

SLRA: Challenges faced by SMEs in the adoption of E-commerce and sustainability in Industry 4.0.

Asmat Ara Shaikh, Amir Nasir Patel, M. Z. Shaikh, C. R. Chavan

ABSTRACT: *The ultimate goal of this article is to delve into and identify the key elements that influence e-business implementation in both “ERP-enabled and non-ERP-enabled” businesses. To comprehensively examine the factors that drive e-business acceptance and to fully articulate the significant intrinsic abilities and traits required to effortlessly convert the organization from brick-and-mortar to click-and-mortar through e-commerce. As the world moves toward technology 5.0, SMEs are unable to thrive in “I-4.0.” The COVID-19 epidemic has undoubtedly proven to the world the value of sustainable technology in empowering distant employees.*

And a very few relative handfuls of literature review-based research have tested the ideas of the “Technology-Organisation-Environment (TOE) framework, Diffusion of Innovation (DOI) theory, and Resource-Based View (RBV) theory”, in combination. Furthermore, the comparative study contributes by proposing the profound significance of E-commerce as a mediator variable amongst essential TOE, DOI, and RBV characteristics and company success. The successful adoption and effective use of e-commerce are critical to progressively increasing potential productivity in the digital age. This exploratory research has successful applicability since it employs the “TOE, DOI, and RBV theories” that are appropriate for the implementation of E-commerce and, as a result, contribute to enhancing the efficiency of Indian small and medium companies.

Keywords: SME's, E-commerce adoption challenges, Industry 4.0, Sustainability.

JEL Code- M150, M210, M310

1. INTRODUCTION

In the present era of digitization, the evolving phenomena of E-commerce are rapidly developing, predominantly in developing economies, and firms are beginning to willingly choose to purchase and trade online. The emerging world's two most important economies, India and China, are diversifying their activities from traditional enterprises to click-and-mortar daily. The economic development of the Indian E-commerce market is undoubtedly expected to achieve 64 billion US dollars by the end of this decade (Dutta, Mishra, Khandelwal, & and Katthawala, 2020).

Similarly, China's internet commerce market figures show that the developed country has indeed obtained a 574 billion US \$ market in 2018 (Lu, Yang, Liu, & and Jia, 2020). In the same way, the rapid growth of the e-commerce market is revolutionizing the way companies function in both major and small enterprises (Ozturk, 2016). Nevertheless, E-commerce adoption in small and medium-sized businesses (SMEs) has substantially enlarged and is continuing to grow tremendously. SMEs are increasing the sustainability and considerable

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progress of many expanding economies across the world in the twenty-first century.

According to the “Asia Pacific Economic Report”, SMEs add to more than half of all employment and more than 97 percent of all enterprises in “Asia-Pacific Economic Cooperation (APEC) economies” (Asia Pacific Economic Cooperation Report, 2018). Furthermore, the outstanding stake of APEC countries' GDP contributed by SMEs ranges from 20% to 50%. Likewise, in the “Association of Southeast Asian Nations (ASEAN)” SMEs are accountable for 63.3 percent of employment and 42.2 percent of the net investment (ASEAN. SME Policy Index; OECD/ERIA: Jakarta, 2020). Equivalently, (Zafar & Mustafa, 2017) stated that, on aggregate, in underdeveloped nations, SMEs provide around 70% of employment and 60% of GDP. Furthermore, in developing nations, SMEs are liable for 95% of employment and 70% of GDP. As a result, it is demonstrated that SMEs are correspondingly significant for every economy around the globe.

Objective

Are SME's (Small and Medium-Sized Enterprises) Ready for Industry 4.0?

The primary objective of the proposed article is to precisely ascertain the key challenges that SMEs encounter while adopting E-commerce for long-term sustainability in Industry 4.0.

