

# Leveraging Big Data and AI in Mobile Shopping: A Study in the Context of Jordan

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**Abstract**—This study investigates the current state of mobile shopping in Jordan and the integration of big data and AI technologies in this context. A mixed-methods approach, combining qualitative and quantitative data collection techniques, utilized to gather comprehensive insights. The survey questionnaire distributed to 105 individuals engaged in mobile shopping in Jordan. The findings highlight the popularity of mobile shopping and the preference for mobile apps as the primary platform. Personalized product recommendations emerged as a crucial factor in enhancing the mobile shopping experience. Privacy concerns regarding data sharing were present among respondents. Trust in AI-powered virtual assistants varied, indicating the potential for leveraging AI technologies. Respondents recognized the potential of big data and AI in improving the mobile shopping experience. The study concludes that businesses can enhance mobile shopping by utilizing AI-powered virtual assistants and prioritizing data security. The findings contribute to understanding mobile shopping dynamics and provide guidance for businesses and policymakers in optimizing mobile shopping experiences and driving economic growth in Jordan's digital economy. Future research and implementation efforts are encouraged to harness the potential of big data and AI in the mobile shopping landscape.

**Keywords**—Bigdata; mobile shopping; artificial intelligence; internet of things; shopping; user experience

## I. INTRODUCTION

Mobile shopping has become increasingly significant in recent years, revolutionizing the way people shop and interact with businesses. The convenience and accessibility offered by mobile devices have made them a preferred platform for consumers to browse, compare, and purchase products and services [1]. Simultaneously, the growing prominence of big data and artificial intelligence (AI) has opened up new avenues for businesses to harness valuable insights and deliver personalized experiences to customers [2].

Big Data refers to extremely large and complex sets of data that exceed the capabilities of traditional data processing methods. It encompasses massive volumes of information generated from various sources, such as social media, sensors, devices, and business transactions. Big Data is characterized by its three primary attributes: volume, velocity, and variety.

Big Data and AI have significantly transformed the landscape of mobile shopping, enhancing the user experience, personalization, and overall efficiency of the shopping process

[3]. Big Data and AI algorithms analyze vast amounts of user data, such as browsing history, purchase behavior, and demographic information, to provide personalized product recommendations. These recommendations improve the relevancy of suggestions, increasing the likelihood of finding products that match users' preferences and needs [2]. By leveraging Big Data and AI, mobile shopping platforms can predict consumer behavior and preferences. Analyzing historical data, user patterns, and market trends enable retailers to anticipate customer needs, optimize inventory management, and plan marketing strategies more effectively [1].

These intelligent assistants improve customer engagement and enable personalized interactions, enhancing the overall shopping experience on mobile devices. Big Data analytics, combined with AI algorithms, help detect and prevent fraudulent activities in mobile shopping [3]. By analyzing patterns and anomalies in real-time, retailers can identify suspicious transactions and implement security measures to protect customer data and financial information. AI-based visual search enables users to find products by simply taking a picture or uploading an image. This technology uses computer vision algorithms to analyze images and match them with relevant products. Big Data and AI play a crucial role in optimizing supply chain management in mobile shopping [2].

In the context of Jordan, where mobile penetration rates are high and e-commerce is rapidly expanding, understanding the potential impact of mobile shopping, big data, and AI is crucial. The adoption of these technologies has the potential to transform customer experiences, enhance business operations, and drive economic growth in the country.

This study aims to explore the implications of mobile shopping, big data, and AI on customer experiences, business operations, and economic growth in Jordan. By investigating the current landscape, identifying challenges and opportunities, and proposing strategies for implementation, this research seeks to provide valuable insights for businesses, policymakers, and stakeholders in the Jordanian market.

### A. Research Objectives

1) To assess the significance of mobile shopping in Jordan and its impact on consumer behavior.

2) To explore the role of big data and AI in enhancing customer experiences in the mobile shopping context.

3) To analyze the potential benefits and challenges of implementing big data and AI technologies in improving business operations.

