

E-business adoption among small to medium-sized firms in Saudi Arabia

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Abstract

If the Saudi Vision 2030 target of 35% contribution to the GDP by SMEs should be achieved, they need to sell their products and services more efficiently. This is possible if they have a wider reach of customers both in the domestic and international markets. E-business provides a way to do this. However, the adoption rate of e-business by Saudi SMEs is low. The reasons for this need to be found out and rectified fast as the time available is too short. This paper aims to systematically review the literature on e-business adoption by Saudi SMEs and find out the factors related to the low adoption levels. Google Scholar was searched for identifying papers. They were screened for the selection of papers for this review using the PRISMA flow diagram. Finally, 33 papers were available for this review. The review showed that various technological, organisational, and environmental factors affect e-business adoption by Saudi SMEs. Slow diffusion of innovations causes slow uptake of new ideas like e-business. Although the Islamic traditional culture of the country was a suspect, the evidence shows no significant effect for this factor. Thus, there is no cultural barrier to the adoption of e-business. Two new tools tested were cloud computing and mobile commerce. Both have high promise for the future. The earliest paper selected was that of 2008. Although a maximum of five papers were noted for 2020, the general year-wise trend was irregular. Most papers aimed at identifying the factors of e-business adoption and used surveys as their investigation methods. Some limitations of this review have been outlined at the end.