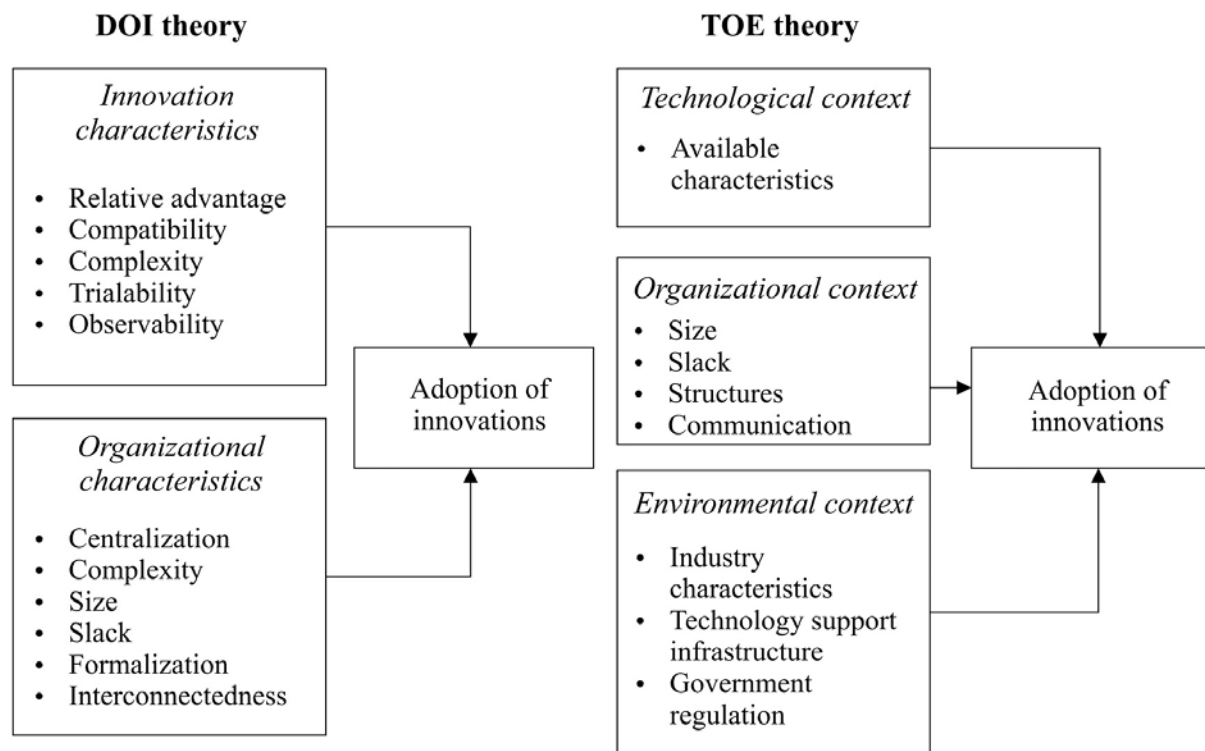
Background to the study

According to the reviewed research, two ideas could represent essential theoretical approaches for the comprehensive report of circumstantial elements. The original key concept is the “Diffusion Of Innovation (DOI)”, which adequately provides a vital framework for exploring the diffusion of innovative technologies (Hsu, Kraemer, & Dunkle, 2006)

According to DOI theory, innovation features and organizational factors accurately determine a company's acceptance and successful implementation of key innovations. According to Rogers, innovation features are composed of five aspects (Ref. Fig.1(a)), authors proposed that numerous organizational features (Ref. Fig.2(a)) affect the acceptance and application of breakthroughs at the organizational level. The “Technology-Organization-Environment (TOE) framework”, originally taken from the “DOI” concept, is the second theoretical approach. The comprehensive TOE framework highlights three contributing factors that may positively impact an organization's use of technical innovation (Ref. Fig.1(b)): (1) The technical feasibility positively identifies the current technologies in practical use and the pertinent technical expertise obtainable in an organization. (2) The organizational design states to in-house organizational gauges like the size. And (3) the environmental context represents the peripheral realm in which an enterprise operates – its businesses, recent entrants, and business associates.

The “TOE framework” and the “DOI theory” intersect in many possible ways. There are apt analogies between the unique features of key innovation and the technical setting, as well as between the qualities of organizations and the organizational milieu. There are, however, some significant discrepancies between the two prevailing philosophies. Inapt comparison to the DOI theory, the “TOE framework” does not attribute the active participation of personality traits like organizational support. Similarly, unlike the TOE framework, the DOI theory does not take into account the profound effect of environmental factors. More initial studies on e-business adoption have highlighted the importance of including TOE situations to reinforce the DOI theories (Hsu, Kraemer, & Dunkle, 2006).

Fig. 1 DOI (a) and TOE (b) framework



Source: (Hsu, Kraemer, & Dunkle, 2006)

E-business adaptation and practice perspective

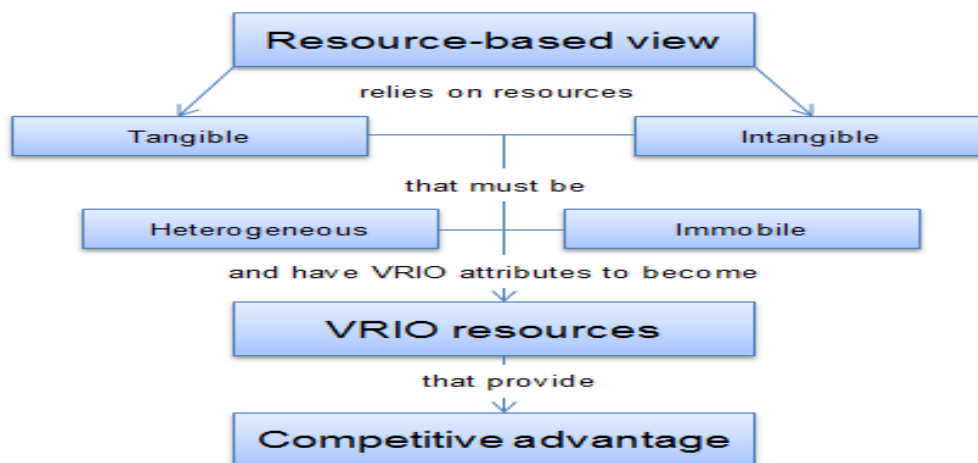
Although E-business deployment has been thoroughly researched in the earlier studies its reality does not diminish with considerable epoch. Peer-reviewed experimental articles on e-business uptake and extensive applications are invariably found and emphasized in IT acceptance studies to ensure this compelling argument. Only research articles that smear “DOI and/or TOE” techniques are sufficiently shown in the pursuit of scholarly databases to reduce the search for relevant significant contributions. The “TOE framework and the DOI theory” have been instantly discovered to be widely employed frameworks in the evaluation of E-business implementation (Banerjee, Wei, & Ma, 2012). Experiential studies on E-business deployment seek to adequately demonstrate the diverse ramifications of E-business espousal based on the technology adoption of the enterprises included. The experiential research on E-business applications seeks to highlight the potential benefits of E-business and the possible consequences for e-business advancement. Initial research on E-business implementation demonstrated it is not a phenomenon owned by big enterprises in European industrialized nations. (Zhu, Kraemer, & Xu, 2003). E-business impact is assessed by three primary actions throughout the value chain, according to (Zhu, Kraemer, & Xu, 2003) downstream sales, upfront procuring, and operational processes demonstrated that, while both front-head and back-end abilities deliver a significant contribution to E-business value, back-end collaboration exercises a significantly more considerable influence.