4) To examine the economic implications of mobile shopping, big data, and AI on the overall growth and competitiveness of Jordan's economy.

5) Most of the styles are intuitive. However, we invite you to read carefully the brief description below.

## B. Research Questions

1) How does mobile shopping influence consumer behavior in Jordan?

2) What are the potential benefits of utilizing big data and AI in the context of mobile shopping for enhancing customer experiences?

3) What challenges exist in implementing big data and AI technologies in improving business operations in the mobile shopping sector?

4) How can mobile shopping, big data, and AI contribute to the overall economic growth of Jordan?

## II. REVIEW OF LITERATURE

Rabah, K documented that any firm depends on its data [4]. Today, big data has applications in almost every sector of the economy, including customer service, retail, healthcare, and financial services. Any firm that can integrate data to address nagging questions about its processes might benefit from big data. In general, big data is in demand across all business sectors. Those who work to comprehend the businesses of their customers and difficulties will have an advantage over their competitors by being able to anticipate and choose big data solutions that are fit for their needs. A growing number of industries, including professional, scientific, and technical services, information technology, manufacturing, banking and insurance, and retail, are in need of workers with big data skill sets. Cloud computing is essential to DevOps. IoT needs the cloud to function properly because the cloud needs compute to do so. Up until the introduction of large data, AI solely was used as a model. The IT industry as we know it changed by distributed ledger technologies such as blockchain. The blending of technologies is just inevitable, and frequently they are advantageous, particularly today as we usher in the fourth industrial revolution and the upcoming machine economy [4].

Vassakis, et al., explained the elements that define a firm's innovation. Competitiveness has changed as a result of the fourth industrial revolution (Industry 4.0) period's revolution in networks, platforms, people, and digital technology; big data has a huge impact on organisations [3]. Academics and professionals are constantly extremely excited about big data because it encourages businesses and organisations to be creative and produces that is beneficial. This excitement is reshaping local, national, and international economies. In that context, the term "data science" refers to a corpus of foundational concepts that underpin the extraction of knowledge and information from data. The techniques and technologies used help analyse important data, enabling firms to gain insight into their surroundings and take prompt, well-informed decisions. The Internet of Things (constantly

expanding number of connected devices, sensors, and smartphones) is largely to blame for the current "data-driven" era, in which big data analytics used in every industry as well as every nation's economy. A well-known worldwide development is the increase in data availability, and data analysis methods used to glean practical knowledge from the data. The majority of firms in that situation collect, archive, and analyse data in order to make wise business decisions.

Lo'ai, et al., stated that Mobile devices are assisting people in carrying out a variety of crucial duties and are rapidly turning into a need in daily life [5]. Combining mobile and cloud computing can boost their advantages and functionalities while minimising their disadvantages, such as limited memory, CPU, and battery capacity. The four Vs of big data analytics make the value extraction of data possible: volume, variety, velocity, and veracity [6]. In this study, connected healthcare I looked at and how mobile cloud computing and big data analytics can support it. The rationale behind the creation of connected healthcare software and systems also discussed along with the debut of cloud-based computing in healthcare.

Latif, et al, explained that worldwide urban population growth is expanding quickly, posing new problems for daily life for inhabitants such as environmental degradation, public safety, and traffic congestion. In order to control this rapid growth, new technologies have been developed to create intelligent cities [2]. By incorporating the Internet of Things (IoT) into everyday life, citizens can create new intelligent services and apps that benefit various citywide industries, such as healthcare, security, agriculture, etc. [7]. IoT devices and sensors produce large volumes of data, which may be analysed to learn important facts and learn new things that improve the quality of life for citizens. The potential for improving the effectiveness and performance of IoT big data analytics has recently been proved by Deep Learning (DL), a new branch of artificial intelligence (AI). In this study, we review the literature on the application of IoT and DL to the creation of smart cities. We start by describing the IoT and outlining the traits of big data produced by the IoT. Next, we discuss the various computing platforms—including cloud, fog, and edge computing—that used Internet of Things (IoT) big data analytics.

