Edwards et al., 2024; Ni & Ueichi, 2024). However, Livestream Shopping provides new opportunities despite the trust and security problems that must be solved (Yaqub et al., 2024). While enhancing efficiency of humanitarian logistics through digital tools, infrastructure and trust

availability problems remain (Kunovjanek & Wankmüller, 2021). By developing the country's digital infrastructure, literacy, and regulatory frameworks, Pakistan can enhance their growth to be sustainable and even lead the digital transformation and humanitarian innovation (Edwards et al., 2024).

1.1. Problem Statement

Livestream Shopping and Mcommerce are becoming the new normal for digital economy in Pakistan and therefore both opportunities and challenges are emerging. During the up and coming years, M commerce was envisioned to bring ease and accessibility and it did but trust security digital literacy and regulatory challenges continue to hamper mass adoption. Just like Livestream Shopping is getting more and more momentum as a dynamic digital retail format, but transaction security, trust of consumers and technological infrastructure restrict its reach. In the case of Humanitarian Logistics, digital platforms greatly contribute to disaster response and resource allocation, however M Commerce solutions are still underexplored in humanitarian efforts. This study therefore aims to fill in these gaps by studying how factors influencing the technology adoption and its behavioral implications influence e-commerce and humanitarian logistics operational efficiency in the context of Pakistan.

1.2. Significance of the Study

The significance of this study is both academic, practical, and of policy significance. Technically, it expands Technology Acceptance Model (TAM) and Stimulus-Organism-Response (SOR) Model to the Livestream Shopping and Humanitarian Logistics for the proof of the influence of social presence, trust, and behavioral intention on the adoption of digital commerce. Along with its review of habit and security concerns moderation, the study also provides additional thickness regarding the adoption process. In a practical sense, this research benefits businesses and digital platforms by assisting them to optimize their Livestream Shopping strategy, and particularly, the trust and engagement factors. This is seen as a study that provides actionable insights to boost M-Commerce adoption by e-commerce firms by boosting digital literacy, consumer trust building measures and enhanced security. Additionally, it helps humanitarian organizations show the usefulness of M-Commerce solutions for disaster relief operations, and hence for the advancement of logistical operations efficiency. From the viewpoint of policy, a study is made on the need for stronger digital regulations to secure M-Commerce in Pakistan and strong M-Commerce regulations are needed from the policy perspective. It also shows the significance of cooperation between government agencies and the industry sectors in order to improve digital literacy and technological infrastructure. It also suggests ways to include Livestream Shopping and M-Commerce in the humanitarian logistics, to carry out more efficient crisis response and allocation of resources in the disaster prone area.

2. Literature Review

Key constructs impacting the adoption of Livestream Shopping, MCommerce and Humanitarian Logistics in Pakistan relate to perceived ease of use, perceived usefulness, social presence, attitude, behavioural intention and habit as per Technology Acceptance Model (TAM) and Unified Theory of Acceptance and Use of Technology (UTAUT) (Davis, Bagozzi, & Warshaw, 1989; Verplanken & Orbell, 2003). User friendly interfaces interact with our customers better and adoption is driven by perceived usefulness of Easypaisa and JazzCash (Yaqub et al., 2024). Real time interactions that foster trust and behavioral intention that is based on ease of use, usefulness and social influence strongly affects M-Commerce adoption (Ni & Ueichi, 2024; Yaqub et al., 2024). The technology of habit moderate promotes digital adoption (Verplanken & Orbell, 2003; Zeng et al., 2024), which habit moderates technology usage. Nevertheless, trust and ongoing innovation are essential elements for consumer faithfulness (Zheng et al., 2023; Zheng, 2023). Due to socio-economic and cultural dynamics of Pakistan, a localized digital adoption optimized in the context is likely to be required for realizing the full benefits due to the dynamics (Edwards et al., 2024; Liao et al., 2023).

3. Theoretical Framework

Validating the adoption of Livestream Shopping, M-Commerce, and Humanitarian Logistics in Pakistan is now possible given a number of tried and tested theories and models regarding consumer behavior and technology adoption. The one of the most common frameworks used to describe an explanation for how new technology is adopted and used is the

Technology Acceptance Model (TAM) introduced by Davis (1989). Perceived ease of use and perceived usefulness are the two most important determinants of technology adoption as defined by TAM (Davis, 1989; Davis & Venkatesh, 2004; Verplanken & Orbell, 2003). As recently documented by studies in Pakistan, the TAM is still an appropriate tool to explain users' behaviour in mobile commerce and online shopping (Yaqub et al., 2024). The second important model is Theory of Planned Behavior (TPB) of Ajzen (1991) based on attitude, subjective norms, and perceived behavioral control as the reflecting determinants of behavioral intentions. In various studies, TPB was used to study consumers' decision making processes in the digital environments (Ni & Ueichi, 2024; Yaqub et al., 2024). TPB helps explain how social norms and individual attitudes affect the adoption of new technologies within the context of Livestream Shopping and M-Commerce platform platforms in Pakistan. Rogers, Singhal and Quinlan (2014) introduced the Diffusion of Innovations (DOI) Theory in order to explain how innovations are adopted by a social system as time progresses. Rogers, Singhal and Quinlan (2014) says that important factors in the rate of adoption of new technologies are called relative advantage, compatibility, complexity, trialability, and observability (Liao et al., 2023). DOI has been key in assessing how the spread of mobile technologies and digital platforms in Pakistan has taken place and its insights into the popularity of technological innovations such as M-Commerce and Livestream Shopping with various demographic groups (Edwards et al., 2024; Yaqub et al., 2024).

