Journal of Infrastructure, Policy and Development 2024, 8(6), 4078.
https://doi.org/10.24294/jipd.v8i6.4078

Article

SMEs and e-commerce. Why or why not?

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CITATION

Fakieh B, Wali AM. (2024). SMEs and e-commerce. Why or why not? Journal of Infrastructure, Policy and Development. 8(6): 4078. https://doi.org/10.24294/jipd.v8i6.4078

ARTICLE INFO

Received: 7 January 2024
Accepted: 20 February 2024
Available online: 12 July 2024

Abstract: E-commerce plays an important role in many organizations and businesses, including small and medium-sized enterprises (SMEs). Although the body of scientific knowledge carries significant research in addressing the main drivers and challenges of e-commerce among SMEs, the Saudi market was untouched, especially after the official Saudi government classification of SMEs back in December of 2016. Therefore, this study aims to explore the most common factors and challenges of SMEs when utilizing e-commerce in Saudi Arabia. It focused on Jeddah City as the second-largest city and the main seaport of the country. This research is based on a quantitative survey carried out among 63 firms, due to the difficulty in reaching a larger number of participants who had dedicated time and budget. The examined factors were collected from the literature and classified using the Technology, Organization, and Environment Model (TOE). Out of 63 firms, only six were adopting e-commerce. This led us to focus more on the challenges that hindered the remaining 57 from utilizing e-commerce. The analysis results uncovered the status of e-commerce among a sample of Saudi SMEs and showed that the knowledge and awareness level of e-commerce potential for businesses play a significant factor in reaching this incredibly low number.

Keywords: adoption; challenges; electronic commerce; Saudi Arabia; SMEs; utilization

1. Introduction

The advancement of the Internet led most nations to depend more on it for most of their life activities. From reading and writing, studying and absorbing knowledge, electronic business, and electronic commerce (e-commerce) in relation to the current revolutions of cloud computing, machine learning, everything on the Internet, blockchains and other Internet-related affairs, researchers realize the heavy dependence on the Internet that became a common utility of life and has the potential to improve daily and business activities. (Ho and Chuang, 2023; Noor et al., 2018; Yang et al., 2019). As the significance of the utilization of the Internet became common, the industry started shifting beyond just the use of the technology toward creativity and gaining competitive advantage in different sectors (Chiu and Yang, 2019; Ho and Chuang, 2023). One of those sectors is Small and Medium Enterprises (SMEs), which gain a lot from being presented on the web (Ballerini et al., 2023; Jean and Kim, 2019) to perform different sorts of business activities. One of the core activities that is proven to boost SMEs' income is utilizing electronic commerce (e-commerce), which can be defined as using the Internet as a platform for trading and transactions, and selling products and services that can be delivered offline or online (Saridakis et al., 2018).

The main purpose of this paper is to explore the status of utilizing e-commerce by a sample of Saudi SMEs. As this topic seems common in several countries, the paper will show the lack of similar academic studies in Saudi Arabia. To gain an in-

depth understanding of the Saudi SMEs' trend towards adopting information and communication technology (ICT) solutions, the study also covered the harness of social commerce by the same studied sample.

This paper is structured as follows: the second section defines SMEs in some global countries and in Saudi Arabia. The third section discusses some of the current research studies of adopting e-commerce by SMEs in order to identify the gap in the fourth section. Then, the fifth to the eighth sections discuss this study in detail. And the last section concludes this paper.

2. Small and medium-sized enterprises (SMEs)

2.1. Global SMEs classification

Although the term SMEs became common among several countries, each country has its own factors to classify the firms as large, medium, small, or even micro enterprises (Fakieh, 2018).

From the east to the west, the Australian government has one of the simplest classification rules of organizations compared to the other nations. Australian government standard depends mainly on the number of employees to classify the firms (Artin, 2022; Asbfeo, 2016; Nicholls and Orsmond, 2015) as shown in **Table 1**.

Table 1. Australian classification of the enterprises.

Type	**Employee No.**
Non-Employing	0
Micro	1–4
Small	5–19
Medium	20–199
Large	200+

The definition of SMEs in the European nations goes into more detail. Unlike the Australian standard that focuses on the number of employees only, organizations in Europe are considered as SMEs based on the turnover and the balance sheet total as well as the number of employees (Commission, 2015; Muller et al., 2017). **Table 2** below summarizes the European regulation of classifying organizations.

Table 2. European classification of the enterprises.