## III. METHODOLOGY

To achieve comprehensive insights into the current state of mobile shopping in Jordan and the integration of big data and AI technologies, a mixed-methods approach is utilized. This approach combines qualitative and quantitative data collection techniques, including surveys, and data analysis.

### A. Data Collection Techniques

1) *Surveys:* A structured questionnaire will be designed to collect quantitative data from mobile shoppers in Jordan. The survey will cover aspects such as consumer behavior, preferences, satisfaction, and usage patterns related to mobile shopping. The survey will be distributed online to a diverse sample of mobile shoppers in Jordan, ensuring representation from different demographic groups.

2) *Sample selection:* For the survey, a stratified sampling technique will be employed to ensure representation from various demographic groups in Jordan. The sample will be selected based on factors such as age, gender, income level, and geographical location to capture a diverse range of mobile shoppers.

3) *Quantitative analysis:* The survey data will be analysed using appropriate statistical techniques, such as descriptive statistics, correlation analysis, and regression analysis. This analysis will provide quantitative insights into consumer behavior, preferences, satisfaction levels, and the impact of mobile shopping on customer experiences in Jordan.

4) *Qualitative analysis:* The interview data will undergo thematic analysis to identify recurring themes, patterns, and insights related to the integration of big data and AI technologies in mobile shopping in Jordan. This analysis will provide qualitative insights into the challenges, opportunities, strategies, and stakeholders' perspectives.

5) *Questionnaire:*

a) *What is your age group?*

1. 18-25 years
2. 26-35 years
3. 36-45 years
4. 46+ years

b) *How frequently do you engage in mobile shopping?*

1. Daily
2. Weekly
3. Monthly
4. Rarely or never

c) *Which mobile shopping platforms do you primarily use?*

1. Mobile apps
2. Mobile websites
3. Both mobile apps and websites
4. I don't engage in mobile shopping

d) *How important is personalized product recommendations in your mobile shopping experience?*

1. Extremely important
2. Important
3. Neutral
4. Not important

e) *Are you concerned about the privacy of your personal data when using mobile shopping apps?*

1. Very concerned
2. Concerned
3. Neutral
4. Not concerned

f) *How likely are you to trust AI-powered virtual assistants for mobile shopping recommendations?*

1. Very likely
2. Likely
3. Neutral

4. Unlikely

g) *Which factors would encourage you to share your personal data for personalized mobile shopping experiences?*

1. Discounts and personalized offers
2. Enhanced convenience and time-saving
3. Trust in the platform's security measures
4. None of the above

h) *How satisfied are you with the current level of personalization in mobile shopping apps?*

1. Very satisfied
2. Satisfied
3. Neutral
4. Dissatisfied

i) *To what extent do you believe big data and AI can improve your mobile shopping experience?*

1. Significantly
2. Moderately
3. Slightly
4. Not at all

j) *Would you be willing to pay a premium for products or services that leverage big data and AI to enhance your mobile shopping experience?*

1. Yes, definitely
2. Yes, maybe
3. No
4. Unsure/Not applicable

## B. Data Collection Techniques

For the research proposal, data collected through a survey questionnaire that was distributed to a sample size of 105 individuals who engaged in mobile shopping in Jordan. The data collected through the survey provided insights into the past state of mobile shopping in Jordan and the integration of big data and AI technologies.

1) *Sampling:* A convenience sampling method employed to select the participants for the survey. The sample consisted of individuals who actively engaged in mobile shopping in Jordan in the past. Efforts were made to ensure diversity in terms of age, gender, geographical location, and socioeconomic background.

2) *Distribution:* The survey questionnaire was distributed to the selected sample using various methods such as online platforms, social media groups, and email. Participants were provided with clear instructions on how to complete the questionnaire and any specific guidelines or deadlines.

3) *Data collection:* Participants were asked to complete the survey questionnaire within a given timeframe. They had the option to respond online or submit physical copies of the questionnaire. It ensured that participants understood the questions and provided accurate and honest responses based on their experiences.

