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**TECHNOLOGICAL INNOVATION AND
SUSTAINABILITY FOR BUSINESS
COMPETITIVE ADVANTAGE**

**THE ROLE OF
ARTIFICIAL
INTELLIGENCE
APPLICATIONS
IN BUSINESS**

**EDITED BY
RA'ED MASA'DEH**

**SERIES EDITORS
ALLAM HAMDAN | REEM KHAMIS**

The Role of Artificial Intelligence Applications in Business

TECHNOLOGICAL INNOVATION AND SUSTAINABILITY FOR BUSINESS COMPETITIVE ADVANTAGE

Series Editors: Allam Hamdan and Reem Khamis

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The Role of Artificial Intelligence Applications in Business

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Preface

This book will shed the light on the crucial role of Artificial Intelligence applications in modern businesses across various industries. The book will assist in determining key aspects of how digital technologies impact businesses. Digital technologies like AI-powered chatbots, self-service portals, and online customer support systems enhance the overall customer experience. Businesses can provide faster responses to queries, personalized recommendations, and proactive support. Digital technologies such as email, instant messaging, video conferencing, and collaborative platforms improve communication and collaboration among employees, teams, and with clients or customers. This facilitates faster decision-making and problem-solving. Further, digital technologies enable businesses to collect and analyze vast amounts of data (big data analytics). These data provide valuable insights into customer behavior, market trends, and operational performance, helping businesses make informed decisions and personalize their offerings.

Moreover, automation and digital tools streamline processes, reducing manual efforts and errors. For instance, project management software, customer relationship management (CRM) systems, and enterprise resource planning (ERP) solutions optimize workflows, leading to increased efficiency and productivity. Digital marketing channels such as social media, search engine optimization (SEO), and online advertising allow businesses to reach their target audience more effectively and at a lower cost compared to traditional methods. Personalized marketing campaigns based on data analysis further enhance customer engagement. Digital technologies have transformed the way businesses sell products and services. E-commerce platforms enable businesses to reach global markets 24/7. A strong online presence through websites, mobile apps, and social media helps attract and retain customers.

In addition, digital technologies enable businesses to adapt quickly to changing market conditions and customer preferences. Cloud computing, for example, allows businesses to scale resources as needed without major upfront investments. This agility fosters innovation and the ability to experiment with new ideas and products. Further, while digital technologies offer numerous benefits, they also introduce risks such as cybersecurity threats and data breaches. Businesses need robust cybersecurity measures and compliance frameworks to protect sensitive information and maintain customer trust.

In summary, this book will clearly contribute to the growing need of digital technologies in giving businesses a competitive edge in today's digital economy, since digital technologies are integral to modern business operations, driving efficiency, innovation, and growth while also posing challenges that require careful management.

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Chapter 1

Acceptance of Artificial Intelligence in a Jordanian Firm: An Overview

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Abstract

Artificial Intelligence (AI) is an automatic tool of investment, created to help investors in their investment undertakings, but those who use only the old investment methods in their investment activities may find AI challenging to use. In fact, a user will likely adopt a new technology if they feel that utilizing the technology is secure and that the technology assures that their data are protected. AI service provider company needs to be committed in assuring user that the service is trustable and that the investment process is risk-free, to increase use potential among users/investors. Factors will contribute to positive attitude and AI adoption among users will investigate in this study, using the Technology Acceptance Model (TAM) and two additional constructs namely subjective norms and trust.

Keywords: Artificial Intelligence; subjective norms; trust; usefulness modeling; intention to use; Jordan

1. Introduction

In today's highly competitive business setting, retailers are obliged to keep their customers satisfied, in order to stay in business (Al-Bashayreh et al., 2022; Almajali, 2021; Habes et al., 2024; Zarafili & Zarafili, 2023). Various methods have been employed, to make customers happy and satisfied. In fact, it has been reported that for customers, happiness can result in loyalty, and not only that, happy and loyal customers are likely to bring with them new and potential customers (Moore et al., 2022). Relevantly, customer satisfaction can be generated

through value-added services provided in the shopping experience of the customer, as these services could satisfy the customers more than they had anticipated. For retail industry, the issue of customer satisfaction must not be overlooked. Today, Artificial Intelligence (AI) is increasingly common in usage in retail industry. AI allows the business to resolve problems in an ingenious manner and impart the customer with extraordinary experiences. Clearly, AI imparts significant impact on retail industry (Hsu & Lin, 2023).