Keywords: E-business, SME, Saudi Arabia, Review

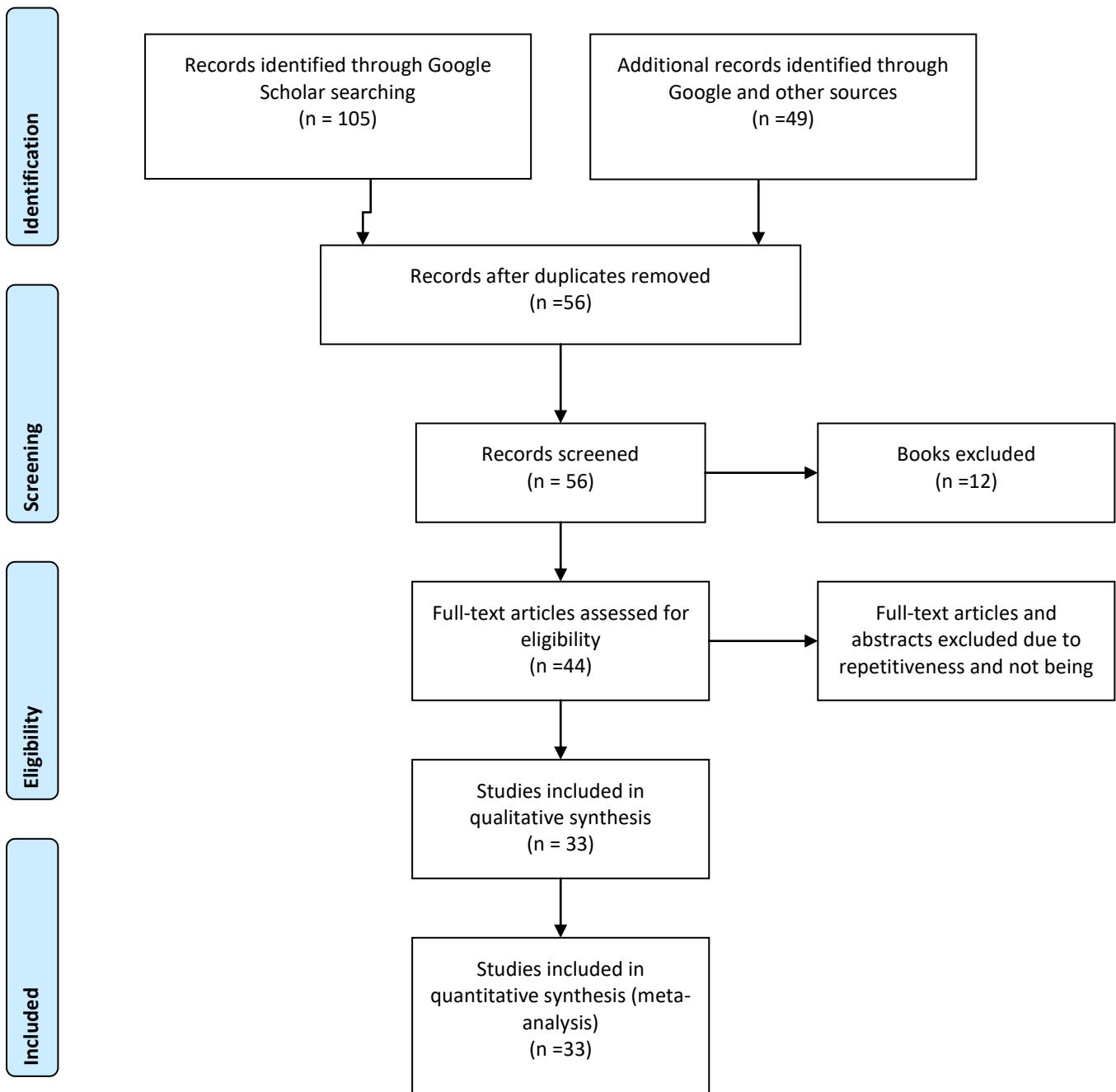
Introduction

E-business can transform the models, structures, and processes of businesses. It provides strategic advantages for small and medium enterprises (SMEs). However, the adoption rate of e-business by SMEs in developed countries is higher than those in developing countries. Saudi Arabia has more than 1.4 million SMEs. It should be noted that one of the Saudi Vision 2030 (Saudi Arabia, 2016) goals is to increase the contribution of SMEs to contribute 35% of the total national GDP by 2030. No separate estimate of private SMEs in Saudi Arabia. However, based on a report that 99.6% of private sector firms are SMEs (Roomi, Kelley, & Coduras, 2021) and the total number of private firms in 2021 was 2.05 million, the total number of private SMEs will be around 2.04 million. But this estimate may not be precise. According to Al Tayyar, Abdullah, Rahman, and Ali (2021) only 9% of Saudi SMEs have adopted e-commerce. The situation regarding private SMEs is not clear. Unless this situation is corrected, reaching the Vision 2030 goal will be difficult. For this, the reasons for low adoption rates need to be identified and corrected.

The factors related to this low adoption of e-business by Saudi SMEs have been investigated by many researchers. This paper aims to systematically review the factors influencing e-business adoption by Saudi private SMEs using published literature.

Methodology

A simple search of Google Scholar revealed the availability of many papers on the review topic. Hence, the papers available from Google Scholar were identified, screened, and selected using the PRISMA flow diagram. Finally, 33 papers were used for this review. The PRISMA flow diagram used for this review is appended. The results are presented and discussed in the following sections.



Results

Using the Technology-Organisation-Environment- Individual (TOEI) as the framework, based on a survey of 111 Saudi SMEs, Roomi et al. (2021) showed that firm size, competitive pressure, entrepreneurial innovativeness, and IT capabilities significantly influenced their e-business adoption. In Saudi Arabia, SMEs usually adopt only the development of their own websites and the use of emails. The component “Individual” was added to TOE because a review of the literature identified factors related to e-business adoption by SMEs as information systems and technology, firm characteristics and top management support, external business environment, and individual aspects.

In a doctoral thesis, Abid (2013) used a three-stage e-business adoption model to identify the factors determining the e-business adoption factors of Saudi SMEs. A case study of 20 Saudi SMEs identified 14 factors consisting of compatibility, complexity, trialability, observability, perceived e-business attributes, availability of technical expertise, knowledgeable employee attitude toward technology, communication, customer readiness, security concerns, high competence in IS, perceived e-business value, owner attitude toward technology, and training and eight common factors of cost, relative advantage, management support, external pressure, owner-manager characteristic, organisational readiness and awareness, trading partners’ readiness, and organisational culture. The final model based on survey findings and online expert suggestions is given in Fig 1.

