



**DETERMINANTS OF BUSINESS-TO- CONSUMER E- COMMERCE
ADOPTION AMONG SME RETAILERS IN SAUDI ARABIA**

By

ALTAYYAR, RAED SAUD D

**Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia,
in Fulfilment of the Requirements for the Degree of Doctor of Philosophy**

April 2022

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Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment of the requirement for the degree of Doctor of Philosophy

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E-commerce has not been popularly and effectively adopted among Small and Medium-sized Enterprises (SMEs) in developing countries, particularly in Saudi Arabia. Of the country's 34 million citizens, 32 million are Internet users, yet only 12 million use e-commerce platforms and online services. In 2019, Saudi's percentage of online shoppers was 43%, far below that of developed countries like the USA (81%), the UK (82%), China (76.5%), and the United Arab Emirates or UAE (80%). Thus, compared with other countries, especially with other Gulf States like the UAE, business-to-consumer (B2C) e-commerce has not been effectively implemented in Saudi Arabia.

SMEs are among the most significant agents of economic growth and development because they create jobs, support innovation, and increase exports. However, the literature shows that the use of e-commerce in Saudi Arabia's SME sector is extremely low. Given that research on e-commerce adoption is limited among SMEs in developing countries, this study aimed to investigate the factors that influence B2C e-commerce adoption among SME retailers in Saudi Arabia. Prior studies have mainly focused on culture at the social-cultural and national level as well as political and religious characteristics, leaving gaps at the organizational level. There also appears to be limited analysis of organizational culture's moderating role in the adoption of B2C e-commerce. In the attempt to fill these gaps, this study integrated technological, organizational, environmental, and individual factors from the e-commerce literature to develop a model of e-commerce adoption for SMEs in Saudi Arabia.

The survey research design was employed to collect questionnaire data from a sample of 363 retail SME owners from three states in Saudi Arabia, namely Riyadh, Makkah, and the Eastern Province. Descriptive statistics and structural equation modeling using Smart-PLS 3.0 were utilized to analyze and interpret the data. The results showed that relative advantage, cost in technology, Internet capability, technology readiness,

competitive pressure, owner innovativeness, and owner IT knowledge have a positive effect on e-commerce adoption among SMEs in Saudi Arabia. However, firm size as well as regulatory and legal environment demonstrated an insignificant effect on the B2C adoption of e-commerce among SME retailers in the Saudi context. Moreover, the moderation test revealed that organizational culture (flexible orientation) significantly moderates the effects of technological, organizational, and individual factors on e-commerce adoption among SME retailers, but not the effect of environmental factors on e-commerce adoption.

Theoretically, the study extends the technology-organization-environment (TOE) model and innovation diffusion theory (IDT) by establishing organizational culture as a moderating variable. Practically, the findings aid SMEs in improving their e-commerce adoption through the identified factors. However, this study has several limitations. First, the data was cross-sectional, whereby the associations among the variables cannot be used to infer longitudinal processes. Second, the current findings are specific to the SME and Saudi Arabian contexts, which impacts generalizability. Future studies should test the present model in other Gulf States and developing countries to compare results. This can help scholars better predict the adoption of e-commerce and the variables affecting them, especially across various other cultures. Research in the future should also focus on large enterprises, since they are more technologically advanced than small enterprises.

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah Doktor Falsafah

**PENENTU PENGGUNAAN E-DAGANG PERNIAGAAN-KE-PENGGUNA
DALAM KALANGAN PERUNCIT PERUSAHAAN KECIL DAN
SEDERHANA DI ARAB SAUDI**

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E-dagang belum diterima pakai secara popular dan berkesan dalam kalangan Perusahaan Kecil dan Sederhana (PKS) di negara membangun, khususnya di Arab Saudi. Daripada 34 juta rakyat negara itu, 32 juta adalah pengguna Internet, namun hanya 12 juta menggunakan platform e-dagang dan perkhidmatan dalam talian. Pada 2019, peratusan pembeli dalam talian Saudi adalah 43%, jauh lebih rendah daripada negara maju seperti AS (81%), UK (82%), China (76.5%) dan Emiriah Arab Bersatu atau UAE (80%). Oleh itu, berbanding dengan negara lain, terutamanya dengan Negara Teluk lain seperti UAE, e-dagang perniagaan-ke-pengguna (B2C) tidak dilaksanakan dengan berkesan di Arab Saudi.

PKS adalah antara ejen pertumbuhan dan pembangunan ekonomi yang paling penting kerana mereka mencipta pekerjaan, menyokong inovasi dan meningkatkan eksport. Walau bagaimanapun, literatur menunjukkan bahawa penggunaan e-dagang dalam sektor PKS Arab Saudi adalah sangat rendah. Memandangkan penyelidikan mengenai penggunaan e-dagang adalah terhad dalam kalangan PKS di negara membangun, kajian ini bertujuan untuk menyiasat faktor-faktor yang mempengaruhi penggunaan e-dagang B2C dalam kalangan peruncit PKS di Arab Saudi. Kajian terdahulu lebih tertumpu kepada budaya di peringkat sosial-budaya dan kebangsaan serta ciri-ciri politik dan agama, meninggalkan jurang di peringkat organisasi. Diperhati juga bahawa terdapat analisis terhad tentang peranan penyederhanaan budaya organisasi dalam penggunaan e-dagang B2C. Dalam usaha untuk mengisi jurang ini, kajian ini menyepadukan faktor teknologi, organisasi, alam sekitar dan individu daripada literatur e-dagang untuk membangunkan model penggunaan e-dagang untuk PKS di Arab Saudi.

Reka bentuk kajian tinjauan digunakan untuk mengumpul data soal selidik daripada sampel 363 pemilik PKS runcit dari tiga negeri di Arab Saudi, iaitu Riyadh, Makkah dan Wilayah Timur. Statistik deskriptif dan pemodelan persamaan struktur menggunakan Smart-PLS 3.0 telah digunakan untuk menganalisis dan mentafsir data. Keputusan menunjukkan bahawa kelebihan relatif, kos dalam teknologi, keupayaan Internet, kesediaan teknologi, tekanan persaingan, inovasi pemilik, dan pengetahuan IT pemilik mempunyai kesan positif terhadap penggunaan e-dagang dalam kalangan PKS di Arab Saudi. Walau bagaimanapun, saiz firma serta persekitaran kawal selia dan undang-undang menunjukkan kesan yang tidak signifikan terhadap penggunaan e-dagang B2C dalam kalangan peruncit PKS dalam konteks Saudi. Selain itu, ujian penyederhanaan mendedahkan bahawa budaya organisasi (orientasi fleksibel) menyederhanakan dengan signifikan kesan faktor teknologi, organisasi dan individu terhadap penggunaan e-dagang dalam kalangan peruncit PKS, tetapi bukan kesan faktor persekitaran terhadap penggunaan e-dagang.

Secara teorinya, kajian ini memanjangkan model teknologi-organisasi-persekitaran (TOE) dan teori difusi inovasi (IDT) dengan menimbulkan budaya organisasi sebagai pembolehubah penyederhana. Secara praktikal, penemuan ini membantu PKS dalam meningkatkan penggunaan e-dagang mereka melalui faktor-faktor yang dikenal pasti. Walau bagaimanapun, kajian ini mempunyai beberapa batasan. Pertama, data adalah keratan rentas, di mana perkaitan antara pembolehubah tidak boleh digunakan untuk membuat kesimpulan proses membujur. Kedua, penemuan semasa adalah khusus untuk konteks PKS dan Arab Saudi, yang memberi kesan kepada kebolehgeneralisasian. Kajian masa depan harus menguji model semasa di Negara Teluk dan negara membangun lain untuk membandingkan keputusan. Ini boleh membantu para penyelidik meramalkan penggunaan e-dagang dan pembolehubah yang mempengaruhinya dengan lebih baik, terutamanya merentasi pelbagai budaya lain. Penyelidikan pada masa hadapan juga harus memberi tumpuan kepada perusahaan besar, kerana mereka lebih maju daripada perusahaan kecil dari segi teknologi.

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This thesis was submitted to the Senate of Universiti Putra Malaysia and has been accepted as fulfilment of the requirement for the degree of Doctor of Philosophy. The members of the Supervisory Committee were as follows

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LIST OF ABBREVIATIONS

AMOS	Analysis of Moment Structures
B2B	Business-To-Business
B2C	Business-To-Consumer
CITC	Communications and Information Technology Commission
C2C	Consumer-To-Consumer
DOI	Diffusion Of Innovation
EC	Electronic Commerce
EDI	Electronic Data Interchange
EFT	Electronic Funds Transfer
IT	Information Technology
IDT	Innovation Diffusion Theory
TOE	Technology-Organization-Environment Framework
CVM	Competing Values Model
IWS	Internet World Statistics
GASR	General Authority for Statistics Report
UTAUT	The Unified Theory of Acceptance and Use of Technology
GDP	Gross Domestic Product
SBA	Small Business Administration
ICT	Information and Communications Technology
IMT	International Mobile Telecommunications
ATM	Automated Teller Machines
ISP	Internet Service Provider
SOM	Stage-Oriented Model

CEO	Chief Executive Officer
RA	Relative Advantage
CT	Cost in Technology
IC	Internet Capability
ITU	International Telecommunication Union
TR	Technology Readiness
FS	Firm Size
RLE	Regulatory & Legal Environment
CP	Competitive Pressure
OI	Owner Innovativeness
OIK	Owner IT Knowledge
CO	Control-oriented
FO	Flexibility-oriented
EC	E-commerce
KACST	King Abdulaziz City for Science and Technology
SMEs	Small and Medium Enterprises
SPSS	Statistical Package for Social Science
SEM	Structural Equation Modeling
TAM	Technology Acceptance Model
TOE	Technology–Organization-Environment
TPB	Theory of Planned behavior
TRA	Theory of Reasoned Action
WTO	World Trade Organization

CHAPTER 1

INTRODUCTION

1.1 Introduction

This chapter provides an overview of Internet growth and e-commerce adoption among Small and Medium-sized Enterprises (hereafter referred to as SMEs in this thesis). The chapter also explains the problem statement, the objectives of the study, and the research questions. The significance of the study, its scope, and its limitations are outlined in this chapter as well. The chapter ends with the operational definitions of key terms and the organization of the study.

1.2 Overview of Internet and E-commerce Adoption among SMEs

In the current digitization era, the Internet's key role has become crucial and is projected to grow faster than ever to influence the future. A report released by the Internet World Statistics (2019) showed a tremendous increase in the number of people who used the Internet between 2000 and 2019. As of June 2019, there were over 4.5 billion Internet users worldwide compared to 114 million in 2000, displaying a universal increase of 1,157 percent. The most important task the Internet performs is allowing individuals to communicate over long distances and across borders (Fonseka et al., 2021). The spread of the Internet has also changed the individual's lifestyle from offline to online commercial activities. Additionally, the Internet has introduced new forms of relationships, changing informal social relationships to formal ones, such as political, economic, and business relationships. Specifically, the Internet has become an important platform for international business and trading activities (Fonseka et al., 2021). The number of products and services available online is growing at an exponential rate. Many products and services, in fact, can only be purchased online, including high-class foreign products and the financial reports of international companies (Telegraph, 2022). In short, the key purpose of the Internet is to connect the globe and bring it closer to a broadly knowledgeable market, where goods and services are advertised, procurement is accessible anywhere, and shoppers and suppliers can access each other at zero cost.

Ben et al. (2016) mentioned that the Internet has become the lifeblood for businesses, as it provides significant assistance for the trade and corporate sectors. It allows companies to participate in a range of online operations, such as e-commerce, e-training, e-procurement, e-learning, e-tendering, and more. It also facilitates online customer interactions using versatile social media sites and virtual platforms that allow staff to organize their work more effectively. Businesses are thus aware of the level of Internet communication that is appropriate for their needs Pisar and Tomaskova (2020). as the amount of bandwidth they need depends on what they do and how many people are involved Pisar and Tomaskova (2020).

Hussain et al. (2022) urged that commercial activities on the Internet increase the number of new suppliers and service hours inexpensively, as a business can find new dealers with more competitive products and prices. This is more effective than other conventional approaches, such as replicas and mobile phones. Rahayu and Day (2017) corroborated that Internet transactions have decreased commercial transaction costs and improved profitability. For example, fast electronic transactions, such as for purchase orders, can decrease operational costs from holding surplus stock (Hussain et al., 2022). Ultimately, vital benefits can be obtained by using the Internet for business purposes and transactions, including better communication within a company and with its stakeholders, such as suppliers, customers, and regulators. As a result, Internet transactions play a key role in how global trade is conducted. Nations worldwide have found this technology to be indispensable, including Saudi Arabia, which is the case at hand. Saudi Arabia became a member of the World Trade Organization (WTO) in 2005, (Alhijris, 2013) which contributed to enhancing the country's business-to-business (B2B) commercial activities. Since then, the Saudi domestic market has been open to foreign businesspeople and investments, thereby improving the country's investment environment via advanced Internet communication technologies.

The Internet activities and applications surrounding online business consist of electronic mails and other electronic-based services (Nazir & Roomi, 2021; Sila, 2013). Notably, electronic commerce (hereafter e-commerce) was introduced in 1990 to perform specific transactions online as a subset of electronic business. According to Jain and Arya (2021), e-commerce is defined as the process of purchasing, selling, transferring, or exchanging goods, services, and/or information over computer networks such as the Internet and intranets. E-commerce is a main aspect of business-to-consumer research, as it involves the process of purchasing and selling goods and services through data transmitted electronically via online services (Al-Somali et al., 2015). The prevalence of e-commerce in recent decades is confirmed by the continuous rise of the use of websites for e-commerce globally. According to a report by Statistica (2019), an approximate 1.8 billion individuals buy online products worldwide. Additionally, international e-retail trade amounted to 2.8 trillion U.S. dollars that year and was estimated to reach 4.8 trillion U.S. dollars by the end of 2021. Furthermore, Asia has shown tremendous growth in the e-commerce sector.

The evolution of e-commerce since then has extended its perspective to several organizational and individual aspects (Jahanshahi et al., 2013; Nazir & Roomi, 2021). In a previous study, Zainuddin et al. (2021) suggested that e-commerce has changed not only the way business activities are conducted but also perspectives of excellence in production. Specifically, there has been a shift from the current perspective of business being the seller's agent to the buyer's agent (Rahayu & Day, 2017). This brings differences in the economic world by moving from the post-industrial era, which was mainly associated with physical goods, to the era of the knowledge economy, where the main focus is intelligence and service information (Rahayu & Day, 2017).