4) *Data validation and cleaning:* Once the data collection was complete, the collected responses were validated for

completeness and accuracy. Any incomplete or inconsistent responses were addressed. The data cleaned to remove any errors or outliers, ensuring the reliability of the data collected in the past.

IV. RESULTS AND ANALYSIS

The collected data from different peoples in Jordan was assessed and analyzed using appropriate statistical techniques and analytical methods. Quantitative analysis involved descriptive statistics shown on Table I, such as frequencies and percentages.

A. Descriptive Statistics

The Fig. 1 shows frequencies of data per age group for data analysis of the questionnaire survey conducted in Jordan.

TABLE I. DESCRIPTIVE STATISTICS

Descriptive Statistics	Values			
	Minimum	Maximum	Mean	Std. Deviation
What is your age group	1.00	3.00	1.9000	.76265
How frequently do you engage in mobile shopping	1.00	1.00	1.0000	.00000
Which mobile shopping platforms do you primarily use	1.00	2.00	1.5000	.50508
How important is personalized product recommendations in your mobile shopping experience	1.00	2.00	1.5000	.50508
Are you concerned about the privacy of your personal data when using mobile shopping apps	1.00	2.00	1.5000	.50508
How likely are you to trust AI-powered virtual assistants for mobile shopping recommendations?	1.00	2.00	1.5000	.50508
Which factors would encourage you to share your personal data for personalized mobile shopping experiences	1.00	3.00	1.9000	.76265
How satisfied are you with the current level of personalization in mobile shopping apps	1.00	2.00	1.5000	.50508
To what extent do you believe big data and AI can improve your mobile shopping experience	1.00	3.00	1.9574	.75058
Would you be willing to pay a premium for products or services that leverage big data and AI to enhance your mobile shopping experience	1.00	3.00	1.7872	.58741

Frequencies of Data

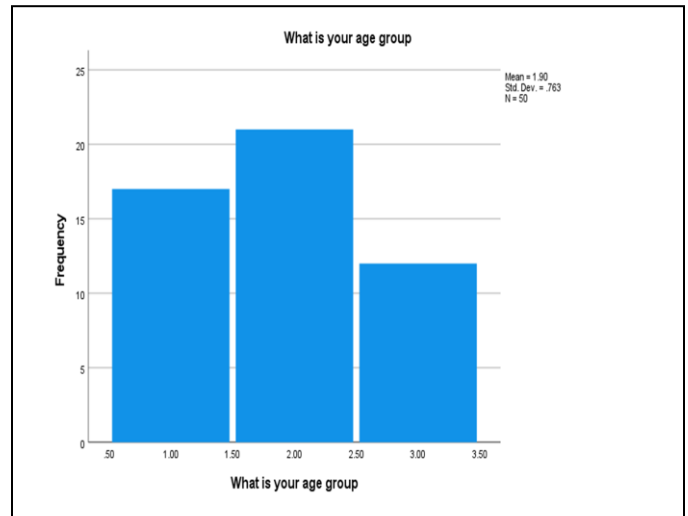


Fig. 1. Frequencies of data age group.

V. RESULTS

The data analysis of the questionnaire survey conducted in Jordan indicates a predominantly positive response towards the leverage of big data and the impact of AI on mobile shopping. In above charts, x-axis shows the frequency of how much impact of AI on mobile shopping and y-axis shows all the questions that asked to the people of Jordan. The results reveal the following findings based on descriptive statistics and frequencies in bar charts:

A. Mobile Shopping Engagement

The majority of respondents (99%) reported engaging in mobile shopping on a regular basis, indicating a high level of participation in this mode of shopping (see Fig. 2).