Digital disruption is becoming extremely significant in SMEs, and the prospective intensity of technological uptake has risen rapidly since COVID-19. It is past time for SMEs' proprietors and sustainable utilization to adequately incorporate innovative technology enthusiastically; they can no longer support fiercely resist it (Asmat, Anuj, Asif, & Zafar, 2021). Scientifically derived from the previous explanation, a human resource department that effectively leverages self-confidence in active recruitment, training, cooperation, and policy formation may powerfully aid enterprises in meeting the current COVID-19 difficulties (Ayedee, Anuj, & Asmat, 2021). To satisfactorily accomplish targeted goals and to fulfil the demands of teams, suppliers and distributors, consumers, and substantial concerned citizens to transmit specific

disparities throughout epidemics, a progressive changeover can be properly developed (Asmat & Mohd, A VIEWPOINT ON SUSTAINABLE PRACTICES OF COLES AND WOOLWORTHS DURING COVID-19, 2021). Furthermore, (Hsu, Kraemer, & and Dunkle, 2006) contend that the most considerable value of e-business is obtained when numerous supply chain members use it, but (Lin & and Lin, Determinants of e-business diffusion: A test of the technology diffusion perspective., 2008) discovered that internal communication is crucial for meaningfully improving e-business productivity. Along with TOE and DOI theories, asset perspective (RBV) is used in many technologies' usage/adoption research. RBV is used as the grounding theory in this investigation. The fundamental point of the RBV theory is resource heterogeneity, which invariably refers to the firm's capacities, various resources, and immobility (Mata, Fuerst, & and Barney, 1995).

These distinct resources possess qualities such as being economically valued, comparatively rare, hard to replicate by adversaries, and non-replaceable by other market participants. Organizations safeguard distinct assets that they utilize efficiently and effectively to achieve a competing edge (Hwang & and Min, 2015). Furthermore, very few researchers have adequately investigated the organizational and environmental elements of the TOE model in conjunction with “DOI and RBV theories”. As a result, the emphasized conceptual and technical concerns warrant further investigation, and this work adds to current knowledge by addressing the research questions in developing nations (Depietro, Wiarda, & Fleischer, 1990)

Fig. 2 Resource Based View



Source: (Rothaermel, 2013)

Is the Resource or Capability...

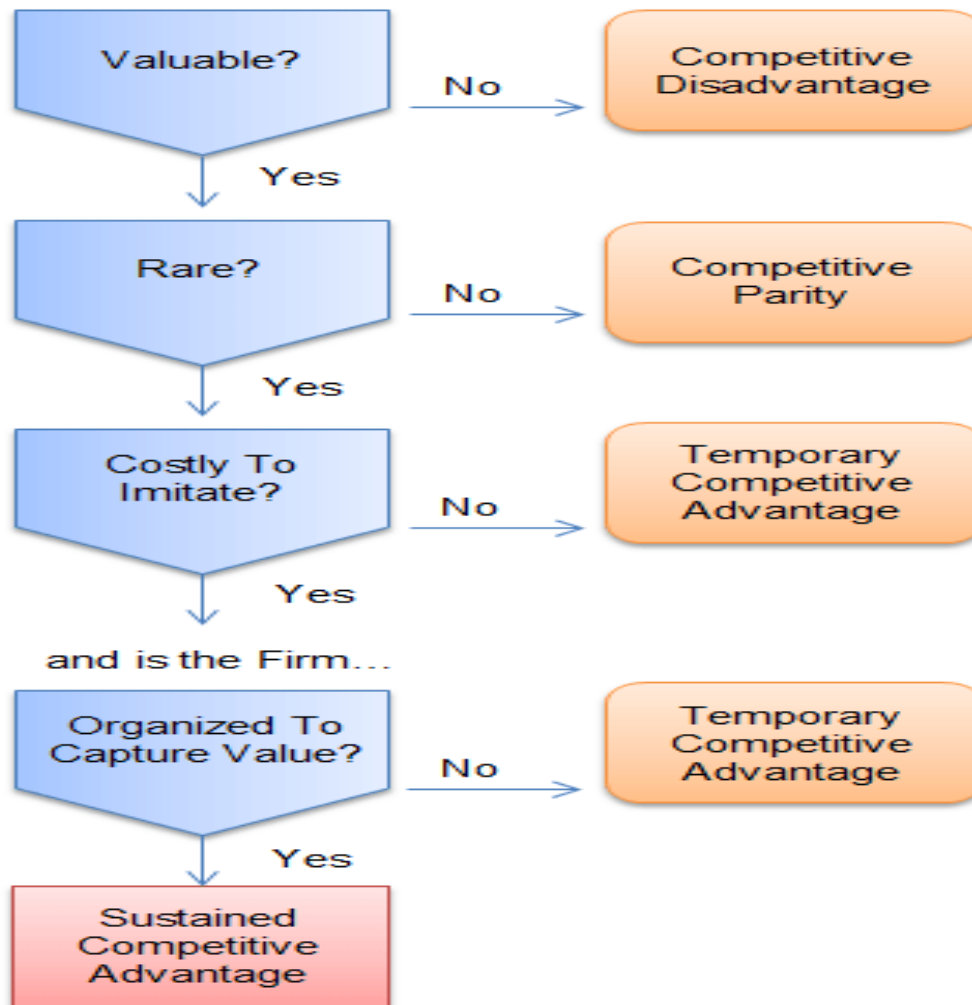


Fig. 3 Resource or Capability

Source: (Rothaermel, 2013)

2. METHODS

This paper's delving technique is built on a Systematic Literature Review Analysis (SLRA) of scholarly research articles. A series of published research papers carefully outlining the key problems that SMEs experience when adopting E-commerce has been adequately evaluated in a transverse style. (Snyder, 2019) contended that a systematic literature review may be employed as a study approach. The investigators can efficiently conduct a structured review by meticulously constructing tables after methodically searching for illustrated papers in their subject domain (Paul & and Bhukya, 2021). Through a proposed comprehensive study, the prominent authors methodically evaluated 50 published articles from the prior decade to adequately identify the common obstacles experienced by SMEs while embracing E-commerce. ProQuest, Absco, Elsevier, Google Scholar, and other repositories are prominently used to persistently seek research articles.

