

Adoption success of using Generative AI apps for the E-Commerce Platforms in Sri Lanka

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Abstract – The digital landscape has witnessed the widespread influence of e-commerce, with the Information Technology industry embracing generative AI applications. This research aims to investigate the adoption success of existing e-commerce platforms in Sri Lanka in incorporating generative AI technologies. A systematic literature review using the PRISMA framework identified how generative AI is used in various industries, its Future Directions, Ethical Concerns, Security, and Privacy Considerations, and the most widely used and accepted models for understanding technology adoption. The Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT) are the two most widely used in past research for the acceptance of technology. These two models and past literature were used to develop a conceptual framework. The variables in this research model were measured through questionnaires with five-point Likert scales and close-ended questions completed by the Software Engineering and Software development process-related employees in Sri Lanka. Data cleaning and demographic data analysis were conducted using IBM SPSS 21, and preliminary data analysis was performed using PLS-SEM (SmartPLS 4). The study found that generative AI apps are productive, effective, and capable of retaining users with a positive intention to use them in E-commerce. High implementation costs negatively impact, and Low training and maintenance costs positively affect the intention of users to adopt generative AI apps. The factors such as innovativeness, perceived benefits, and level of attitudes, positively impact the overall adoption success. These findings are expected to guide Sri Lankan e-commerce platforms, aiding them in enhancing the successful adoption and seamless integration of generative AI apps. By aligning with the wisdom of TAM and its associated models, our research contributes to understanding the adoption success of Sri Lankan e-commerce platforms to embrace generative AI technologies.

Keywords: Adoption Success, Acceptance of Technology, E-Commerce, Generative AI Apps, Technology Acceptance Model

I. INTRODUCTION

Generative AI applications, characterized by their ability to create original and creative content using artificial intelligence, have gained wide attention in recent years. Recently, there has been a great surge of interesting and ground-breaking works on generative AI applications, demonstrating a capability to use Artificial Intelligence (AI) for the generation of creative content (OpenAI, 2024). These applications cover various domains, from images and text to music, and user interfaces capable of generating realistic, high-quality output. (Bell & Bell, 2023)

Generative AI Applications for e-commerce, the possibilities to use deep learning models in fundamentally transforming customer interactions within each E-Commerce sector are huge. Such tech could provide personalized customer experiences, automate some of the support provided to customers, or be used in creating content and therefore allow for a new way that online systems are interacted with by clients. In the end, as generative AI technologies develop, and businesses start employing them in their e-commerce platforms; user experiences are going to get much more personalized, and

efficient than they ever were. ChatGPT (OpenAI) and Google Bard are recent examples of generative conversational model applications. (Google, 2024)

ChatGPT builds itself as a milestone in AI development, starting with OpenAI's commitment to democratizing AGI for the good of humanity and introducing multimodal communication which expands its usage even further (Radford et al., no date). Generative AI has illustrated its potential to improve user experiences across different sectors including customer service, education, and overall satisfaction by combining ideas for enabling highly tailored interactions using personalization capabilities. Yet, there are important ethical considerations that need to be taken into account (i.e. privacy and data biases). On the same lines, Google's Bard - an AI chatbot using generative techniques to hold down natural conversations even in non-traditional areas. So for websites like Daraz and Wow, their app loses a share of revenue as no one goes over to the website.lk (Annual Report 2019 | Central Bank of Sri Lanka, no date) which have localized according to preferences and seen phenomenal growth in the wallet space.

Though there is an extensive discourse around what generative AI can do, and how it may be used across other sectors, research about whether this technology could also find application in the E-commerce industry remains scarce. Previous scholarly works have focused greatly on the advancement of generative AI and individual applications; however, a clear framework is missing to help us understand how these technologies can be best embraced into e-commerce platforms.

The motivation of this study is to fill this gap by finding the factors that make these generative AI technologies adopted in e-commerce platforms successful in Sri Lanka. As more and more businesses integrate generative AI, this research aims to shed light on what aspects are driving adoption and the predicaments faced.