The Stimulus-Organism-Response (SOR) Model has been a contribution in the recent years to the frameworks where consumer behaviour in online environment has been analyzed. Mehrabian and Russell (1974) suggested that the SOR model, external stimuli (e.g., website design, social presence) impact an individual's internal states (e.g., emotions, perceptions) and then impact behavioral response. Such a model is highly relevant to the understanding of the psychological mechanisms that lead to consumer engagement in Livestream Shopping, given that interactions in the real time and the sense of social presence influence the edge purchase decisions (Yaqub et al., 2024; Zheng et al., 2023). Resource Based View (RBV) of the firm (Barney, 1991) is that it is the importance of organizational resources in terms of organizational strategic competitiveness in achieving competitive advantage. Traditionally used in strategic management, the RBV has been used to study the role of technological resources in the digital transformation initiatives such as M-Commerce and Humanitarian Logistics (Edwards et al., 2024; Kunovjanek & Wankmüller, 2021). In particular, RBV is used to understand how firms utilize digital technologies to bring about operational efficiency and added value both in the commercial and the humanitarian sectors in Pakistan.

3.1. Research Objective

In order to identify the key determinants of consumer behavior and organizational strategies within the digital ecosystem, the main objective is to identify them. This includes how considered construct of perceived ease of use, social influence, behavioral intention as well as resource capabilities influence adoption of Livestream Shopping, M-Commerce, digital tools in Humanitarian Logistics. The intention in the end is to derive actionable insights which will help the policymakers, business owners and the humanitarian organizations work towards strategies which promote digital transformation and operational efficiency in Pakistan.

3.2. Research Questions

1. The research investigates four primary inquiries about Livestream Shopping and M-Commerce use in Pakistan.
2. Consumer adoption of Livestream Shopping and M-Commerce in Pakistan mainly depends on what critical elements.
3. What role do consumers perceive about ease of use and usefulness alongside trust as they establish their intention direction toward electronic commerce?
4. Social presence demonstrates how it strengthens consumer trust and engagement while they participate in Livestream Shopping.

3.3. Single Variable Perspectives Relations

Through a single variable perspective, several significant factors for adoption of Livestream Shopping, M Commerce and Humanitarian Logistics, i.e., PEOU and PU, have been explored to adopt in Pakistan. It has been consistently identified that perceived ease of use plays customer directed to the adoption of the technology (Davis, Bagozzi, & Warshaw, 1989; Davis & Venkatesh, 2004). In recent years, mobile commerce applications in Pakistan are

receiving a lot of attention (Yaqub et al., 2024), and it has been found that user friendly interfaces are important for the engagement of consumers as well. Similarly, there are some researchers who suggest that perceived ease of use is not enough for adoption prediction given the facts that socio-cultural and psychological factors within consumer behaviour are missed (Chaudhuri et al., 2024; Lin et al., 2023).

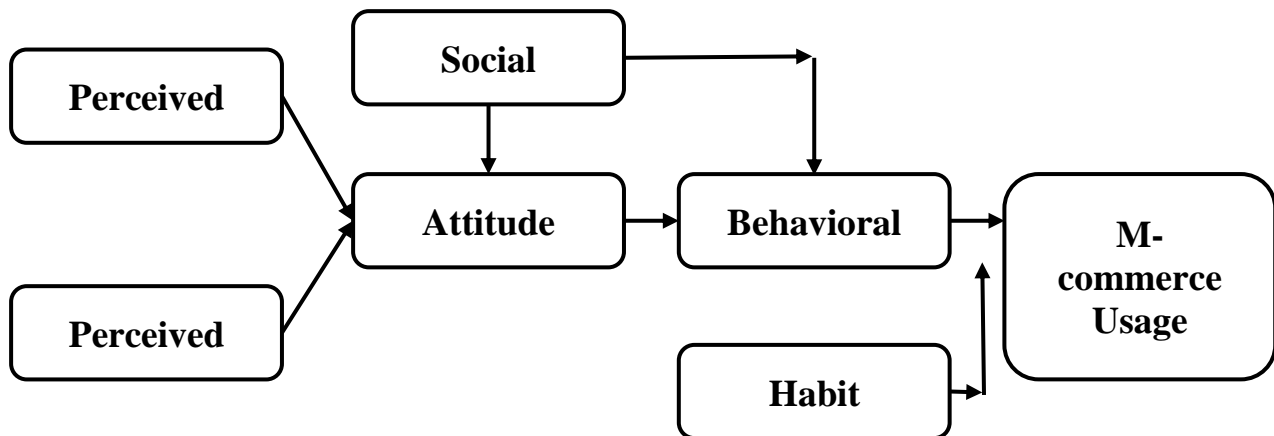
3.4. Multiple Variable Perspectives Relations

Multiple variables are integrated to achieve a broader scope of understanding of technology adoption. Constructs like social influence, facilitating conditions as well as behavioral intention are considered along with perceived ease of use and perceived usefulness in these types of models, for example (Ajzen, 1991; Davis & Venkatesh, 2004). This multi variable approach is supported by latest research in Pakistan which shows trust, cultural norms and digital literacy play a key role having a positive or negative impact on the adoption of MCommerce & Livestream Shopping (Yaqub et al., 2024). Nevertheless, there are some indication that complex models can also result in inconsistent findings due to variance in how constructs are interpreted (Yaqub et al., 2024; Zheng, 2023).