For firms to survive and sustain in this economy, they must embrace technological advancements like e-commerce. Failure to do so will leave firms and nations lagging behind those that adopt e-commerce. This is because e-commerce does not only offer firms new ways of selling, purchasing, and dealing with customers and suppliers, but also provides other benefits like time management, cost-cutting, market expansion, and better overall performance (Rahayu & Day, 2015). For consumers, e-commerce is a new prototype which makes shopping more convenient, as it offers cheaper prices, customized products, and combined offerings (Alzahrani, 2019).

Therefore, e-commerce has now become a critical component of many businesses' day-to-day operations. In Saudi Arabia, several government agencies have implemented effective development plans to promote local e-commerce businesses (AlTaiar, 2020). The Ministry of Commerce and Investment (MCI) and its associated agencies, for example, are working to improve the environment for e-commerce by updating regulatory policies and frameworks, increasing customer satisfaction in e-commerce transactions, and enhancing SMEs. However, a review of previous studies indicates that Saudi consumers continue to lack trust in e-commerce practices for a variety of reasons, including insufficient laws and legislations that protect them (Abed et al., 2015b).

SMEs are among the core sources of employment and technological development in any country (Jahanshahi et al., 2013; Mathkur, 2019; Savrul et al., 2014). According to the General Authority for Statistics (2018), an SME is defined in Saudi Arabia as any business which employs six to 49 employees (i.e., small) or 50 to 249 employees (i.e., medium). Large firms typically employ more than 250 workers and are not considered SMEs. Governments have acknowledged the contribution of SMEs to their economies. Therefore, they have given SMEs appropriate incentives that boost their continuous contribution to the economy, including incentives for e-commerce adoption. Indeed, Zainuddin et al. (2021) stated that the implementation of e-commerce presents SMEs the significant potential to broaden their access on a worldwide scale. In the current organizational surrounding, SMEs are rapidly using e-commerce to improve their performance to gain a competitive edge and secure a long-term favorable position (Sarfo & Song, 2021).

The adoption of e-commerce technology in the SME sector is crucial for firms' survival, as it provides competitive advantages that bigger organizations have (Altayyar et al., 2021). E-commerce gives SMEs access to accomplish their marketing goals through cost-effective means, thereby boosting the efficiency of their operations and enabling global recognition (Senarathna et al., 2013). With the advent of this technology, small businesses can also improve their communication and information sharing with customers, introduce new products in the market, and gain valuable partners or suppliers. Furthermore, e-commerce enables SMEs to achieve operational flexibility, production competence, minimized cost structures, faster decision-making, and improved customer service (Alzahrani, 2019). Additionally, e-commerce bridges the physical and time distance between suppliers and clients while reducing market entry barriers and increasing market competitiveness. Existing research on e-commerce (Alam et al., 2011; Govindaraju et al., 2015; Rahayu & Day, 2017; Turban et al., 2010) further states that

its most significant benefits are lower operating costs, higher revenue, greater productivity, stronger customer loyalty, shorter processing times, wider market access, and greater market penetration.

However, despite these advantages, the adoption of e-commerce by SMEs remains limited (Zhu & Chen, 2016), while the rapid advancements in e-commerce are implemented mostly by bigger firms (Abbas et al., 2018; Awiagah et al., 2016; Govindaraju et al., 2015; Ocloo et al., 2018; Setiyani & Rostiani, 2021). Al-tayyar et al. (2021) identified three primary reasons SMEs are still hesitant to adopt e-commerce technology, namely a lack of success stories, a lack of knowledge in e-commerce, and a lack of information about the potential impact of e-commerce implementation on business performance. In a similar vein, Rahayu and Day (2017) observed that one of the obstacles mentioned by Indonesian SMEs pertaining to the adoption of e-commerce is the belief that it does not bring any benefits to their business. Due to these factors, many SMEs, particularly those in developing nations, are hesitant to invest their resources in this technology. Unfortunately, the vast majority of e-commerce studies (Abbas et al., 2018; AlTaiar, 2020; Kurnia et al., 2015) have been carried out in affluent nations, with very few focusing on SMEs or developing countries. This obviously presents a barrier to the comprehension of e-commerce adoption among SMEs in developing nations. It is vital to identify the variables that support or impede adoption, particularly for SMEs, to subsequently understand how adoption can benefit SMEs' performance. This raises questions about the factors that influence SMEs' adoption of B2C e-commerce in a developing country like Saudi Arabia, which is the focus of this study.

1.3 Problem Statement

Many firms rely on e-commerce to stay competitive in today's market, as it is a key driver of economic growth (Abed et al., 2015a; Chen & Zhang, 2015). The Middle East and North Africa (MENA) region's total market value was expected to reach \$13.4 billion in 2020. In the United Arab Emirates (UAE), it reached \$4.4 billion (32.8%), while in Saudi Arabia, it amounted to \$2.9 billion (21.6%) (Al-Khalidi et al., 2015). This indicates that the rate of e-commerce growth in Saudi Arabia is slower than that of UAE and MENA, despite Saudi's fast-expanding economy, the growing use of the Internet, and the country's vigorous purchasing power (Abed et al., 2015a). Moreover, the money spent on e-commerce activities in Saudi Arabia amounted to \$7.93 billion in 2017. Interestingly, customers who have used online services from local businesses only constitute seven percent, whereas the majority of 93 percent have utilized online services from foreign-owned businesses (CITC, 2017). As a developing nation striving to develop its economy, the Saudi government has exerted considerable efforts to encourage businesses' adoption of new technologies through various programs, such as the introduction of Vision 2030. However, there are shortcomings and obstacles in the adoption of e-commerce in several Saudi businesses, especially SMEs (Elhassan, 2019).

SMEs are among the most significant agents of economic growth in a country because they contribute to creating jobs, supporting innovation, and enhancing trade. However, unlike in advanced countries, SMEs in Saudi Arabia are not key contributors to the country's GDP (Government of Saudi Arabia, 2016). This may be because while SMEs all over the world look forward to embracing e-commerce as an extremely profitable source of sales, in the Saudi context, SMEs still prefer traditional retailing. Figure 1.1 shows that most SME retailers in Saudi Arabia use traditional marketing methods, with only a small number of enterprises using electronic marketing methods (General Authority for Statistics, 2018).

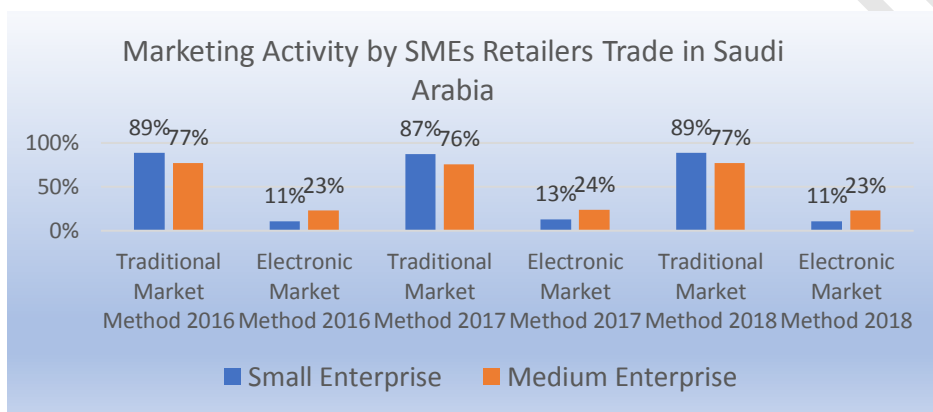


Figure 1.1 : Marketing Activity by SME Retailers in Saudi Arabia
(Source : General Authority for Statistics 2018)

As discussed earlier, the literature on e-commerce has empirically shown that e-commerce adoption can provide substantial benefits for SMEs (Al-tayyar et al., 2021), including access to limited market segments that are divided geographically as well as the potential to expand to worldwide availability (AlTair, 2020). However, e-commerce adoption by Saudi SMEs remains limited and ineffective. For example, a survey of 444 SMEs revealed that most of them are unwilling to conduct online transactions, whereby over 80 percent use the Internet only to communicate (e.g., e-mail) and find commercial information (Miao & Tran, 2018). It appears that Saudi SMEs mainly utilize the Internet for advertisement purposes and for obtaining general information rather than for conducting e-commerce activities (General Authority for Statistics, 2018).

In this regard, Altayyar et al. (2021) stated that the main obstacles SMEs encounter in implementing e-commerce are related to uncooperative customers and suppliers, privacy and security issues, a lack of expertise, distrust in the effectiveness of the online e-commerce environment, high costs of operation, and technical limitations of hardware or software. Access to finance, trade laws and regulations, availability of skilled labor, and labor laws and regulations are also obstacles that SMEs face in Saudi Arabia (CITC, 2017). Moreover, Saudi business owners lack awareness regarding online payments, leading most customers to prefer paying cash on delivery. As shown in Figure 1.2,

Eshopworld (2019) reported that only one percent of shoppers pay through online transfer. Thus, it can be observed that SMEs need support for e-commerce adoption in terms of technological and training assistance (AlGhamdi et al., 2012).

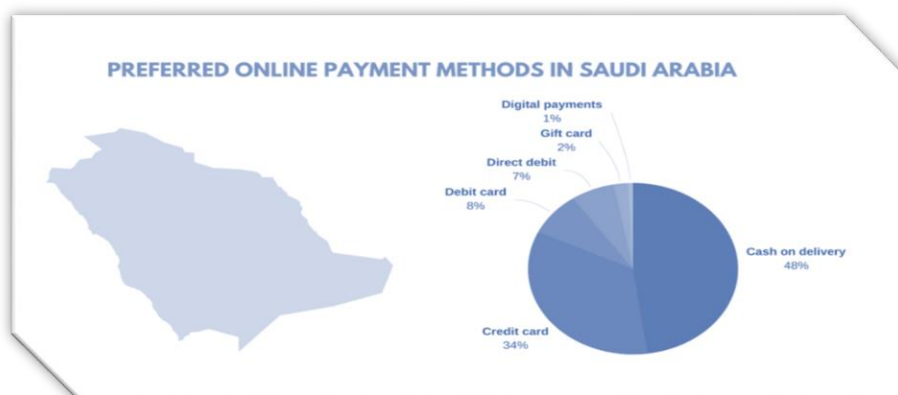


Figure 1.2 : Online Payment Methods in Saudi Arabia
(Source : Eshopworld, 2019)

Table 1.1 : Rank of B2C E-commerce in Developing Countries

2018 Rank	Economy	Share of individuals using the Internet (2017 or latest)	Share of individuals with an account (15+, 2017 or latest)	Secure Internet servers (normalize) (2017)	UPU postal reliability score (2017 or latest)	Index value (2017 data)	Index value change (2016-17 data)	2017 Index rank
2	Singapore	84	98	98	100	95.2	1.7	18
15	Hong Kong (China)	89	95	84	92	90.2	1.1	16
21	Korea (Republic of)	95	95	66	100	89.0	0.6	5
33	United Arab Emirates	95	88	66	75	81.2	-4.6	23
34	Malaysia	80	85	78	80	80.8	2.2	39
43	Thailand	53	82	60	98	73.2	4.3	49
47	Turkey	65	69	74	76	71.1	4.5	60
49	Iran (Islamic Republic of)	60	94	52	77	70.9	0.8	47
50	Chile	82	74	81	44	70.4	-0.8	54
52	Saudi Arabia	80	72	49	74	68.7	0.7	46

(Source : United Nations Conference on Trade and Development 2018)

Table 1.1 shows that Saudi Arabia ranked 52nd in the United Nations Conference on Trade and Development's (2018) B2C e-commerce index. In comparison, UAE was ranked 33rd, confirming that Saudi Arabia is lagging in B2C e-commerce adoption compared to other Arab nations. Only a small number of Saudi businesses, generally medium and large organizations in the manufacturing sector, engage in business-to-business online exercises. As illustrated in Table 1.2, only 12 million customers in Saudi Arabia use online services out of 32 million Internet users in its population of 34 million. Also, while e-commerce spending is nearly \$7.93 billion, revenue amounts to only

\$1.648 million. Therefore, the practical problem addressed by this study is the limited and ineffective adoption of e-business among SMEs in Saudi Arabia.

Table 1.2 : Statistics of Global E-commerce

<i>Country</i>	<i>Population (Millions & Billions)</i>	<i>Internet Users (billions& Millions)</i>	<i>Online shoppers (Millions)</i>	<i>The online shoppers' percentage of the total Internet Users</i>	<i>E-Commerce spent (Billions, Trillion)</i>	<i>E-Commerce Revenue (Millions)</i>
<i>UK</i>	66,7m	63,544m	52,106m	82 %	\$141,93 bn	\$78,903m
<i>US</i>	327,5m	292,892m	224,1m	81 %	\$586,92 bn	\$365,207m
<i>China</i>	1,4 bn	854m	650m	76.5 %	\$1,935 tn	\$867,586m
<i>Japan</i>	126,854m	118,626m	82,6m	70 %	\$81 bn	\$91,192m
<i>Malaysia</i>	32,6 M	26,353m	20,800m	80 %	\$6 bn	\$3,680 m
<i>Saudi Arabia</i>	34m	31,856m	12,9m	43 %	\$ 7.93 bn	\$1,648m
<i>UAE</i>	9,682m	9,38m	7,50m	80 %	\$10 bn	\$3,707m

[Source : Internet World Statistics (2019); Statistica 2019]

From the theoretical perspective, although research on e-commerce started in the 1990s, there remain gaps in the literature that need further investigation. According to Williams et al.'s (2009) review of 340 articles from 19 peer-reviewed journals, most studies from the 1990s to 2009 focused on developed countries. Significant recent studies have also been conducted in developed countries (Abebe, 2014; Duan et al., 2012; Shen, 2020; Sila, 2013). It can thus be concluded that e-commerce studies in developing countries are relatively limited, especially regarding SMEs' e-commerce adoption (Abbas et al., 2018). Within the past few years, however, there has been an increase in e-commerce studies in Asian and developing nation contexts, such as China, India, Indonesia, Pakistan, Egypt, and Malaysia (Abbas et al., 2018; Adam et al., 2020; Alam et al., 2011; Hamad et al., 2018; El-Ebiary et al., 2022; Liu et al., 2021; Rahayu & Day, 2015; Sarfo & Song, 2021; Setiyani & Rostiani, 2021; Yadav & Mahara, 2019; Zhu & Chen, 2016). Nonetheless, scholars have highlighted the dearth of research on Saudi Arabia's delayed adoption of e-commerce, particularly among its SMEs (Abed et al., 2015a, 2015b; AlGhamdi et al., 2011; AlGhamdi, Nguyen et al., 2012; Almousa, 2013; AlTaiar, 2020). This is a major gap of knowledge on the Saudi market compared with Western markets where numerous retailers sell their products through e-commerce (AlGhamdi et al., 2011; AlTaiar, 2020). Therefore, this study on e-commerce adoption among Saudi SME retailers aimed to bridge this context-related gap in the literature.

