



Review

Analyzing the Retail Sector in Jordan to Determine the Elements Influencing the Intention to Implement AI and ML

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ABSTRACT

In the context of Jordan's retail business, this study aims to examine the variables that determine the desire to use AI and ML. Approach: A total of 400 people were surveyed by several Jordanian retail firms to provide the main data used in this research report. A Likert scale, with five options ranging from "strongly agree" to "strongly disagree," was used to construct the survey questionnaire. The usage of artificial intelligence and machine learning in Jordan's retail industry was examined using structural equation modeling (SEM). Findings: This study found that the adoption of artificial intelligence and machine learning in Jordan's retail sector is impacted by communication, government legislation, market structure, and technical infrastructure. This study's findings, however, suggest that vendor relationships and management buy-in do not significantly impact AI and ML adoption. Restrictions: This study solely covers the retail business as a whole. The studies conducted in Jordan cannot be generalized to other locations because of this. The framework takes into account limited elements because of time and scope constraints.

Keywords

Artificial intelligence (AI); Adoption intention; Factors; Jordan; Machine learning (ML); Retail industry.

INTRODUCTION

Most businesses now function differently as a result of the paradigm shift brought about by the advent of artificial intelligence. In their research, Alarie, Niblett, and Yoon contend that AI's introduction has altered business practices [1]. Nevertheless, the majority of organizations in the business world still find it tough to use AI [2]. Because there are a lot of obstacles to AI adoption, which makes it hard for businesses to use AI to its full potential [3]. Contrarily, businesses either don't understand the value of AI or don't have the means to implement the notion. One finding from Di Vaio's research is that many businesses fail to see the value in using AI systems [4]. In contrast, neural networks One of the most important uses of AI is in making systems that can learn and develop on their own based on previously programmed experiences [5]. Thus, the creation of computer algorithms that can access and utilize data for learning is the focus of machine learning [6-8]. Businesses gain a great deal from it since it improves their operations and makes them more efficient. On the other hand, these Jordanian retail enterprises are unable to implement and reap the benefits of these technologies due to either a lack of knowledge

about them or a lack of funding. Lack of growth in Jordan's retail business, according to the report, prevents retail sector enterprises from adopting industry-wide technical developments [9]. Thus, the organizations' retail operations are being negatively impacted by the non-adoption of these innovations. Consequently, these firms need to think about how it impacts their performance. In addition, there are a number of elements that influence the adoption intention of firms. when it comes to AI and ML, which need to be thought about and decided upon in order to make sure the technology is adopted and used effectively [10]. In light of these concerns, the purpose of this research was to identify the aspects of AI and ML that influence the adoption intention of Jordanian retail enterprises. Thus, this research aims to provide light on the elements that impact the desire to embrace AI and ML in Jordan, which could be useful for the country's retail industry.

Literature Review

For the adoption of artificial intelligence and machine learning, it is essential for the companies that they are provided with the infrastructure which can support the adoption of technology [11]. It is due to the reason that if the technology is not supported by the



infrastructure, there would be an ineffective implementation of the technology. It has been argued in the study of Moberg and Blomberg that technological infrastructure is the most essential factor for companies with respect to the adoption of technology [12]. In this manner, the effect of technology support infrastructure has been tested over the adoption intention of artificial intelligence and machine learning in the retail industry of Jordan. Therefore, the first hypothesis has been developed for the purpose of testing the effect of technology support infrastructure on the AI and ML in Jordan which is provided below:

H1: There is a significant effect of technology support infrastructure on the AI and ML in Jordan.

On the other hand, government regulations and policies have also been a critical factor in the adoption of artificial intelligence and machine learning. It is due to the reason that companies need to comply with the policies and regulations of technology adoption [13]. It has been argued in the study of Chen that the policies and regulations of the government are the major factors which restrict the companies for the purpose of adopting the artificial intelligence and machine learning [14]. In this manner, it is essential for companies to consider the regulations and policies of the government. Therefore, the second hypothesis has been developed for the purpose of testing the effect of government regulations and policies on the adoption intention of artificial intelligence and machine learning in the retail sector of Jordan. This hypothesis has been provided below:

H2: There is a significant effect of government regulations and policies on the adoption intention of artificial intelligence and machine learning in Jordan.

Moreover, the market structure is yet another factor which has been determined to have influence over the adoption intention of machine learning and artificial intelligence. It is due to the reason that the market structure defines the operations of the company which must be supported by artificial intelligence and machine learning [15]. It has been argued in the study of Chen that the market structure affects the adoption of artificial intelligence and machine learning [14]. In this manner, the effect of government regulations and policies over the adoption intention of artificial intelligence and machine learning in Jordan has been tested. Therefore, the third hypothesis of the study is presented below:

H3: There is a significant effect of market structure over the adoption intention of artificial intelligence and machine learning in Jordan.