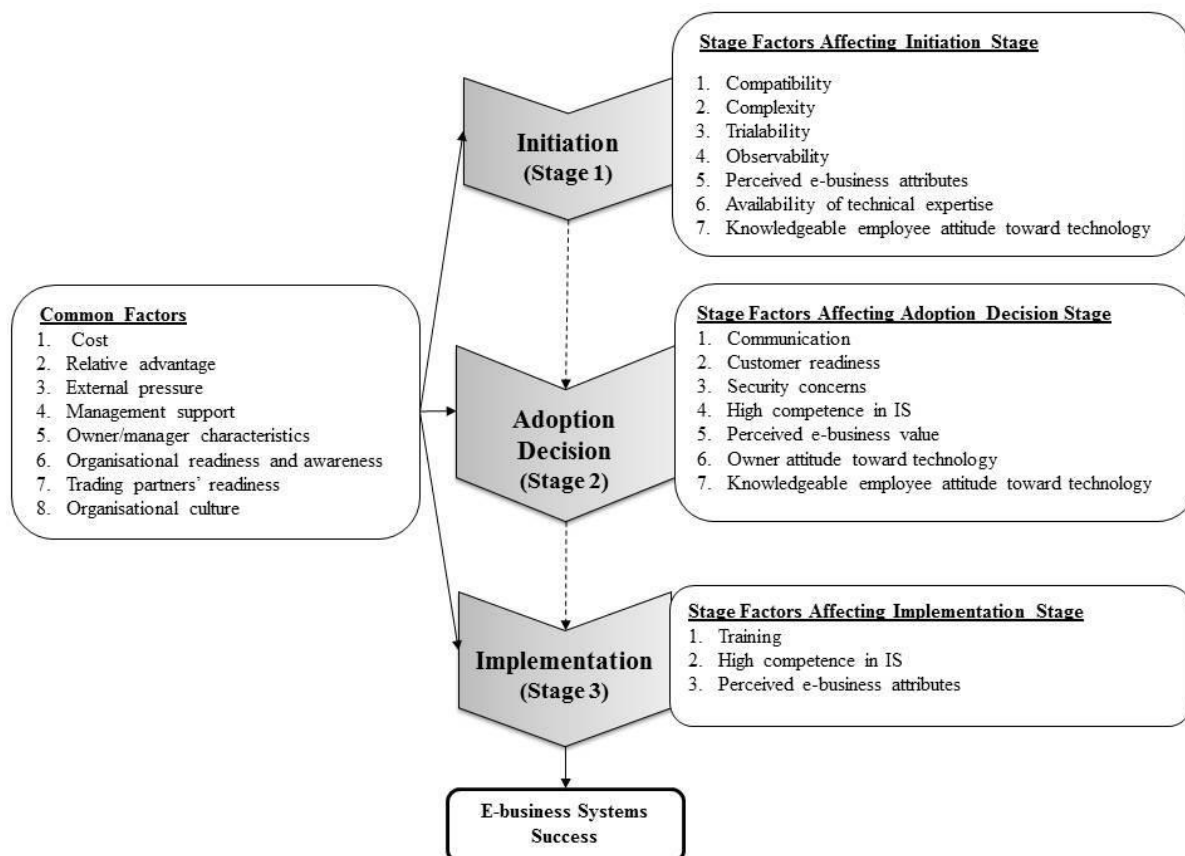


Figure 1 The final 3-stage model for e-business adoption by Saudi SMEs (Abid, 2013).

In Fig 1, the factors related to the initiation, adoption and the eight common factors leading to e-business success, have been shown.

A research model, in which, knowledge acquisition, dissemination and application influence the adoption of e-business by SMEs for supply chain management, was tested by Azyabi (2018). The responses of a survey of 128 Saudi SMEs showed that only knowledge acquisition influenced e-business adoption by SMEs.

The level of e-business adoption and limitations and barriers related to it were investigated by Batwa and Alamoudi (2019) using a model. Results of a survey of 109 Saudi SMEs showed that 14% of them depended only on e-mails for communications, 76% used websites for marketing, 6% used e-commerce for online sales, and only 4% had fully integrated e-business systems through their supply chains. The most important barriers to e-business adoption were organizational, technical, and economic in nature. The authors have provided a diagram of the different types of barriers affecting e-business adoption by SMEs, as shown in Fig 2.