Despite the popularity of new technology, few studies have investigated the factors affecting the adoption of new technologies (e.g., B2B e-commerce, social media, e-procurement, etc.) in Saudi Arabia (Abu Abid & Rahim, 2012; AlGhamdi et al., 2013; Almaaf et al., 2018; AlTaiar, 2020; Altayyar & Kerridge, 2016; Alzahrani, 2019;

Bahaddad et al., 2018; Humaid & Sabri, 2019). Similar to e-commerce research, most existing theories on innovation adoption were designed and used in developed countries such as the UK, USA, Europe, Australia, and New Zealand (Idris et al., 2017; Ocloo et al., 2020). The factors that influence e-commerce adoption among SMEs in developing countries remains understudied, resulting in a lack of theoretical frameworks that explain the contextual characteristics particular to SMEs in each part of the world. The contextual factors known to affect SMEs in developing countries include poor infrastructure, lack of government policy, and cultural issues; these factors are not captured by prevailing technology adoption models (Al-tayyar et al., 2021; Hassen et al., 2021). There are also differences among developing countries in terms of economic, political, environmental, and social-cultural elements. For example, Arab countries (e.g., Jordan, Egypt, Sudan, Lebanon, and Saudi Arabia) have specific cultural convictions wherein they prefer face-to-face dealings, which does not favor technological interfaces. In addition, the family climate is prevalent in the Arabic business community (Ghobakhloo & Tang, 2013; Rahayu & Day, 2017). The levels of technology readiness, competitiveness, and government support also differ greatly among developing countries; therefore, the findings on the factors of e-commerce adoption from different developed and developing countries might not be relevant in the Saudi context. This creates a gap pertaining to the limited literature on the barriers, benefits, and determinants of e-commerce adoption among SME retailers in Saudi Arabia. Therefore, to fill this gap, this study sought to examine the environmental, individual, organizational, and technological factors affecting B2C e-commerce adoption among Saudi SME retailers.

Studies indicate that cultural differences influence the adoption of e-commerce by SMEs (Al-Dmour et al., 2017; Mohtaramzadeh et al., 2018; Rahman et al., 2013; Senarathna et al., 2014; Zeb et al., 2021). However, prior studies have mainly focused on culture at the socio-cultural and national levels as well as from political and religious perspectives (Al-Dmour et al., 2017; Setiyani & Rostiani, 2021). This has left gaps at the organizational level, whereby extant research has not analyzed the moderating role of organizational culture in the adoption of B2C e-commerce. Indeed, technological innovation, such as e-commerce, is much more likely to be adopted by organizations with a culture that enables its members to try new things to meet environmental demands. This study thus attempted to address this gap in the e-commerce literature by adopting organizational culture as a moderator between the determinant factors and e-commerce adoption. Scholars have proposed several orientations of organizational culture, such as relationship, transaction, flexibility, and control (Zeb et al., 2021). Based on these dimensions, Mohtaramzadeh et al. (2018) found that flexibility-oriented (i.e., developmental and group culture) and control-oriented (i.e., rational and hierarchical culture) cultures have distinct effects on a firm's interpretations of external events, and thus differentially affect their responses to the expectations and requirements of the environment (Zeb et al., 2021). Previous studies have also mentioned that a flexibility-oriented culture plays a key role in e-commerce adoption among SMEs (Al-Dmour et al., 2017; Setiyani & Rostiani, 2021; Zeb et al., 2021), as it involves the ability of an organization to process information, streamline plans, and prudently take decisions in e-commerce adoption (Baird et al., 2011; Liu et al., 2010; Rahman et al., 2013; Senarathna et al., 2014; Zeb et al., 2021). Therefore, the flexibility orientation culture from the Competing Values Model (CVM) (Quinn & Rohrbaugh, 1983) was adopted as a moderator to address the organizational culture gap in this study.

When business owners introduce new technologies in their companies, careful consideration should be given to the various factors that affect technology diffusion to minimize associated problems (Rogers, 2010). To this end, numerous theories have emerged to explain the diffusion and adoption of technology in organizations, each with their own limitations. For example, Altayyar and Kerridge (2016) pointed out that Gunasekaran and Ngai's (2009) model has the main limitation of focusing only on internal factors within the jurisdiction of the owner/manager of SMEs. Almaaf et al. (2018), on the other hand, employed the institutional theory, which has been criticized because it considers e-commerce adoption to be primarily based on the organizational context rather than the individual context. Alternatively, Humaid and Sabri (2019) used the Unified Theory of Acceptance and Use of Technology (UTAUT) model. Its limitation, however, is that it does not incorporate important external influences that might impact an individual's behavior, given that behavioral intention does not mirror only the individual's inner beliefs. Consequently, the UTAUT model cannot address external and internal stimuli, which change intentions over time.

Considering the limitations of these models, Hamad et al. (2018) and Sila (2013) proposed that the Technology-Organization-Environment (TOE) framework provides a solid basis to study the adoption of e-commerce. Several scholars (Almunawar et al., 2022; Hussain et al., 2022; Ocloo et al., 2020; Sin & Sin, 2020) recently found that TOE is one of the strongest frameworks to explain technology adoption. However, Hassen et al. (2021) reported that one of the limitations of the TOE in examining e-commerce adoption by SMEs is that some of its constructs are more appropriate for large businesses because of their richness of resources. Additionally, Al-Somali et al. (2011) stated that the TOE factors are broadly used, yet the framework ignores mediators and moderators, while Hassen et al. (2019) criticized the TOE for lacking factors related to individual attributes, such as owner and director attributes. For this reason, the TOE alone is not enough to explain the e-commerce adoption of SMEs in developing countries. In the same vein, scholars (Alzahrani, 2019; El-Gohary, 2012; Wang et al., 2020) have highlighted the Innovation Diffusion Theory (IDT) as a strong and valid framework that illustrates e-commerce adoption among SMEs. However, Abu Abid and Rahim (2012), Bahaddad et al. (2018), Idris et al. (2017), and Alzahrani (2019) found that this theory is insufficient on its own to explain all the contextual issues concerning e-commerce adoption by SMEs, especially in developing countries. In particular, the IDT has been criticized for ignoring social issues in SMEs (Abu Abid & Rahim, 2012; Bahaddad et al., 2018). Hence, the IDT theory may neglect key aspects (e.g., limited resources and customer readiness) which are associated with e-commerce adoption among SMEs in developing countries. Based on the limitations of the two aforementioned theories, this study aimed to integrate both the TOE and IDT to study e-commerce adoption among SME retailers in Saudi Arabia.

1.4 Research Objectives

With various research and theories on the factors influencing e-commerce adoption by individuals and organizations all over the world, this study specifically sought to combine relevant theories to fit the context of Saudi Arabian SMEs. The main objective of this study was to find out the factors that influence the willingness of SMEs in Saudi

Arabia to adopt e-commerce services. The specific objectives of the study were as follows:

1. To measure the influence of technological factors on e-commerce adoption by SMEs retailers in Saudi Arabia.
2. To investigate the influence of organizational factors on e-commerce adoption by SMEs retailers in Saudi Arabia.
3. To determine the influence of environmental factors on e-commerce adoption by SMEs retailers in Saudi Arabia.
4. To examine the influence of individual factors on e-commerce adoption by SMEs retailers in Saudi Arabia.
5. To examine the moderation effect of organizational culture on the relationships between the identified factors and e-commerce adoption by SME retailers in Saudi Arabia.

1.5 Research Questions

Understanding the adoption of any innovation or technology, including e-commerce, involves understanding the enablers or the facilitators of that activity. However, theoretical frameworks analyzing the factors influencing e-commerce adoption have been developed in different settings from the Saudi economy and infrastructure. Therefore, the usage of a single model may not give a clear picture of country-specific factors. Based on the integration of the TOE, IDT, and CVM the research questions of this study were as follows:

1. Do technological factors influence the adoption of e-commerce by SMEs retailers in Saudi Arabia?
2. Do organizational factors influence e-commerce adoption by SMEs in Saudi Arabia?
3. Do environmental factors influence e-commerce adoption by SMEs in Saudi Arabia?
4. Do individual factors influence e-commerce adoption by SMEs retailers in Saudi Arabia?
5. Dose organizational culture a moderator between the technological, organizational, environmental, and individual factors and adoption of e-commerce by SMEs retailers in Saudi Arabia.

1.6 Significance of the Study

Theoretical significance: This study is expected to enrich the literature on e-commerce by identifying the factors that influence B2C e-commerce adoption among SMEs. In particular, the findings would provide a clear picture of the different categories of factors (i.e., technological, organizational, environmental, and individual) that influence B2C e-commerce adoption by SME retailers. This research also adds to extant knowledge by integrating the IDT and TOE theories as determinants of e-commerce adoption, as well as by incorporating the CVM's flexibility-oriented organizational culture as a moderator. As it investigates e-commerce adoption in the Arabian context, this study further extends the use of these models to specific environments, such as developing nations or specific countries. This is timely as e-commerce adoption needs extensive and comprehensive research from different perspectives. Another worthy contribution of this study is its examination of the impacts of different factors through the moderation of one specific variable: flexibility-oriented organizational culture.

Managerial significance: By ascertaining the variables that influence e-commerce adoption, this study aims to forward recommendations for enhanced e-commerce adoption in the context of Saudi Arabia. To this end, the study assists SMEs in Saudi Arabia in developing proper strategies to create an enabling environment for e-commerce adoption, in line with the nation's Vision 2030. Moreover, the findings of this study inform policy makers and governments on the key considerations to develop suitable policies and initiatives that encourage SMEs to adopt e-commerce. It also forwards recommendations and directions for governments to provide advice to SMEs on the process of transforming towards the use of technology and e-commerce. Additionally, policymakers can use the findings to reduce the barriers to e-commerce adoption and provide technical, financial, and managerial support for SMEs. The findings can further help SMEs and their owners prepare for e-commerce adoption in numerous ways, such as allocating the necessary resources, implementing training, and more. This study also enhances SME owners' understanding and acknowledgement of the impact of e-commerce on their plans and strategies. In general, this study assumes that its results will contribute to enhancing Saudi SMEs' capability to adopt e-commerce, which in turn, improves the country's economic growth and development.

1.7 Scope of the Study

This study focuses on B2C e-commerce adoption by Saudi Arabian SMEs in the retail industry, because this sector has the highest number of SMEs by economic activity. Table 1.3 shows the number of Saudi SMEs by economic activity (General Authority for Statistics, 2018).

Table 1.3 : Number of SMEs by Economic Activity

الهيئة العامة للإحصاء
General Authority for Statistics

المعلومات | منشآت
monsha'at

جدول
عدد المنشآت حسب النشاط الاقتصادي وفق حجم المنشأة

Table 1
NUMBER OF SMEs ESTABLISHMENTS BY ECONOMIC ACTIVITY AND SIZE OF ESTABLISHMENT

Economic activity	6-49 منشآت 6-49 employees	50-250 منشآت 50-250 employees	الجملة Total
A - Agriculture, forestry and fishing	1,633	146	1,779
B - Mining and quarrying	809	158	967
C - Manufacturing	14,955	1,996	16,951
D - Electricity, gas, steam and air conditioning supply	238	56	294
E - Water supply; sewerage, waste management and remediation activities	256	35	291
F - Construction	40,755	5,020	45,775
G Wholesale and-Retail trades	46,339	4,530	49,869
H - Transportation and storage	3,624	485	4,109
I - Accommodation and food service activities	10,623	1,099	11,722
J - Information and communication	1,240	114	1,354
K - Financial and insurance activities	411	71	482
L - Real estate activities	849	125	974
M - Professional, scientific and technical activities	2,444	273	2,717
N - Administrative and support service activities	11,060	1,367	12,427
P - Education	1,307	572	1,879
Q - Human health and social work activities	2,681	693	3,374
R - Arts, entertainment and recreation	684	59	743
S - Other service activities	7,317	481	7,798
Total	146,225	17,280	163,505

Source - General Authority for Statistics (Small and Medium Survey 2019) (المصدر - الهيئة العامة للإحصاء [مسح المنشآت الصغيرة والمتوسطة (2019)])

Retail SMEs in Riyadh, Makkah, and Eastern Province were the focus of this study because they have the highest number of SMEs. Table 1.4 shows the number of SME retailers by area in Saudi Arabia (General Authority for Statistics, 2018). The number of SME retailers is 17,275 in Riyadh, 14,490 in Makkah, and 7,013 in the Eastern Province. Moreover, Riyadh is the capital and the biggest city in Saudi Arabia, while Makkah is an important trade center which attracts traders and businesses from all over the country (Randheer & Al-Aali, 2015). Also, the Eastern Province is the oil and gas leader for economic development in Saudi Arabia (Arab News, 2012). Thus, these areas were considered the most suitable for this study.