In addition to this, managerial support is yet another factor which can influence the adoption intention of artificial intelligence and machine learning. It is due to the reason that the adoption of new technology is resisted by the employees and top management due to the change in process and procedures [16]. It has also been stated in the study of Chen that managerial support is one of the most significant factors which affect the adoption of new technology [14]. In this manner, the fourth hypothesis has been developed for the

purpose of testing the effect of managerial support on the adoption intention of artificial intelligence and machine learning in the retail industry of Jordan. This hypothesis has been provided below:

H4: There is a significant influence of managerial support over the adoption intention of artificial intelligence and machine learning in Jordan.

Additionally, the vendor partnership is yet another factor which influences the adoption intention of artificial intelligence and machine learning. It is due to the reason that with the partnership of the vendor, it is essential to integrate all the functions with the vendors for the affective implication of technology. It has also been argued in the study of Moberg and Blomberg that the partnership of vendor is essential in terms of adopting the artificial intelligence and machine learning as the integration of vendor can restrict the company towards the technology adoption [12]. In this manner, the fifth hypothesis has been developed for the purpose of testing the effect of vendor partnership on the adoption intention of artificial intelligence and machine learning in Jordan. This hypothesis has been provided below:

H5: There is a significant effect of vendor partnership on the adoption intention of artificial intelligence and machine learning in Jordan.

Similarly, the communication process is also an essential factor which restricts the adoption intention of artificial intelligence and machine learning. It is due to the reason that with the effective communication process, the company is able to integrate all the functions involved in the process. It has been argued in the study of Moberg and Blomberg that the lack of communication process in the company adversely affects the adoption of artificial intelligence [12]. In this manner, the effect of the communication process on the adoption intention of artificial intelligence and machine learning in Jordan. This hypothesis has been provided below:

H6: There is a significant effect of the communication process on the adoption intention of artificial intelligence and machine learning in Jordan.

Furthermore, the characteristics of the firm have also been determined as one of the most crucial factors which influence the adoption of artificial intelligence and machine learning. It is due to the reason that the characteristics of the company must support the adoption of new technology. It has also been stated in the study of Moberg and Blomberg that the characteristics of the firm restrict the adoption of new technology if the company is not able to change the way it operates [12]. Therefore, the seventh hypothesis has been developed for the purpose of testing the effect of characteristics of the firm on the adoption intentions of artificial intelligence and machine learning in Jordan. This hypothesis has been provided below:

H7: There is a significant effect of characteristics of the firm on the adoption intentions of artificial intelligence and machine learning in Jordan.



Conceptual Model

The below Figure 1 depicts the conceptual model of the study which shows the variables those have been adopted for the purpose of determining the effect of factors influencing the adoption intention of artificial intelligence and machine learning with respect to the companies operating in the retail industry of Jordan. In this manner, it is evident from the below Figure 1 that the factors which affect the adoption intention of artificial intelligence and machine learning in the retail industry of Jordan include technology support infrastructure, government regulations and policies, market structure, managerial support, vendor partnership, communication process and firm characteristics [12, 14]. On the other hand, the adoption intention of artificial intelligence and machine learning in the retail industry of Jordan has been considered as the dependent variable of the study.

Method and Materials

This research paper follows a quantitative method where numeric information was used to collect and analyses data in order to achieve the aim and objectives of this research. For this research paper, primary data was collected with the help of surveying different retail companies that are operational in Jordan. The survey questionnaire was based on a Likert scale where five points ranging from strongly agree to strongly disagree were provided to the participants. The population of this research comprised of all the retail companies in Jordan however, suitable sample size was drawn in the light of the constraints of accessibility and time. With the help of a convenience sampling technique, a sample of 400 employees and managers from retail companies in Jordan. Structural Equation Modelling (SEM) has been used in this research paper in order to carry out a quantitative analysis of the data collected via a survey questionnaire. Confirmatory Factor Analysis (CFA) has been used to analyze the reliability of the constructs of the variables that are included in the research model. Path coefficients were used to analyze the impact and significance of the different factors on the adoption of AI and ML in Jordanian retail sector.

Results

For the purpose of assessing the reliability and validity of the different constructs of the variables included in the research framework, outer loadings, Cronbach Alpha, composite reliability, and average variance extracted have been used. The above metrics come under the broad category of confirmatory factor analysis. Table 1 indicates the results of the confirmatory factor analysis:

Outer loading shows the absolute contribution of an item with respect to its assigned construct. According to Hair, Ringle, and Sarstedt, outer loading needs to be higher than 0.70 in order for the constructs to reflect the variable sufficiently [17]. It is shown in table 1 that for all the variables, the constructs sufficiently define them. The next metric is of Cronbach alpha which for each variable represent the internal consistency of the scale used. The benchmark to test reliability via Cronbach alpha is 0.70 as per Ringle, Da Silva, Bido [18]. For this model, all the variables have been measured with the help of an internally consistent scale. The next metric for the purpose of determining reliability is composite reliability which also reflects the scale reliability when EFA is used for factor extraction. The acceptable range for composite reliability in CFA is 0.70 which

is considered fair and 0.90 onwards is considered strong [19]. In the above table, nearly all variables have composite reliability greater than 0.90 thus, the internal consistency is very high. The last value given in table 1 is of average variance extracted (AVE) which indicate the variance in a construct that is caused due to fallacy in measurement. According to Hamid, Sami, and Sidek, the value of AVE should be greater than 50% or 0.50 to indicate that more than 50% of the variance is due to measurement error [20]. It is apparent in table 1 that based on AVE, all the variables are reliable.