II. LITERATURE REVIEW

A. Search Process

Once the comprehensive list of keywords is finalized, then start to create a search string. Keywords were then combined using Boolean operators (AND, OR) to construct an effective search string. Utilizing the Google Scholar search engine, relevant research was retrieved from reputable academic databases, including IEEE Digital Library, Scopus, and ScienceDirect. The researcher's focus was restricted to English-language articles published between 2018 and 2023. Keywords: Adoption Success, Acceptance of Technology, E-Commerce, Generative AI Apps, Technology Acceptance Model

All the keywords mentioned above, and synonyms are needed to create a search string that is used to search on Google Scholar. The search string is defined as follows: [(“Adoption Success”) AND (“Acceptance of Technology”) AND (“E-Commerce”) AND (“Generative AI Apps”) AND (“Technology Acceptance Model”)]

B. Inclusion and Exclusion Criteria

A tentative application of the search string is sufficient to read the title of the contributions to the concerned candidates of the paper as a candidate. Sometimes the abstract is read, and, if necessary, the introduction and full paper are read. Papers were excluded based on their publication date before 2018 and publication place journals and conferences only to get the latest situation of Readiness of using Generative AI apps to E-commerce Platforms. Because of the large number of relevant research papers obtained in Google Scholar

search, only consider the first ten pages of Google Scholar in the identification stage and finalize 43 papers for a full review.

C. Generative AI in Marketing and Customer Support

Generative AI, like ChatGPT, transforms marketing and customer support, providing efficient solutions (Suganya, 2023). ChatGPT's versatility spans email composition, essay writing, programming assistance, and quick user query responses (Suganya, 2023). In marketing, its AI-driven insights are pivotal for trend analysis and precise target audience profiling. AI-powered chatbots, derived from ChatGPT, streamline processes like email marketing and data analysis, resulting in significant time and cost savings (Suganya, 2023). They enhance user engagement through personalized interactions and dynamic content creation, driving customer satisfaction (Kripanont, no date). The integration of AI in marketing strategies improves customer retention rates and brand loyalty (Rajasinghe, 2021). Successful adoption by e-commerce platforms in Sri Lanka is crucial for their competitive edge in the dynamic digital commerce landscape.

D. User Preferences and Interactions

The surge in e-commerce technology favors text-based interactions, with chatbots meeting individual preferences (Moriuchi et al., 2021). Despite programming limitations, recognizing diverse user perspectives is vital for optimal user experiences and increased sales (Moriuchi et al., 2021). In chatbot commerce, factors such as anthropomorphism and perceived enjoyment significantly influence customer engagement and purchase intentions, shaping effective digital marketing strategies (Nuanchaona et al., 2021). Real-time personalization in text-based interactions is emphasized for enhanced user engagement and satisfaction (Venkatesh et al., 2003). The infusion of natural language processing capabilities, as seen in models like ChatGPT, emerges as a key driver for authentic conversational experiences (Baker, 2012). The integration of human-like features in technology provides valuable insights into consumer behavior during shopping via chatbots (Nuanchaona et al., 2021).

E. Personalization and Personalized Answer Generation for Product Question Answering (PQA)

In the evolving retail landscape, AI-driven personalization, exemplified by ChatGPT, is standard, bridging the gap between customer segmentation and individual customization (Gerlick & Liozu, 2020). AI's potency in generating personalized digital content is recognized, enhancing customer satisfaction and boosting conversion rates in digital advertising (Matz et al., 2024). A transformative development is the use of AI for personalized answer generation in Product Question Answering (PQA), revolutionizing customer access to information from reviews and elevating the shopping experience (Deng et al., 2021).

F. Trust, Ethical Concerns, Security and Privacy Considerations

Trust plays a pivotal role in user engagement with AI-driven technologies like ChatGPT, influencing user intent (Choudhury & Shamszare, 2023). Conscientious design is imperative for developers to enhance user satisfaction and trust, ensuring widespread adoption (Choudhury & Shamszare, 2023). While integrating ChatGPT into e-commerce brings benefits, ethical concerns like accuracy, privacy, and biases require careful consideration (Choudhury & Shamszare, 2023). Regulatory frameworks, especially in

healthcare, need to evolve to address challenges posed by AI models like ChatGPT (Deng et al., 2021). Efforts to enhance the security of generative AI models, including ChatGPT, are underway to address security concerns. Privacy considerations highlight the importance of transparency and adherence to privacy laws (Bell & Bell, 2023). Responsible development and use of AI, with awareness of ethical implications, are crucial in navigating the evolving AI landscape (Larwood et al., 1984).