Table 1.4 : Number of SME Retailers By Area in Saudi Arabia

الهيئة العامة للإحصاء
General Authority for Statistics

المعلومات | منشآت
monsha'at

جدول
عدد المنشآت حسب النشاط الاقتصادي وفق حجم المنشأة

Table 1
NUMBER OF SMEs ESTABLISHMENTS BY REGIONS AND SIZE OF ESTABLISHMENT

Regions	6-49 منشآت 6-49 employees	50-250 منشآت 50-250 employees	الجملة Total
Riyadh	16290	1985	17,275
Jazan	1395	68	1,463
Najran	708	59	767
Al-Baha	711	32	743
Al-Jouf	441	18	459
Makkah	13246	1244	14,490
Madinah	2356	162	2518
Qassim	1738	128	1,866
Eastern. Province	6351	662	7,013
Asir	1781	101	1,882
Tabuk	568	25	593
Hail	527	36	563
North Board	227	10	237
Total	45,339	4,530	49,869

Source - General Authority for Statistics (Small and Medium Survey 2019) (المصدر - الهيئة العامة للإحصاء [مسح المنشآت الصغيرة والمتوسطة (2019)])

(Source : General Authority for Statistics, 2018)

1.8 Definition of Terms

- E-commerce adoption: The process of purchasing, selling, transferring, or exchanging goods, services, and/or information over computer networks such as the Internet and intranets (Jain & Arya, 2021).
- Retailers: Those who engage in the commercial activity of buying and selling goods (Randheer & Al-Aali, 2015).
- Technological factors:
 - Relative advantage: The degree to which an innovation is perceived as better than the idea it supersedes (Rogers, 2010).
 - Cost in technology: The costs incurred for the adoption of e-commerce technology, ranging from the cost of technology infrastructure to maintenance and training costs (Sujatha & Karthikeyan, 2021).
 - Internet capability: The degree to which the Internet is continuously accessible (Al-Somali et al., 2015).
- Organizational factors:
 - Technological readiness: The extent of availability of technology infrastructure and relevant system and technical skills to support e-commerce adoption (Hussain et al., 2022).
 - Firm size: In Saudi Arabia, a small business employs six to 49 employees, while a medium-sized business employs 50 to 249 employees. Large firms have more than 250 employees (General Authority for Statistics, 2018).
- Environmental factors:
 - Regulatory and legal environment: The assessment of organizations in preparation for the promotion, assistance, facilitation, and regulation of e-commerce and the various requirements of the nation-state and its specific institutions (Adam et al., 2020).
 - Competitive pressure: The e-commerce efficiency level in the industry of the company and its competitors (Sin & Sin, 2020).
- Individual Factors:
 - Owner innovativeness: The degree to which, in the same social context, an individual adopts innovation faster than others (Sánchez-Torres et al., 2021).
 - Owner IT knowledge: The level of IT knowledge of an SME owner (Sin & Sin, 2020).

- Organizational culture:
 - Flexibility-oriented: The desire of the company to focus on change based on the values of creativity, spontaneity, and risk-taking (Zeb et al., 2021).

1.9 Organization of the Thesis

This study is divided into seven chapters. Chapter 1 provides the background of the study, the problem statement, the research objectives and questions, the significance of the study, the research scope, and the organization of the chapters. Chapter 2 provides key information about Saudi Arabia and explains the concept of SMEs and e-commerce in Saudi Arabia, whereas Chapter 3 reviews the literature on e-commerce and e-commerce adoption by SMEs. Chapter 4 explains the theories applied in e-commerce adoption research, with a focus on the combination of two main theories in this study. The chapter then develops the conceptual framework and proposes the research hypotheses on the factors influencing B2C e-commerce adoption. Chapter 5 discusses the research design and methodology. It also describes the procedures of data collection and questionnaire design, followed by the analytical tools used in this study. Chapter 6 presents the data screening results, including the identification of missing values, detection of outliers, response rates, and common method bias tests. The results of the SmartPLS analysis, specifically the measurement model, the structural model, and blindfolding, are then reported. Chapter 7 discusses the conclusions from the findings of this study, followed by the contributions of the study. Finally, the chapter addresses the study's limitations and forwards suggestions for future research.

REFERENCES

- Abbas, A., Abdullah, S. H., & Saad, R. M. (2018). Affecting factors to intentions to adoption of e-commerce technologies in SMEs of Pakistan. *Journal of Social Sciences Research, Special Issue 4*, 147–155.
- Abebe, M. (2014). Electronic commerce adoption, entrepreneurial orientation and small-and medium-sized enterprise (SME) performance. *Journal of Small Business and Enterprise Development*, 21(1), 100–116. <https://doi.org/10.1108/JSBED-10-2013-0145>
- Abed, S. S., Dwivedi, Y. K., & Williams, M. D. (2015a). SMEs' adoption of e-commerce using social media in a Saudi Arabian context: A systematic literature review. *International Journal of Business Information Systems*, 19(2), 159–179. <https://doi.org/10.1504/IJBIS.2015.069429>
- Abed, S. S., Dwivedi, Y. K., & Williams, M. D. (2015b). Social media as a bridge to e-commerce adoption in SMEs: A systematic literature review. *The Marketing Review*, 15(1), 39–57.
- Abid, A. A. (2013). *Factors affecting the e-business systems adoption process in Saudi small and medium enterprises (SMEs)*. Monash University.
- Abu Abid, A., & Rahim, M. M. (2012). E-business adoption process by SMEs in Saudi Arabia. *4th Global Conference on SME, Entrepreneurship & Service Innovation (GCSMES)*.
- Adam, I. O., Alhassan, M. D., & Afriyie, Y. (2020). What drives global B2C E-commerce? An analysis of the effect of ICT access, human resource development and regulatory environment. *Technology Analysis & Strategic Management*, 32(7), 835–850.
- Ahmed, A. M., Zairi, M., & Alwabel, S. A. (2006). Global benchmarking for internet and e-commerce applications. *Benchmarking*, 13(1–2), 68–80. <https://doi.org/10.1108/14635770610644583>
- Akanbi, T. (2016). An investigative study of challenges facing Nigerian small and medium scale enterprises in adoption of e-commerce technology. *International Journal of Advances in Management and Economics*, 5(1), 22–31.
- Al-Debei, M. M., Akroush, M. N., & Ashouri, M. I. (2015). Consumer attitudes towards online shopping: The effects of trust, perceived benefits, and perceived web quality. *Internet Research*, 25(5), 707-733. <https://doi.org/10.1108/IntR-05-2014-0146>
- Al-Dmour, H., Nweiran, M., & Al-Dmour, R. (2017). The influence of organizational culture on e-commerce adoption. *International Journal of Business and Management*, 12(9), 204-220. <https://doi.org/10.5539/ijbm.v12n9p204>

- Al-Hudhaif, S. A., & Alkubeyyer, A. (2011). E-commerce adoption factors in Saudi Arabia. *International Journal of Business and Management*, 6(9), 122–133. <https://doi.org/10.5539/ijbm.v6n9p122>
- Al-Khalidi, F., Abdalla, N., Soudodi, O., & Syed, S. (2015). *State of payments 2015*. <http://stateofpayments.com/#ecommerce>
- Al-Maghrabi, T., Dennis, C., & Halliday, S. V. (2011). Antecedents of continuance intentions towards e-shopping: The case of Saudi Arabia. *Journal of Enterprise Information Management*, 24(1), 85–111. <https://doi.org/10.1108/17410391111097447>
- Al-Qirim, N. (2005). An Empirical investigation of an e-commerce adoption-capability model in small businesses in New Zealand. *Electronic Markets*, 15(4), 418–437. <https://doi.org/10.1080/10196780500303136>
- Al-Qirim, N. (2007). The adoption of ecommerce communications and applications technologies in small businesses in New Zealand. *Electronic Commerce Research and Applications*, 6(4), 462–473. <https://doi.org/10.1016/j.elerap.2007.02.012>
- Al-Salamin, H. A., & Al-Hammad, A. A. (2014). Attitude of Saudi consumers towards Al-Hassa region (KSA). *Journal of WEI Business and Economics-December 2014*, 3(3), 39-56
- Al-Solbi, A., & Mayhew, P. J. (2005). Measuring e-readiness assessment in Saudi organisations preliminary results from a survey study. *From E-Government to M-Government, Mobile Government Consortium International LLC, Brighton, UK*, 467–475.
- Al-Somali, S. A., Gholami, R., & Clegg, B. (2011). An investigation into the adoption of electronic commerce among Saudi Arabian SMEs. *Journal of Electronic Commerce in Organizations*, 9(2), 41–65. <https://doi.org/10.4018/jeco.2011040103>
- Al-Somali, S. A., Gholami, R., & Clegg, B. (2015). A stage-oriented model (SOM) for e-commerce adoption: A study of Saudi Arabian organisations. *Journal of Manufacturing Technology Management*, 26(1), 2–35. <https://doi.org/10.1108/JMTM-03-2013-0019>
- Al-tayyar, R., Abdullah, A. R., Rahman, A. A., & Ali, M. H. (2021). Challenges and obstacles facing SMEs in the adoption of e-commerce in developing countries: A case of Saudi Arabia. *Estudios de Economia Aplicada*, 39(4), <https://doi.org/10.25115/eea.v39i4.4644>
- Al-Tit, A. A. (2020). E-commerce drivers and barriers and their impact on e-customer loyalty in small and medium-sized enterprises (SMES). *Business: Theory and Practice*, 21(1), 146–157.

- Alaaraj, H., & Ibrahim, F. W. (2014). An overview and classification of e-readiness assessment models. *International Journal of Scientific and Research Publications*, 4(12), 1–5.
- Alam, S. S., Ali, M. Y., & Jani, M. F. M. (2011). An empirical study of factors affecting electronic commerce adoption among SMEs in Malaysia. *Journal of Business Economics and Management*, 12(2), 375–399. <https://doi.org/10.3846/16111699.2011.576749>
- Alam, S. S., Khatibi, A., Ahmad, M. I. S., & Ismail, H. Bin. (2008). Factors affecting e-commerce adoption in the electronic manufacturing companies in Malaysia. *International Journal of Commerce and Management*, 17(1–2), 125–139. <https://doi.org/10.1108/10569210710776503>
- AlBar, A. M., & Hoque, M. R. (2019a). Factors affecting cloud ERP adoption in Saudi Arabia: An empirical study. *Information Development*, 35(1), 1-15 <https://doi.org/10.1177/0266666917735677>
- AlBar, A. M., & Hoque, M. R. (2019b). Factors affecting the adoption of information and communication technology in small and medium enterprises: a perspective from rural Saudi Arabia. *Information Technology for Development*, 25(4), 1-24 <https://doi.org/10.1080/02681102.2017.1390437>
- AlGhamdi, R., Drew, S., & Al-Ghaith, W. (2011). Factors influencing e-commerce adoption by retailers in Saudi Arabia: a qualitative analysis. *The Electronic Journal of Information Systems in Developing Countries*, 47(1), 1–23. <https://doi.org/10.1002/j.1681-4835.2011.tb00335.x>
- AlGhamdi, R., Drew, S., & Alhussain, T. (2012). A conceptual framework for the promotion of trusted online retailing environment in Saudi Arabia. *International Journal of Business and Management*, 7(5), 140–149.
- AlGhamdi, R., Nguyen, A., & Jones, V. (2013). A study of influential factors in the adoption and diffusion of B2C e-commerce. *International Journal of Advanced Computer Science and Applications*, 4(1), 89–95.
- AlGhamdi, R., Nguyen, J., Nguyen, A., & Drew, S. (2012). Factors influencing e-commerce adoption by retailers in Saudi Arabia: A quantitative analysis. *International Journal of Electronic Commerce Studies*, 3(1), 83–100.
- Alhijris, A. A. (2013). Determinants of Business to Business E-commerce Adoption Among Public-listed Companies in Saudi Arabia, *PhD. Dissertation, Universiti Putra Malaysia*.
- Ali, B., Baluch, N., & Mohamed Udin, Z. (2015). The moderating effect of religiosity on the relationship between technology readiness and diffusion of electronic commerce. *Modern Applied Science*, 9(12), 52–60. <https://doi.org/10.5539/mas.v9n13p176>

- Ali, H., & Alrayes, A. (2014). An empirical investigation of the effect of e-readiness factors on adoption of e-procurement in kingdom of Bahrain. *International Journal of Business and Management*, 9(12), 220–229. <https://doi.org/10.5539/ijbm.v9n12p220>
- Alim, Z., & Fitria, S. E. (2020). Analysis effect between relative advantage and competitive pressure towards adoption e-commerce in SMEs (Among Cigondewah Textile Area). *EProceedings of Management*, 7(1), 70–78.
- Aljarboa, S. (2016). Online Shopping in Saudi Arabia: Opportunities and challenges. *International Journal of Managing Value and Supply Chains*, 7(4), 1-15 <https://doi.org/10.5121/ijmvsc.2016.7401>
- Almaaf, B. A. A., Miao, J.-J., & Tran, Q. D. (2018). Study on e-commerce adoption in SMEs under the institutional perspective. *International Journal of E-Adoption*, 10(1), 53–72. <https://doi.org/10.4018/ijea.2018010104>
- Almoawi, A. R. (2011). *E-commerce adoption among small and medium enterprises in Saudi Arabia*. Universiti Utara Malaysia.
- Almoawi, A. R., & Mahmood, R. (2011). Applying the OTE model in determining the e-commerce adoption on SMEs in Saudi Arabia. *Asian Journal of Business and Management Sciences*, 1(7), 12–24.
- Almobaireek, W. N., Alshumaimeri, A., & Manolova, T. S. (2017). Challenges to venture growth in emerging economies. In R. Blackburn, D. De Clercq, J. Heinonen, & Z. Wang (Eds.), *The SAGE Handbook of Small Business and Entrepreneurship* (pp. 454–467). SAGE Publications. <https://doi.org/10.4135/9781473984080.n24>
- Almoussa, M. (2013). Barriers to E-commerce adoption: consumers' perspectives from a developing country. *IBusiness*, 5(2), 65–71.
- Almunawar, M. N., Auzzali, A., Oseli, N. H., & Ariff, W. Z. A. M. Z. (2022). E-commerce adoption among micro, small, and medium enterprises in Brunei Darussalam. *International Journal of E-Business Research*, 18(1), 1-18 <https://doi.org/10.4018/ijebr.293297>
- Alrousan, M. K., & Jones, E. (2016). A conceptual model of factors affecting e-commerce adoption by SME owner/managers in Jordan. *International Journal of Business Information Systems*, 21(3), 269-308 <https://doi.org/10.1504/IJBIS.2016.074762>
- AlTair, A. R. S. (2020). Factors affecting on the use of e-commerce from the perspective of Saudi consumers. *Journal of Educational Sciences and Humanities*, 4(9), 361–385.