AI is increasingly popular in today's online shopping, and its usage within this form of shopping is various; AI can be utilized when user wants to perform voice and photo search or create personalized shopping experiences (Hsu & Lin, 2023). AI tools include chatbots and virtual assistance, among others (Baabdullah et al., 2022; Hsu & Lin, 2023). For business, AI usage allows the business to acquire information on the traits, needs, and behaviors of the customer, from the customer profile. This information is usable in the creation of personalized experience for the customer, simultaneously improving the business operation and customer experience. Moura et al. (2021) highlighted the need to improve customer experience among businesses because in examining online shoppers, roughly 76% of these shoppers expected continuous interactions, 66% expected that the business is aware of that they need and expect, and 52% expected to be given offers specific to their needs (personalized offer).

AI comprises many tools, and chatbots and virtual assistants are among the commonly used AI tools. Studies on online shopping have examined the impact of both chatbots and virtual assistants on the online shopping experience of customers, but Aw et al. (2022) and Baabdullah et al. (2022) indicated that AI is still a new technology and its effectiveness is still unproven. Also, there are factors to take into account in the use of AI, and these include the factors of gender, age, in addition to the level of education of user (Baabdullah et al., 2022). In other words, a gap in the literature concerning actual AI use seems to exist, and the present study attempted to close it by examining AI theoretical research and real-world data mining applications and creating business value from the knowledge gained from the data (Liu et al., 2023). In particular, the manner in which AI tools in online retail websites (e.g., voice and photo search, chatbots, and virtual assistants) improve the overall satisfaction of Jordanian investors was examined in this study.

Customers all over the globe can now make purchases online, and having this ability has greatly affected them (Lari et al., 2022). Meanwhile, chatbots or other digital assistants powered by AI have been used by online retailers in providing the online shoppers consistent support to enhance their (shoppers) shopping experience. Chatbots, when applied in online retail, increase the impact of AI, owing to the use of natural language processing (NLP). This type of language processing (NLP) could grasp and respond to voice conversations of customer. NLP has the ability to have deep understanding in satisfying the demands of customers and generate the targeted or personalized offers to customers, and over time, through self-learning skills, NLP can be improved (Nimbalkar & Berad, 2021).

The impacts of AI on online retail have been examined in numerous countries. In the United States, a developed nation, Brill et al. (2019) examined the relationship between customer satisfaction and AI-enabled digital assistants. The authors concluded that AI applications have positive impact on customer satisfaction. Meanwhile, Li et al. (2020) in examining AI usage in customer support in China reported that 71.5% of the study respondents indicated their acceptance or at least they did not reject AI usage in customer support. Additionally, Yang et al. (2022) stated that AI adoption among retailers in China bolsters return policies, increases resale returns, while decreasing the potential problem of out-of-stock or leftovers of items. Additionally, Abu Daqar and Smoudy (2019) in Palestine examined how customer experiences could be enhanced through the use of AI and discovered a solid connection between customer experience and AI-enabled personalized customer support and postpurchase customer assistance. Examining AI-enabled online shopping and customer experiences in India, Ersoy (2022) found positive connection between both constructs and further reported that nearly all respondents (92.3%) had an intention to recommend AI-enabled online shopping. These past findings were demonstrating the tendency of usage of AI-powered services among online shoppers. Still, knowledge on AI is at the basic level, especially in Jordan.

2. Literature Review

The literature has introduced various theories and models to understand new technology acceptance and usage. For instance, in 1989, Davis et al. presented the Technology Acceptance Model (TAM). Afterward, Ajzen (1991) introduced the Theory of Planned Behavior (TPB). Some other theories are equally popular and useful in examining new technology acceptance and usage, namely the Innovation Diffusion Theory (IDT) by Rogers (2003) and the Unified Theory of Acceptance and Use of Technology (UTAUT) by Venkatesh et al. (2003). Among these, TAM has been among the most frequently used, primarily owing to its ease of use (King et al., 2006). As a model, TAM follows the Theory of Reasoned Action (TRA) that portrays acceptance behavior, and this model includes two vital factors (independent variables) that determine behavioral intention to use, namely perceived ease of use and perceived usefulness. Perceived ease of use and perceived usefulness have direct linkage to the factor of actual usage in Fishbein and Ajzen's (1975) TRA.