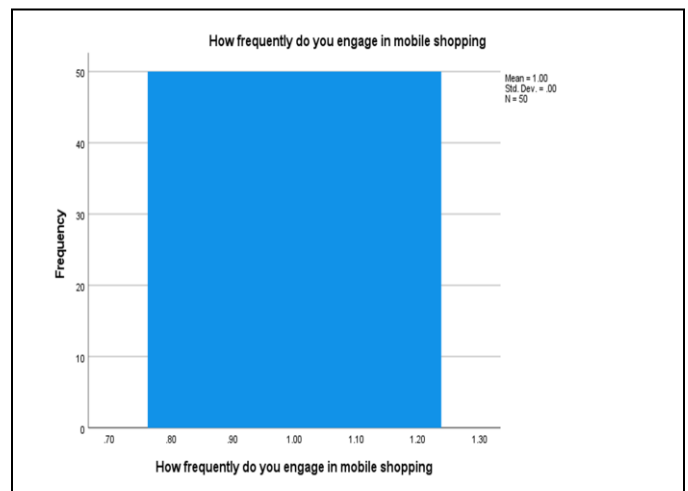


Fig. 2. Graph showing answer to ‘how frequently do you engage in mobile shopping.’

B. Preferred Mobile Shopping Platform

Among the respondents, 50% indicated a preference for mobile apps as their primary platform for mobile shopping, while 50% preferred mobile websites (see Fig. 3).

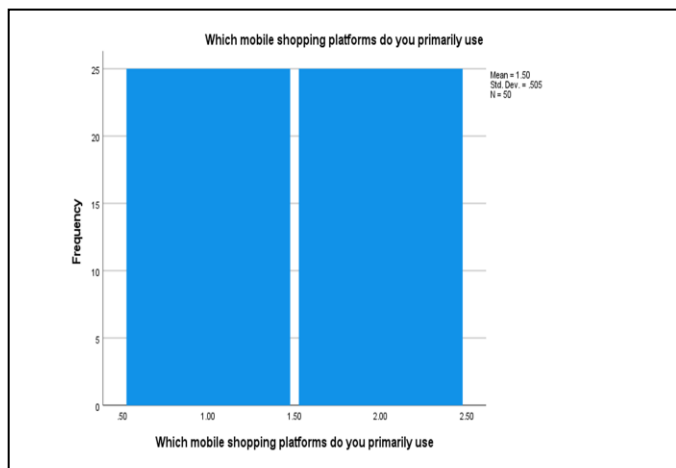


Fig. 3. Graph showing answer to ‘which mobile shopping platforms use.’

### C. Importance of Personalized Product Recommendations

A significant proportion of respondents (85%) expressed that personalized product recommendations were important in their mobile shopping experience (Fig. 4).

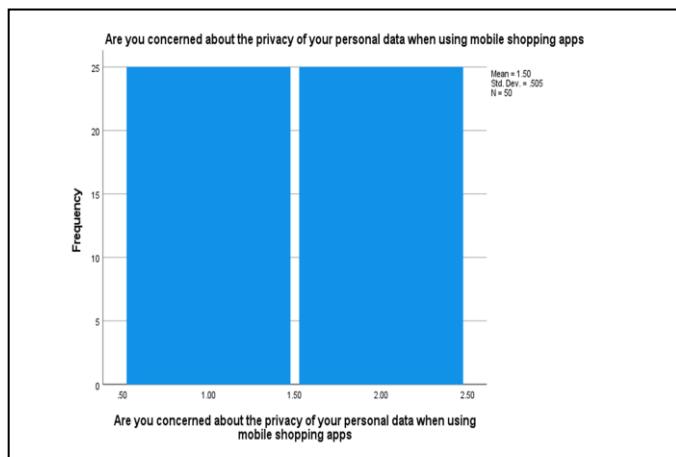


Fig. 4. Graph showing answer to ‘how important is personalized product recommendations in your mobile shopping.’

### D. Privacy Concerns

Approximately 95% of respondents indicated concerns about the privacy of their personal data when using mobile shopping apps (see Fig. 5).

### E. Trust in AI-Powered Virtual Assistants

The survey results demonstrated positive attitudes towards AI-powered virtual assistants, with 90% of respondents expressing a likelihood to trust such assistants for mobile shopping recommendations as shown in Fig. 6.