G. Generative AI in Various Industries and Future Directions

The integration of ChatGPT across industries, from data analytics to personalized learning, highlights its adaptability and effectiveness (Kripanont, no date). In the dynamic e-commerce landscape, leveraging generative AI, particularly ChatGPT, requires addressing ethical concerns, navigating regulations, and building user trust. Businesses and policymakers must adopt an adaptable stance to unlock the full potential of these technologies (Larwood et al., 1984). Ongoing research and analysis are essential to understand and navigate the evolving implications and applications of generative AI in e-commerce (Kripanont, no date).

H. Acceptance of Technology

Technology acceptance, defined as an individual's psychological state towards using a particular technology (Rajasinghe, 2021), plays a crucial role in the adoption of new technologies. Models such as the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT) are instrumental in examining factors influencing technology acceptance (Masombuka & Mnkandla, 2018). Over the years, several technology adoption models have been developed to investigate and analyze the impact of various factors on individuals' acceptance and use of new technologies, such as the Theory of Reasoned Action (TRA), Theory of Planned Behavior, Technology Acceptance Model (TAM), Unified Theory of Acceptance and Use of Technology (UTAUT). In the context of the research on the adoption of generative AI apps in Sri Lankan e-commerce platforms, TAM and UTAUT offer a relevant and structured approach (Venkatesh et al., 2003). These models, widely used in understanding technology acceptance, will help explore determinants such as perceived usefulness and ease of use in the unique setting of generative AI adoption in Sri Lankan e-commerce (Venkatesh et al., 2003).

I. Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) serves as a theoretical framework to analyze factors influencing technology adoption, particularly in the context of the "Adoption success of using generative AI apps in e-commerce platforms in Sri Lanka" (Baker, 2012). TAM emphasizes Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) as central factors shaping technology adoption decisions. In the context of generative AI apps in Sri Lankan e-commerce, PU becomes crucial, reflecting users' perceptions of the benefits these apps bring to their online shopping experiences (Baker, 2012).

The interplay between PEOU and PU underscores that users are more likely to accept generative AI apps if they find them user-friendly and perceive them as valuable for enhancing online shopping (Baker, 2012). Applying TAM in this research provides a structured approach to understanding factors influencing user decisions and informs strategies for optimizing the integration and acceptance of generative AI apps in Sri Lankan e-commerce.

J. Unified Theory of Acceptance and Use of Technology (UTAUT)

In the realm of technology adoption, Venkatesh's Unified Theory of Acceptance and Use of Technology (UTAUT) provides a comprehensive framework for understanding users' intentions in organizational contexts, especially pertinent in exploring generative AI app adoption in Sri Lankan e-commerce (Huallpa et al., 2023). UTAUT's core constructs—Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), and Facilitating Conditions (FC)—play pivotal roles in shaping users' intentions (Huallpa et al., 2023). For generative AI apps in Sri Lankan e-commerce, PE is crucial, reflecting users' belief in the system's ability to enhance job performance (Huallpa et al., 2023). EE assesses the perceived effort needed, with user-friendly apps being more likely to be adopted (Huallpa et al., 2023). SI recognizes social factors' impact, and FC evaluates the essential organizational and technical framework, both influencing adoption (Huallpa et al., 2023). Demographic factors also moderate these constructs' influence, providing a nuanced understanding of generative AI app adoption in Sri Lankan e-commerce (Baker, 2012). Applying the UTAUT framework in this research offers a comprehensive perspective on the adoption success of generative AI apps in Sri Lankan e-commerce.

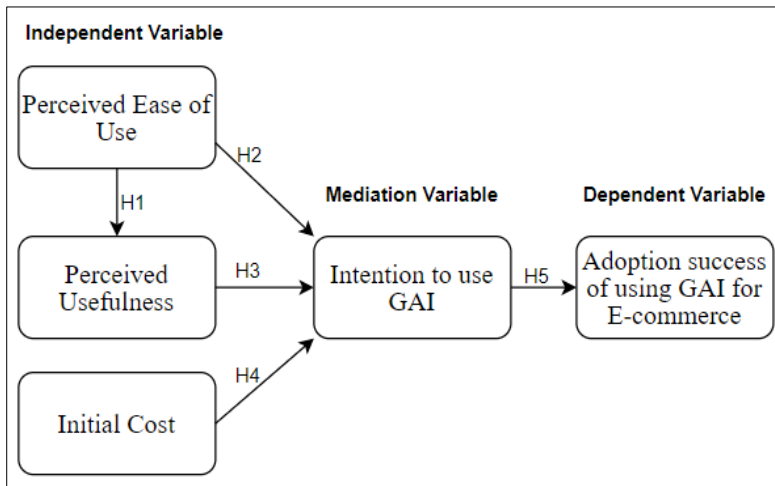
III. METHODOLOGY

This study aimed to analyze the Adoption success of Generative AI apps in e-commerce platforms in Sri Lanka, specifically assessing the technical feasibility of integration and exploring the challenges associated with its implementation, from the developers' perspective. The study employed deductive and quantitative methodologies aligned with the research objectives. The conceptual framework is designed upon TAM, UTAUT, and relevant literature from the past.