- Altayyar, A., & Beaumont-Kerridge, J. (2016). External factors affecting the adoption of e-procurement in Saudi Arabian's SMEs. *Procedia - Social and Behavioral Sciences*, 229, 363–375. <https://doi.org/10.1016/j.sbspro.2016.07.147>
- Alzahrani, J. (2019). The impact of e-commerce adoption on business strategy in Saudi Arabian small and medium enterprises (SMEs). *Review of Economics and Political Science*, 4(1), 73–88. <https://doi.org/10.1108/REPS-10-2018-013>
- Anderson, J. C., & Gerbing, D. W. (1988). Structural equation modeling in practice: a review and recommended two-step approach. *Psychological Bulletin*, 103(3), 411–423. <https://doi.org/10.1037/0033-2909.103.3.411>
- Arab, N. (2012). *The Eastern Province, land of opportunities*. Arab News.
- Aryani, D., Wang, L., & Patikirikorala, T. (2014). Control oriented system identification for performance management in virtualized software system. *IFAC Proceedings Volumes (IFAC-PapersOnline)*, 19. <https://doi.org/10.3182/20140824-6-za-1003.01100>
- Astuti, N. C., & Nasution, R. A. (2014). Technology readiness and e-commerce adoption among entrepreneurs of SMEs in Bandung city, Indonesia. *Gadjah Mada International Journal of Business*, 16(1), 69–88. <https://doi.org/10.22146/gamaijb.5468>
- Aswar, K., & Ermawati. (2021). E-commerce adoption by small medium enterprises: An extensive literature review. *Information Management and Business Review*, 12(4(I)). [https://doi.org/10.22610/imbr.v12i4\(i\).3123](https://doi.org/10.22610/imbr.v12i4(i).3123)
- Asyraf, W. M., & Afthanorhan, B. W. (2013). A comparison of partial least square structural equation modeling (PLS-SEM) and covariance based structural equation modeling (CB-SEM) for confirmatory factor analysis. *International Journal of Engineering Science and Innovative Technology (IJESIT)*, 2(5), 198-205
- Addo, A. (2012). The adoption, usage and functions of the Internet and e-commerce among SMEs in Ghana. *International Journal of Business and Management Tomorrow*, 2(9), 1–10.
- Avenell, S. (2001). *Some lessons for higher education from the economics of electronic commerce*. Citeseer.
- Awa, H. O., Ukoha, O., & Emecheta, B. C. (2016). Using T-O-E theoretical framework to study the adoption of ERP solution. *Cogent Business and Management*, 3(1), 1–23. <https://doi.org/10.1080/23311975.2016.1196571>
- Awiagah, R., Kang, J., & Lim, J. I. (2016). Factors affecting e-commerce adoption among SMEs in Ghana. *Information Development*, 32(4), 815–836 <https://doi.org/10.1177/0266666915571427>

- Bahaddad, Adel A., Drew, S., Houghtoni, L., & Alfarraj, O. A. (2018). Factors attracting online consumers to choose e-malls for e-procurement in Saudi Arabia. *Enterprise Information Systems*, 12(7), 856–887. <https://doi.org/10.1080/17517575.2015.1091952>
- Bahaddad, Adel Aboud., Houghton, L., & Drew, S. (2013). Attracting customer in Saudi Arabia to buy from your business online. *International Journal of Business and Management*, 8(7),65-81 <https://doi.org/10.5539/ijbm.v8n7p65>
- Baird, K., Hu, K. J., & Reeve, R. (2011). The relationships between organizational culture, total quality management practices and operational performance. *International Journal of Operations and Production Management*, 31(7), 789–814. <https://doi.org/10.1108/01443571111144850>
- Baker, E. W., Al-Gahtani, S.S., & Hubona, G. S. (2007). The effects of gender and age on new technology implementation in a developing country: Testing the theory of planned behavior (TPB). *Information Technology and People*, 20(4), 352–375. <https://doi.org/10.1108/09593840710839798>
- Baronov, D. (2015). Conceptual foundations of social research methods. In *Conceptual Foundations of Social Research Methods*. Routledge. <https://doi.org/10.4324/9781315636436>
- Basarir-Ozel, B., & Mardikyan, S. (2017). Factors affecting e-commerce adoption: A case of Turkey. *The International Journal of Management Science and Information Technology*, 23,1-18
- Beatty, R. C., Shim, J. P., & Jones, M. C. (2001). Factors influencing corporate web site adoption: a time-based assessment. *Information & Management*, 38(6), 337–354.
- Ben, L., Peltier, A., & Youssef, A. Ben. (2016). *Does internet speed matter? impact of internet speed on e-applications adoption by firms in Luxembourg*.
- Berndt, A. E. (2020). Sampling Methods. *Journal of Human Lactation*, 36(2), 224-226 <https://doi.org/10.1177/0890334420906850>
- Bless, C., Higson-Smith, C., & Kagee, A. (2006). *Fundamentals of social research methods: An African perspective*. Juta and Company Ltd.
- Bordens, K. S., & Abbott, B. B. (2011). *Research design and methods: a process approach*. McGraw-Hill Education. <https://doi.org/10.1088/0953-2048/11/3/002>
- Boris, Blumberg., Donald, R. Cooper., & Pamela S. Schindler. (2014). *Business research methods*. McGraw-Hill Education, Fourth Edition, 1-780
- Briscoe, E., Trehwitt, E. B., & Hutto, C. J. (2011). Closing the micro-macro divide in modeling technology adoption. *2nd Annual Conference of the Computational Social Science Society of America*. 1–11.

- Bryman, A., & Bell, E. (2003). *Business research methods* (7th ed.). Thomson.
- Bryman, A. (2012). *Social research methods*. Oxford university press.
- Bryman, A., & Bell, E. (2015). *Business research methods* (4th ed.). Oxford University Press.
- Burt, S., & Sparks, L. (2003). E-commerce and the retail process: A review. *Journal of Retailing and Consumer Services*, 10(5), 275–286. [https://doi.org/10.1016/S0969-6989\(02\)00062-0](https://doi.org/10.1016/S0969-6989(02)00062-0)
- Cao, Q., Jones, D. R., & Sheng, H. (2014). Contained nomadic information environments: Technology, organization, and environment influences on adoption of hospital RFID patient tracking. *Information and Management*, 51(2), 225-239 <https://doi.org/10.1016/j.im.2013.11.007>
- Cazabat, G., Paraschiv, D. M., Călin, A. C., & Popovici, O. C. (2019). A contemporaneous statistical note on e-commerce adoption in Romania - Based SMEs. *Amfiteatru Economic*, 21(50), 177-193 <https://doi.org/10.24818/EA/2019/50/177>
- Chairoel, L., & Riski, T. R. (2018). Internal and external factor influence ict adoption: a case of Indonesian SMEs. *Journal Manajemen Dan Kewirausahaan*, 20(1), 38-44 <https://doi.org/10.9744/jmk.20.1.38-44>
- Chairoel, L., Widyarto, S., & Pujani, V. (2015). ICT adoption in affecting organizational performance among Indonesian SMEs. *The International Technology Management Review*, 5(2), 82-93 <https://doi.org/10.2991/itm.2015.5.2.3>
- Chen, Qibin, Lin, J., Zhang, Y., Yang, H., Zhou, J., & Tang, J. (2019). Towards knowledge-based personalized product description generation in e-commerce. *Proceedings of the 25th ACM SIGKDD International Conference on Knowledge Discovery & Data Mining*, 3040–3050.
- Chen, Qingyi., & Zhang, N. (2015). Does e-commerce provide a sustained competitive advantage? An investigation of survival and sustainability in growth-oriented enterprises. *Sustainability (Switzerland)*, 7(2), 1411–1428. <https://doi.org/10.3390/su7021411>
- Chin, W. W. (2010). How to write up and report PLS analyses. In *Handbook of Partial Least Squares*. https://doi.org/10.1007/978-3-540-32827-8_29
- Chin, W. W., Marcelin, B. L., & Newsted, P. R. (2003). A partial least squares latent variable modeling approach for measuring interaction effects: Results from a Monte Carlo simulation study and an electronic-mail emotion/adoption study. *Information Systems Research*, 14(2), 189–217. <https://doi.org/10.1287/isre.14.2.189.16018>

- Chivasa, S., & Hurasha, C. (2016). Small and medium enterprises' (SMEs) adoption and usage of ecommerce: A probit modelling. *International Journal of Economics, Commerce and Management*, 4(3), 218–226.
- Chong, S. (2006). An empirical study of factors that influence the extent of deployment of electronic commerce for small-and medium-sized enterprises in Australia. *Journal of Theoretical and Applied Electronic Commerce Research*, 1(2), 45–57.
- Choshin, M., & Ghaffari, A. (2017). An investigation of the impact of effective factors on the success of e-commerce in small- and medium-sized companies. *Computers in Human Behavior*, 66, 67–74. <https://doi.org/10.1016/j.chb.2016.09.026>
- Chu, Z., Wang, L., & Lai, F. (2019). Customer pressure and green innovations at third party logistics providers in China: The moderation effect of organizational culture. *International Journal of Logistics Management*, 30(1), 57-75 <https://doi.org/10.1108/IJLM-11-2017-0294>
- CITC. (2017). *E-commerce in Saudi Arabia*. http://www.citc.gov.sa/en/reportsandstudies/Reports/Documents/CITC_ECOMM ERCE_2017_ENGLISH.PDF
- Claycomb, C., Iyer, K., & Germain, R. (2005). Predicting the level of B2B e-commerce in industrial organizations. *Industrial Marketing Management*, 34(3), 221–234. <https://doi.org/10.1016/j.indmarman.2004.01.009>
- Dijkstra, T. K., & Henseler, J. (2015). Consistent partial least squares path modeling. In *MIS Quarterly: Management Information Systems* (Vol. 39, Issue 2, pp. 297–316). <https://doi.org/10.25300/MISQ/2015/39.2.02>
- Duan, X., Deng, H., & Corbitt, B. (2012). What drives the adoption of electronic markets in Australian small-and-medium sized enterprises?—an empirical study. In J. Lamp (Ed.), *ACIS 2012: Location, location, location: Proceedings of the 23rd Australasian Conference on Information Systems 2012* (pp. 1–11). ACIS.
- Easterby-Smith, M., Thorpe, R., & Jackson, P. (2012). *Management research*. SAGE Publications.
- Easterby-Smith, Mark., Thorpe, R., & Jackson, P. (2015). *Management research & business research*. SAGE Publication LTD.
- Ekong, U. O., Ifinedo, P., Ayo, C. K., & Ifinedo, A. (2012). E-commerce adoption in Nigerian businesses: An analysis using the technology-organization-environmental framework. In *Leveraging Developing Economies with the Use of Information Technology: Trends and Tools*. 22 <https://doi.org/10.4018/978-1-4666-1637-0.ch009>

- El-Ebiary, Y. A. B., Ghanem, W. A. H. M., Saany, S. I. A., Rose, A. N. M., Jusoh, J. A., & Yusoff, M. H. (2022). The influence of e-commerce in encouraging the tourism industry in Malaysia. *Lecture Notes in Networks and Systems*, 299, 381-388 https://doi.org/10.1007/978-3-030-82616-1_33
- El-Gohary, H. (2012). Factors affecting e-marketing adoption and implementation in tourism firms: An empirical investigation of Egyptian small tourism organisations. *Tourism Management*, 33(5), 1256-1269. <https://doi.org/10.1016/j.tourman.2011.10.013>
- Elhassan, O. M. (2019). Obstacles and problems facing the financing of small and medium enterprises in KSA. *Journal of Finance and Accounting*, 7(5), 168-183.
- Eshopworld. (2019). *Saudi Arabia e-commerce insights*. <https://learning.eshopworld.com/ecommerce-blog/saudi-arabia-ecommerce-insights-2018/>
- Etikan, I. (2016). Comparison of convenience sampling and purposive sampling. *American Journal of Theoretical and Applied Statistics*, 5(1), 1-4. <https://doi.org/10.11648/j.ajtas.20160501.11>
- European, U. (2016). User guide to the SME definition. In *Chemical Engineer (London)* (Issue 410). 1-60 <https://doi.org/10.2873/782201>
- F. Hair Jr. J., Sarstedt, M., Hopkins, L., & G. Kuppelwieser, V. (2014). Partial least squares structural equation modeling (PLS-SEM). *European Business Review*, 26(2), 106-121. <https://doi.org/10.1108/EBR-10-2013-0128>
- Faisal, S. binti M., & Idris, S. (2019). Determinant factors of supply chain technology adoption among Sabah small and medium enterprises (SMEs). *Malaysian Journal of Business and Economics*, 6(2), 63-76
- Faisal, S., Science, S. I.-I. J. of S., & (2020), Innovation factors influencing the supply chain technology (SCT) adoption: Diffusion of innovation theory. *Myjms.Mohe.Gov.My*, 2(2).
- Falk, R. F., & Miller, N. B. (1992). *A primer for soft modeling*. The University of Akron Press.
- Faloye, D. O. (2014). The adoption of e-commerce in small businesses: An empirical evidence from retail sector in Nigeria. *Journal of Business and Retail Management Research*, 8(2), 54-64.
- Flora, J. L., & Johnson, T. G. (2019). Small businesses. Rural Policies for the 1990s, 1(3), 47-59. <https://doi.org/10.4018/ijbsa.2020070102>
- Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention and behavior: An Introduction to Theory and Research*. Addison-Wesley. <https://doi.org/10.2307/2065853>