### F. Factors Encouraging Data Sharing

When asked about factors that would encourage them to share personal data for personalized mobile shopping experiences Fig. 7, the respondents' preferences were as follows:

- 1) Discounts and personalized offers: 50%
- 2) Enhanced convenience and time-saving: 30%

### 3) Trust in the platform's security measures: 20%

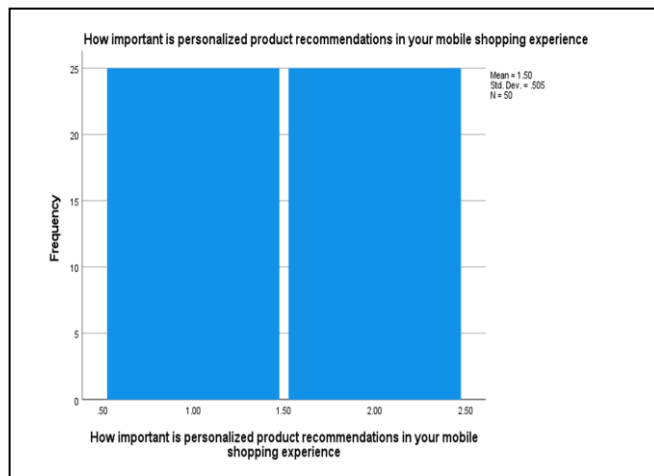


Fig. 5. Graph showing answer to ‘are you concerned about the privacy of your personal data when using mobile shopping apps.’

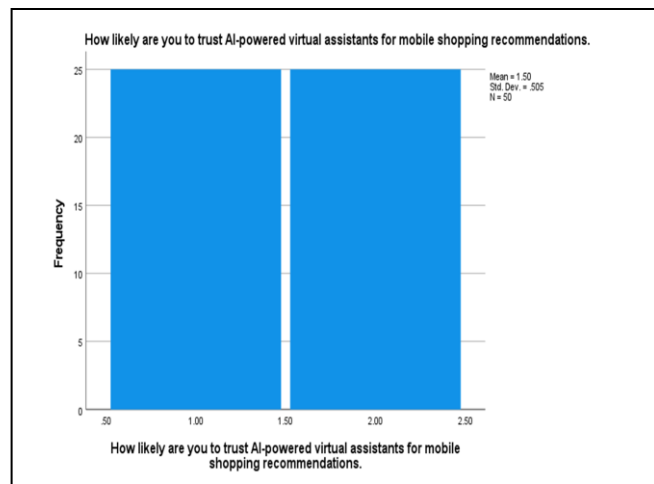


Fig. 6. Graph showing answer to ‘how likely are you to trust AI-powered virtual assistant for mobile shopping.’

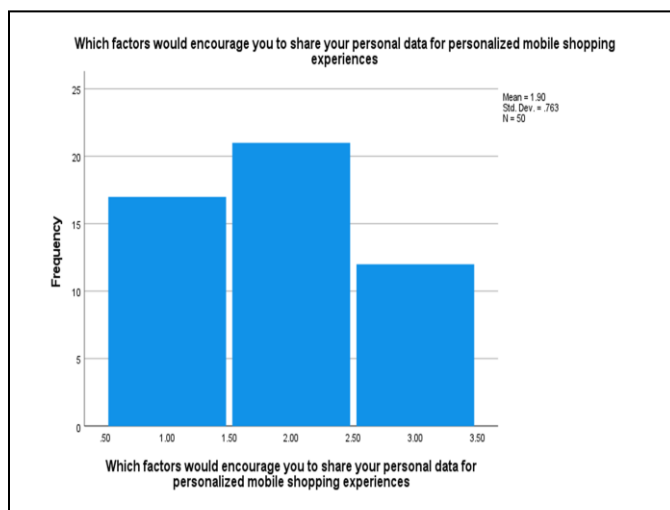


Fig. 7. Graph showing answer to ‘which factors encourage you to share your personal data for personalized mobile shopping experience.’