A. Developing a Conceptual Framework

The TAM (Technology acceptance model) and UTAUT (Unified Theory of Acceptance and Use of Technology) models and past literature have been used to develop the conceptual framework. The TAM model is mainly used to identify the Perceived usefulness and perceived ease of use. The UTAUT model is mainly used to identify Intention to use generative AI. Initial Cost and Adoption success of using generative AI for E-commerce were identified from the past Literature. In shaping the conceptual framework, an extensive review of the literature was integral. The concluded conceptual framework is a synthesis that integrates a combination of both the TAM and UTAUT models. The conceptual framework used in this study is in the Fig.1.

Figure 1. Proposed Conceptual Framework



Source: Authors’ compilation.

To validate the proposed conceptual framework, this study examined a set of hypotheses as follows.

H1- There is a relationship between Perceived Ease of Use and Perceived Usefulness.

H2- There is a relationship between Perceived Ease of Use and Intention to use Generative AI.

H3- There is a relationship between Perceived Usefulness and Intention to use Generative AI.

H4- There is a relationship between Initial Cost and Intention to use Generative AI.

H5- There is a relationship between the Intention to use Generative AI and the Adoption success of using Generative AI for E-commerce.

B. Operationalization Process

Table 1 provides a detailed presentation of the operationalization process for independent, mediation, and dependent variables, along with their respective indicators. All indicators were measured on ordinal scales, utilizing a 1-5 Likert scale for accurate quantification.

Table 1. Operationalization Process

Variable	Indicators	
Perceived Ease of Use (PEOU)	PEOU 1	Ease of Opening
	PEOU 2	Ease of Learning
	PEOU 3	Flexibility
Perceived Usefulness (PU)	PU 1	Improve Productivity
	PU 2	Improve Effectiveness
	PU 3	Perceived User Retention
Initial Cost (IC)	IC 1	Implementation Cost
	IC 2	Training Cost
	IC 3	Maintaining Cost
	ITUG 1	Innovativeness

Variable	Indicators	
Intention to use Generative AI (ITUG)	ITUG 2	Perceived Benefits
	ITUG 3	Level of Attitude
Adoption success of using Generative AI apps for E-commerce (ASGE)	ASGE 1	Perceived user Satisfaction
	ASGE 2	Perceived Efficiency
	ASGE 3	Perceived Service Success

Source: Authors' compilation.

C. Data Collection

To identify the factors influencing the adoption of generative AI in E-commerce platforms in Sri Lanka, a questionnaire was distributed to professionals, including Software Engineers and Business analysts. The survey targeted individuals from companies involved in E-commerce Application development within the software industry.

With a planned data analysis sample size of 113 responses, questionnaires were sent through various channels, including emails, social media direct messages, and groups. Ultimately, 132 responses were received, exceeding the intended sample size. The data analysis was done with Smart PLS 4 with PLS-SEM was used in the study to analyze the data and determine the strength and significance of the relationships among latent constructs. PLS-SEM stands for Partial Least Squares Structural Equation Modeling, which is a statistical technique used to analyze complex relationships between variables. It is particularly useful when the sample size is small or when the data does not meet the assumptions of traditional SEM.

IV. DATA ANALYSIS AND DISCUSSION

The online survey questionnaire design ensured mandatory completion of Likert scale questions for PLS-SEM analysis, minimizing missing values and it accommodates non-normalized data, providing flexibility in handling real-world datasets with varied distributions, a feature especially beneficial in complex and diverse research settings. Open-ended questions did not have such restrictions. The dataset was carefully examined for anomalies, with no straight-line responses detected. Demographic data review led to the removal of 11 responses, leaving 121 responses. IBM SPSS Statistics was employed to identify and eliminate outliers, resulting in the removal of 5 outliers. The final dataset comprised 116 data records.