Category	**Number of Employees**		**Turnover (in Millions)**		**Balance Sheet (in Millions)**
Micro	< 10	**And**	≤ 2	**OR**	≤ 2
Small	< 50		≤ 10		≤ 10
Medium	< 250		≤ 50		≤ 43

The classification of SMEs in the United States has its own identity. The American regulations classify the type of the business into one of four categories; for each category, the number of employees and the annual revenue are the main factors to classify the firms within SME sectors (USITC, 2010), as shown in **Table 3**.

Table 3. The U.S. classification of organizations.

	Manufacturing and non-exporting services	Exporting services		Farms
		Most	High Value (Computer Services)	
Number of Employees	< 500	< 500	< 500	< 500
Annual Revenue	N/A	≤ $7 Million	≤ $25 Million	< $250,000

SMEs in South Africa's classification seems the most complicated taxonomy among the explored examples in this article. South Africa's classification considered two factors, which are the number of employees and the turnover of the business. Employee numbers look straightforward, where a firm of 0–10 represents micro business, 11–50 for small, and 51–250 for medium-sized businesses. However, the maximum turnover to classify the firm as SME varies among 11 classifications of business activities (Wet, 2019; Writer, 2019).

The criteria for SME classification vary across Asian countries like China, Japan, and India, reflecting the unique economic and industrial structures of each nation. In China, the regulations classify the SMEs into three categories: medium, small, and mini, with specific standards for different industries. The common standards used are, operating revenue, number of employees, or total assets, for more information, please refer to (China Briefing, 2011). Japan's classification system for SMEs, primarily focusing on the number of employees and the capital or sales amount. This system is industry-specific and divides enterprises into manufacturing, wholesale, and retail/services sectors (Clavecilla, 2023), as shown in **Table 4**.

Table 4. Japan classification of the enterprises.

Category	Number of Employees		Capital (Sales amount in million yen)
Manufacturing	≤ 300	**And**	≤ 300
Wholesale	≤ 100		≤ 10
Retail/Services	≤ 50		≤ 50

India recently updated its criteria for the SMEs classification, which are defined based on investment in plant and machinery or equipment and annual turnover, with micro, small, and medium categories based on the investment amount (**Table 5**) (GOI, 2020).

Table 5. India classification of the enterprises.

Category	Investment in plant and machinery/equipment (INR Million)		Annual turnover (INR Million)
Micro	≤ 10	**And**	≤ 50
Small	≤ 100		≤ 500
Medium	≤ 500		≤ 2500

Notes: INR means Indian Rupee.

2.2. Global SMEs significance

The SMEs sector plays a significant role in the nations' economies that led several parties, such as governments and enormous numbers of study groups, to consider this as a vital sector (De Marco et al., 2020; Odlin, 2019; Özbuğday et al.,

2019; Tajeddin et al., 2023). Selected examples of global SMEs are discussed in the following pages.

In Australia, SMEs act as a significant driver of the national economy. The Australian Bureau of Statistics (ABS) reported that SME organizations represent 98.9% of all Australian firms in 2019 (ASBFEO, 2019). In 2017, the SME sector employed around 4,770,000, which was equivalent to 68% of the total workforce in Australia (Gilfillan, 2018).

The 2016/2017 annual report of European SMEs revealed that SMEs in Europe account for 99.8% of all businesses, and the number of SMEs is growing among most of the European nations (Muller et al., 2017).

The significance of SMEs in the U.S. market is similar to the other investigated nations. The 2018 small business profile revealed that the U.S. market contained 30.2 million small businesses, which is equivalent to 99.9% of the total number of U.S. businesses. This significant number of SMEs in the United States employed 47.5% of the U.S. workforce, which was around 58.9 Million employees (SBA, 2018).

The impact of SMEs on the national economy appears clearly in the South African situation. There is a sort of inconsistency of SME survival there that affected the employment rate by leaving around 250,000 people unemployed. This considerable number swelled the unemployment rate to 27.2% (Africa, 2018). Although the South African SMEs are currently facing several difficulties to survive, they are still considered as a key driver of the national economy of South Africa, where they contributed 98.5% to the economy (Writer, 2019), and towards 40% increase in GDP in 2020 (SAIA, 2020).

SMEs play a significant role in the economies of Asian countries such as China, Japan, and India. In 2020, the number of Chinese SMEs reached over 140 million which contributed to more than 60% of GDP, 50% of tax income, 70% of technological innovation, and 79% of job positions (OECD-iLibrary, 2020). In Japan, SMEs represent 99.7% of all business and employ around 70% of the workforce (Clavecilla, 2023). According to Indian governmental reports, SMEs constitute about 90% of the industrial sectors, about 36% of the manufacturing sector in 2021–2022, about 44% of all India exports in 2022–2023, and 29% of India's GDP. However, these enterprises encounter a variety of challenges, such as limited access to technological resources, finance services, and international markets (CII, 2023).