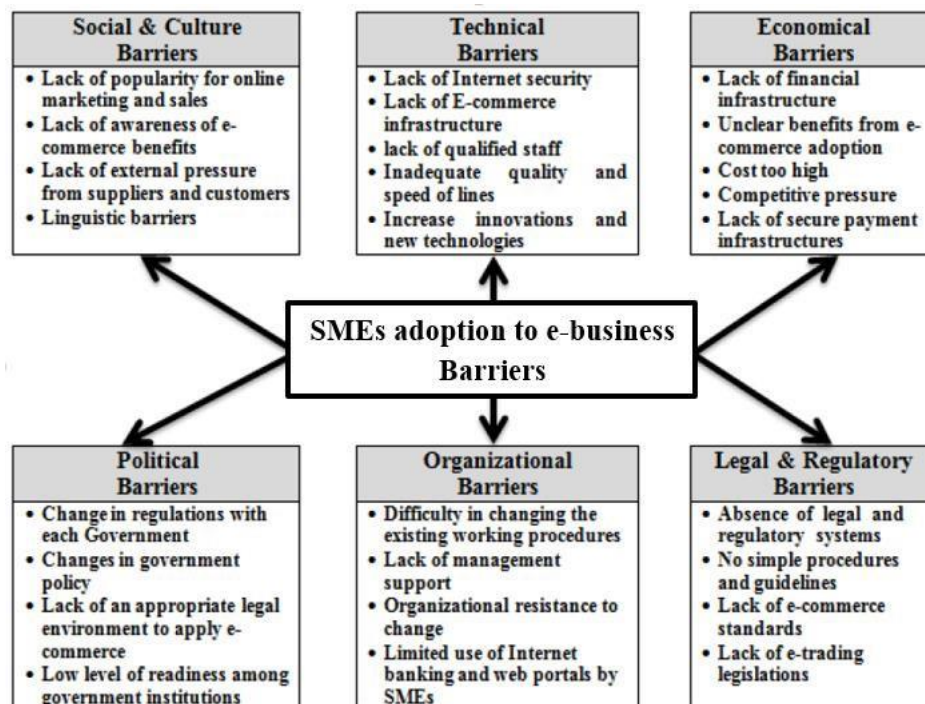


Figure 2 Types of barriers affecting e-business adoption by SMEs (Batwa & Alamoudi, 2019).

E-procurement as an enabler of e-business among SMEs was tested by Altayyar and Beaumont-Kerridge (2016) adding perceived cultural and external factors to e-procurement to the five-components model of Gunasekaran, McGaughey, Ngai, and Rai (2009). The authors used a within and a cross-case analysis of four Saudi SMEs. The results revealed that nine external factors were relevant to the adoption of e-procurement among Saudi Arabian SMEs. These external factors were government support, own postal addresses and delivery service, secure and trustworthy online payment options, low-cost high-speed internet connection, IT-related educational programs, supplier's willingness, and readiness to participate or exert pressure, competitor's pressure, policy and regulations and business and national culture of the country.

Based on a face-to-face survey of 137 SMEs in 2013 and interviews with the senior officers of three SMEs in Saudi Arabia in 2016, Miao and Tran (2018) found a clear difference between initial e-commerce adoption and institutionalisation in SMEs considering institutional predictors. In the early stages, governmental support and a well-defined legal

and regulatory system served as the main institutional forces for the adoption of e-commerce by SMEs. Over the course of time, e-commerce became more business-driven, and the effects of government support and legal and regulatory factors were replaced by perceived market forces. The perceived social awareness of e-commerce became critical factors to engage SMEs in e-commerce more sophisticatedly.

Social commerce (S-commerce) denotes the purchase and sale of goods and services through social networks based on the social behaviour of social network users. Thus, S-commerce is a variant of e-commerce. In the studies of Abed (2020) trading partner pressure in the environmental context, followed by top management support in the organisational context, and perceived usefulness in the technological context influenced the intention of Saudi SMEs to adopt social commerce. A survey of 181 Saudi SMEs and the TOE model were used for these findings. The authors used a combination of the Technology Acceptance Model (TAM) and the Theory of Planned Behaviour (TPB), C-TAM-TPB, to identify the factors influencing Saudi SMEs to adopt S-commerce. Online survey responses from 592 SMEs showed that all factors of the models including attitude, perceived usefulness, perceived behavioural control, and subjective norms influenced the adoption of S-commerce by the Saudi SMEs. The combined TAB and TPB used by the authors are shown in Fig 3.