A. Analysis of Demographic Variables

Table 2. Demographic Overview

Variable	Percentages	
Gender	Male	73%
	Female	27%
Designation	Software Engineer	71%
	Business Analyst	20%
	IT related others	7%
	Management related others	2%
Experience	0 – 1 Year	48%
	1 – 5 Years	43%

Variable		Percentages
	5 – 10 Years	8%
	More than 10 Years	1%
Involved in E-commerce	Yes	77%
Application Development	No	23%
Aware of Generative AI	Yes	99%
	No	1%
Best Generative AI application	ChatGPT	77%
	Bard	15%
	Bing Chat	7%
	Other	1%

Source: Authors' compilation.

B. Assessment of Measurement Models

1) Reflective Measurement Model: In PLS-SEM, a conceptual model can be interpreted in terms of the measurement model and the structural model. The measurement model involves the evaluation of latent variables or composite variables based on their respective indicators, while the structural model focuses on the relationships between these latent variables.

The assessment of the measurement model includes three critical steps: measuring internal consistency and reliability, evaluating convergent validity, and ensuring discriminant validity. Internal consistency and reliability were assessed using Cronbach's alpha and composite reliability. Cronbach's alpha values, which indicate the reliability of the constructs, ranged from 0.5 to 0.9 in this study, aligning with the acceptable threshold specified in the literature (Henseler et al., 2015). Similarly, composite reliability values above 0.6 were deemed acceptable and all constructs in the study exceeded this benchmark, reinforcing the reliability of the measurement model.

Convergent validity, which assesses the degree to which indicators of a construct converge or share a high proportion of variance, was evaluated through the outer loadings of indicators and the Average Variance Extracted (AVE). Most individual factor loadings exceeded the recommended threshold of 0.7, indicating strong indicator reliability. The AVE for all constructs met the criterion of 0.50 or higher (Henseler et al., 2015), suggesting that the constructs explained a significant portion of the variance in their indicators.

Discriminant validity was confirmed using multiple criteria: cross-loadings, the Fornell-Larcker criterion, and the Heterotrait-Monotrait (HTMT) ratio. Cross-loadings ensured that indicators loaded higher on their respective constructs than on others. The Fornell-Larcker criterion was met as the square root of the AVE for each construct was greater than its highest correlation with any other construct. The HTMT ratio, used to assess discriminant validity, approached 1.0, which further supported the distinctiveness of the constructs (Sujatha & Karthikeyan, 2021).

C. Formative Measurement Model

Convergent validity of formative constructs was evaluated using outer loadings and Average Variance Extracted (AVE) (Henseler et al. 2015). Outer loadings exceeding 0.7 were considered acceptable, indicating strong convergent validity (Davis, 1989). In this

study, no outer loading was below 0.4, with all values falling within the acceptable range, further supporting the reliability of the indicators.

Collinearity among formative indicators was assessed through the Variance Inflation Factor (VIF). VIF values below 5 are considered acceptable to ensure that multicollinearity does not pose a significant issue (Henseler et al., 2015). In this research, all VIF values were within this acceptable range, indicating minimal collinearity among the formative indicators.

In formative SEM models, outer weights are crucial for indicating the significance of observed indicators in shaping latent constructs (Henseler et al., 2015). Although there is no universal numerical range for acceptable outer weights, theoretical alignment and coherence were emphasized in this study. Outer loadings higher than 0.708 were considered acceptable for indicator reliability, aligning with established guidelines (Henseler et al. 2015). This approach ensures that the indicators reliably measure the constructs they are intended to represent, contributing to the overall validity of the measurement model. By adhering to these rigorous validation criteria, the study ensures that the measurement model accurately reflects the underlying constructs, providing a robust foundation for subsequent analysis of the structural model.

D. Assessment of Structural Model

Table 3 displays the path coefficients, p-values, t-values, and the confirmation of hypotheses derived from the analysis of the structural model. The acceptance criteria for hypotheses were based on a 95% confidence interval and a significance level of 0.05.

Table 3. Summary of the Results on the Base Model

Variable	Path Coeff	T value	P value	Hypothesis	Accepted or rejected
PEOU -> PU	0.739	15.544	0.000	H1	Accepted
PEOU -> ITUG	0.303	5.389	0.000	H2	Accepted
PU -> ITUG	0.195	17.298	0.000	H3	Accepted
IC -> ITUG	0.412	2.239	0.025	H4	Accepted
ITUG -> ASGE	0.779	15.544	0.000	H5	Accepted

Source: Authors' compilation.