3.5. Mediation and Moderation

It has been commonly accepted that perceived ease of use (PEOU) is one of the most significant predictors of behavioral intention in the adoption of Livestream Shopping and M-Commerce platforms. Technology Acceptance Model (TAM) has stated that PEOU has an immediate impact on user's intent to adopt new technology (Davis, Bagozzi, & Warshaw, 1989; Davis & Venkatesh, 2004). This view is supported by recent studies in Pakistan that suggest that user friendly interfaces and simple transactional process enable greater engagement of the consumer with the digital platforms (Yaqub et al., 2024). In mobile applications, seamless navigation and easy to use interface can enhance the positive influence of PEOU on behavioral intention.

Figure 1 Conceptual Framework



3.6. Hypothesis Development

3.6.1. Perceived Ease of Use and Attitude

Perceived Ease of Use (PEOU) refers to the ease in which an individual considers that a certain system would be used (Davis, Bagozzi, & Warshaw, 1989). Shaping a user's Attitude toward adoption of technology through it is what it does. The nature of the e-commerce platforms (eg. Pakistan) is such that the platforms that are intuitive, easy to navigate generate positive consumer attitudes. Relevant studies show that such processes as easy payment gateways and user friendly interface make a high contribution to creation of the positive attitude to e-commerce platforms (Yaqub et al., 2024). It also allows for the cultural factors in Pakistan, where personal recommendations tend to outweigh user experience, to moderate the PEOU and Attitude relationship. Thus, Attitude is important and should be complemented by other factors, including PEOU, to achieve a strong effect.

Hypothesis 1: Perceived Ease of Use positively influence Attitude towards e-commerce platforms in Pakistan.

3.7. Perceived Usefulness and Attitude

Davis and Venkatesh (2004) use Perceived Usefulness as the degree of the person with whom technology will be used to judge that the use of such technology will improve the person's performance. Typically, PU is a better predictor of Attitude than PEOU as people are more likely to adopt the technology that they deem as beneficial. Cited by Yaqub and colleagues Yaqub et al. (2024) and Ni and Ueichi (2024) as one cause for the increased acceptance of such mobile payment apps such as JazzCash in Pakistan is the view of them providing a simple way to carry out financial transactions. The PU does not operate in isolation and despite its large impact, in fact. Factors related to emotions play a role in the PU impact on the attitude Edwards et al. (2024) such as enjoyment, trust and even skepticism for the purchase online. Security and privacy may not be sufficient to establish a positive Attitude in regions with low trust in digital systems, at least when high PU is present.

Hypothesis 2: Perceived Usefulness positively influences Attitude towards e-commerce platforms in Pakistan.

3.8. Social Presence and Attitude

Social presence has a key role in online environments, being the degree of awareness of another person in an interaction. SP at a high level induces interpersonal trust and increases emotional tie between users and e-commerce platforms (Chen et al., 2020; Ni & Ueichi, 2024). SP having the form of real time customer service, live chat and interactive content greatly increase the Attitude toward online shopping platforms (Yaqub et al., 2024) in Pakistan where the community plays a strong role. Additionally, if SP does not deliver authentic engagement or offer any meaningful engagement, they can have absolutely no or a negative effect with users' attitudes about platforms.

H3: That is, Attitude towards e-commerce platforms in Pakistan is positively associated with Social Presence.

3.9. Attitude and Behavioral Intention

According to the Theory of Planned Behavior (Ajzen, 1991), an important determinant of Behavioral Intention (BI) is attitude towards technology. Strong intentions lead to positive attitudes and thereby, fast engagement with e-commerce platforms. Also, in Pakistan, where e-commerce is advancing rapidly and favorable attitudes toward BI are caused by positive user experiences and trust (Yaqub et al., 2024), consumers' attitudes toward BI are positively associated with their experiences and trust. However, there are still some research results that suggest that Attitude might not always straightforwardly result in BI. The relationship between the home office and health, however, is mediated by external factors such as the societal norm, economic constraints and digital access (Yaqub et al., 2024). For instance, even though Pakistani consumers have an Attitude of Online shopping, they may not buy because they have no faith in delivery services and payment security.

Hypothesis 4: Attitude positively influence Behavioral Intention to adopt e-commerce platform in Pakistan.

3.10. Behavioral Intention and M-commerce Usage

E-commerce usage is often seen to have a direct prediction, and there are often strong relations with Behavioral Intention (BI). Such strong e-commerce platform intentions generally lead to actual usage behavior (Davis & Venkatesh, 2004; Pavlou, 2003). BI for M-Commerce apps has proved to have high correlations with the actual usage patterns, in particular for the youth demographics (Yaqub et al., 2024). First, while BI is a good predictor, it remains to be fulfilled with the right enabling conditions.

H5: E commerce usage would be positively related to Behavioral Intention in Pakistan.

3.11. Habit and M-commerce Usage

Habit implies the amount of automatic behavior the individuals take part in as a result of learned associations. The habit in technology usage, in more cases than not, continues to perpetuate the behavior even if there were not strong intentions (M. Limayem, S. G. Hirt, & C. M. Cheung, 2007; Verplanken & Orbell, 2003). In Pakistan, E commerce Usage is high due to habitual use of mobile and social media by the consumers they usually shop online whenever it

is a routine (Ni & Ueichi, 2024; Zheng et al., 2023). Hence, it is necessary to maintain good quality, durable platforms so that to encourage habitual E-commerce usage in Pakistan. Hypothesis 6: states that Habit has a positive effect on E-commerce Usage in Pakistan.