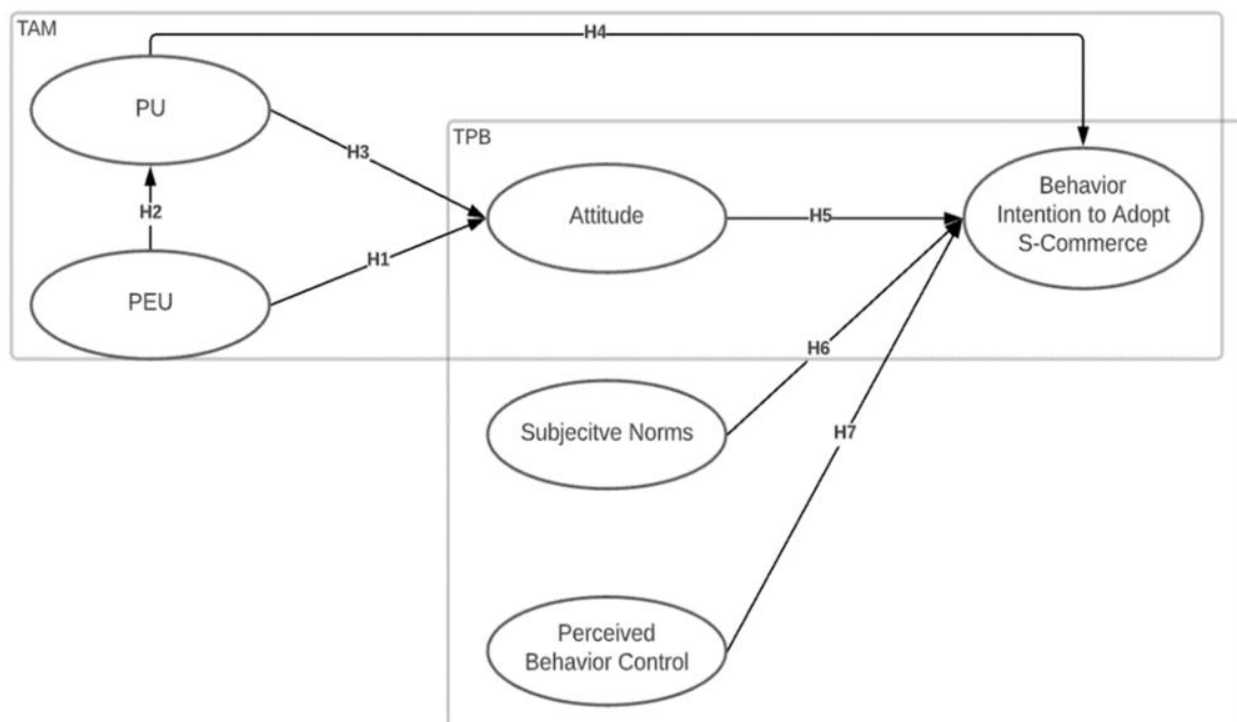


Figure 3 Combined TAB and TBP used in the study of s-commerce adoption by Saudi SMEs.

Using the responses from 332 Saudi SMEs, Alzahrani (2019) showed a major impact of e-commerce adoption on the business strategies of Saudi SMEs. Introduction of e-commerce in Saudi market changed their business plans and strategies. Some moderators and predictors on the relationship between e-commerce adoption and business strategies were identified.

Adoption of information and communication technology (ICT) is a pre-requisite for e-business. This has helped Saudi SMEs to access international markets. Relative advantages, top management support, culture, regulatory environment, owner/manager innovativeness and ICT knowledge influenced the ICT adoption by Saudi SMEs, in a survey study on 137

Saudi rural SMEs by AlBar and Hoque (2019) in which an extended the T-O-E framework (adding individual context) was used.

Based on a survey of 140 Saudi SMEs, Aseri (2021) observed that technological capabilities were strong predictors of the application of e-business directly and through the mediating variable team-working and openness to change. Organisational capabilities influenced the application of e-business by mediating variable openness to change. Financial capabilities were the driving force for e-business applications through mediating variable team-working.

Survey data from 550 Saudi SMEs led Al-Somali, Gholami, and Clegg (2010) to conclude that firm technology competence, size, top management Support, technology orientation, consumer readiness, trading partner readiness and regulatory support as important antecedents of e-business adoption and utilisation. A conceptual model based on the T-O-E framework was used. Out of 10 factors included in the model, the above seven were identified as antecedents of e-business.

In a brief study using interviews with Saudi SMEs in different sectors and regions, Albelaihi and Khan (2020) obtained a positive association of the use of cloud computing with organizational quality performances. However, the knowledge level of the SMEs regarding accessibility to cloud services was low. Privacy and security were the greatest challenges in this respect. In a survey study, using both diffusion of innovation (DOI) and T-O-E theories, only a negative relationship of security (technological), organisation readiness, top management support and enterprise status (organisational), government support (environmental), compatibility (DOI) had significant relationship with the adoption of cloud computing by Saudi SMEs. These results were obtained from the online responses of 81 Saudi SMEs (Alhammadi, Stanier, & Eardley, 2015).

The results of a survey by Migdadi, Abu Zaid, Al-Hujran, and Aloudat (2016) showed that organizational factors influenced e-business implementation and e-business implementation affected organizational performance. The organisational factors considered were learning capabilities (training availability, technical expertise, and Knowledge level), knowledge management capabilities (knowledge acquisition, knowledge application and Knowledge sharing), a flexible and informal organisational culture, and top management support.

Based on the results of a single case study, Naushad and Sulphey (2020) identified relative advantage, affordability and ease of use, and value creation and productivity as the priority factors in the decreasing order of importance for ICT adoption by Saudi SMEs. Individual characteristics, consisting of technological self-efficacy and personal characteristics of the owners, were influential in using these factors for ICT adoption. Among the economic factors, profitability was the most important. Among the organisational factors, the top management support influenced the ICT adoption decision of SMEs. However, some barriers affecting ICT adoption by SMEs were not measured but sourced from the literature.

To test a model showing the effects of four organizational factors (learning capabilities, knowledge management capabilities, adhocracy culture, and top management support) on e-business implementation, and organizational performance, a survey of 301 Saudi SMEs was used by Roomi et al. (2021). A positive effect of the four organizational factors on e-business implementation, and of e-business on organizational performance were obtained.