1) Relationship between Perceived Ease of Use and Perceived Usefulness: The variable Perceived Ease of Use (PEOU) has a path coefficient of 0.739 and a P value of 0.000, indicating a strong and significant positive influence on Perceived Usefulness (PU). This significant relationship highlights that as the ease of use of generative AI applications increases, their perceived usefulness on e-commerce platforms in Sri Lanka also increases. This finding aligns with the Technology Acceptance Model (TAM) 2, which posits that Perceived Ease of Use and Perceived Usefulness are crucial factors in the acceptance and adoption success of new technologies.

The strong positive relationship between PEOU and PU suggests that making generative AI applications more user-friendly can significantly enhance their perceived value among users. This has important implications for the design and implementation of these technologies on e-commerce platforms. By prioritizing ease of use, developers and platform managers can foster greater acceptance and utilization of generative AI, thereby improving overall user satisfaction and engagement.

Existing literature supports the finding that Perceived Ease of Use is a critical determinant of Perceived Usefulness. Numerous studies have demonstrated that technologies that are easier to use are perceived as more useful by users, leading to higher adoption rates (Davis, 1989). This is particularly relevant in the context of generative AI applications, which can be complex and challenging for users unfamiliar with advanced AI technologies. By simplifying the user interface and experience, e-commerce platforms can lower the barrier to entry and encourage more widespread use of these applications.

The TAM 2 model, which extends the original Technology Acceptance Model (TAM), emphasizes the importance of both PEOU and PU in technology adoption. According to TAM 2, PEOU influences PU directly, as users are more likely to find technology useful if they perceive it as easy to use. This theoretical framework supports the study's findings and underscores the importance of considering both ease of use and perceived usefulness when evaluating the adoption potential of generative AI applications in e-commerce.

2) Relationship between Perceived Ease of Use and Intention to Generative AI: The variable Perceived Ease of Use (PEOU) has a path coefficient of 0.303 and a P value of 0.000, indicating a significant positive influence on the Intention to Use Generative AI (ITUG). This significant relationship highlights that as the perceived ease of use of generative AI applications increases, so does the intention to use these technologies on e-commerce platforms in Sri Lanka. This finding is supported by both the Technology Acceptance Model (TAM) 2 and the Unified Theory of Acceptance and Use of Technology (UTAUT), which propose that Perceived Ease of Use is a critical factor in the intention to use and subsequent adoption success of new technologies.

The positive relationship between PEOU and ITUG suggests that user-friendly generative AI applications are more likely to be adopted by users on e-commerce platforms. This has important implications for developers and platform managers, who should prioritize ease of use to encourage greater user intention to adopt these technologies.

Literature consistently supports the notion that the Perceived Ease of Use is a crucial determinant of the intention to use technology. According to the TAM 2 model, PEOU directly influences users' behavioral intention to use technology, as users are more inclined to adopt a system that they find easy to navigate and interact with. Similarly, the UTAUT model posits that effort expectancy, analogous to PEOU, is a significant predictor of behavioral intention [35]. These theoretical frameworks underscore the importance of ease of use in driving user acceptance and intention to use generative AI applications.

Both the TAM 2 and UTAUT models emphasize the role of PEOU in technology adoption. TAM 2 extends the original TAM by incorporating additional factors that influence user acceptance, while UTAUT integrates several models of technology acceptance to provide a comprehensive understanding of user behavior. Both models highlight that technologies perceived as easy to use are more likely to be adopted, supporting the study's finding that PEOU positively influences ITUG.

3) Relationship between Perceived Usefulness and Intention to use Generative AI: The variable Perceived Usefulness (PU) has a path coefficient of 0.195 and a P value of 0.000, indicating a significant positive influence on the Intention to Use Generative AI (ITUG). This significant relationship suggests that as the perceived usefulness of generative AI

applications increases, so does the intention to use these technologies on e-commerce platforms in Sri Lanka. This finding is supported by both the Technology Acceptance Model (TAM) 2 and the Unified Theory of Acceptance and Use of Technology (UTAUT), which propose that Perceived Usefulness is a critical factor in the intention to use and subsequent adoption success of new technologies.