Before one decade **40 published articles** include a description of the supporting theoretical background for this active investigation. First, the utmost pertinent theories on electronic-business implementation are satisfactorily established. A conceptual framework for E-business implementation must take into account the variables that impact the tendency to investigate, embrace, and enforce IT advancement; such variables are deeply embedded in particular technological innovation attributes as well as a particular organization's structural factors and environmental exposures (Lin, Understanding the determinants of electronic supply chain management system adoption: Using the technology–organization–environment framework., 2014). Subsequently, to thoughtfully provide the underlying principles for this extensive

research, the e-business adaptation, and use viewpoint, as well as the settings of e-business adoption in developing nations, are discussed.

Table 1

One Decade Literature Review			
Sr No	Year	Author	E-commerce adoption challenges faced by SME's
1	2011	(Good, 2011)	Microentrepreneurs' access to products and services may be hampered due to lack of financial support, lack of operational infrastructure and/or a selection of high-cost/low-benefit technological products/services, lack expertise or are averse to technology, as well as those who are inefficient in terms of administration, may be less able to turn IT into competencies than others.
2	2011	(Ghobakhloo, 2011)	Factors influencing EC adoption in SMEs include: RBV- Perceived relative advantage, perceived compatibility, and perceived competitiveness. DOI- CEO ingenuity, information intensity TOE- Technology vendor assistance.
3	2011	(Bélanger, 2011)	The author addressed how information privacy is a significant issue influencing "E-commerce adoption".
4	2012	(Bin, Yongyi, & Lei, 2012)	SMEs' capability development faces three major challenges: lack of resource availability and accessibility, resource utilization capability, and capability of utilizing and developing institutions.
5	2012	(Mwangi & Mwakaba, 2012)	According to the author, the following are the problems that African microenterprises face: Affordability, limited Internet access, competition, a complex procedure, and a lack of knowledge, lack of Government support.
6	2012	(Banerjee, Wei, & Ma, 2012)	The author concludes following are the limitations to the adoption of technology: DOI- Observability, Complexity, and Compatibility

7	2012	(Eze, Duan, & Chen, 2012)	<p>Factors withholding SMEs to adopt E-commerce:</p> <p>TOE: “Organization context- size, organization readiness, top Management Support Environment Technology Context- perceived direct Benefit, perceived indirect benefit external pressure in the context, E-market trust”.</p>
8	2012	(Zaied, 2012)	<p>“According to the study findings, the following are the most significant hurdles to e-commerce implementation:</p> <p>Technological impediments, Legal and regulatory hurdles, political barriers, Social and cultural barriers, lack of internet security, limited usage of Internet banking, expensive, government policy changes, lack of e-commerce standards”.</p>
9	2013	(OP, 2013)	<p>The preceding context demonstrates the major variables influencing the adoption of technology e-commerce: Organizational variables, Environmental factors, technical factors.</p>
10	2013	(Kamal, 2013)	<p>Small firms confront the following challenges:</p> <p>DOI: IT awareness,</p> <p>TOE: Lack of infrastructure, lack of technical skills</p> <p>RBV: Affordability</p>
11	2013	(A.P & C.T, 2013)	<p>“The following are the most common challenges that SMEs face:”</p> <p>Low Internet speed; the dearth of the trained workforce; the expense of employing and securing expert IT personnel; the operating cost of Internet.</p>
12	2013	(Alzahrani, 2013)	<p>The following are the issues impeding e-commerce adoption:</p>

			<p>DOI- “Perceived Privacy” and Customers Concerns regarding security</p> <p>TOE- “IT Systems, Accountable Business Practices, Tangible Design, and Networked Infrastructure”.</p>
13	2013	(Larreina, 2013)	<p>Critical Factors Impeding E-Business Adoption in Logistics Companies:</p> <p>RBV- Expensive initial investment, budgetary restrictions, and high operating and maintenance costs.</p> <p>Inadequate IT abilities, Uncertainty and danger, Inadequate access to ICT consultant services Data protection, incompatible Services.</p>
14	2014	(Juhi & Maryann, 2014)	<p>Raising enough money and obtaining loans from microfinance organizations and commercial banks are among the challenges that Kenyan micro and female entrepreneurs confront. Lack of financial resource management expertise, inadequate management, gender inequalities, complex registration processes and excessive levies imposed, and a lack of marketing information.</p>
15	2014	(M.E & J.P, Drivers and inhibitors to e-Commerce adoption among SMEs in Nigeria, 2014)	<p>One significant barrier to e-commerce adoption is a lack of awareness of its enormous potential. Furthermore, insufficient skill investment and the relatively high initial costs of establishing e-commerce strategies all serve as solid foundations for non-use.</p>
16	2014	(D.O, 2014)	<p>Based on the data, the study found that, despite SSE owners' high computer literacy and personal computer usage, the degree of e-commerce adoption in the Nigeria retail sector is relatively low due to the following factors:</p> <ul style="list-style-type: none"> • Energy, electricity, and capital shortages; e-commerce security issues; and a lack of a developed/effective legal and regulatory structure.