- Fisher, M. J., & Marshall, A. P. (2009). Understanding descriptive statistics. *Australian Critical Care*, 22(2), 93–97. <https://doi.org/10.1016/j.aucc.2008.11.003>
- Fonseka, K., Jaharadak, A. A., Raman, M., & Tham, J. (2021). Determinants affecting the adoption of e-commerce and its impact on organisational performance of SMEs in Sri Lanka. *Journal of Telecommunications and the Digital Economy*, 9(4), 23-43 <https://doi.org/10.18080/JTDE.V9N4.412>
- Fonseka, K., Jaharadak, D. A. A., Raman, D. M., & Dharmaratne, D. I. R. (2020). Literature review of technology adoption models at firm level; special reference to e-commerce adoption. *Global Journal of Management and Business Research*. <https://doi.org/10.34257/gjmrbrvol20is6pg1>
- Gamlen, A., & McIntyre, C. (2018). Mixing methods to explain emigration policies: A post-positivist perspective. *Journal of Mixed Methods Research*, 12(4), 374–393. <https://doi.org/10.1177/1558689818782822>
- Ganguli, M., Snitz, B. E., Saxton, J. A., Chang, C.C. H., Lee, C.W., Vander Bilt, J., Hughes, T. F., Loewenstein, D. A., Unverzagt, F. W., & Petersen, R. C. (2011). Outcomes of mild cognitive impairment by definition: A population study. *Archives of Neurology*, 68(6), 761–767. <https://doi.org/10.1001/archneurol.2011.101>
- García-Moreno, M. B., García-Moreno, S. M., Nájera-Sanchez, J. J., & De-Pablos-Heredero, C. (2018). The impact of organizational factors on e-business adoption: An empirical analysis. *Journal of Industrial Engineering and Management*, 11(3), 466-496 <https://doi.org/10.3926/jiem.2378>
- Garg, A. K., & Choeu, T. (2015). The adoption of electronic commerce by small and medium enterprises in pretoria east. *The Electronic Journal of Information Systems in Developing Countries*, 68(1), 1–23. <https://doi.org/10.1002/j.1681-4835.2015.tb00493.x>
- Gefen, D., Rigdon, E. E., & Straub, D. (2011). An update and extension to SEM guidelines for administrative and social science research. *MIS Quarterly: Management Information Systems*, 35(2), iii-xiv <https://doi.org/10.2307/23044042>
- General authority for statistics. (2018). *Small and Medium Establishments Survey*. https://www.stats.gov.sa/sites/default/files/small_and_medium-sized_establishments_survey_2018.pdf
- Ghavamifar, A., Beig, L., & Montazer, G. A. (2008). The comparison of different e-readiness assessment tools. *3rd International Conference on Information and Communication Technologies: From Theory to Applications, ICTTA*, 1–5. <https://doi.org/10.1109/ICTTA.2008.4529945>
- Ghobakhloo, M., Arias-Aranda, D., & Benitez-Amado, J. (2011). Adoption of e-commerce applications in SMEs. *Industrial Management and Data Systems*, 111(8), 1238–1269. <https://doi.org/10.1108/02635571111170785>

- Ghobakhloo, M., & Tang, S. H. (2013). The role of owner/manager in adoption of electronic commerce in small businesses: The case of developing countries. *Journal of Small Business and Enterprise Development*, 20(4), 754–787. <https://doi.org/10.1108/JSBED-12-2011-0037>
- Ghoneim, A., Ghoneim, S., & Kamel, S. (2018). The role of the government in e-commerce in Egypt. *Proceedings of the International Research Foundation for Development (IRFD); Conference of the UN World Summit on Information Society*, 1–15.
- Gibbs, J., Kraemer, K. L., & Dedrick, J. (2003). Environment and policy factors shaping global e-commerce diffusion: A cross-country comparison. *The Information Society*, 19(1), 5–18.
- Government of Saudi Arabia. (2016). Vision 2030 Kingdom of Saudi Arabia. In *Report*. <https://vision2030.gov.sa/download/file/fid/417>
- Govindaraju, R., Chandra, D. R., & Siregar, Z. A. (2012). Stakeholder role in e-commerce adoption by small and medium enterprises. *IEEE 6th International Conference on Management of Innovation and Technology, ICMIT*, 430–435. <https://doi.org/10.1109/ICMIT.2012.6225844>
- Govindaraju, R., Wiratmadja, I. I., & Rivana, R. (2015). Analysis of drivers for e-commerce adoption by SMEs in Indonesia. *Interdisciplinary Behavior and Social Sciences - Proceedings of the 3rd International Congress on Interdisciplinary Behavior and Social Sciences, ICIBSoS 2014*, 391–395. <https://doi.org/10.1201/b18146-69>
- Govinnage, D. Y., & Sachitra, K. M. V. (2019). Factors affecting e-commerce adoption of small and medium enterprises in Sri Lanka: Evidence from retail sector. *Asian Journal of Advanced Research and Reports*, 6(2): 1-10 <https://doi.org/10.9734/ajarr/2019/v6i230147>
- Grandón, E. E., & Ramírez-Correa, P. (2018). Managers/owners' innovativeness and electronic commerce acceptance in Chilean SMEs: A multi-group analysis based on a structural equation model. *Journal of Theoretical and Applied Electronic Commerce Research*, 13(3), 1-16 <https://doi.org/10.4067/S0718-18762018000300102>
- Grubbs, F. E. (1969). Procedures for detecting outlying observations in samples. *Technometrics*, 11(1), 1–21. <https://doi.org/10.1080/00401706.1969.10490657>
- Haenlein, M., & Kaplan, A. M. (2004). A beginner's guide to partial least squares analysis. *Understanding Statistics*, 3(4), 283–297 https://doi.org/10.1207/s15328031us0304_4
- Hahn, E. D., & Ang, S. H. (2017). From the editors: New directions in the reporting of statistical results in the Journal of World Business. *Journal of World Business*, 52(2), 125–126. <https://doi.org/10.1016/j.jwb.2016.12.003>

- Hair, Joe F., Ringle, C. M., & Sarstedt, M. (2011). PLS-SEM: Indeed a silver bullet. *Journal of Marketing Theory and Practice*, 19(2), 139-151 <https://doi.org/10.2753/MTP1069-6679190202>
- Hair, Joseph F., Hult, G. T., Ringle, C., & Sarstedt, M. (2017). *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM) - Sage Publications*. ISBN: 978-1-4522-1744-4. 307 pp.
- Hair, Joseph F., Ringle, C. M., & Sarstedt, M. (2013). Partial least squares structural equation modeling: Rigorous applications, better results and higher acceptance. *Long Range Planning*, 46(1–2), 1–12. <https://doi.org/10.1016/j.lrp.2013.01.001>
- Hair, Joseph F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. *European Business Review*, 31(1), 2-24. <https://doi.org/10.1108/EBR-11-2018-0203>
- Hamad, H., Elbeltagi, I., & El-Gohary, H. (2018). An empirical investigation of business-to-business e-commerce adoption and its impact on SMEs competitive advantage: The case of Egyptian manufacturing SMEs. *Strategic Change*, 27(3), 209–229. <https://doi.org/10.1002/jsc.2196>
- Hameed, M. A., Counsell, S., & Swift, S. (2012). A conceptual model for the process of IT innovation adoption in organizations. *Journal of Engineering and Technology Management - JET-M*, 29(3), 358–390. <https://doi.org/10.1016/j.jengtecman.2012.03.007>
- Hassen, H., Abd Rahim, N. H., & Shah, A. (2019). Analysis of models for e-commerce adoption factors in developing countries. *International Journal on Perceptive and Cognitive Computing*, 5(2), 73-80 <https://doi.org/10.31436/ijpcc.v5i2.100>
- Hassen, H., Rahim, N. H. B. A., Othman, A. H. A., & Shah, A. (2021). A model for e-commerce adoption by SMEs in developing countries. *Lecture Notes in Networks and Systems*, 194 LNNS. https://doi.org/10.1007/978-3-030-69221-6_39
- Henseler, J., Ringle, C. M., & Sinkovics, R. R. (2009). The use of partial least squares path modeling in international marketing. In R. R. Sinkovics & P. N. Ghauri (Eds.), *New Challenges to International Marketing (Advances in International Marketing)* (Vol. 20). Emerald Group Publishing Limited. [https://doi.org/10.1108/S1474-7979\(2009\)0000020014](https://doi.org/10.1108/S1474-7979(2009)0000020014)
- Herath, T. C., Herath, H. S. B., & D'Arcy, J. (2020). Organizational adoption of information security solutions: An integrative lens based on innovation adoption and the technology-organization-environment framework. *ACM SIGMIS Database: The DATABASE for Advances in Information Systems*, 51(2), 12–35.
- Herzallah, F., & Mukhtar, M. (2016). The effect of technology, organization factors on e-commerce adoption among Palestinian SMEs. *Indian Journal of Science and Technology*, 9(38), 1–4. <https://doi.org/10.17485/ijst/2016/v9i38/101279>

- Ho, A. D., & Yu, C. C. (2015). Descriptive statistics for modern test score distributions: Skewness, kurtosis, discreteness, and ceiling effects. *Educational and Psychological Measurement*, 75(3), 365–388. <https://doi.org/10.1177/0013164414548576>
- Hsieh, P. J., Chen, C. C., & Liu, W. (2019). Integrating talent cultivation tools to enact a knowledge-oriented culture and achieve organizational talent cultivation strategies. *Knowledge Management Research and Practice*, 17(1), 108-124 <https://doi.org/10.1080/14778238.2019.1571872>
- Hsu, P. F., Kraemer, K. L., & Dunkle, D. (2006). Determinants of e-business use in U.S. firms. *International Journal of Electronic Commerce*, 10(4), 9–45. <https://doi.org/10.2753/JEC1086-4415100401>
- Hughes, J. A., & Sharrock, W. W. (2016). *The Philosophy of Social Research* (3rd ed.). Routledge.
- Humaid, A. Bin., & Sabri, Y. (2019). The examination of factors influencing Saudi small businesses' social media adoption, by using UTAUT model. *International Journal of Business Administration*, 10(2), 96–114. <https://doi.org/10.5430/ijba.v10n2p96>
- Hussain, A., Akbar, M., Shahzad, A., Poulouva, P., Akbar, A., & Hassan, R. (2022). E-commerce and SME performance: The moderating influence of entrepreneurial competencies. *Administrative Sciences*, 12(1), 1-16 <https://doi.org/10.3390/admsci12010013>
- Hussain, A., Shahzad, A., & Hassan, R. (2020). Organizational and environmental factors with the mediating role of e-commerce and SME performance. *Journal of Open Innovation: Technology, Market, and Complexity*, 6(4), 196–216.
- Hussin, H. H., Jemari, M. A., Kasuma, J., Yacob, Y., & Panie, R. (2018). Actors influencing e-commerce adoption among Malay women entrepreneurs in Kuching Sarawak. *Journal of Borneo-Kalimantan*, 3(1), 1–19. <https://doi.org/10.33736/jbk.614.2017>
- Iacovou, C. L., Benbasat, I., & Dexter, A. S. (1995). Electronic data interchange and small organizations: Adoption and impact of technology. *MIS Quarterly: Management Information Systems*, 19(4), 465–485. <https://doi.org/10.2307/249629>
- Ibrahim, W., Turyakira, P., & Katumba, P. M. (2018). E-commerce adoption and growth of SMEs in Uganda. *International Journal of Business and Management*, 14(1), 46–54. <https://doi.org/10.5539/ijbm.v14n1p46>
- Idris, A., Edwards, H., & Mcdonald, S. (2017). E-commerce adoption in developing countries SMEs: What do the prevailing theoretical models offer us? *4th International Conference on E-Commerce*, 21–28.

- Internet world statistics. (2019). *World internet users statistics and world population stats*. <https://www.internetworldstats.com/stats.htm>
- Jahanshahi, E., Skogestad, S., & Grøtli, E. I. (2013). Nonlinear model-based control of two-phase flow in risers by feedback linearization. *IFAC Proceedings Volumes (IFAC-PapersOnline)*, 9(1), 301–306. <https://doi.org/10.3182/20130904-3-FR-2041.00041>
- Jalal, A. N., Bahari, M., & Tarofder, A. K. (2021). Transforming traditional CRM into social CRM: An empirical investigation in Iraqi healthcare industry. *Heliyon*, 7(5), 1-12 <https://doi.org/10.1016/j.heliyon.2021.e06913>
- Jeddah economic gateway. (2016). *Small-Medium Enterprises in Saudi Arabia Report*. <https://www.jeg.org.sa/sites/default/files/library/files/SME-EN.pdf>
- Johanson, G. A., & Brooks, G. P. (2010). Initial scale development: Sample size for pilot studies. *Educational and Psychological Measurement*, 70(3), 394-400 <https://doi.org/10.1177/0013164409355692>
- Johnston, R., Jones, K., & Manley, D. (2018). Confounding and collinearity in regression analysis: A cautionary tale and an alternative procedure, illustrated by studies of British voting behaviour. *Quality and Quantity*, 52(4), 1957–1976. <https://doi.org/10.1007/s11135-017-0584-6>
- Junglas, I., Goel, L., Ives, B., & Harris, J. (2019). Innovation at work: The relative advantage of using consumer IT in the workplace. *Information Systems Journal*, 29(2), 317–339. <https://doi.org/10.1111/isj.12198>
- Kaushik, M. K., & Agrawal, D. (2021). Influence of technology readiness in adoption of e-learning. *International Journal of Educational Management*, 35(2), 483–495.
- Kock, N. (2015). Common method bias in PLS-SEM: A full collinearity assessment approach. *International Journal of E-Collaboration*, 11(4), 1–10. <https://doi.org/10.4018/ijec.2015100101>
- Kock, N., & Lynn, G. S. (2012). Lateral collinearity and misleading results in variance-based SEM: An illustration and recommendations. *Journal of the Association for Information Systems*, 13(7), 1–40. <https://doi.org/10.17705/1jais.00302>
- Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and Psychological Measurement*, 30(3), 607–610. <https://doi.org/10.1177/001316447003000308>
- Kurnia, S., Choudrie, J., Mahbubur, R. M., & Alzougool, B. (2015). E-commerce technology adoption: A Malaysian grocery SME retail sector study. *Journal of Business Research*, 68(9), 1906–1918. <https://doi.org/10.1016/j.jbusres.2014.12.010>

- Kwak, J., Zhang, Y., & Yu, J. (2019). Legitimacy building and e-commerce platform development in China: The experience of Alibaba. *Technological Forecasting and Social Change*, 139, 115–124. <https://doi.org/10.1016/j.techfore.2018.06.038>
- Lambert, D. M., Cooper, M. C., & Pagh, J. D. (1998). Supply chain management: Implementation issues and research opportunities. *The International Journal of Logistics Management*, 9(2). <https://doi.org/10.1108/09574099810805807>
- Laudon, K. C., & Laudon, J. P. (2014). *Managing information systems: Managing the Digital Firm* (13th ed.). Pearson. <https://doi.org/10.1108/eb000831>
- Laudon, K. C., & Traver, C. G. (2013). *E-commerce*. Pearson.
- Laudon, K. C., & Traver, C. G. (2016). *E-commerce: Business, technology, society*. Pearson Prentice Hall.
- Li, J., Wang, Y. F., Zhang, Z. M., & Chu, C. H. (2010). Investigating acceptance of RFID in Chinese firms: The technology- organization-environment framework. *Proceedings of 2010 IEEE International Conference on RFID-Technology and Applications, RFID-TA 2010*, 263–268. <https://doi.org/10.1109/RFID-TA.2010.5529927>
- Lim, S. C., Baharudin, A. S., & Low, R. Q. (2017). Factors influence SMEs in Malaysia to adopt e-commerce: Moderating roles of perceived strategic value. *Journal of Engineering and Applied Sciences*, 12(6), 1566–1574.
- Lim, S. C., Lim, S. P., & Trakulmaykee, N. (2018). An empirical study on factors affecting e-commerce adoption among SMEs in west Malaysia. *Management Science Letters*, 8(5), 381-392 <https://doi.org/10.5267/j.msl.2018.4.008>
- Limas, S. (2020). El comercio electrónico (e-commerce) un aliado estratégico para las empresas en Colombia. *Revista Ibérica de Sistemas e Tecnologías de Informação*, 9(E34).
- Lin, H. F. (2014). Understanding the determinants of electronic supply chain management system adoption: Using the technology-organization-environment framework. *Technological Forecasting and Social Change*, 86(1), 80–92 <https://doi.org/10.1016/j.techfore.2013.09.001>
- Lin, H. F., & Lin, S. M. (2008). Determinants of e-business diffusion: A test of the technology diffusion perspective. *Technovation*, 28(3), 135–145. <https://doi.org/10.1016/j.technovation.2007.10.003>
- Lin, J. Li. L., Luo, X. R., & Benitez, J. (2020). How do agribusinesses thrive through complexity? The pivotal role of e-commerce capability and business agility. *Decision Support Systems*, 135, 113342.
- Lin, Judy., & Lu, H. (2000). Towards an understanding of the behavioural intention to use a web site. *International Journal of Information Management*, 20(3), 197–208.