The positive relationship between PU and ITUG indicates that users are more likely to intend to use generative AI applications if they perceive these technologies as beneficial and advantageous in enhancing their e-commerce experience. This has important implications for e-commerce platform managers and developers, who should focus on demonstrating the practical benefits and value of generative AI to encourage greater adoption. Literature consistently supports the notion that Perceived Usefulness is a crucial determinant of the intention to use technology. According to the TAM 2 model, PU directly influences users' behavioral intention to use technology, as users are more likely to adopt a system that they find beneficial and effective. Similarly, the UTAUT model posits that performance expectancy, analogous to PU, is a significant predictor of behavioral intention. These theoretical frameworks underscore the importance of perceived usefulness in driving user acceptance and the intention to use generative AI applications.

Both the TAM 2 and UTAUT models emphasize the role of PU in technology adoption. TAM 2 extends the original TAM by incorporating additional factors that influence user acceptance, while UTAUT integrates several models of technology acceptance to provide a comprehensive understanding of user behavior. Both models highlight that technologies perceived as useful are more likely to be adopted, supporting the study's finding that PU positively influences ITUG.

4) Relationship between Initial Cost and Intention to use Generative AI: The variable Initial Cost (IC) has a path coefficient of 0.412 and a P value of 0.025, indicating a significant positive influence on the Intention to Use Generative AI (ITUG). This suggests that lower initial costs are likely to increase the intention to adopt generative AI technologies on e-commerce platforms in Sri Lanka. This finding is consistent with previous studies and the Unified Theory of Acceptance and Use of Technology (UTAUT), which highlight the importance of cost considerations in technology adoption.

The positive relationship between IC and ITUG underscores the importance of managing initial costs to enhance the adoption of generative AI applications. Users are more inclined to adopt these technologies if they perceive the initial investment as reasonable and justified by the expected benefits. Research supports the idea that cost is a significant factor influencing the intention to use new technologies. The UTAUT model, which includes facilitating conditions such as cost, suggests that when the initial cost of a technology is perceived as affordable, users are more likely to adopt it (Davis, 1989). This is particularly relevant for generative AI applications, where the perceived value must outweigh the initial expense.

The UTAUT model emphasizes facilitating conditions, including cost, as crucial for technology adoption. This model integrates several theories of technology acceptance, highlighting the importance of cost considerations in shaping user behavior and intentions. The study's finding aligns with UTAUT's proposition that reasonable initial costs can enhance the likelihood of technology adoption.

5) Relationship between Intention to use Generative AI and Adoption Success of using Generative AI apps for E-commerce: The variable Intention to Use Generative AI (ITUG) has a path coefficient of 0.779 and a P value of 0.000, indicating a significant positive influence on the Adoption Success (AS) of using Generative AI for e-commerce. This finding suggests that a strong intention to use generative AI applications directly correlates with successful adoption on e-commerce platforms in Sri Lanka. This relationship is supported by previous studies and the Unified Theory of Acceptance and Use of Technology (UTAUT), which emphasize the critical role of user intention in technology adoption.

The significant positive relationship between ITUG and AS underscores the importance of fostering a strong intention to use generative AI applications to achieve successful adoption. This implies that efforts to enhance user intention can lead to greater acceptance and effective use of generative AI in e-commerce. The literature consistently highlights the importance of user intention in technology adoption. According to the UTAUT model, behavioral intention is a key predictor of actual technology use. Studies have shown that when users have a strong intention to use a technology, it significantly increases the likelihood of successful adoption and integration into their workflows (Davis, 1989). This is particularly relevant for generative AI applications, where user intention can drive engagement and utilization.

The study concludes that Perceived Ease of Use, Perceived Usefulness, Initial Cost, and Intention to Use Generative AI are critical factors influencing the adoption success of generative AI applications on e-commerce platforms in Sri Lanka. By addressing these factors through strategic design, communication, pricing, and support initiatives, e-commerce platforms can enhance user engagement, satisfaction, and successful adoption of generative AI technologies. These insights provide a valuable framework for developers and platform managers aiming to leverage generative AI to drive innovation and improve customer experiences in the e-commerce sector.