2.3. SMEs in Saudi Arabia

Although the SME sector is commonly known globally, the Saudi definition of the SME industry would be considered as recent. The government of Saudi Arabia decreed the official definition of SMEs in December of 2016 (MCI, 2016). The Saudi definition tends to follow the U.S. philosophy, where the number of employees and the annual revenue are the two factors of classification. Unlike the American definition, the Saudi definition does not consider the industry sector (Fakieh, 2018; MCI, 2016). **Table 6** below shows how the Saudi government classified businesses.

Table 6. The Saudi classification of businesses.

Classification	Number of Employee		Annual Revenue (SAR)
Micro	1–5		≤ 3 Million
Small	6–49	**Or**	> 3 Million & < 40 Million
Medium	50–249		≥ 40 Million & < 200 Million
Large	≥ 250		≥ 200 Million

The significance of SMEs in Saudi Arabia looks limited compared to the countries discussed previously in this paper. A report published in 2019 stated that the number of businesses registered as SMEs in Saudi Arabia was around 950,000 firms only (Khan and Alsharif, 2019). Before that, the Saudi government reported that the contribution of Saudi SMEs to the national gross domestic product (GDP) was only 20% in 2016 (Monshaat, 2018). Between the Q4 of 2022 and Q1 2023, the number of SMEs increased by 4.8%. Saudi SME ecosystem grew significantly with 88, 858 new SMEs established in Q1 2023 to reach in total of 1.2 million businesses. The International Monetary Fund (IMF) predicted another 3.1% growth in GDP in 2023 (Monsha'at, 2023). The to. Thus, with the Saudi government realizing the potential of SMEs to the national economy, they set out, as part of the national 2030 vision, to boost this critical sector. One of the Saudi goals is to raise SMEs' contribution to the GDP from 20% to 35% by the year 2030 (Fakieh, 2018; Khan and Alsharif, 2019; Monshaat, 2018).

3. SMEs and e-commerce research

It is generally accepted that harnessing information and communication technology would support the growth of businesses, including SMEs (Singh et al., 2019). This seems widely applicable in the global e-commerce industry, even before the COVID 19 pandemic, where SMEs saw it as a new channel to open the door to innovations and attracting new markets as well as boosting the employment rate. These are two of several reasons that a significant number of SMEs are utilizing e-commerce (Biagi and Falk, 2017; Cui et al., 2017; Falk and Hagsten, 2015).

The scientific research, governments and press have already considered, in papers and reports, exploring the adoption of e-commerce by SMEs in a significant number of countries, both developed and developing nations. **Table 7** shows some examples with a variety of publication dates which show the continuous interest in e-commerce adoption researchers. The table shows the global interest from different continents including Oceania, Asia, Africa, Europe and North and South America. The samples in this table are in chronological order, according to the date of publication.

Like the other countries, the adoption of e-commerce by the Saudi SMEs are in the focus of researchers, governments, and the press. Even if the presented research is limited, it is possible to see publications in various timeframes, such as from 2011, as presented in **Table 8**.

Table 7. Samples of the adoption of e-commerce research in several countries.

Year of Publication	Country	Theory	Methodology	Source
2001	Singapore	Rogers' model of innovation decision process	Survey	(Kendall et al., 2001)
2003	England	N/A	Survey	(Drew, 2003)
2004	U.S.A.	Technology Acceptance Model (TAM)	Survey	(Grandon and Pearson, 2004)
2007	Australia	Technology Acceptance Model (TAM)	Interviews + Survey	(Quaddus and Hofmeyer, 2007)
2008	Chile	Theory of Planned Behaviour	Survey	(Nasco et al., 2008)
2011	U.S.A.	Technology Acceptance Model (TAM) and Diffusion of Innovation (DOI)	Survey	(Li et al., 2011)
2012	Egypt	Self-developed framework by the author	Survey	(Zaied, 2012)
2015	Indonesia	Technological, Organizational and Environmental Framework (TOE)	Survey	(Rahayu and Day, 2015)
2015	Malaysia	Diffusion of Innovation (DOI) and National Institutional Perspective (NIP)	Survey	(Kurnia et al., 2015)
2015	Thailand	N/A	Survey	(Ueasangkomsate, 2015)
2017	Tanzania	Structuration theory	Interviews and Observation	(Kabanda and Brown, 2017)

Table 8. Sample of e-commerce research for Saudi SMEs.