- Lincoln, N. K. D. Y. S. (2005). The SAGE handbook of qualitative research. In *Choice Reviews Online*. SAGE Publications. <https://doi.org/10.5860/choice.43-1330>
- Liu, H., Ke, W., Wei, K. K., Gu, J., & Chen, H. (2010). The role of institutional pressures and organizational culture in the firm's intention to adopt internet-enabled supply chain management systems. *Journal of Operations Management*, 28(5), 372–384. <https://doi.org/10.1016/j.jom.2009.11.010>
- Liu, M., Min, S., Ma, W., & Liu, T. (2021). The adoption and impact of e-commerce in rural China: Application of an endogenous switching regression model. *Journal of Rural Studies*, 83(1), 106-116 <https://doi.org/10.1016/j.jrurstud.2021.02.021>
- Liu, Y. (2015). Analysis of college students adopting mobile e-commerce. *International Conference on Automation, Mechanical Control and Computational Engineering (AMCCE 2015)*, 530–537. <https://doi.org/10.2991/amcce-15.2015.99>
- Looi, H. C. (2005). E-commerce adoption in Brunei Darussalam: A quantitative analysis of factors influencing its adoption. *Communications of the Association for Information Systems*, 15(1), 61–81. <https://doi.org/10.17705/1cais.01503>
- Maiti, M., Krakovich, V., Shams, S. M. R., & Vukovic, D. B. (2020). Resource-based model for small innovative enterprises. *Management Decision*, 58(8), 1525–1541.
- Makki, E., & Chang, L.-C. (2014). E-commerce in Saudi Arabia: Acceptance and implementation difficulties. *The 2014 International Conference on E-Learning, e-Business, Enterprise Information Systems, and e-Government (EEE'14)*, 114–120.
- Masocha, R., Chiliya, N., & Zindiye, S. (2011). E-banking adoption by customers in the rural milieus of South Africa: A case of Alice, Eastern Cape, South Africa. *African Journal of Business Management [E]*, 5(5), 1857–1863. <https://doi.org/10.5897/AJBM10.850>
- Mathkur, N. (2019). The role of SMEs in Saudi Arabia in light of vision 2030. *International Journal of Economics, Commerce and Management*, 7(2), 472–485. <https://doi.org/ISSN 2348 0386>
- McDonald, R. P., & Ho, M. H. R. (2002). Principles and practice in reporting structural equation analyses. *Psychological Methods*, 7(1), 64-82 <https://doi.org/10.1037/1082-989X.7.1.64>
- Miao, J.-J., & Tran, Q. D. (2018). Study on e-commerce adoption in SMEs under the institutional perspective: The case of Saudi Arabia. *International Journal of E-Adoption (IJEA)*, 10(1), 53–72.
- Mohtaramzadeh, M., Ramayah, T., & Jun-Hwa, C. (2018). B2B e-commerce adoption in Iranian manufacturing companies: Analyzing the moderating role of organizational culture. *International Journal of Human-Computer Interaction*, 34(7), 621–639. <https://doi.org/10.1080/10447318.2017.1385212>

- Molla, A., & Heeks, R. (2007). Exploring e-commerce benefits for businesses in a developing country. *Information Society*, 23(2), 95–108. <https://doi.org/10.1080/01972240701224028>
- Molla, A., & Licker, P. S. (2005a). E-commerce adoption in developing countries: A model and instrument. *Information and Management*, 42(6), 877–899. <https://doi.org/10.1016/j.im.2004.09.002>
- Molla, A., & Licker, P. S. (2005b). Perceived e-readiness factors in e-commerce adoption: An empirical investigation in a developing country. *International Journal of Electronic Commerce*, 10(1), 83–110. <https://doi.org/10.1080/10864415.2005.11043963>
- Monsha'at. (2021). *Small and Medium Enterprise Authorities in Saudi Arabia*. <https://www.monshaat.gov.sa/>
- Mooi, E., & Sarstedt, M. (2014). *A concise guide to market research: the process, data, and methods using IBM SPSS statistic*. Springer. <https://doi.org/10.1007/978-3-642-12541-6>
- Morris, M. G., Venkatesh, V., & Ackerman, P. L. (2005). Gender and age differences in employee decisions about new technology: An extension to the theory of planned behavior. *IEEE Transactions on Engineering Management*, 52(1), 69–84. <https://doi.org/10.1109/TEM.2004.839967>
- Nasution, M. D. T. P., Rafiki, A., Lubis, A., & Rossanty, Y. (2021). Entrepreneurial orientation, knowledge management, dynamic capabilities towards e-commerce adoption of SMEs in Indonesia. *Journal of Science and Technology Policy Management*, 12(2), 256-282 <https://doi.org/10.1108/JSTPM-03-2020-0060>
- Nazir, M. A., & Roomi, M. A. (2021). Barriers to adopting electronic commerce for small and medium-sized enterprises in emerging economies. *EMAJ: Emerging Markets Journal*, 10(2), 43-55 <https://doi.org/10.5195/emaj.2020.203>
- Nguyen, T. U. H., & Waring, T. S. (2013). The adoption of customer relationship management (CRM) technology in SMEs: An empirical study. *Journal of Small Business and Enterprise Development*, 20(4), 824–848. <https://doi.org/10.1108/JSBED-01-2012-0013>
- Ocloo, C. E., Xuhua, H., Akaba, S., Addai, M., Worwui-Brown, D., & Spio-Kwofie, A. (2018). B2B e-commerce adoption amongst manufacturing SMEs: Evidence from Ghana. *Australian Journal of Economics and Management Science*, 1(8), 126-146
- Ocloo, C. E., Xuhua, H., Akaba, S., Shi, J., & Worwui-Brown, D. K. (2020). The determinant factors of business to business (B2B) e-commerce adoption in small- and medium-sized manufacturing enterprises. *Journal of Global Information Technology Management*, 23(3), 191–216.

- Oliveira, T., & Martins, M. F. (2010). Understanding e-business adoption across industries in European countries. *Industrial Management & Data Systems*, 110(9), 1337–1354. <https://doi.org/10.1108/02635571011087428>
- Oliveira, T., Martins, M. F., & Lisboa, U. N. De. (2011). Literature review of information technology adoption models at firm level. *Review of Economics Studies*, 14(1), 110-121
- Omoga, C. O., Liyala, S., Raburu, G., Charles, M., & Omoga, O. (2018). Small sized businesses and e-marketing adoption: Towards a conceptual model. *International Journal of Scientific Research Engineering & Technology (IJSRET)*, 7(4).
- Parker, C. M., & Castleman, T. (2009). Small firm e-business adoption: A critical analysis of theory. *Journal of Enterprise Information Management*, 22(1–2), 167–182. <https://doi.org/10.1108/17410390910932812>
- Pavic, S., Koh, S. C. L., Simpson, M., & Padmore, J. (2007). Could e-business create a competitive advantage in UK SMEs? *Benchmarking*, 14(3), 320–351. <https://doi.org/10.1108/14635770710753112>
- Pisar, P., & Tomaskova, A. (2020). The importance of social networks for the SME's innovation potential in Industry 4.0. *Innovative Marketing*, 16(3), 48-61 [https://doi.org/10.21511/im.16\(3\).2020.05](https://doi.org/10.21511/im.16(3).2020.05)
- Pouzevara, S., Strigel, C., & Watson, J. (2008). Innovative information and communication technology in education and its potential for reducing poverty in the Asia and Pacific region. In *Technical Assistance Consultant's Report*.
- Quaddus, M., & Hofmeyer, G. (2007). An investigation into the factors influencing the adoption of B2B trading exchanges in small businesses. *European Journal of Information Systems*, 16(3), 202–215. <https://doi.org/10.1057/palgrave.ejis.3000671>
- Quinn, R. E., & Rohrbaugh, J. (1983). A spatial model of effectiveness criteria: Towards a competing values approach to organizational analysis. *Management Science*, 29(3), 363–377. <https://doi.org/10.1287/mnsc.29.3.363>
- Rahayu, R., & Day, J. (2015). Determinant factors of e-commerce adoption by SMEs in developing country: Evidence from Indonesia. *Procedia - Social and Behavioral Sciences*, 195, 142–150. <https://doi.org/10.1016/j.sbspro.2015.06.423>
- Rahayu, R., & Day, J. (2017). E-commerce adoption by SMEs in developing countries: Evidence from Indonesia. *Eurasian Business Review*, 7(1), 25-41 <https://doi.org/10.1007/s40821-016-0044-6>
- Rahman, A. A., Kamarulzaman, N. H., & Sambasivan, M. (2013). A study on organizational culture, performance, and technological adoption behaviours of Malaysian food-processing SMEs. *Pertanika Journal of Social Science and Humanities*, 21, 231–256.

- Raj, P., Raman, A., Nagaraj, D., & Duggirala, S. (2015). *High-performance big-data analytics*. Springer.
- Ralston, D. A., Terpstra-Tong, J., Terpstra, R. H., Wang, X., & Egri, C. (2006). Today's state-owned enterprises of China: Are they dying dinosaurs or dynamic dynamos? *Strategic Management Journal*, 27(9), 825 - 843 <https://doi.org/10.1002/smj.545>
- Ramayah, T., Cheah, J., Chuah, F., Ting, H., & Memon, M. A. (2016). *Partial least squares structural equation modeling (PLS-SEM) using smartPLS 3.0: An Updated Guide and Practical Guide to Statistical Analysis*. Pearson.
- Ramdani, B., Chevers, D., & Williams, D. A. (2013). SMEs' adoption of enterprise applications: A technology-organisation-environment model. *Journal of Small Business and Enterprise Development*, 20(4), 735–753. <https://doi.org/10.1108/JSBED-12-2011-0035>
- Randheer, K., & Al-Aali, A. (2015). What, who, how and where: Retailing industry in Saudi Arabia. *Journal of Competitiveness Studies*, 23(3), 54–69.
- Raymond, L. (2001). Determinants of website implementation in small businesses. *Internet Research*, 11(5), 411–422. <https://doi.org/10.1108/10662240110410363>
- Razzaq, A., Asmai, S. A., Abidin, Z. Z., Talib, M. S., Ali, M. F., & Mohammed, A. A. (2021). Propose a conceptual framework for the cloud ERP adoption among Malaysian SMEs. *Journal of Engineering Science and Technology*, 16(4), 3387-3406
- Religia, Y., Surachman, S., Rohman, F., & Indrawati, N. K. (2021). E-commerce adoption in SMEs: A literature review. *InCEEES 2020*.
- Resnik, D. B. (2011). What is ethics in research & why is it important. *National Institute of Environmental Health Sciences*, 1(10), 49–70.
- Rezaeinejad, I. (2021). Impact Online marketing strategies on improving the status of businesses in the COVID-19 situation in Iran. *Asian Basic and Applied Research Journal*, 4(2), 24–33.
- Ringle, C. M., Sarstedt, M., & Straub, D. W. (2012). Editor's comments: A critical look at the use of PLS-SEM in "MIS Quarterly." *Journal of Education for Business*, 36(1), iii-xiv
- Rogers, E. (2010). *Diffusion of innovations* (4th ed.). Simon and Schuster.
- Rogers, E. M. (2003). *Diffusion of innovations*. Free Press.
- Saif-Ur-Rehman., & Alam, R. (2016). A study of barriers to e-commerce adoption among SMEs in Malaysia. *Gulf-Pacific Journal of Business Administration*, 1(1), 45–58. <https://doi.org/http://dx.doi.org/10.1007>

- Salah, O. H., Yusof, Z. M., & Mohamed, H. (2021). The determinant factors for the adoption of CRM in the Palestinian SMEs: The moderating effect of firm size. *PLoS ONE*, *16*(3 March), 1-25 <https://doi.org/10.1371/journal.pone.0243355>
- Saldanha, T. J. V., & Krishnan, M. S. (2012). Organizational adoption of web 2.0 technologies: An empirical analysis. *Journal of Organizational Computing and Electronic Commerce*, *22*(4), 301–333. <https://doi.org/10.1080/10919392.2012.723585>
- Sánchez-Torres, J. A., Berrío, S. P. R., & Rendón, P. A. O. (2021). The adoption of e-commerce in SMEs: The colombian case. *Journal of Telecommunications and the Digital Economy*, *9*(3), 110-135 <https://doi.org/10.18080/jtde.v9n3.403>
- Sarfo, C. A., & Song, H. (2021). E-commerce adoption within SME's in Ghana, a tool for growth? *International Journal of Electronic Business*, *16*(1), 33-51 <https://doi.org/10.1504/IJEB.2021.112764>
- Saunders, C., & Kulchitsky, J. (2021). Enhancing self-administered questionnaire response quality using code of conduct reminders. *International Journal of Market Research*, *63*(6), 715-737 <https://doi.org/10.1177/14707853211055060>
- Saunders, M., Lewis, P., & Thornhill, A. (2016). *Research methods for business students* (7th ed.). Pearson.
- Savrul, M., Incekara, A., & Sener, S. (2014). The potential of e-commerce for SMEs in a globalizing business environment. *Procedia - Social and Behavioral Sciences*, *150*, 35–45. <https://doi.org/10.1016/j.sbspro.2014.09.005>
- Schaupp, L. C., & Bélanger, F. (2016). Social commerce benefits for small businesses: An organizational level study. *Journal of Organizational and End User Computing*, *28*(3), 49–66. <https://doi.org/10.4018/JOEUC.2016070104>
- Senarathna, I., Warren, M., Yeoh, W., & Salzman, S. (2014). The influence of organisation culture on e-commerce adoption. *Industrial Management and Data Systems*, *114*(7), 1007–1021. <https://doi.org/10.1108/IMDS-03-2014-0076>
- Senarathna, J., Rege, A., Li, N., & Thakor, N. V. (2013). Laser speckle contrast imaging: Theory, instrumentation and applications. *IEEE Reviews in Biomedical Engineering*, *6*, 99–110. <https://doi.org/10.1109/RBME.2013.2243140>
- Setiyani, L., & Yeny Rostiani. (2021). Analysis of e-commerce adoption by SMEs using the technology - organization - environment (TOE) model: A case study in Karawang, Indonesia. *International Journal of Science, Technology & Management*, *2*(4), 1113-1132 <https://doi.org/10.46729/ijstm.v2i4.246>
- Shemi, A. P., & Procter, C. (2018). E-commerce and entrepreneurship in SMEs: Case of mybot. *Journal of Small Business and Enterprise Development*, *25*(3), 501-520 <https://doi.org/10.1108/JSBED-03-2017-0088>