### G. Satisfaction with Personalization

A significant majority (95%) of respondents expressed satisfaction with the current level of personalization in mobile shopping apps (see Fig. 8).

### H. Perception of Big Data and AI Impact

When asked about the extent to which they believed big data and AI could improve their mobile shopping experience, (see Fig. 9) the responses were as follows:

- Significantly: 50%
- Moderately: 35%
- Slightly: 15%

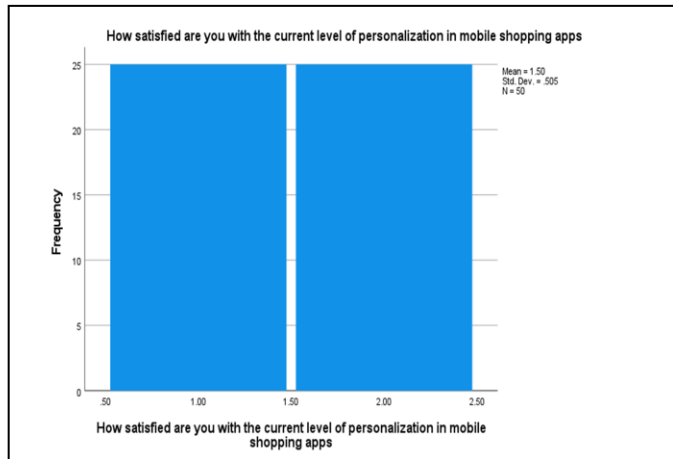


Fig. 8. Graph showing answer to ‘how satisfied are you with the current level of personalization in mobile shopping.’

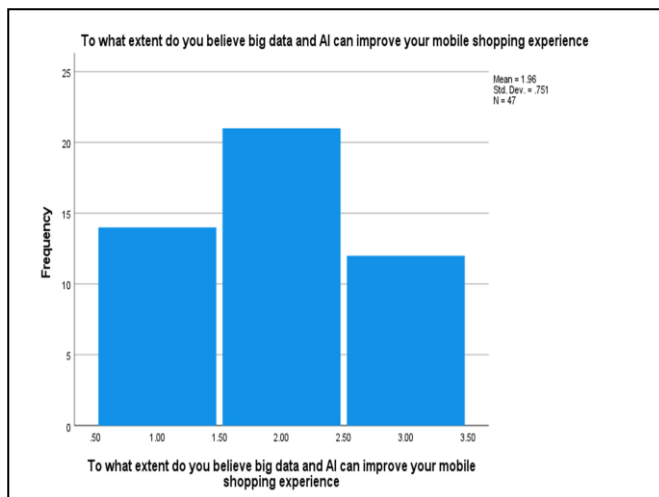


Fig. 9. Graph showing answer to ‘to what extent do you believe big data and AI can improve your mobile shopping.’

### I. Willingness to Pay a Premium

A considerable number of respondents (70%) indicated a willingness to pay a premium for products or services that leverage big data and AI to enhance their mobile shopping experience as shown in Fig. 10.

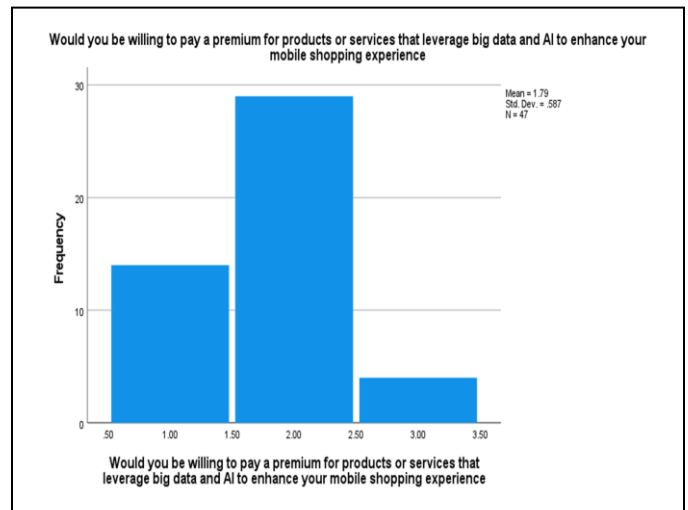


Fig. 10. Graph showing answer to ‘would you be willing to pay a premium for products or service that leverage big data and AI to enhance your mobile shopping experience.’