17	2014	(Lin, Understanding the determinants of electronic supply chain management system adoption: Using the technology–organization–environment framework., 2014)	<p>“The following factors have a significant impact on the adoption of supply chain management systems”:</p> <p>TOE:</p> <p>“Benefits Perceived and incurred costs in the technological context</p> <p>Firm size, top management support, and absorptive ability are examples of organizational context.</p> <p>Environmental context- Influence of trading partners, Competitive pressure”.</p>
18	2015	(Pendse, 2015)	<p>The following are the challenges that the SMEs faces in terms of IT adoption:</p> <p>Inadequate IT knowledge, Finances, and affordability are dependent on the availability of trained workers.</p> <p>Lack of infrastructure, Inadequate recognition of the operational issue.</p>
19	2015	(Saha, 2015)	<p>The following remain the issues that SMEs encounter when it comes to IT adoption:</p> <p>Insufficient IT expertise, Funds, and affordability are dependent on the presence of skilled professionals, and insufficient infrastructure, and an inability to recognize technical challenges.</p>
20	2015	(Mbinda, 2015)	<p>The following are the obstacles that SMEs face:</p> <p>Financial assistance, a lack of government assistance, a labor shortage, insufficient infrastructure, and a lack of access to technology are all issues that must be addressed. Inadequate awareness.</p>

21	2015	(M.E & J.P, 2015)	<p>The study's findings indicated the following hurdles to E-commerce adoption:</p> <p>Limited knowledge of the entire range of advantages of electronic commerce, Lack of awareness of its huge potential, Insufficient talent investment, High initial expenses of developing e-commerce strategies.</p>
22	2015	(Pendse, 2015)	<p>The following are the challenges that the SMEs faces in terms of IT adoption:</p> <p>Inadequate IT knowledge, Finances, and affordability are dependent on the availability of skilled labor, Accessibility, Infrastructure, Inadequate recognition of the organizational problem</p>
23	2016	(Ahmad & Sinha, 2016)	<p>“Barriers to SMEs entering e-commerce are as follows:</p> <p>Lack of awareness, knowledge of e-commerce, trust and confidence issues, legal and regulatory framework, poor infrastructure access, Concerns about security, high costs.</p>
24	2016	(Hussein & Baharudin, 2016)	<p>According to the author, the following are the challenges that SMEs face when it comes to IT adoption:</p> <p>Intention/Continued Adoption of E-Commerce Compatibility, Pressure from Competitors, Organizational Security Support.</p>
25	2016	(Abualrob, 2016)	<p>The author cites the following hurdles to technology adoption:</p> <p>TOE- “External Barriers: Government Instability, Occupation Restrictions, and Logistics Difficulties”</p> <p>DOI- “Internal Barriers: Perceived Losses, Uncertainty, and Complexity”.</p>

26	2016	(Chatzoglou, Fragidis, Chatzoudes, & Symeonidis, 2016)	<p>“Independent factors affecting the adoption of E-commerce”:</p> <p>TOE:</p> <p>IT infrastructure and Internet skills are examples of technological context.</p> <p>Firm size, firm scope, CEO expertise, and adoption cost are all factors to consider in the organizational environment.</p> <p>Environmental context-supply chain partners' willingness and capabilities Pressure from competitors, government assistance, and consumer preparedness.</p>
27	2017	(Darsinouei & Kaukab, 2017)	<p>The following are some of the most prevalent difficulties:</p> <p>TOE- Infrastructure impediments</p> <p>RBV- Factors of cost, Factors of security, and trust</p> <p>DOI- Obstacles to logistics, The digital knowledge gap.</p>
28	2017	(Pascucci, Gigliarano, & Gregori, 2017)	<p>SMEs make minimal use of internet technologies.</p> <p>In terms of internet usage, micro-enterprises fall behind small businesses. The adoption of the internet varies by economic sector. The size of the company is a significant element in deciding whether or not the internet is used as a management tool.</p>
29	2017	(Mbuyisa, 2017)	<p>The following were identified as obstacles to ICT usage in the study:</p> <p>Usage complexity, Expensive hardware, and connection, Inadequate digital literacy</p> <p>An unreliable communication networks.</p>
30	2017	(AYER, 2017)	<p>Many Indian SMEs do not desire to grow into middle-sized businesses and so show no evidence of</p>

			change or development. The causes might be linked to MSME firms' fear of being watched, non-compliance, and lack of governance, many of which are unregistered and conduct cash transactions to evade correct tax payments.
31	2017	(Darsinouei & Kaukab, 2017)	Some of the most prevalent issues are as follows: Infrastructure constraints, Cost factors, Logistics barriers, Digital knowledge gap.
32	2017	(Domadenik, Koman, & Redek, 2018)	TOE- (Technological, Organizational, Environmental) are the Factors Influencing Technology Adoption.
33	2018	(Domadenik, Koman, & Redek, 2018)	The following factors significantly limit the capacity of micro, small, and medium-sized businesses to engage in digital marketplaces: Inadequate infrastructure, inadequate scalability Cross-border marketplaces are fragmented.
34	2018	(Nazir & Zhu, 2018)	“According to the author, the following are key considerations in the adoption of e-commerce by all four SMEs: Slow Internet speed, Electricity shortages, Limited financial budget; Lack of ICT infrastructure, Higher maintenance expenses, Lack of social awareness, Lack of local government assistance, and poor government policies, Inadequate tariff rates, Absence of online payment options, Owner-manager traits; a lack of entrepreneurship, Lack of understanding about innovation, Lack of passion and a lack of managerial education.”
35	2019	(Purwandari, Otmen, & Kumaralalita, 2019)	All of this has an impact on SMEs' use of e-marketplaces and influences Instagram adoption in Indonesia.