The discriminant validity of the variables included in the research model is also important to be interpreted. It indicates that the measure of constructs that are supposed to be uncorrelated to one another are in fact not related to each other. Heterotrait-Monotrait Ratio (HTMT) is the metric through which discriminant validity has been determined for this research model:

Hensler, Ringle, and Sarstedt consider a value less than 0.90 to be suitable for HTMT as it shows that the correlation between the constructs is less than 0.90 [21]. Table 2 indicates that the value of HTMT for each variable is less than 0.90 hence the constructs that are not supposed to be related theoretically are in fact not correlated. After determining that the variables of the research model are statistically reliable and valid, the strength of the model can be determined with the help of R-square. The following table shows the results:

The value of R-square shown in the above table indicates that the factors included in the research model tend to predict 71.3% of the variation in adoption intention associated with ML and AI. After adjusting the model for any discrepancies, the factors can predict 70.8% of the variations in the adoption of AI and ML by Jordanian retail firms. The R-squared can also be viewed from the following figure.

The above table of path coefficients basically indicates the impact of the predictors or independent variable on the dependent construct. As this study is focused on the factors that promote adoption of AI and ML, hence the path coefficients show which of the factor has an impact over the adoption. The first factor in the model is the communication process which has a sig value of 0.000 which indicates significance hence the factor successfully results in the adoption of AI and ML. The second factor in the model is government regulations which have a sig value of 0.000 which indicates significance hence the factor successfully results in the adoption of AI and ML. The third factor in the model is managerial support which has a sig value of 0.358 which indicates no significance hence the factor does not play a role in the adoption of AI and ML. The fourth factor in the model is market structure which has a sig value of 0.000 which indicates significance hence the factor successfully results in the adoption of AI and ML. The fifth factor in the model is technology support which has a sig value of 0.001 which indicates significance hence the factor successfully results in the adoption of AI and ML. The last factor in the model is vendor partnership which has a sig value of 0.468 which indicates no significance hence the factor does not play a role in adoption of AI and ML.



Based on the results of this research, the following table shows the assessment of the hypotheses that were developed from the literature review:

Discussion

According to the results of the preceding investigation, the desire to use AI and ML in Jordan is significantly affected by the communication process. Moberg and Blomberg's research lends credence to the idea that a company's ineffective communication approach hinders the implementation of AI [12]. Furthermore, it is ascertained that the adoption intention of artificial intelligence and machine learning in Jordan is significantly impacted by policy and legislation. Consistent with Chen's research, this suggests that government rules and regulations are the primary barrier preventing businesses from fully embracing AI and ML [14]. In addition, the impact of market structure on the anticipation of AI and machine education in Jordan. That the market structure influences the adoption of AI and ML is further supported by Chen's research [14]. Finally, the will to use AI and ML in Jordan is heavily influenced by the technical support infrastructure. According to Moberg and Blomberg's research, technical infrastructure is the single most important component for businesses when it comes to implementing new technologies [12]. Nevertheless, the impact of managerial backing on the desire to embrace AI and ML in Jordan could not be ascertained. It goes against what Chen found, which is that having the backing of upper management is a major influence in whether or not new technologies are adopted [14].

Limitations

This research has been carried out in such a manner that the aim and objectives of the paper are being fulfilled, however, there are certain limitations which are to be acknowledged for the purpose of ensuring the reliability of the results. Firstly, the scope of the research is restricted to the context of the retail industry only. For each industry, there are different internal and external factors that can influence the adoption of AI and ML. Although some of the factors are common for all the industries such as managerial support and communication processes however, the results of this research cannot be necessarily applied to other industries. Moreover, this research has been carried out in the context of Jordan thus it cannot be applied on to other geographical backgrounds. Furthermore, due to the time and scope limitations, there are restricted factors considered in the framework. For future researches, other factors such as industry characteristics, relative advantage, and compatibility can be considered for the purpose of evaluating their role in influencing the adoption of AI and ML by retail companies.

Conclusion

Several key aspects that aid Jordanian retail enterprises in adopting AI and ML have been identified by this study. This study paper's elements were chosen from the existing literature; they served as the foundation for the survey questionnaire that was used to gather first-hand information from managers and workers in the retail business in Jordan. According to the findings, some of the characteristics do have an effect on adoption, while others are not adoption dependent. This study report concludes that the adoption of AI and ML in Jordan's retail business is influenced by major aspects such as government legislation, market structure, communication, and technical

infrastructure. This study's findings, however, suggest that vendor relationships and management buy-in do not significantly impact AI and ML adoption. Previous studies have deemed the aforementioned elements relevant; nevertheless, they are not significant within the scope of this study and according to the conclusions of main findings.

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