Year of Publication	Theory	Methodology	Source
2011	Technological, organizational and environmental framework (TOE)	Survey	(Almoawi and Mahmood, 2011)
2012	N/A	Survey	(Bahaddad et al., 2012)
2015	Literature Review	N/A	(Abed et al., 2015)

4. Research gap

Improving the utilized information technologies by SMEs would assist them to achieve the attempted goals and lead to much better outcomes (Africa, 2018; Singh et al., 2019). While the literature discussed some examples of adopting e-commerce by SMEs, to the best of our knowledge, the gap in exploring the adoption rate is still unfilled in Saudi Arabia. Even though there are some studies that explored the adoption rate of e-commerce in the Saudi market before the official definition of SMEs by the Saudi government in December of 2016 (MCI, 2016), these studies need to be validated under the Saudi SME definition. There is a study that was published in 2018 regarding the adoption of e-commerce by Saudi SMEs. However, the actual study had been conducted prior to December of 2016 (Miao and Tran, 2018). Thus, understanding the status of utilizing e-commerce by SMEs in Saudi Arabia after the official classification is still ambiguous from the academic perspective, as the only available view of adopting e-commerce status – but still not focusing on SMEs—came from the government sector of Saudi Arabia in a comprehensive national report (CITC, 2017).

Attempting to address the discussed gap led to the aim of this study, which is exploring the status of utilizing e-commerce by a sample of Saudi SMEs. Therefore, the main research questions of this research are:

1) What is the status of utilizing e-commerce by Saudi SMEs?
2) What are the common drivers for utilizing e-commerce by SMEs in Saudi Arabia?
3) What are the possible challenges that Saudi SMEs would encounter when adopting and running e-commerce solutions?

5. Theory

When discussing the possible theories and frameworks to examine the technology adoption by SMEs, the global research provides several practiced methods that would help in synthesizing this study. As mentioned above, **Table 7** tells us that the adoption of e-commerce started to be explored around two decades ago. This research study started by following the grounded theory philosophy. It started by collecting the required data from the industry. Then, the data was scanned to pick the proper theory to accommodate the explored factors. The outcome of this stage led to a reliance on the TOE framework to classify the factors. Those factors that are going to be studied in this research were explored by scanning the collected data, and then synthesized by other studies. Some factors would behave as a source of power to drive the adoption or could act as a challenge that pulls SMEs from utilizing e-commerce in Saudi Arabia. The examined factors in this study are summarized in **Table 9**. As shown in this table, the factors were classified according to the TOE framework that fit them into three categories, which are technology, organization, and environment-related factors.

Table 9. The essential examined factors.

Adoption Factor	Source
Technology	
Understanding the technology	(Abed, 2020)
The ease of use	(Ziemba et al., 2017)
System security	(Yoon and Occeña, 2015)
Data privacy	(Yoon and Occeña, 2015)
Outsourcing data storage	(Dahbi and Benmoussa, 2019)
Having IT skilled personnel	(Abed, 2020)
Service performance	(Ziemba et al., 2017)
Organization	
Business requirements for e-commerce	(Dahbi and Benmoussa, 2019)
Current business process	(Rana et al., 2019)
Time	(Rana et al., 2019)
Return on investment (ROI)	(Rana et al., 2019)
The desire of business senior management	(Abed, 2020)
The cost of adopting and operating the platform	(Abed, 2020)
Environment	
Customer needs	(Han and Kim, 2019)
Reaching more customers	(Han and Kim, 2019)
Exposing more products/services	(Rana et al., 2019)

6. Methodology

After providing a well-defined research framework, it can safely be acknowledged that little or no research has been carried out on e-commerce adoption by the Saudi SMEs, which justified the need for this research. This study will therefore adopt an exploratory case study which was chosen as an appropriate research method to examine the adoption of e-commerce by SMEs in Saudi Arabia, with a focus on the city of Jeddah. This case study allowed us to ask in-depth questions which enabled us to elicit rich data needed to explain the situation, thereby increasing our understanding of e-commerce use by SMEs. As stated in the previous sections, this study aims to explore the status of utilizing e-commerce by a sample of Saudi SMEs.