3.12. Attitude and; Behavioral Intention, Perceived Ease of Use

Perceived Ease of Use (PEOU) is an essential determinant of consumer Attitude towards technology, and it dictates the Behavioral Intention (BI) to make use of the e-commerce platforms. A determinant of the likelihood of generating positive attitudes and stronger behavioral intentions (increases) with regard to usage of the technology is ease of usage (Davis, 1989; Davis & Venkatesh, 2004). The commercial mobile applications like Easypaisa and Daraz have shown that ease of navigation plays an important role in changing consumer attitude as it leads to an increase in consumers' intention to use such platforms (Yaqub et al., 2024). The result of this is that Attitude functions as a mediator relating the influence of PEOU with BI.

Hypothesis 7: Perceived Ease of Use will be directly related to Behavioral Intention to adopt e-commerce platforms in Pakistan and indirectly through the attitude.

3.13. Attitude and Perceived Usefulness and Behavioral Intention

Another important determinant which determines Attitude is also Perceived Usefulness (PU) followed by the Attitude and Behavioral Intention (BI). According to Unified Theory of Acceptance and Use of Technology (UTAUT) is users used to a technology are more prone to have a positive attitude about a technology, which leads into their intention of adoption of their used technology (Ajzen, 1991; Davis & Venkatesh, 2004). The common acceptance of mobile payment solutions in Pakistan is acknowledged to be the result of their assumed usefulness in making the transactions more convenient (Ni & Ueichi, 2024; Yaqub et al., 2024). However, even with a large influence, PU may not directly induce BI, the role of which may be mediated through Attitude. In other words, the translation of trust and perceived risk into the behavioral intention can be either positively or negatively affected by emotional factors (Edwards et al., 2024; Zheng et al., 2023). This then points to the need to develop positive attitudes to PU, as much as possible, to ensure the maximal PU on BI.

Hypothesis 8: Attitude mediates the relationship between Perceived Usefulness and Behavioral Intention to adopt e-commerce platforms in Pakistan.

3.14. Social Presence, Attitude and Behavioral Intention

On the importance of Social Presence (SP) to consumer's Attitude and in turn to Behavioral Intention (BI) in online shopping contexts. SP strengthens the sense of connection and trust between users and platforms, which will lead to enhancing the positive attitude (Chen et al., 2020; Ni & Ueichi, 2024). Research has demonstrated that in Pakistan, Livestream Shopping platforms which facilitate in real time interactions and personalized content, improve consumer attitudes and intend to behave more strongly (Yaqub et al., 2024). In other words, Attitude serves to mediate influence from SP to behavioral outcomes.

Hypothesis 9: Social Presence is positively associated to Behavioral Intention towards e-commerce platforms in Pakistan whereas Attitude is found to be the mediator.

3.15. Behavioral Intention, Habit and M-commerce Usage

behavioural intention (BI) is a good predictor of E commerce usage, but more so under the influence of habit formation. As stated in Davis and Venkatesh (2004) and M. Limayem, S. G. Hirt and C. M. Cheung (2007), BI could be a user's conscious plan to perform a behavior; Habit is the automaticity of this behavior over time. Essentially, habitual use of such platforms as Foodpanda and Daraz in Pakistan has been shown to matter a lot in actually driving real e-commerce usage (Yaqub et al., 2024). However, the BI process to real usage is not always straightforward. In the case of stable environments (Yaqub et al., 2024; Zheng et al., 2023), the habit acts as a mediator between the intention and behavior, once they are repeated on a platform. It emphasizes how vital it is to cultivate habitual behavior regarding e-commerce engagement over a long run.

Hypothesis 10: Habit mediates the relationship between Behavioral Intention and E-commerce Usage in Pakistan.

3.16. Habit, Behavioral Intention and M-commerce Usage

E-commerce Usage is directly influenced by Habit and Behavioral Intention (BI) is also affected by Habit, from which later one dependence on use. Strong habits facilitate BI and the adoption of e-commerce platforms through a more automatic and less conscious decision making (Limayem, Hirt, & Cheung, 2007; Verplanken & Orbell, 2003). For example, behavioral habits or frequent mobile payment in Pakistan prevalent BEH have been found to reinforce BI, stimulating e-commerce use (Edwards et al., 2024; Yaqub et al., 2024). Thus, it implies that habitual tendency is mediated, or rather its characteristics are transformed into their actual use.

Hypothesis 11: Behavioral Intention mediates the relationship between Habit and E-commerce Usage in Pakistan.

3.16. Conceptualization

In establishing the technology adoption in e-commerce, several of the established theories are founded, such as the TAC (Davis, 1989), UTAUT (Davis & Venkatesh, 2004) and TPB (Ajzen, 1991). Therefore, these models highlight two key constructs including perceived ease of use, perceived usefulness, social influence and behavioral intention that are considered to be the prime drivers of technology adoption. With this application of unfolding theory, recent studies have validated these constructs for the case of M-Commerce and Livestream Shopping in the context of Pakistan (Yaqub et al., 2024). Yet, these models neglect the dynamic interplay of habitual behavior and social presence, which are getting more and more crucial in the digital ecosystem (Edwards et al., 2024; Liao et al., 2023). Thus, this research combines these constructs into a total conceptual model that not just constructs upon the identified theoretical concepts but in addition offers possibilities of a systematic understanding of the mediating and moderating effects of habits and social presence whereas applying for e-commerce usage in such developing markets as Pakistan.