A survey of 550 Saudi private firms (including SMEs) by Al-Somali, Gholami, and Clegg (2010) showed that the firm's technological readiness, top management Support, technology orientation, consumer readiness, trading partner readiness and regulatory support influenced their decision to adopt e-business.

In Saudi Arabia, businesses and consumers are slow in adopting e-commerce technologies for running their business transactions. Most of the studies collected data from larger companies than SMEs. Most of the studies used web-based surveys to investigate consumer input which may not reflect the use by a large section of the Saudi population owing to the absence of internet connectivity in some regions of Saudi Arabia. A review of the literature by Abed, Dwivedi, and Williams (2015) showed customer and partner e-readiness, supporting industry e-readiness, government e-readiness, and IT skills development e-readiness, as the most important factors for the adoption of social media as a method of e-commerce by Saudi SMEs. Government support with regulation is the main issue to adopt e-commerce by SMEs. Studies on mobile commerce and social media use were rare. Outsourcing or franchising was unknown to most Saudi SMEs.

E-malls may be an effective low-cost substitute for independent e-business facility for SMEs. Using a survey of 110 SMEs, Bahaddad, AlGhamdi, and Houghton (2012) observed that only 8% of Saudi SMEs sell online and organizational factors, and technology and environmental factors as significant factors for adoption of e-malls by them, based on a survey of 110 SMEs. Bahaddad, AlGhamdi, and Alkhalaf (2014) identified the factors impacting e-mail adoption by Saudi SMEs. The groups of factors were the people and organisational variables, technological and environmental variables, and traditional and cultural variables. In the survey, almost all SMEs agreed on the importance and the need for laws and regulations to protect customers during transactions, and the need for the government to provide an e-mail framework and act as a dependable third party for consumer trust.

For SMEs to fully go online to conduct its business by providing online information services, their database needs to be connected to the Web. There are some issues related to doing it beyond their capabilities in Saudi Arabia. These include website management, technical issues, and security concerns. Al-Hawari, Al-Yamani, and Izwawa (2008) listed some barriers to this from the literature. They were high cost of implementation, too complex nature, requirement of short-term ROI for long-term e-commerce, resistance to change from employees, preference for traditional methods, lack of knowledge and skills, lack of time for implementation, perception that e-commerce not being suitable for the SME or the consumers, lack of critical mass among consumers, suppliers and partners, heavy reliance on external experts, and lack of e-commerce standards. The authors conclude that the question is not whether it is needed, but how quickly the SME needs to do it. The authors recommended some methods to implement it depending on the conditions.

Saudi SMEs face fierce competition from new entrants to local markets due to the accession of Saudi Arabia to the World Trade Organisation (WTO). But e-commerce technologies can strengthen the competitive edge of Saudi SMEs. The extent to which SMEs in Saudi Arabia deployed e-commerce technologies determines the level of competitive advantage they gained in the global competitive context (Al-Somali, Clegg, & Gholami, 2013).

From a survey of 63 SMEs, Roomi et al. (2021) observed that Saudi SMEs could successfully gain knowledge about five business model canvas (BMC). These included key partners, value propositions, customer relationships, customer segments, and cost structures. On the other hand, four issues related to key activities, key resources, channels, and revenue streams. These SMEs still lacked an understanding of BMC, as they used traditional methods to identify BMC factors.

From a survey of 153 retail Saudi SMEs, Alqahtani and Song (2018) identified six key barriers to e-commerce implementation: Cost of Launching an e-commerce venture; cultural influences; lack of professionals; incomplete logistics distribution systems; imperfect information and communication technology; fear of risk-taking and failure.

Using the TOE framework, survey data were collected by Ali, Miao, and Tran (2016) from 133 Saudi SMEs, which have already adopted e-commerce. There was significant difference in the key factors of initial adoption of e-commerce and the key factors of institutionalization of the technology. The SME experience of adopting e-commerce did not influence their upward movement towards sophistication.

In a doctoral thesis, Alhindi (2019) collected quantitative data consisting of surveys of 525 Saudi citizens and 488 Saudi B2C SMEs and qualitative data from interviews with 17 with the officers of the relevant government departments and industries. Although SMEs were increasingly adopting e-commerce, the customers preferred traditional physical in-store shopping due to cultural issues. However, young customers are using online shopping to a large extent. Therefore, awareness about e-commerce and its advantages needs to be created among the Saudi population.