The key data collection strategy chosen for this research was structured surveys, for their potential to gather more details about particular factors of concern and to examine the challenges and advantages of e-commerce adoption for in-depth issues. This approach also allows the researcher to grasp the present situation and future prospects of e-commerce directly from professionals and provides the ability to discover, examine and express opinions to address certain relevant subject areas. The researchers used other tools to create case studies, such as financial accounts, web pages, and information leaflets.

Companies that participated in the research were based in Jeddah City in Saudi Arabia's western region. In terms of technical and economic development, the western region displays the highest degree of industrial growth of all regions in Saudi Arabia. Jeddah is a vibrant, fast-growing, commercial city on the Red Sea. It is known as an important gateway to Makkah and Madinah, the Islamic holy cities. Indeed, Jeddah is a cosmopolitan city with a rich cultural heritage, and many of its inhabitants are pilgrims who settled hundreds of years before the establishment of the Saudi Arabian Kingdom in the Arabian Peninsula. As the largest port on Saudi Arabia's west coast, Jeddah has been a hub for services, commerce, manufacturing, and culture. Additionally, Jeddah is considered the most liberal city in Saudi Arabia.

For choosing the respondents, purposive (or judgmental) sampling was used (Trochim and Donnelly, 2007). Companies were selected from the business catalog provided by the Chamber of Commerce and Industry. In addition, the businesses listed represent a wide variety of industries, including supermarkets, suppliers and utilities. It was hypothesized that studying companies from different industries would contribute to a richer collection of data than just studying companies from the same industries (Scupola, 2006), and help to explain the issue of rigorous analysis.

After concluding the process of data collection, our answered questionnaires were entered into the Microsoft Excel spreadsheet and analyzed in accordance with the research questions, using some exploratory data analysis techniques to explain the connection between the collected data and research questions which were used for presenting the findings, concluding the study and making recommendations regarding SMEs and their attitude towards adoption of e-commerce for policy makers in Saudi Arabia.

7. Results

In this section, the results of the data and analysis were presented. The data were collected and then processed in response to the problems identified in the previous sections of this paper. One fundamental goal drove the collection of the data and the subsequent data analysis. This goal is to explore the status of utilizing e-commerce by a sample of Saudi SMEs. This objective was successfully accomplished, and the findings presented in this section demonstrate the potential for SMEs' adoption of e-commerce in Saudi Arabia.

The questionnaire used for data collection was sent to 244 firms which were recruited to participate in the study after contacting them at least two weeks before sending in the questionnaire and putting a follow-up call across, but 107 firms confirmed acceptance and 93 returned the questionnaire. After a rigorous process of data cleaning, this study came up with just 63 valid responses (n = 63, response rate = 25.82%). The sample of 63 organizations consisted of 43 micro, 19 small, and one medium-sized enterprise. Presented in **Table 10** below is the summary of profiles that participated in this study and their main business activities.

Table 10 shows a surprising adoption result, where only 6 (9.5%) out of 63 firms were utilizing e-commerce solutions. This unexpected minimum adoption rate led to focusing heavily on exploring the reasons behind the lack of adopting e-commerce by Saudi SMEs, in addition to finding the possible drivers that led the 9.5% of the sample to adopt e-commerce solutions. In addition, the collected data contains only two medium-sized enterprises.

The presented result in **Table 11** shows the average of considering each studied factor as a challenge by 57 SMEs. Also, these challenges are illustrated in **Figure 1**. Additionally, **Table 11** presents the average of considering each factor as a driver by the 6 adopting firms of SMEs. Those drivers would give a clue, but it is required to collect a larger sample of e-commerce adopters to explore the drivers more accurately.

Table 10. Participant firms' profile and sample summary.

Variables	Frequency (n)	Percentage (%)
E-commerce Adoption		
Uses e-commerce	6	9.5%
Does not use e-commerce	57	90.5%
Organization size (based on number of employees)		
Micro	41	65.1%
Small	20	31.7%
Meduim	2	3.2%
Business Activity		
Arts and Photography	2	3.17%
Café	4	6.35%
Computers	4	6.35%
Footwear	2	3.17%
Pharmacy	1	1.59%
Phones	22	34.92%

Table 10. (*Continued*).

Variables	Frequency (n)	Percentage (%)
Restaurant	3	4.76%
Sports equipment	1	1.59%
Travel	1	1.59%
Accessories	3	4.76%
Building materials	1	1.59%
Clothes	5	7.94%
Convenience store	7	11.11%
Fuel station	2	3.17%
Souvenirs	2	3.17%
Technician	3	4.76%

Table 11. The average rate of the challenges and drivers when adopting e-commerce by Saudi SMEs.