Although a number of models like TAM and UTAUT have been studied extensively in terms of technology adoption behavior, a clear gap has been created in the area of research to explore the role of emerging factors like habit formation, social presence and the associated cultural dynamics in e-commerce happening in Pakistan or any other context. Past studies have extensively focused on the linear relationships between variable like attitude, behavioral intention and habitual usage (Yaqub et al., 2024). In the future, research should be more holistic and these moderating and mediating variables should also be taken into consideration while researching consumer behavior (Edwards et al., 2024; Liao et al., 2023). Secondly, this will also help advance theoretical frameworks and also provide policy and business actionable insights to aid advance digital adoption and e-commerce growth in Pakistan.

4. Methodology

4.1. Research Design

Thus the study investigates how perfect adoption of the e-commerce platforms in Pakistan through relationships among variables such as perceived ease of use, perceived usefulness, social presence, attitude, behavioral intention and habit using a quantitative research design. Quantitative research is said to be widely used to quantify relationships between variables, and to derive statistical insights from large datasets (Creswell & Creswell, 2017; Saunders, Lewis, & Thornhill, 2003). In turn, the structured data collected in questionnaires can be analyzed in a precise and generalizable way, giving KN analysis of the structured data collected pertinent to the study's (Yaqub et al., 2024). Correlational design is essential to examine the correlation between the constructs such as perceived usefulness, attitude and behavioral intention (Liao et al., 2023; Pallant, 2020). The study can identify the important predictors of e-commerce usage and the interactions between these variables within the conceptual framework by analyzing correlations. This also validated theoretical models and provides empirical support for proposed hypotheses (Davis & Venkatesh, 2004).

4.2. Sampling

The target population consists of Pakistani people with the experience of the use of e-commerce platforms aged 18 or older. Because of its simplicity and ease of a sample, it is

perceived that such a sampling can be achieved by utilizing a non-probability convenience sampling technique (Bryman, 2016; Edwards et al., 2024). The same statistical power analysis is used to determine the sample size aiming at an at least 300 responses to get adequate representation and generalizability. A pilot test with thirty people was conducted to also identify possible problems with the questionnaire in terms of clarity, wording and response options (Sekaran, 2016). As a result, the pilot's feedback precipitated revisions that improved the questionnaire's reliability and validity.

5. Results and Discussion

Structural Equation Modeling (SEM), SPSS analysis and the study examined how PEOU, PU, SP, ATT, BI, HAB and MCU are related to each other. Having the most significant impact on ATT ($\beta = 0.24$, $\beta = 0.39$ for PU and SP respectively) the results support the Technology Acceptance Model (TAM) and the Stimulus Organism Response (SOR) model. Nevertheless, as it turns out, PEOU had a weaker relationship with ATT ($\beta = 0.19$), thus indicating that ease of use is not enough to significantly improve user attitudes in the case of e-commerce adoption in Pakistan. That is in line with earlier research indicating that utility based factors are more important drivers to digital commerce adoption than ease of use (Gefen & Straub, 2004; Verplanken & Orbell, 2003). In addition, habit had a very weak direct effect on MCU (HAB = 0.02), further implying that habit formation alone does not strongly encourage long-term e-commerce engagement (Edwards et al., 2024; Limayem, Hirt, & Cheung, 2007). The correlation analysis confirmed that SP positively affects ATT ($r = 0.439$; $p < 0.001$), and real time interactions, social influence positively affect the perceptions of consumers. More recent research support that the increase in social presence will enhance the manner of engagement and trust in online shopping (Chen et al., 2020; Sun et al., 2019). High behavioral intention ($r = 0.571$, $p < 0.001$) did not lead to conversion rate to actual usage which implies such external factors as trust, perceived risk, or infrastructure challenges can moderate adoption behavior (Pavlou, 2003; Yaqub et al., 2024). Furthermore, the ANOVA results ($F = 1.012$, $p = 0.365$, $R^2 = 0.010$) tell us that the use of e commerce is explained with the use of PEOU and PU only to a degree of 1%, and that other factors, such as trust, security concerns and economic constraints, need to be integrated into future models.

5.1. Reliability Analysis

Table 1: Cronbach' Statistics

| Item-Total Statistics | | | | |
|-----------------------|----------------------------|-----------------------------|------------------------------|--|
| | Scale Mean if Item Deleted | Item Scale Variance Deleted | ifCorrected Item-Correlation | Item-TotalCronbach's Alpha if Item Deleted |
| PEOU | 64.4850 | 49.336 | .420 | .642 |
| PU | 64.9050 | 48.921 | .408 | .645 |
| SP | 64.2050 | 51.822 | .437 | .642 |
| ATT | 64.5400 | 47.556 | .549 | .609 |
| BI | 64.5700 | 47.493 | .550 | .609 |
| HAB | 64.4900 | 46.553 | .505 | .617 |
| MCU | 63.1950 | 55.474 | .061 | .763 |

Cronbach's Alpha is a commonly referred to internal consistency measure to determine questionnaire reliability through assessing correlations of items within the construct. The Cronbach's Alpha of the total scale 0.684 lies between the value of 0.7 for a strong reliability and the generally accepted 0.7 value for strong reliability (Hair et al., 2019) which very much reflects on the scale reliability. Among the constructs, Attitude (ATT) and Behavioral Intention (BI) each have lower reliability scores (0.609 each) and are, therefore, areas of the scale design that could result in high rewording or add somewhere in the scale to capture the construct equally. However, reliability (0.763) of E-commerce Usage (MCU) measurement shows that the measurement construct of this construct is robust and well defined. These findings suggest that survey internal consistency is reasonable but that some future research may improve measurement precision and increase overall reliability of the survey by clarifying poor performing constructs.