To promote enterprise resource planning (ERP) and business intelligence (BI) (ERPBI, all significant factors including system quality, service quality, and information quality factors, change management, effective communication, training factors, clear vision and planning, competitive pressure, and government role, need to be considered (Aldossari & Mokhtar, 2020). E-commerce has grown rapidly in Saudi SMEs recently. The main e-commerce tools are social media, websites, and various electronic payment systems. User interface must be easy to use for the customers for successful e-commerce. Saudi environment is congenial for e-commerce development among SMEs and is supported by privacy protection and security laws. Further studies can be done on the use of digital analytical tools for e-commerce.

Exploratory qualitative study of three SMEs, case studies on six SMEs, and interviews with 27 SMEs, consisting of quantitative and qualitative analysis were done by Altayyar (2017) to study e-procurement by Saudi SMEs. The exploratory study showed that on average, Saudi Arabian SMEs had only a basic level of e-procurement readiness and limited use of technology for procurement activities. Interview results showed that Saudi SMEs placed lower priority on the improvement in relationships with suppliers and customers and better utilisation of staff. A higher priority was placed on the reduction in cost, improvement in supply chain and reduction in processing time. Increased transparency and cultural and perceived external factors were the additional relevant factors for the adoption of e-procurement. Top management involvement and collaboration with suppliers, the user-friendliness of the solution, technical maturity of the market in terms of IT use, knowledge management and data warehousing and strategic alliance and networking, and cost-benefit analysis were additional factors important for the e-procurement of Saudi SMEs. However, weaker infrastructure, absence of procurement-related laws and lack of trust in e-payments were some barriers to the adoption of e-procurement by the SMEs. The framework of Gunasekaran, McGaughey, Ngai, and Rai (2009) was used in this research.

Using diffusion innovation theory (DOI) as the framework, Al-Somali, Mashat, and Aburokbah (2020) surveyed 202 Saudi B2B SMEs. Relative advantage, compatibility, quality of service provider and security risks influenced e-commerce adoption by the B2B Saudi SMEs.

Using a meta-analysis of 89 papers, Šumak, Heričko, Budimac, and Pušnik (2017) identified consumer type, device type, continent and respondent type as the moderators of e-business adoption by SMEs of both B2C and B2B types in all continents (includes Saudi SMEs).

A comparison of SMEs in the UK and Saudi Arabia by Ezzi (2016) showed some differences in the adoption of e-business. The UK-KSA comparisons identified were 90%-37% e-commerce usage, 82%-15% e-commerce purchases and 59%-14% of SMEs using websites in

their businesses. These numbers and the evidence from literature showed that the adoption and usage of e-commerce were related to the market development status of the countries reflecting on the internet services available to consumers.

Discussions

Aims of papers

As Fig 5 shows, 20 out of the 33 papers dealt with factors related to e-business adoption. Half of them aimed to identify factors related to specific aspects of e-business adoption. Although many papers used models like TOE and DOI, studies focused on models were only five. Four papers evaluated the level of e-business adoption. In three papers, use of cloud computing and mobile commerce as tools for e-business, were studied.

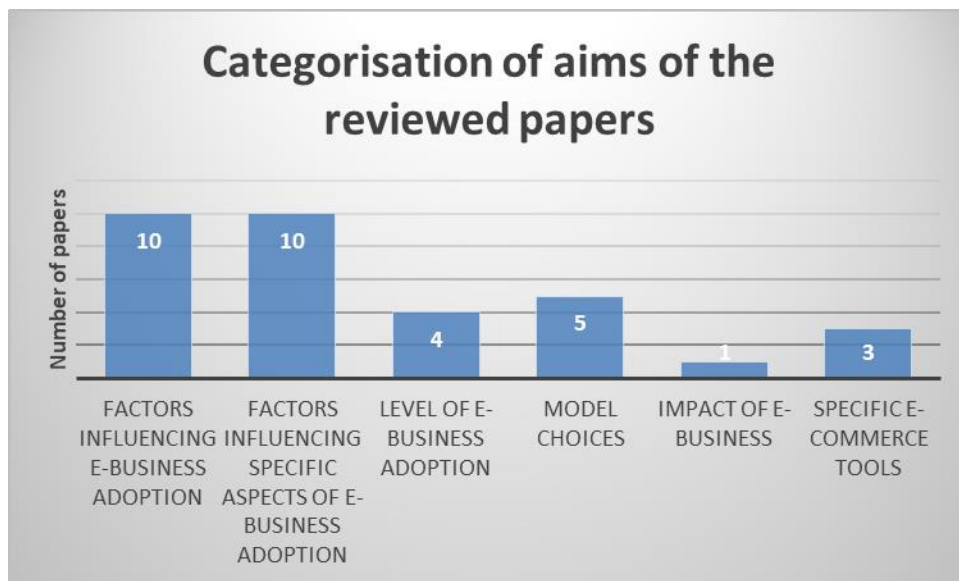


Figure 4 Categorised aims of reviewed papers.