The Examined Factor	Considered as a challenge (n = 57)	Considered as a driver (n = 6)
Technology		
Understanding the technology	53 (93%)	3 (50%)
The ease of use	51 (89.5%)	4 (66.7%)
System security	35 (61.4%)	5 (83.3%)
Data privacy	35 (61.4%)	4 (66.7%)
Outsourcing data storage	35 (61.4%)	3 (50%)
Having IT-skilled personnel	52 (91.2%)	2 (33.3%)
Service performance	52 (91.2%)	4 (66.7%)
Organization		
Business requirements for e-commerce	51 (89.5%)	5 (83.3%)
Current business process	49 (86.0%)	5 (83.3%)
Time	52 (91.2%)	4 (66.7%)
Return on investment (ROI)	47 (82.5%)	2 (33.3%)
The desire of business senior management	41 (71.9%)	3 (50%)
The cost of adopting and operating the platform	38 (66.7%)	5 (83.3%)
Environment		
Customer needs	47 (82.5%)	3 (50%)
Reaching more customers	47 (82.5%)	4 (66.7%)
Exposing more products/services	43 (75.4%)	4 (66.7%)

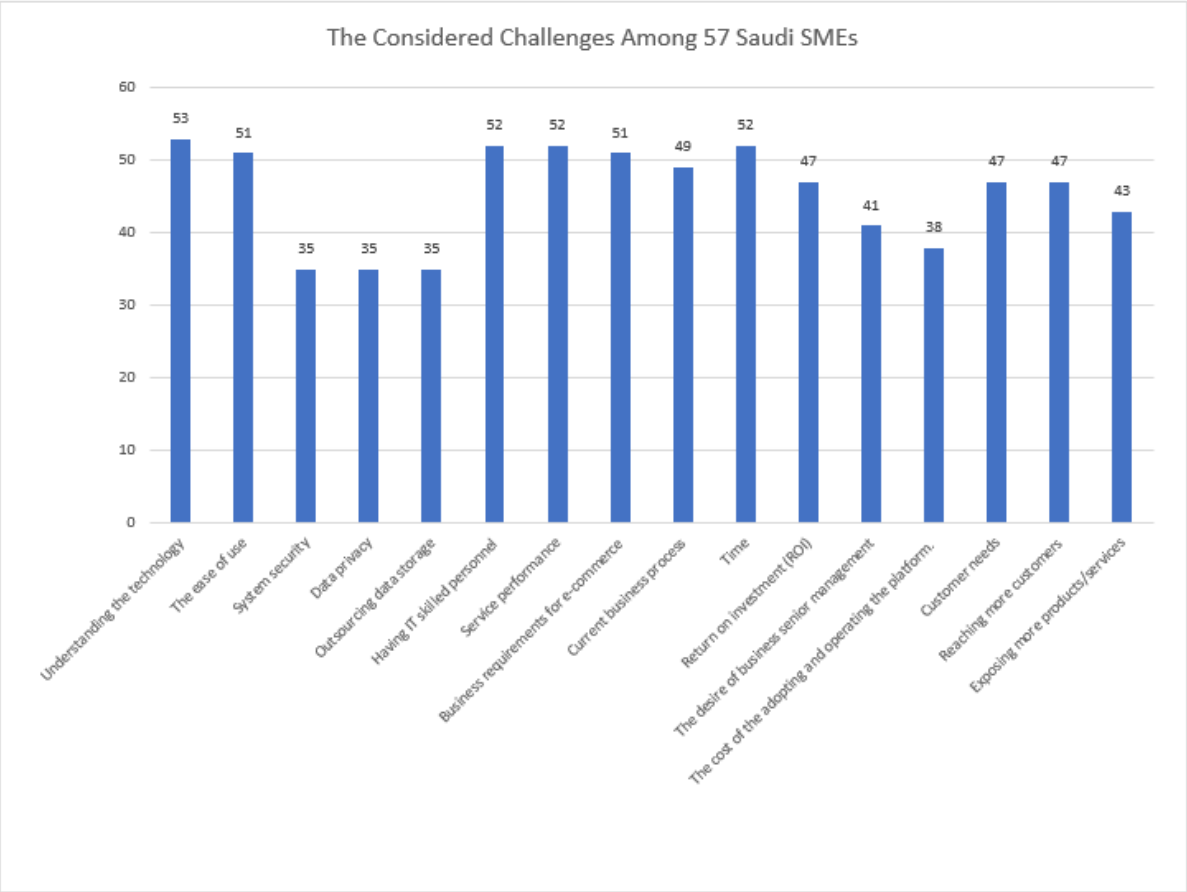

Figure 1. The challenges that face 57 Saudi SMEs when adopting e-commerce.