			Top Management Approval, Pressure from Competitors, Financial resources, Risk Perception, Top management backing, Competitive rivalry, Benefit as perceived, Vendor assistance.
36	2019	(Kosasi, Kasma, Vedyanto, & Susilo, 2019)	<p>The majority of SMEs in West Kalimantan faced the following problems, according to the circumstances:</p> <p>Problems with technology. There is no IT preparedness. There is no configuration appropriateness, unreliable internet connections.</p> <p>Problems with online purchases. There is no internet access.</p>
37	2020	(Verma & Shaiba, 2020)	<p>According to the report, SMEs are frequently confronted with internal and external challenges in terms of growth and development since they are small in size and operated by people or families.</p> <p>Internal difficulties that SME owners confront include a lack of qualified people, a lack of competent personnel, a lack of cash, a lack of competencies necessary to embrace ICT, and a lack of innovation.</p> <p>External obstacles that impede the growth of SMEs include macroeconomic concerns, changing demand, political issues, and export issues.</p>
38	2020	(Wahyuni, Widodo, Zulianto, & Islami, 2020)	<p>The following are the obstacles that prevent micro and small businesses from adopting technology and growing:</p> <p>Lack of Capital and technology, Market access, Restricted management, External effects, Monopolistic tactics.</p>
39	2020	(Anas, Panjaitan, & Yean, 2020)	<p>The following are four hurdles to e-commerce adoption:</p> <p>Organizational or internal motivations, Environmental considerations, Factors of Technology, CEO/owner/senior manager viewpoints</p>

40	2021	(Asmat, Kumar, Syed, & Shaikh, 2021)	Managers encounter a range of hurdles and roadblocks when it comes to technology adoption, according to the authors, including Data security, high infrastructure costs, training expenses, Adoption problems, administrative difficulties, Organizational difficulties, problems with attitude, high infrastructure costs, a lack of technical skills and efficiency, a lack of government help, a lack of organizational support.
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Source: Author's own

Holistic Analysis and Discussion

Table 2

Common Challenges	Authors	Frequency
Lack of Unique resources and capabilities	<p>(Good, 2011), (Ghobakhloo, 2011), (Bin, Yongyi, & Lei, 2012), (Bin, Yongyi, & Lei, 2012), (Mwangi & Mwakaba, 2012), (Banerjee, Wei, & Ma, 2012),</p> <p>(Eze, Duan, & Chen, 2012),</p> <p>(OP, 2013), (Kamal, 2013), (A.P & C.T, 2013), (Alzahrani, 2013), (Larreina, 2013)</p> <p>, (Juhi & Maryann, 2014), (M.E & J.P, Drivers and inhibitors to e-Commerce adoption among SMEs in Nigeria, 2014), (D.O, 2014), (Lin, Understanding the determinants of electronic supply chain management system adoption: Using the technology–organization–environment framework., 2014), (Pendse, 2015), (Saha, 2015), (Mbinda, 2015), (Pendse, 2015),</p> <p>(Ahmad & Sinha, 2016), (Hussein & Baharudin, 2016), (Abualrob, 2016), (Chatzoglou, Fragidis, Chatzoudes, & Symeonidis, 2016) , (Darsinouei & Kaukab, 2017), (Pascucci, Gigliarano, & Gregori, 2017), (AYER, 2017), (Darsinouei & Kaukab, 2017), (Pascucci, Gigliarano, & Gregori, 2017),</p>	35

	(Domadenik, Koman, & Redek, 2018), (Kosasi, Kasma, Vedyanto, & Susilo, 2019), (Verma & Shaiba, 2020), (Anas, Panjaitan, & Yean, 2020), (Asmat, Kumar, Syed, & Shaikh, 2021).	
Lack of IT acquaintance for e-business implementation	<p>(Good, 2011), (Ghobakhloo, 2011), (Bélanger, 2011), (Mwangi & Mwakaba, 2012), (Banerjee, Wei, & Ma, 2012), (Eze, Duan, & Chen, 2012), (Zaied, 2012), (Kamal, 2013), (Alzahrani, 2013), (Larreina, 2013), (M.E & J.P, Drivers and inhibitors to e-Commerce adoption among SMEs in Nigeria, 2014),</p> <p>(D.O, 2014), (Pendse, 2015), (Pendse, 2015), (Saha, 2015), (Mbinda, 2015), (M.E & J.P, 2015), (Pendse, 2015), (Ahmad & Sinha, 2016), (Hussein & Baharudin, 2016), (Abualrob, 2016), (Chatzoglou, Frigidis, Chatzoudes, & Symeonidis, 2016), (Darsinouei & Kaukab, 2017), (Pascucci, Gigliarano, & Gregori, 2017), (Mbuyisa, 2017), (Darsinouei & Kaukab, 2017), (Hsu & W, 2017),</p> <p>(Nazir & Zhu, 2018),</p> <p>(Purwandari, Otmen, & Kumaralalita, 2019), (Kosasi, Kasma, Vedyanto, & Susilo, 2019), (Verma & Shaiba, 2020), (Wahyuni, Widodo, Zulianto, & Islami, 2020), (Anas, Panjaitan, & Yean, 2020), (Asmat, Kumar, Syed, & Shaikh, 2021).</p>	33
E-commerce Adoption cost	<p>(Good, 2011), (Zaied, 2012), (OP, 2013), (Kamal, 2013), (A.P & C.T, 2013), (Alzahrani, 2013),</p> <p>(Juhi & Maryann, 2014), (M.E & J.P, Drivers and inhibitors to e-Commerce adoption among SMEs in Nigeria, 2014), (D.O, 2014), (Lin, Understanding the determinants of electronic supply chain management system adoption: Using the technology–organization–environment framework., 2014), (Pendse,</p>	26