Methods used in the selected papers

Fig 6 shows the frequencies of papers according to the methods used. Surveys were used in 20 papers (61%). This excludes the surveys done in the papers which used mixed methods. Interviews were used in two papers. Additionally, in some papers which used mixed methods, interviews have been used. However, mixed methods seem to be less preferred by researchers, as only three papers used this method. Case studies were used in three papers, out of which, one was a qualitative case study. Five papers were included in the others category as there were only one paper each for some methods like review of literature.

Other aspects of analysis

Recognition and acceptance of limitations is important for further progress of research. Yet 24 out of 33 papers acknowledged limitations of their study. In some papers, the description of the methods was not clear as they were too wordy and tried to explain basic issues of research citing many references. The two thesis reports did not clearly explain the methods or the exact findings. There was a general lack of precision and robustness in studies which used low sample sizes or focused on narrow range of topics. Such papers may not be useful for generalisation. Models were modified in some research before or after the findings. Then, the modified models require further validation. One paper presented a meta-analysis of 89

papers, and this was a good paper to understand some aspects of e-business adoption by SMEs.

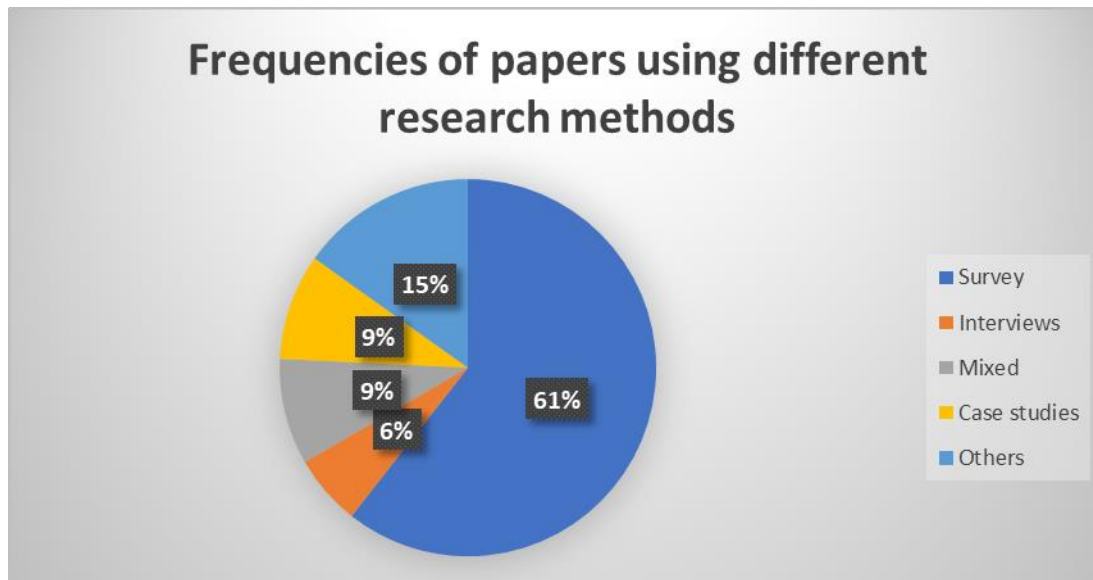


Figure 5 Frequencies of papers according to the methods used.

Conclusions

The e-business adoption rate of Saudi SMEs is low. Many factors can affect the adoption or non-adoption of e-business. The 33 papers reviewed here examined the levels of e-business adoption, its general and specific factors, used or tested different models and frameworks, studied the impact of e-business adoption on firm performance or other aspects and evaluated cloud computing and mobile commerce as tools to implement e-business by SMEs. Mainly technological, organizational, and environmental factors of TOE model were found to influence the adoption of e-business by Saudi SMEs. Barriers of the same types were also identified. Although the specific Islamic traditional culture could be suspected to adversely affect e-business adoption by Saudi SMEs, this was not observed. Thus, addressing barriers and challenges of any type could be addressed by taking appropriate steps at different authority levels.

Limitations

Despite using the search term specifying Saudi SMEs, out of over 100 papers displayed in the first 10 pages of Google Scholar, only 33 were related to Saudi SMEs. Selection of papers from databases could have resulted in selection of more papers. Since all papers were on Saudi Arabia, quantitative analysis of the reviewed papers was limited to the above aspects.

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