V. CONCLUSION AND RECOMMENDATIONS

This research has unveiled critical factors influencing the adoption success of Generative AI apps in E-commerce platforms in Sri Lanka. Users who perceive generative AI apps as easy to operate and flexible and find it easy to learn how to use them are more likely to express a positive intention to use these applications in E-commerce. The productivity, effectiveness, and capability of retaining users also play pivotal roles in fostering positive intentions. Implementation costs were identified as a potential barrier, with high costs negatively impacting the intention to adopt generative AI apps. On the contrary, low training and maintenance costs were found to positively influence users' intentions. The recognition of these cost dynamics emphasizes the need for strategic approaches to mitigate implementation costs, focusing on cost-effective methods to facilitate widespread adoption. These findings are aligned and consistent with previous studies (Abdelkader, 2023; Matz et al., 2023; Wiese & Humbani, 2020). Factors such as innovativeness, perceived benefits, and overall attitudes were identified as positive contributors to the overall adoption success of generative AI apps. The positive correlation between perceived ease of use and the intention to use underscores the importance of enhancing the user experience and learning aspects, which can lead to higher adoption rates (Stoykova & Shakev, 2023). also identified that perceived ease of use and the intention to use enhance the user experience. Recognizing the significance of perceived usefulness, stakeholders should emphasize the productivity, effectiveness, and

user retention aspects to foster positive intentions among users in their research also identified the negative impact of high implementation costs underscores the need for strategies to mitigate these costs, such as exploring cost-effective implementation methods (Short & Short, 2023).

This research aimed to not only assess the technical feasibility of integrating ChatGPT and Bard into existing E-commerce platforms but also to provide actionable recommendations for successful adoption. The insights gained from developer perspectives, technical requirements, and strategic recommendations contribute to a holistic understanding of the adoption landscape for generative AI apps in Sri Lankan E-commerce. As the field of generative AI continues to evolve, the findings and recommendations from this research offer valuable guidance for E-commerce platforms in Sri Lanka. The identified opportunities and challenges provide a roadmap for future research and strategic planning, marking the beginning of a transformative journey for E-commerce platforms in Sri Lanka.

VI. LIMITATIONS AND FUTURE WORKS

While this study illuminates the technical aspects of generative AI adoption, there's a need for further exploration of user experiences. Subsequent research could delve deeper into user interactions, satisfaction, and overall experiences with generative AI apps in Sri Lankan e-commerce. Understanding how users interact with these applications, the factors contributing to their satisfaction, and their overall experience will provide valuable insights for improving these technologies.

The study briefly addresses initial cost challenges, suggesting the need for in-depth investigations into cost-effective strategies for implementing, training, and maintaining generative AI-powered e-commerce applications. Research could focus on identifying cost-saving measures, optimizing resource allocation, and exploring funding options to make these technologies more accessible to a broader range of businesses. Examining the long-term return on investment and cost-benefit analysis of generative AI adoption will help businesses make informed decisions. Longitudinal studies are essential for tracking generative AI adoption success over time, offering a nuanced understanding of its impact on Sri Lankan e-commerce platforms. These studies can monitor changes in adoption rates, user satisfaction, and the overall effectiveness of generative AI applications over extended periods. By observing trends and patterns, researchers can identify factors that contribute to sustained success or highlight areas that require further improvement.

Future researchers may complement quantitative approaches with qualitative studies to gain deeper insights into the subjective experiences and challenges faced by users, developers, and businesses during adoption. Qualitative research methods such as interviews, focus groups, and case studies can provide rich, detailed data on the personal and contextual factors influencing generative AI adoption. This approach will help capture the complexities of user experiences and the specific needs and preferences of different stakeholders.

In the ever-evolving landscape of generative AI, further research should explore how businesses adapt to the latest features, focusing on user-centric aspects such as preferences, ethical considerations, and societal impacts. Investigating how businesses keep up with technological advancements and integrate new capabilities into their operations will provide insights into successful adaptation strategies. Additionally, understanding user preferences and ethical concerns will help ensure that generative AI

applications are developed and deployed in a manner that aligns with societal values and promotes user trust.

Emphasizing the Human Element in Technology Adoption. Future research should emphasize the human element in technology adoption for sustainable and user-friendly implementations. This includes studying the impact of generative AI on job roles, user training and support needs, and the overall societal implications of widespread adoption. By focusing on the human aspect, researchers can develop strategies to mitigate negative effects, enhance user acceptance, and ensure that generative AI technologies are implemented in a way that benefits all stakeholders.

This study provides a foundational understanding of the factors influencing generative AI adoption in Sri Lankan e-commerce. However, there is ample scope for further research to build on these findings. By exploring user experiences, cost-effective strategies, longitudinal impacts, qualitative insights, adaptation to evolving technologies, and the human element, future research can contribute to the development of generative AI applications that are not only technologically advanced but also user-friendly, ethical, and sustainable. This holistic approach will ultimately drive successful adoption and maximize the benefits of generative AI in the e-commerce sector.

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