	2015), (Saha, 2015), (Mbinda, 2015), (M.E & J.P, 2015), (Pendse, 2015), (Ahmad & Sinha, 2016), (Hussein & Baharudin, 2016), (Chatzoglou, Fragidis, Chatzoudes, & Symeonidis, 2016) , (Darsinouei & Kaukab, 2017), (Mbuyisa, 2017), (Mbuyisa, 2017), (Darsinouei & Kaukab, 2017), (Nazir & Zhu, 2018), (Purwandari, Otmen, & Kumaralalita, 2019), (Wahyuni, Widodo, Zulianto, & Islami, 2020), (Asmat, Kumar, Syed, & Shaikh, 2021).	
Lack of top management support	(Ghobakhloo, 2011), (Banerjee, Wei, & and Ma, 2012), (Eze, Duan, & Chen, 2012) , (Zaied, 2012), (Juhi & Maryann, 2014), (M.E & J.P, Drivers and inhibitors to e-Commerce adoption among SMEs in Nigeria, 2014), (Lin, Understanding the determinants of electronic supply chain management system adoption: Using the technology–organization–environment framework., 2014), (Saha, 2015), (M.E & J.P, 2015), (Hussein & Baharudin, 2016), (Abualrob, 2016), (Chatzoglou, Fragidis, Chatzoudes, & Symeonidis, 2016), (Mbuyisa, 2017), (AYER, 2017), (Nazir & Zhu, 2018), (Purwandari, Otmen, & Kumaralalita, 2019), (Verma & Shaiba, 2020), (Wahyuni, Widodo, Zulianto, & Islami, 2020), (Anas, Panjaitan, & Yean, 2020), (Asmat, Kumar, Syed, & Shaikh, 2021).	21
Lack of Government Support	(Mwangi & Mwakaba, 2012), (Zaied, 2012), (OP, 2013), (A.P & C.T, 2013), (Juhi & Maryann, 2014), (Mbinda, 2015), (Abualrob, 2016) , (Chatzoglou, Fragidis, Chatzoudes, & Symeonidis, 2016), (AYER, 2017), (Nazir & Zhu, 2018), (Verma & Shaiba, 2020), (Asmat, Kumar, Syed, & Shaikh, 2021).	13
	(Mwangi & Mwakaba, 2012), (Eze, Duan, & Chen, 2012), (Zaied, 2012), (OP, 2013), (A.P	

Competitive Pressure	& C.T, 2013), (Lin, Understanding the determinants of electronic supply chain management system adoption: Using the technology–organization–environment framework., 2014), (Hussein & Baharudin, 2016), (Abualrob, 2016), (Chatzoglou, Fragidis, Chatzoudes, & Symeonidis, 2016), (Domadenik, Koman, & Redek, 2018), (Purwandari, Otmen, & Kumaralalita, 2019), (Wahyuni, Widodo, Zulianto, & Islami, 2020),	12
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Source: Authors Own

3. RESULTS

According to a holistic review of the literature over the last decade with specific reference to RBV, DOI, and TOE theories, and below mentioned challenges were uncovered and considered to be more prevalent in SMEs while implementing E-commerce for I4.0 sustainability, a lack of unique resources and capabilities, a dearth of IT acquaintance for e-business implementation, the cost of E-commerce adoption, top management support, government support, and competitive pressure.

- **Resource-Based View (RBV)**
 - Lack of unique resources and capabilities
- **Diffusion Of Innovation (DOI)**
 - *Innovation Characteristics*
 - Lack of IT acquaintance for e-business implementation
- **Technology- Organization-Environment (TOE)**
 - *Organisational Factors*
 - E-commerce Adoption cost
 - Top management support
 - *Environmental Factors*
 - Government Support
 - Competitive Pressure

The proposed study linked the adoption of e-commerce innovation to the notable performance of SMEs. The TOE model's two valuable components were adequately incorporated. As a satisfactory result, the initial contribution was the efficient implementation in consonance with the TOE model and advanced technologies utilization (DOI theory), namely the successful mediation of e-commerce use. The comprehensive study reveals precisely that two parts of the TOE model, namely the organizational and environmental context variables, are undoubtedly required for technological implementation. The study also established a methodological approach for small and medium enterprises based on the resource-based perspective (RBV).

Lack of unique resources and capabilities

As per the proposed systematic literature review analysis (SLRA) 35 published articles out of 40 selected articles, the first fundamental premise is that organizations' essential competencies, creative potentials, and other experts should differ appreciably from each other's. If officialdoms had a similar level and composition of resources, they couldn't employ diverse methods to battle with one another. What one company achieves, the other may merely copy, and no competitive edge can be gained. This is a perfect competition situation, but traditional markets have been far from perfect, and some enterprises subjected to certain fierce competitive pressure (same external conditions) can deploy strategic options and surpass one another.

As an ultimate result, Research has reasonably estimated that enterprises realistically achieve a sustainable competitive advantage by utilizing their various resource multipacks. The RBV model emphasizes the paramount importance of valuable resources in assisting lucrative businesses to attain improved organizational effectiveness.

Lack of IT acquaintance for e-business implementation

According to holistic SLRA (33/40), the second most significant factor is IT knowledge and the findings indicate that employing a sustainable innovation approach with an extensive understanding of information systems (IS) with the usage of e-commerce forums can encourage a corporation. Preliminary research on e-business deployment in developing nations incorporated insights from both emerging and established enterprises. (Dewan & Kraemer, 2000) discovered, for notable example, that emerging and advanced countries differ tremendously concerning the appreciable extent of IT implementations and the contributing aspects which positively influence its applications. Security concerns are critical in IT, particularly in e-commerce (Larreina, 2013).

A violation of guaranteed security undoubtedly occurs when a firm or government entity ends up losing relevant data, private information, or other subtle documents. Safety and confidentiality concerns are a fundamental hurdle to e-commerce. The proposed research considered security as a prime concern and it is precisely corresponding to how trustworthy an internet platform is for transferring sensitive facts and controlling online transactions. First, as a matter of fact of the use of multiple direct regulations in the sphere of Internet technology, there's much less control over records.

As a result, sustainable businesses and their informed consumers may be more concerned about unwanted data access, which could credibly threaten data safety and confidentiality. Second, E-business is seamlessly incorporated in business deals, involving the transfer of necessary funds along the value chain. If successful enterprises engaging in online transactions have safety issues, their active involvement in electronic-business activities should be carefully scrutinized.