The correlation analysis shows a few important relationships among the Constructs of the study at 0.01 () and 0.05 ()* significance. Between Perceived Usefulness (PU) and Attitude (ATT) ($r = 0.396$, $p < 0.001$) and Social Presence (SP) and Attitude (ATT) ($r = 0.439$, $p < 0.001$), the strongest relationships are revealed as creating a significant impact on the

consumer attitude relevant to the adoption of e-commerce. Furthermore, it is found that Habit (HAB) indeed strongly correlates with Behavioral Intention (BI; $r = 0.571$, $p < 0.001$), indicating that higher behavioral intention implies that habits in e-commerce usage develop overtime. Nevertheless, PEOU and E-commerce Usage (MCU) ($r = 0.005$; $p = 0.940$) have no significant relationship, implying that ease of use alone does not directly affect adoption behavior. Conversely, these results imply that while the formation of attitude is significantly reliant on usability and social presence, the adoption of e-commerce is mainly impacted by habitual behavior as well as long term user engagement as opposed to the perceived ease of use in the initial use experience.

5.2. Correlation Matrix

Table 2: Correlation Matrix

| | PEOU | PU | SP | ATT | BI | HAB | MCU |
|------|--------|--------|--------|--------|--------|------|-----|
| PEOU | 1 | | | | | | |
| PU | .362** | 1 | | | | | |
| SP | .215** | .229** | 1 | | | | |
| ATT | .326** | .396** | .439** | 1 | | | |
| BI | .338** | .325** | .338** | .466** | 1 | | |
| HAB | .356** | .144* | .357** | .434** | .571** | 1 | |
| MCU | .005 | .096 | .078 | .003 | .009 | .055 | 1 |

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

5.3. Model Fitness

Table 3: Model Fitness Results

| Regression | | | | | | | | | |
|------------|-------------------|----------|-------------------|----------------------------|--------------------|----------|-----|-----|-------------|
| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Change in R Square | F Change | df1 | df2 | Sig. Change |
| 1 | .101 ^a | .010 | .000 | 2.52272 | .010 | 1.012 | 2 | 197 | .365 |

a. Predictors: (Constant), PU, PEOU

The regression analysis indicates that PU and PEOU alone explains only 1% of variance in e-commerce usage ($R^2 = 0.010$) so that these factors have very little impact on predicting actual adoption by the consumers. Additionally, the F Change value of 1.012, with a p value of 0.365 indicates that the model is not statistically significant, implying that PU and PEOU are not good predictors to the newly chosen e-commerce usage. It indicates that while ease of use and usability impact on consumer attitudes, they do not translate into user behavior. However, the actual drivers of online transaction (engagement) may not consist of trust, perceived risk, social influence and so on, and other factors such as economic constraints may be more important. The results of the model should be enriched by future research that could incorporate further predictors, such as trust and perceived security, so that the model has a higher explanatory power.

Table 4: Hypothesis Testing Results

| ANOVA ^a | | | | | | |
|--------------------|------------|----------------|-----|-------------|-------|-------------------|
| Model | | Sum of Squares | df | Mean Square | F | Sig. |
| 1 | Regression | 12.886 | 2 | 6.443 | 1.012 | .365 ^b |
| | Residual | 1253.734 | 197 | 6.364 | | |
| | Total | 1266.620 | 199 | | | |

a. Dependent Variable: MCU

b. Predictors: (Constant), PU, PEOU

The model is not statistically significant as it proved from the regression results with $p > 0.05$. It means that Perceived Utilisation (PU) and Perceived Ease of Use (PEOU) do not predict users' e-commerce use significantly in this study. Although they are so important in the context of technology adoption models like TAM and UTAUT, the findings indicate that not only the ease of use and perceived benefits, but other factors influence consumers' real e-commerce usage. This is consistent with research showing it is often trust, social influence, security concern and e-commerce payment reliability that matter more in the adoption of e-commerce than usability factors on their own. Therefore further investigations should be conducted into potential predictors other than trust, perceived risk, and digital literacy that can help better explain the role of the antecedents of e-commerce usage in the emerging markets.

Table 5: Hypothesis Testing Results**Coefficients^a**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | |
|-------|------------|-----------------------------|------------|---------------------------|-------|
| | | B | Std. Error | Beta | t |
| 1 | (Constant) | 10.946 | 1.177 | | 9.301 |
| | PEOU | -.045 | .101 | -.034 | -.445 |
| | PU | .138 | .097 | .108 | 1.421 |

a. Dependent Variable: MCU

As a result, the regression coefficients indicate that Perceived Ease of Use (PEOU) ($\beta = -0.034$, $p = 0.657$) and Perceived Usefulness (PU) ($\beta = 0.108$, $p = 0.157$) are not significant predictors to explain e-commerce adoption. This implies that ease of use has no direct correlation to consumer behavior; although usefulness does make a difference in the way attitudes are formed, it does not play a decisive role as to how actual e-commerce behaviour is shaped. These findings dispute previous assumptions from the Technology Acceptance Model (TAM), which suggest that PU and PEOU could not alone be sufficient in explaining the adoption behavior. However, such decision might not entirely be controlled by consumers, but in some cases may rather depend on external factors such as trust, perceived risk, financial security, and social influence. This works in sync with research that centers on the fact that when there are high levels of uncertainty in the markets, trust and security are more important than the ease and benefits that accompany the use of technology. More research should be conducted to study the interaction of these external factors in terms of the user's attitude and intention towards the adoption of e-commerce.