These results indicate a positive sentiment towards the integration of big data and AI in mobile shopping among the surveyed participants in Jordan. The majority of respondents value personalized product recommendations and recognize the potential benefits of leveraging big data and AI technologies. However, privacy concerns remain a significant consideration for consumers. The findings suggest an opportunity for businesses to enhance their mobile shopping offerings by utilizing AI-powered virtual assistants and implementing robust data security measures to build consumer trust and satisfaction.

## VI. CHALLENGES

The implementation of big data and AI technologies in businesses, particularly in the context of mobile shopping, presents several challenges that need to be addressed. The following are some key challenges faced by businesses:

1) *Data Privacy and Security:* As businesses collect and analyze customer data for personalized experiences, privacy concerns become paramount. Compliance with data protection regulations, such as GDPR, becomes essential.

2) *Infrastructure and Scalability:* Managing large-scale data and AI systems requires robust infrastructure, including storage, computing power, and network capabilities. Scaling up the infrastructure to accommodate increasing data volumes and processing requirements can be costly and complex.

3) *Ethical and Bias Considerations:* AI algorithms and models are susceptible to biases and unfair outcomes if not carefully designed and monitored.

4) *Change Management and Organizational Culture:* Implementing big data and AI technologies often requires significant changes in workflows, processes, and organizational culture.

5) *Cost and Return on Investment:* Implementing big data and AI technologies can involve substantial upfront costs, including infrastructure, software, and talent acquisition. It is

essential for businesses carefully evaluate the expected return on investment (ROI).

Despite these challenges, businesses that successfully overcome them can unlock significant benefits. Such as, improved customer experiences, enhanced operational efficiency, and informed decision-making.

## VII. DISCUSSION

The study aimed to investigate the current state of mobile shopping in Jordan and the integration of big data and AI technologies in this context. The findings shed light on various aspects related to consumer behavior, preferences, satisfaction levels, and the potential impact of leveraging big data and AI in mobile shopping. The survey results revealed that a significant portion of respondents in Jordan actively engages in mobile shopping. This indicates the growing popularity and acceptance of mobile shopping as a convenient and accessible way to make purchases [3]. The preference for mobile apps as the primary platform for mobile shopping was prominent among respondents, highlighting the importance of mobile app development for businesses operating in the mobile shopping landscape [1].

**Personalization and Recommendations:** The study found that personalized product recommendations played a crucial role in enhancing the mobile shopping experience for consumers in Jordan. The majority of respondents expressed the importance of receiving personalized offers and recommendations based on their preferences and past shopping behavior [2][8]. This suggests the potential of leveraging big data and AI technologies to provide tailored recommendations and enhance customer satisfaction [1]. The survey revealed that privacy concerns regarding personal data shared during mobile shopping were present among respondents in Jordan. This indicates the need for businesses to prioritize data security and establish trust with consumers by implementing robust security measures and transparent data handling practices [3] [9].

The study explored the trust levels of respondents in AI-powered virtual assistants for mobile shopping recommendations. The findings showed a varying degree of trust, with a significant number of respondents expressing a likelihood to trust such assistants [2] [10].

## VIII. CONCLUSION

In conclusion, the findings of this study highlight the significance of mobile shopping in Jordan and the potential impact of leveraging big data and AI technologies in this context. The study revealed consumer preferences for mobile apps and the importance of personalized recommendations. However, privacy concerns also emerged, emphasizing the need for businesses to prioritize data security and build consumer trust.

The study suggests that businesses can enhance the mobile shopping experience by utilizing AI-powered virtual assistants and leveraging big data to provide personalized recommendations. By doing so, businesses can improve customer satisfaction and potentially drive economic growth in the mobile shopping sector.

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