- Shen, R. (2020). The comparative history and development of e-commerce in China and the United States. *Journal of Mathematical Finance*, 10(03), 483-498 <https://doi.org/10.4236/jmf.2020.103029>
- Siddiqui, H. N. (2008). Investigation of Intention to Use E-Commerce in the Arab Countries: A Comparison of Self-Efficacy, Usefulness, Culture, Gender, and Socioeconomic Status in Saudi Arabia and the United Arab Emirates,” *PhD. Dissertation, Nova Southeastern University*.
- Sila, I. (2013). Factors affecting the adoption of B2B e-commerce technologies. *Electronic Commerce Research*, 13(2), 199–236. <https://doi.org/10.1007/s10660-013-9110-7>
- Sila, I., & Dobni, D. (2012). Patterns of B2B e-commerce usage in SMEs. *Industrial Management and Data Systems*, 112(8), 1255–1271. <https://doi.org/10.1108/02635571211264654>
- Sin, K.-Y., Osman, A., Salahuddin, S. N., Abdullah, S., Lim, Y. J., & Sim, C. L. (2016). Relative advantage and competitive pressure towards implementation of e-commerce: Overview of small and medium enterprises (SMEs). *Procedia Economics and Finance*, 35, 434–443. [https://doi.org/10.1016/s2212-5671\(16\)00054-x](https://doi.org/10.1016/s2212-5671(16)00054-x)
- Sin, K.-Y., & Sin, M.-C. (2020). Factors influencing e-commerce adoption: evaluation using structural equation modelling (SEM). *International Journal of Business & Society*, 21(3), 1192–1202.
- Singh, A. S. (2017). Common procedures for development, validity and reliability of a questionnaire. *International Journal of Economics, Commerce and Management*, 5(5), 790-801
- Siponen, M., & Tsohou, A. (2018). Demystifying the influential IS legends of positivism. *Journal of the Association for Information Systems*, 19(7), 600–617. <https://doi.org/10.17705/1jais.00503>
- Sohaib, O., Kang, K., & Nurunnabi, M. (2019). Gender-based itrust in e-commerce: The moderating role of cognitive innovativeness. *Sustainability (Switzerland)*, 11(1), 175–190. <https://doi.org/10.3390/su11010175>
- Sombultawee, K. (2020). Antecedents and consequences of e-commerce adoption for SMEs. *Kasetsart Journal of Social Sciences*, 41(2), 256–261.
- Statista. (2019). *E-commerce - Saudi Arabia Statista Market*. <https://www.statista.com/outlook/243/110/ecommerce/saudi-arabia>
- Sujatha, R., & Karthikeyan, M. S. (2021). Determinants of e-commerce adoption: Evidence from small and medium-sized enterprises in India. *International Journal of Business and Society*, 22(2), 574-590 <https://doi.org/10.33736/ijbs.3740.2021>

- Sullivan, G. M., & Feinn, R. (2012). Using effect size—or why the P value is not enough. *Journal of Graduate Medical Education*, 4(3), 279–282. <https://doi.org/10.4300/jgme-d-12-00156.1>
- Tan, K. S., Chong, S. C., Lin, B., & Eze, U. C. (2009). Internet-based ICT adoption: Evidence from Malaysian SMEs. *Industrial Management and Data Systems*, 109(2), 224–244. <https://doi.org/10.1108/02635570910930118>
- Taufik, N., Prabowo, F. H. E., Santosa, A. D., & Mandasari, A. E. (2020). SMEs e-commerce adoption towards consumer experience. *Jurnal Bisnis Dan Manajemen*, 21(2), 144-155 <https://doi.org/10.24198/jbm.v21i2.373>
- Telegraph. (2022). www.Telegraph.com.
- Thatcher, S. M. B., Foster, W., & Zhu, L. (2006). B2B e-commerce adoption decisions in Taiwan: The interaction of organizational, industrial, governmental and cultural factors. *Electronic Commerce Research and Applications*, 5(2), 92–104. <https://doi.org/10.1109/HICSS.2003.1174620>
- Thi, L.-S., & Eam, L. (2011). Estimating the determinants of B2B e-commerce adoption among small & medium enterprises. *International Journal of Business and Society*, 12(1), 15–30.
- Thong, J. Y. L. (1999). An integrated model of information systems adoption in small businesses. *Journal of Management Information Systems*, 15(4), 187–214. <https://doi.org/10.1080/07421222.1999.11518227>
- Thong, J. Y. L., & Yap, C. S. (1995). CEO characteristics, organizational characteristics and information technology adoption in small businesses. *Omega*, 23(4), 429–442. [https://doi.org/10.1016/0305-0483\(95\)00017-1](https://doi.org/10.1016/0305-0483(95)00017-1)
- Thuy, D. N. H. T. (2022). Empirical research on the influence factors of e-commerce adoption among e-commerce companies in Vietnam. In *Global Changes and Sustainable Development in Asian Emerging Market Economies Vol. 1*. 315–334 https://doi.org/10.1007/978-3-030-81435-9_23
- Tjahjana, D., Manurung, A. H., Setiadi, N. J., & Kosasih, W. (2020). Innovations in Digital Business and Family Commitment. *European Journal of Molecular & Clinical Medicine*, 7(3), 832-841
- Torkian, S., Shahesmaeili, A., Malekmohammadi, N., & Khosravi, V. (2020). Content validity and test-retest reliability of a questionnaire to measure virtual social network addiction among students. *International Journal of High Risk Behaviors and Addiction*, 9(1), 1-5 <https://doi.org/10.5812/IJHRBA.92353>
- Tornatzky, L. G., Fleischer, M., & Chakrabarti, A. K. (1990). *The Processes of Technological Innovation*. Lexington Books.

- Townsend, A., Adam, P., Li, L. C., McDonald, M., & Backman, C. L. (2013). Exploring E-Health ethics and multi-morbidity: Protocol for an interview and focus group study of patient and health care provider views and experiences of using digital media for health purposes. *JMIR Research Protocols*, 2(2), e38.
- Tran, L. (2021). Managing the effectiveness of e-commerce platforms in a pandemic. *Journal of Retailing and Consumer Services*, 58(7), 102287. <https://doi.org/10.1016/j.jretconser.2020.102287>
- Turban, S., Anderson, C., Charleston, J., Miller, E. R., & Appel, L. J. (2010). A comparison of web sites used to manage and present home blood pressure readings. *Journal of Clinical Hypertension*, 12(6), 389–395. <https://doi.org/10.1111/j.1751-7176.2010.00277.x>
- Turner, S. F., Cardinal, L. B., & Burton, R. M. (2017). Research design for mixed methods: A triangulation-based framework and roadmap. *Organizational Research Methods*, 20(2), 243–267.
- Uma Sekaran., & Bougie. (2013). *Research Method for Business: A skill Building Approach* (6th ed.). John Wiley & Sons Inc.
- Uma Sekaran., & Roger Bougie. (2016). Research method for business textbook (a skill building apprao). *United States: John Wiley & Sons Inc.*
- Valencia, J. C. N., Valle, R. S., & Jiménez, D. J. (2010). Organizational culture as determinant of product innovation. *European Journal of Innovation Management*, 13(4), 466–480. <https://doi.org/10.1108/14601061011086294>
- Van Den Besselaar, P. (2003). Descriptive statistics, inferential statistics, rhetorical statistics. *Journal of the American Society for Information Science and mTechnology*, 54(11), 1077–1089. <https://doi.org/10.1002/asi.10304>
- Van Huy, L., Rowe, F., Truex, D., & Huynh, M. Q. (2012). An empirical study of determinants of e-commerce adoption in SMEs in Vietnam: An economy in transition. *Journal of Global Information Management*, 20(3), 23–54. <https://doi.org/10.4018/jgim.2012070102>
- Varajão, J., Silva, T., & Trigo, A. (2021). ISRI - Information systems research constructs and indicators: A web tool for information systems researchers. *Journal of Information Science Theory and Practice*, 9(1), 54-67 <https://doi.org/10.1633/JISTaP.2021.9.1.4>
- Vargas-Hernández, J. G. (2015). Strategies for the adoption of e-commerce. *Journal of Global Economics*, 3(4), 1–5. <https://doi.org/10.4172/2375-4389.1000157>
- Veal, A. J. (2005). *Business research methods: A managerial approach*. Pty Limited. Longman, Pearson Education.

- Vipin, Jain., Satyendra, A. (2021). An overview of electronic commerce (e-commerce). *Journal of Contemporary Issues in Business and Government*, 27(3), 665-670
<https://doi.org/10.47750/cibg.2021.27.03.090>
- Wang, S., Li, P., & Wang, Y. (2015). How do IT competence, organizational agility and entrepreneurial actions coevolve: The Case of Entrepreneurial Etailers on Ecommerce Platforms. *WHICEB 2015 Proceedings*. 17, 65–76.
- Wang, X., Yuen, K. F., Wong, Y. D., & Teo, C. C. (2020). E-consumer adoption of innovative last-mile logistics services: A comparison of behavioural models. *Total Quality Management and Business Excellence*, 31(11–12).
<https://doi.org/10.1080/14783363.2018.1485484>
- Wigand, R. T. (1997). Electronic commerce: Definition, theory and context. *Information Society*, 13(1), 1–16. <https://doi.org/10.1080/019722497129241>
- Wijayanto, A., & D Seno, A. H. (2021). Innovation capabilities and market-based competitive advantage of Indonesian manufacturing companies. *ICISPE 2020*, 110–116.
- Williams, M. D., Dwivedi, Y. K., Lal, B., & Schwarz, A. (2009). Contemporary trends and issues in IT adoption and diffusion research. *Journal of Information Technology*, 24(1), 1–10. <https://doi.org/10.1057/jit.2008.30>
- Wold, H. (1975). Soft modelling by latent variables: The non-linear iterative partial least squares (NIPALS) approach. *Journal of Applied Probability*, 12(S1), 117-142
<https://doi.org/10.1017/s0021900200047604>
- Wu, L., & Chuang, C.-H. (2010). Examining the diffusion of electronic supply chain management with external antecedents and firm performance: A multi-stage analysis. *Decision Support Systems*, 50(1), 103–115.
- Yadav, R., & Mahara, T. (2019). Factors affecting e-commerce adoption by handicraft SMEs of India. *Journal of Electronic Commerce in Organizations*, 17(4), 44–57.
<https://doi.org/10.4018/JECO.2019100104>
- Yousaf, Z., & Majid, A. (2018). Organizational network and strategic business performance: Does organizational flexibility and entrepreneurial orientation really matter? *Journal of Organizational Change Management*, 31(2), 268-285
<https://doi.org/10.1108/JOCM-12-2016-0298>
- Yusoff, M. S. B., Abdul Rahim, A. F., & Yaacob, M. J. (2010). Prevalence and sources of stress among Universiti Sains Malaysia medical students. *Malaysian Journal of Medical Sciences*, 17(1), 30-37
- Zahraa B., Albinahmed., Shakeel, A. (2017). Understanding users behavior in social networking in Saudi Arabia: A survey. *International Journal of Advanced Research in Computer Science and Software Engineering*, 7(5), 331-335

- Zaied, A. N. H. (2012). Barriers to e-commerce adoption in Egyptian SMEs. *International Journal of Information Engineering and Electronic Business*, 4(3), 9–18. <https://doi.org/10.5815/ijieeb.2012.03.02>
- Zain, Z. M., Jusoh, A. A., Intan, R., Munir, S., & Putit, L. (2020). Drivers of e-commerce adoption amongst small & medium sized enterprises (SMEs) in the business service sector. In *Journal of International Business, Economics and Entrepreneurship*, 5(1), 50-58
- Zainuddin, N. A., Ismail, M., Ahmad, N. Z. A., Shariff, S., Mazalan, M. I., & Ab Kadir, M. S. (2021). The driven factors on new electronic commerce adoption by small and medium enterprise (SME) in Klang Valley. *E-Journal of Islamic Thought & Understanding (E-JITU)*, 2, 17–28.
- Zeb, A., Akbar, F., Hussain, K., Safi, A., Rabnawaz, M., & Zeb, F. (2021). The competing value framework model of organizational culture, innovation and performance. *Business Process Management Journal*, 27(2), 658–683. <https://doi.org/10.1108/BPMJ-11-2019-0464>
- Zhu, K., Kraemer, K. L., & Xu, S. (2002). A cross-country study of electronic business adoption using the technology-organization-environment framework. *Proceedings of the International Conference on Information Systems (ICIS)*, 337–348.
- Zhu, L., & Thatcher, S. (2010). National information ecology: A new institutional economics perspective on global e-commerce adoption. *Journal of Electronic Commerce Research*, 11(1), 53–72.
- Zhu, S., & Chen, J. (2016). E-commerce use in urbanising China: The role of normative social influence. *Behaviour and Information Technology*, 35(5), 357–367. <https://doi.org/10.1080/0144929X.2016.1160286>
- Zikmund, W. G., & Carr, G. (2003). *Business Research Methods* (1st ed.). Oxford University Press.