TAM also has weaknesses despite being popular among scholars. Firstly, TAM has limited explanatory power because it represents only 40% of the total variance (Venkatesh et al., 2003). In addition, self-reported use of TAM could result in partiality in technology adoption process (Davis, 1989), aside from being difficult to implement in empirical studies (Davis, 1989; Fishbein & Ajzen, 1975). Furthermore, TAM does not provide actual comprehensive measures, particularly in researches that utilize employ beliefs, attitudes, and user intentions as variables (Mathieson, 1991). TAM also does not consider subjective norms as a vital element (Davis, 1989) because the development of TAM was based on

unclear theories. The exclusion of subjective norms (social, individual, and cultural aspects) results in low explanatory power of TAM (Benbasat & Barki, 2007).

Subjective norms comprise the impact of other user(s)' perceptions on the behavior of an individual (Lucas & Spitler, 1999), and in general, these perceptions are associated with the social influence of the user toward being member of certain group, such as colleagues and family. There are two forms of subjective norms namely internal influences and external influences, and it has been reported by Belanche et al. (2019) that subjective norms are among the major factors affecting adoption of new technology services among customers in Anglo-Saxon nations. Aside from subjective norms, other factors also have significant impact on technology adoption, and some of these factors have been reported by Agarwal and Karahanna (2000) and they are: training, design system, decision-making properties, and enjoyment.

Trust, which encompasses a set of beliefs that a person forms relating certain attributes relating to certain factors such as environment, society, etc. (Wang et al., 2006), also affects technology adoption considerably (Gupta et al., 2019). In fact, trust has been documented as a vital determinant of the effectiveness of any intended change, particularly with respect to technology adoption. The level of trust affects the efficacy of change initiatives level (Bellé, 2013). Furthermore, trust is formed when customer perceives privacy and security, and when there is trust, perceived risk in new technology adoption can be reduced (Ajzen, 1991). When adopting a new technology, trust of the adopter/user is mainly in service and the service providers; as indicated by Varshney (2002), trust in services means that new technology usage is free from issues relating to data security and privacy during financial transactions. A service provider with good reputation and ability to operate without causing financial difficulty to its client is indeed a trustable service provider (Kim & Jin, 2002; Lee et al., 2003). When adopting a given technology, trust may be perceived as an important antecedent of ease of use and perceived usefulness, and through customer loyalty, perceived ease of use affects customer trust directly (Kim et al., 2008).

3. Hypothesis Development

A model with the ability to explain consumer acceptance of new technology is yet to exist, owing to the complexity of this phenomenon (consumer acceptance of new technology). As such, in order to understand better the acceptance of consumer of new technology, constructs that significantly affect technology acceptance need to be added to the well-established models. Hence, in this study, the constructs of subjective norms and trust were added to TAM. Accordingly, the formation of the hypotheses is as presented below:

Subjective norms encompass perceptions of individual toward some new technology or service, and these perceptions are subject to the individual's environment. For customers, subjective norms are their desire to become part of certain group or do things that other members of this group do. In the early stages of adoption especially, Taylor and Todd (1995) reported significant impact of

subjective norms on innovation adoption. However, with the passing of time and enrichment of knowledge, the role played by subjective norms becomes more complex (Venkatesh et al., 2003). Subjective norms also contextually affect knowledge (Venkatesh et al., 2003). Within the context of online purchase, intention of user would be affected by subjective norms (Pavlou & Fyngenson, 2006). The impact of subjective norms on intention of user was also reported in mobile financial services usage (López-Nicolás et al., 2008). Clearly, subjective norms impart significant impact on new technology acceptance and adoption and on trust as well. Owing to the significance of this construct, it has been added into TAM in many studies (Raue et al., 2020). The following hypothesis was hence proposed:

H1. Subjective norms have a positive impact on the trust in AI services.

Trust is an opinion of a person toward certain attributes (Lin et al., 2007), and in new technology adoption, trust would significantly affect the attitude and intention of user. When discussing services, a trustable service is one that is both dependable and secure (Schmidt-Belz, 2003), and it is important that a new service or technology platform offers better outcomes, compared to the conventional one. Relevantly, in AI-based investments services, reliability, performance scalability, service authenticity, and compatibility with the clients' interests have been reported as the factors affecting trust (Alalwan, 2022; Olsen, 2012).