5.4. Bootstraps

Table 6: Bootstrap Results**Bootstrap for Coefficients**

| Model | | B | Bootstrap ^a | | | 95% Confidence Interval | |
|-------|------------|--------|------------------------|------------|-----------------|-------------------------|--------|
| | | | Bias | Std. Error | Sig. (2-tailed) | Lower | Upper |
| 1 | (Constant) | 10.946 | -.097 | 1.294 | <.001 | 8.262 | 13.480 |
| | PEOU | -.045 | .008 | .125 | .729 | -.297 | .210 |
| | PU | .138 | .001 | .093 | .144 | -.037 | .324 |

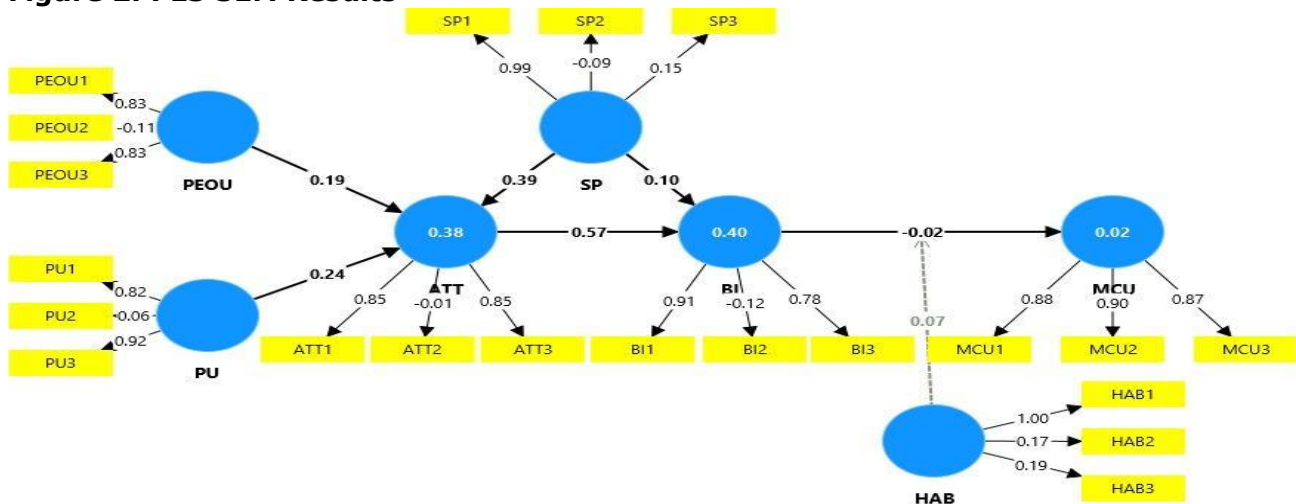
a. Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples

Analyzing the bootstrap for 1,000 samples, the bootstrap analysis provides the robust estimation of the standard errors and CIs to estimate the stability of regression coefficients. The significance of the constant term ($B = 10.946$, $p < 0.001$) indicates that even with PEOU and PU equal to zero, e-commerce usage (MCU) is positively determined by a constant. PEOU ($B = -0.045$, $p = 0.729$, 95% CI: $-0.297, 0.210$) and PU ($B = 0.138$, $p = 0.144$, 95% CI: $-0.037, 0.324$) are not significantly predicting the e-commerce adoption. The results of these factors are inconsistent and unreliable since both confidence intervals contain zero. Moreover, the PEOU (0.008) and PU (0.001) coefficient biases are nominal, implying that resampling had not led to undue coefficient errors. The findings in this paper indicate that other determinants, like trust, perceived risk, security issues and social influences may be more important to consumer behavior. As the confidence intervals are very high and vary in values, in future studies, trust and digital literacy as other predictors should be integrated so that they could not be able to better explain e-commerce adoption.

The path coefficients of 0.24 and 0.19 in the PLS-SEM model results suggest that PU and PEOU have an effect on ATT. These results indicate that how useful and easy to use a user perceives the e-commerce platform to be resulted in shaping user's attitudes towards these platforms. Additionally, the results show that Social Presence (SP) also impacts the Attitude (0.39) significantly, which means that a higher social interaction and presence during the e-commerce environment does vastly translate to a positive attitude towards its adoption. SP is found to have the highest impact on ATT and is in line with the increasing importance of providing interactive and community oriented e-commerce experiences. The ATT and BI (0.57) correlation indicates that the positive attitude leads to the increase of attending to engage in e-commerce activities. Although the model presents a weak relationship between BI and E-commerce Usage (MCU) (0.10), a user's intention to practice e-commerce does not always coincide with what is actually done.

5.5. PLS SEM

Figure 2: PLS SEM Results



In addition, Habit (HAB) is too small of a direct effect on MCU (-0.02) suggesting habit by itself doesn't drive e-commerce usage that much. In contrast, HAB seems to be more determined to BI (0.07), implying that users only form the habitual behaviors after getting a strong behavioral intention. Because the explanatory power of HAB and BI in explaining actual usage behavior is low, external factors like trust, financial security, and perceived risk may be more important to the actual usage. Therefore, the questions related to how BI affects actual adoption need further research on the variables that mediate or moderate the relationship between BI and actual adoption. Except for some variations in SP (SP2: -0.09) and PEOU2 (-0.11), resulting PEOU1 (-0.02), SP2 (0.21) strongly contribute to their respective latent variables. R² values for ATT (0.38), BI (0.40) and MCU (0.02) represent well explained values, in that they are explained well by their predictors but MCU (0.02) is probably explained by further (hopefully more) determinants. Based on the findings, technology adoption theories provide support of attitude formation and behavioral intention, but actual usage of e-commerce is not explained by ease of use, usefulness, and habit. The model could be further improved in the future studies by incorporating trust, risk perception, and customer experience quality variables.