Table 12 shows the result of ANOVA test to explore the statistically significant differences of viewing the factors as challenges between two groups according to their size, which are the micro and the small organizations. The examined list of 57 organizations consists of 36 micro firms, while the small are 21. Therefore, the degree of freedom is $F_{(1,55)}$ and the significance level $\alpha = 0.05$. The values were coded yes = 1 and no = 0.

Table 12. The results of ANOVA test to examine the different view of challenges between micro and small SMEs.

The Examined Factor	**$F_{(1,55)}$ Value**	***P*-Value**
Technology		
Understanding the technology	1.65	0.12
The ease of use	1.122807	0.40
System security	0.987179	0.47
Data privacy	1.185185	0.35
Outsourcing data storage	0.872727	0.35
Having IT-skilled personnel	2.133333	0.037
Service performance	0.171569	3.05×10^{-6}

Table 12. (*Continued*).

The Examined Factor	$F_{(1,55)}$ Value	*P*-Value
Organization		
Business requirements for e-commerce	2.583333	0.01
Current business process	1.578947	0.14
Time	0.419753	0.01
Return on investment (ROI)	0.645833	0.13
The desire of business senior management	0.826531	0.30
The cost of adopting and operating the platform	1.107407	0.41
Environment		
Customer needs	1.253086	0.30
Reaching more customers	0.645833	0.126
Exposing more products/services	0.82963	0.306

In order to examine the ANOVA test result, the hypothesis of this test was created as follows, considering the level of significance of $\alpha = 0.05$:

H_0: There is no difference in viewing factors as challenges between micro and small organizations.

In order to find that micro and small Saudi SMEs of the explored sample have similar views toward specific factors as challenges to adopt e-commerce by Saudi SMEs, the p value must be greater than the significance level, which is $\alpha = 0.05$. Thus, any challenge that has a *p*-value of larger than 0.05 has failed to reject the null hypothesis. **Table 12** shows that the challenges that have *p*-value greater than 0.05 are:

Technology:

- Understanding the technology (0.12)
- The ease of use (0.4)
- System security (0.47)
- Data privacy (0.35)
- Outsourcing data storage (0.35)

Organization:

- Current business process (0.14)
- Return on investment (ROI) (0.13)
- The desire of business senior management (0.3)
- The cost of adopting and operating the platform (0.41)

Environment:

- Customer needs (0.3)
- Reaching more customers (0.126)
- Exposing more products/service (0.306)

The list above shows that micro and small SMEs have similar a view of most examined challenges that businesses would encounter when adopting e-commerce in Saudi Arabia.

H_1: Micro organizations view the challenges differently from the small firms.

Although the micro and small enterprises looked similar in viewing the challenges that are standing against utilizing e-commerce, the results revealed 4

challenges that rejected the null hypothesis, as they were considered differently between the two groups. Those challenges are:

Technology:

- Having IT-skilled personnel (0.037)
- Service performance (3.05×10^{-6})

Organization:

- Business requirements for e-commerce (0.01)
- Time (0.01)

This result led us to go back to investigate the collected data to explore the average of considering those four factors as challenges by micro and small businesses, and the result is presented in **Table 13**.

Table 13. The average of considering challenges by micro and small Saudi SMEs.

The Examined Challenge	The Average by Micro Firms	The Average by Small Firms
Technology		
Having IT-skilled personnel	88.9	95.2%
Service performance	97.2%	81%
Organization		
Business requirements for e-commerce	86.1%	95.2%
Time	94.4%	85.7%

Table 13 shows that micro firms have more concern regarding the service performance and feel that they do not have sufficient time to implement e-commerce, while small businesses have a stronger belief that their businesses do not need to adopt e-commerce as well, as they are concerned more about having the skilled personnel who can deal with the e-commerce activities.

8. Discussion

At the early stages of this research, it was planned to implement more analysis on the collected data, but due to the preliminary analysis, two phases were excluded, which are:

1) Explore the challenges and the drivers for utilizing e-commerce by Saudi SMEs according to the firm's size among micro, small and medium-sized enterprises. However, collecting data from only two medium-sized organizations led to focus more on micro and small firms only.
2) Analyze the drivers for adopting e-commerce from the adopters' perspectives. However, finding only six firms who adopted e-commerce stood against this phase, where the result would not be sufficiently considered.