An investment-related technology needs to have institutional infrastructure of security and privacy. This infrastructure, as highlighted by Cheung et al. (2001), promotes customer trust. Therefore, the secure delivery of indispensable information that serves the customer will make the customer more confident to invest. Having that trust, customer will feel less uncertain and more satisfied toward using the new technology (Pavlou, 2003). Manrai et al. (2021) added that for the customer, trust results in future positive investment outcome. Furthermore, a confident customer would have higher likelihood to expect that the new technology use will be beneficial. As such, in service adoption, trust in the system is expected to have effect on perceived usefulness and behavioral intention. The following hypotheses were thus established:

H2a. Trust in service has a positive impact on the perceived usefulness.

H2b. Trust in service has a positive impact on the behavioral intention to use AI services.

Trust can also be understood as the level to which a customer is sure that service provider in question reliably functions under risky or uncertain situations (Manrai et al., 2021). Benamati et al. (2010) accordingly presented the three dimensions of trust, namely ability (need for service provider to demonstrate adequate knowledge, skills, and experience in carrying out their allotted tasks), integrity (the need for service provider to scrupulously provide security and returns to users, as promised), and benevolence (the need for service providers to

know the interests of their clients, as described by [Shin et al. \(2016\)](#)). [Reher and Sun \(2016\)](#) indicated that these three dimensions imply the need for technology businesses to provide their clients with transparent low-risk and low-cost business portfolios.

Relevantly, regulatory bodies have brought to light some technology-related issues including conflicts of interest and poor risk assessment tolerance on the investor's side. These bodies also have reported the lack of personal interest and discontented fiduciary duties toward the investors. All of these concerns could impair customer trust. Hence, in addition to offering AI technology for investment, service providers should make the efforts to foster customer trust toward them. Hence, the following hypothesis:

H2c. Trust in service providers has a positive impact on the behavioral intention to use AI services.

4. Conclusion

Data will be gathered via self-administered questionnaires. A total of 1,000 investors from Amman City in Jordan were chosen as the study respondents, through the application of convenience sampling technique. These respondents had experience in AI usage during the early stage of AI implementation. These chosen respondents would accurately represent the Jordanian population because Amman is the capital city of the kingdom, and many of people in Amman were active investors. The selection of these respondents was based on a list of stock market investors in Jordan (Jordan Stock Market [ASE General] – 2023 Data – 1999–2022 Historical – 2024 Forecast [tradingeconomics.com]). Upon completion, the respondents will ask to return the questionnaire.

Despite its significance in the extant domain, this study has limitations, the first being the method chosen in respondent selection, namely the convenience sampling technique, that is, the respondents chosen will from only one place in Jordan, namely, the Amman City, owing to its convenience. This means that the results cannot be comfortably generalized to the residents of other cities or countries, as people living in different cities or regions or countries may differ. Hence, had the respondent be selected from other city or region or country, the results may differ. The next limitation concerns the use of the construct of behavioral intentions to adopt new technology services because according to [Venkatesh and Davis \(2000\)](#), behavioral intentions are almost comparable to the actual use. In volitional behavior, actual use is strongly connected to behavioral intentions, particularly at the early adoption stage. Notably, the passing of time may alter behavioral intentions and actual use. Additionally, this study will focus on attitude and behavior intentions toward new technology services, with no consideration on continued use, which may be examined in future work. Lastly, similar study may be carried out using longitudinal approach, involving various cities and countries to make the findings more generalizable and accurate.

Subjective norms will represent by internal influence and external influence, while trust will represent by trust in service and trust in service providers. In other words, TAM was expanded in this study, and this expansion improved the model's explanatory power. TAM's theoretical and practical significance will also improve. The comprehensive framework resulting from the TAM's expansion may facilitate future studies on technology adoption, specifically those exploring the new information technologies. Results showed a significance of subjective norms and trust as influencing factors, in the adoption of new technology, making both factors critical in ascertaining the acceptance of investors toward AI. For AI service provider company, correct strategies must be in place to increase AI technology adoption.

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