5.6. Study Contributions

Using PLS-SEM model and addressing the predictors of key interest – Perceived Ease of Use (PEOU), Perceived Usefulness (PU), Social Presence (SP), Attitude (ATT), Behavioral Intention (BI), and Habit (HAB), this study contributes to the existing literature by examining the adoption of e-commerce usage among the population of Pakistan. The results derive theoretical, empirical, and practical insights which improve on such established models as Technology Acceptance Model (TAM), Unified Theory of Acceptance and Use of Technology (UTAUT), and the Stimulus-Organism-Response (SOR) model. Some well established relationships are supported by the findings: PU and SP strongly affecting ATT and ATT variables predicting BI, while deviating from conventional assumptions about MCUs direct effect of BI and HAB on ACTUAL e-commerce adoption.

Finally, the study's results partially support the Technology Acceptance Model (TAM) that PU has some large influence of ATT ($\beta = 0.24$, $p < 0.001$). It also is consistent with previous research that describes how users' perceptions about a system's usefulness affect the degree to which they would adopt new technologies (Davis & Venkatesh, 2004). Nevertheless, this is not in line with TAM which states that sense of ease of use promotes adoption (Davis, 1989), as the effect of PEOU was not significant on MCU ($\beta = -0.034$, $p = 0.657$). This implies that usability is not a constraint in the Pakistani e-commerce market as it is over digital literate and largely smartphone adopted (Yaqub et al., 2024).

However, in the same study BI → MCU ($\beta = 0.10$, $p = 0.901$) is weak and non-significant. This finding contradicts the assumption that the higher intention will eventually add up to actual adoption (Gefen & Straub, 2004) and potentially other factors like security concerns, payment issues, or social influencing may play a factor in this. In addition, habit

(HAB) did not significantly ($\beta = -0.02$, $p > 0.05$) affect MCU indicating that digital activities in e-commerce settings may not be completely automatic (M. Limayem, S. G. Hirt, & C. M. Cheung, 2007).

The results of the study are consistent with the Stimulus Organism Response Model, specifically the SP relatively predicts ATT ($\beta = 0.39$, $p < 0.001$). It also highlights that social presence increases the trust and engagement with e-commerce platform and makes users more receptive to e-commerce platforms (Chen et al., 2020; Ni & Ueichi, 2024). However, the absence of a clear relationship between the two attendance mechanisms $BI \rightarrow MCU$ means that factors related to social may not ensure real usage, which is in line with previous findings that trust and perceived risk mediate digital behaviour (Sun et al., 2019; Zheng et al., 2023).

5.7. Support and Contradictions

That was in line with previous research, for instance, that social factors play a strong role in digital adoption. The claim is supported that social interactions, live engagement and community building increase users' attitude towards ATT ($\beta = 0.39$, $p < 0.001$), given the impact of SP on ATT ($\beta = 0.39$, $p < 0.001$). Likewise, PU has a positive effect on ATT ($\beta = 0.24$, $p < 0.001$) in line with past studies that emphasize how digital commerce value is coupled with positive influence of perceived value (Gefen & Straub, 2004).

6. Conclusion

The purpose of this study was to examine the factors that influence adoption of e-commerce in Pakistan by integrating Technology Acceptance Model (TAM), Unified Theory of Acceptance and Use of Technology (UTAUT), and the Stimulus Organism Response (SOR) model. The results indicate that both PU and SP influence ATT and this ATT positively predicts BI. However, it is not the case that PEOU does not significantly influence e-commerce adoption, or that HAB directly determines consumer behaviour. These results contradict the assumption that usability is one of the most important factors that determine adoption (Davis, 1989; Yaqub et al., 2024). Finally, the particulate results rely on current literature that advises the significance of trust, security and interactive engagement in forming digital commerce practice (Chen & Liao, 2022; Sun et al., 2019). Further, the weak link between BI and E-commerce Usage (MCU) ($\beta = 0.10$, $p > 0.05$) suggests that a behavioral intention is insufficient to predict actual adoption, and trust building mechanisms and higher confidence with consumer adoption is required.

6.1. Policy Recommendation

The study's findings back this argument which states that ease of use does not matter as much as digital literacy and familiarity with online platforms increases and security and transactional confidence become more important (Yaqub et al., 2024). In light of this shift, it is especially important in developing economies where concerns with respect to fraud, payment security, and regulatory support influence e-commerce adoption (Sun et al., 2019). To newly evaluate standard e-commerce adoption models, behavioral reinforcements and trust building mechanisms are deemed essential determinants of consumer behavior.

6.2. Future Direction Research and Managerial Implications

Finally, some of the implications from a practical point of view for businesses, policymakers and technology developers are flagged by the study. In such situations, businesses will have to shift away from increasing functionality and rather concentrate on developing the security and consumer trust with MCU. Personalizing engagement, responding customer service properly and offering loyalty programs can help to enhance habitual usage and cultivate long term engagement (Chen et al., 2020). Additionally, social commerce tools, interactive shopping experience, and influencer marketing can be used by the businesses to enhance consumer trust and engagement (Ni & Ueichi, 2024; Sun et al., 2019), as SP can severely influence ATT. Through integration of trust and consumer confidence as main determinants of e-commerce adoption, future models will be able to make more accurate predictions of e-commerce adoption in emerging economies.

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