The following subsections discuss the main outcomes of this study, based on the TOE Model.

8.1. The technological challenges

The result shows that there is a clear concern when adopting e-commerce due to the lack of understanding of the technology. Being the top-ranked risk that scored 57

(93%) presents the strong demand to skill up SME owners and operators of Saudi SMEs to take advantage of the e-commerce potential.

Considering the education level as a significant barrier would give the clue to the next-ranked technical challenge even before revealing the results. The lack of skilled IT personnel came as the second top challenge that was ranked by 51 SMEs. The fear of service performance came also second in the list. As the current technologies would be considered as operationally stable, this fear would be linked to the education factor as well.

Moreover, the examined sample still has an education-related concern, which is the difficulty level of the service that was ranked at 51 (89.5%).

8.2. The organizational challenges

The feeling of not having sufficient time to bring e-commerce power to the firm was ranked the top organizational challenge (91.2%) by the explored sample of non-e-commerce adopters. This would lead as well to the awareness level of the e-commerce potential to SMEs. If the organization can see the opportunities of adopting e-commerce, they could dedicate a specific time to implement it and gain from its benefits.

The second-top claimed challenge was the belief that their business does not require an e-commerce channel. This was the belief of 51 firms (89.5%). This significant view seems common among them, but that would lead to another question: do those SMEs from different sectors not really need e-commerce? Are they aware if the business requires e-commerce or not? Again, it seems that this is an awareness issue.

8.3. The environmental challenges

The environmental challenges looked somehow significant, but not as critical as the technological nor the organizational factors. As the list has only three factors, customer needs and the difficulty of reaching more customers via e-commerce platforms were ranked the top environmental challenges by 47 firms (82.5%). The result seems unrealistic as it is common that e-commerce would increase sales by bringing more customers, unless of course the major issue is among Saudi SMEs, which is the insufficient awareness of e-commerce.

9. Conclusion

The potential of e-commerce became a common key player in most countries, that left a positive effect on all business sizes, including SMEs. The adoption and utilization of e-commerce by Saudi SMEs is the main gap that this study aimed to explore.

To examine the status of utilizing e-commerce by Saudi Arabian SMEs, a quantitative survey was distributed among 244 SMEs in Jeddah City, which is the second largest Saudi city and the main seaport of the country. The answers were obtained from 63 firms, which is equal to 25.82%. Those organizations were asked mainly to answer three questions. The first question aimed to explore the adoption rate among the sample. The second question was focused on understanding the main

drivers of adopting e-commerce, while the third question aimed to investigate the challenges that stood against the adoption of e-commerce by the non-adopter Saudi SMEs.

The surprising result showed that only 6 firms were utilizing e-commerce services. This exceptionally low result led us to cancel the phase of investigating the drivers of adopting e-commerce. The challenges of utilizing e-commerce were explored in detail to understand the main hindrances behind this result. The outcomes of this study pointed out that the limited knowledge awareness of e-commerce potential to SMEs would be the main factor that constituted the barrier when utilizing e-commerce.

The market of SMEs in Saudi Arabia needs some effort to increase the awareness of the expected common benefits of adopting e-commerce and several other IT technologies. In addition, the Saudi market of SMEs would have a strong potential for IT service providers to take the advantage and to provide customized business solutions to the Saudi market.

The primary limitation of this research is the sample size, which is relatively small due to the difficulties in reaching out many SMEs. In addition, the geographic concentration of SMEs within Jeddah city limits the generalizability of the findings across different regions and industries within Saudi Arabia. Given the rapid evolution of technology and market conditions, the findings may not reflect the current state of e-commerce adoption, or the ongoing challenges faced by SMEs.

To address these limitations, future research should aim to use this study in a wider range of SMEs from various sectors with more diverse sample that spans across multiple regions among the kingdom of Saudi Arabia. This will provide a more representative understanding of the e-commerce practices among SMEs. Researchers are also encouraged to explore more qualitative case studies that can offer deeper insights into the organizational, technological, and environmental challenges specific to different industries.

Author contributions: Conceptualization, BF and AMW; methodology, BF and AMW; software, BF and AMW; validation, BF and AMW; formal analysis, BF; investigation, BF; resources, AMW; data curation, AMW; writing—original draft preparation, BF and AMW; writing—review and editing, BF and AMW; visualization, BF and AMW; supervision, BF and AMW; project administration, BF; funding acquisition, AMW. All authors have read and agreed to the published version of the manuscript.

Conflict of interest: The authors declare no conflict of interest.

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