E-commerce adoption cost

However, the current study analysis sufficiently indicates that there is little support for the profound effect of adaptation cost on e-commerce use. In addition, cost remains one of the most significant hurdles to technology adoption. Furthermore, the cost of adaptation has no effect on the depletion of E-commerce in SMEs. According to the earlier literature survey, open innovation involves collaborating and supporting underused assets with other businesses. Similarly, with open innovation applications most of the SME's shift to a contract rate, such as third-party cloud services. Furthermore, subscribing to these e-commerce sites is simple and inexpensive. As a result of SLRA 26/40 published articles out of 40 research papers, the cost of implementation appears third most determining factor in the use of E-commerce in SMEs.

Top Management support

The top management is in charge of efficiently allocating the necessary funds and valuable resources required to usage electronic commerce. The excitement and aid of senior management

for strategic cooperation and alliances with international firms are associated with the effectiveness of open innovation implementation. Furthermore, open innovation necessitates inter-and cross-functional and cross-collaboration; hence, SMEs must maintain persistent administration aids and abilities to enable open innovation and profitability ratios.

The key findings show that “top management support (TMS)” and “competitive pressure (CP)” engage in a substantial influence in SMEs' use of e-commerce, and these outcomes are coherent with initial studies. As an ultimate result, the present study analyses E-commerce as a premeditated choice to positively enhance the operational effectiveness of SMEs.

Government support

Furthermore, the influence of government assistance (GS) on the acceptance of E-commerce is inconsiderable in the current study. Because the governments of emerging economies urge and support the use of e-commerce for massive enterprises in the three methods listed below. First, by giving incentives; second, by enacting specified rules and necessary legislation; and devoted third, by adequately developing talented personnel and establishing IT facilities. According to the research, SMEs cannot undertake open innovation to commercialize their business to the international market without the help of the government. In comparison to huge corporations, SMEs necessitate suitable government policies and support, such as tax breaks, regulatory frameworks to ensure security and scam, and electronic-commerce platforms to boost open innovation in industrial Enterprises.

Competitive Pressure

Furthermore, agreeing to RBV theory, asserted the considerable importance of successful enterprises undoubtedly having distinctive resources and essential competencies to contribute positively to industry rivalry to gain a competitive edge. Much research on technology-enabled innovation and company performance has revealed excellent results. Furthermore, organizations might gain a competitive vantage if they pool their resources and competencies to make it challenging for entrants to replicate them. Additionally, some successful businesses are focusing on a full open innovation strategy. Most, on the other hand, thrive on continuous development. Though, open innovation, like E-commerce, remains a nonstop cycle that can be used to obtain a competitive edge.

Findings (Proposed)

According to the intriguing findings, “ERP-enabled enterprises and non-ERP-enabled” organizations are confronting specific challenges like “lack of unique resources and capabilities, lack of IT knowledge for E-commerce adaptation, top management support, government resource assistance, and government regulatory support” to efficiently implement E-business. The investigative findings adequately provide a variety of prevailing views for executives in “ERP-enabled and non-ERP-enabled” enterprises, the E-commerce industry, ERP providers, government, established professionals in the production, distribution, and service sectors. Furthermore, the considerable intended and unintended association with the efficient utilization of e-commerce requires SME managers should pay attention to the provision of illustrated resources before adopting E-commerce in their firms. The significance of the study is to support SMEs to realistically achieve an ultimate result to achieve long-term sustainability.

4. CONCLUSION

The comprehensive study's investigative findings provide insights into administrative and environmental aspects through the unintended relationship of E-commerce adoption to positively enhance the potential productivity of SMEs. The empirical analysis amply demonstrates that organizational support and intense competition undoubtedly have a persuasive direct and indirect influence on the performance when using e-commerce as an effective medium. However, the cost of adaptation and government backing do not consider to be substantial when it comes to e-commerce implementations.

The practice of implementing the use of E-commerce in the present new digital era is essential as time progresses. This exploratory study is significant for E-commerce implementation because it is focused on technological and environmental unique phases in the setting of construction companies. Soon, the effective deployment of e-commerce will achieve a considerable increase in the remarkable success of small and medium SMEs. The current study contributes by giving valuable advice to legislators, government agencies, and executive management. These organizations have achieved a successful effort to undoubtedly encourage the efficient implementation of e-commerce incorporation in manufacturing SMEs.

Before implementing e-commerce, scientific scholars and successful practitioners should adequately consider foundational resources and necessary expertise associated with organizational and ecological elements, according to the conclusions of the study. Furthermore, rather than encouraging firms to embrace e-commerce solely while some market participants have been doing so, the present study concludes that organizations ought to decide on a concrete goal before selecting to practice E-commerce. It should be consistent with the company's ultimate purposes and key priorities

Limitations and Future Research Directions

The current study is merely valuable to SME businesses in emerging economies because it focuses primarily on business enterprises. To boost the extensive research's universal applicability, the study should have been conducted through manufacturing SMEs in underdeveloped nations across the world. Research progress should also meet the speculative underpinning of vibrant philosophy by taking overt and covert active resources into account to gain a competitive vantage.

The present study also has certain limitations, but there are interesting opportunities for subsequent research. The authors of this study comprehensively examined specific hurdles in the effective implementation of E-commerce in SMEs. This study is geographically unrestricted; nevertheless, aspiring researchers can carefully collect primary data from a specified geographic area and then analyse the information to determine whether the identical impediments would emerge as between the most significant barriers in user acceptance or not. Other challenges may exist that haven't even been addressed.

Implications for Business Managers

Nonetheless, relatively few researchers have adequately tested the ideas of the TOE, DOI, and RBV in conjunction. Furthermore, the comprehensive study contributes by satisfactorily addressing the profound significance of electronic-commerce as a moderating variable between essential TOE characteristics and company success. The gradual incorporation and effective use of electronic commerce are critical to progressively increasing overall effectiveness in the digital realm. This study has successful applicability since it employs the "TOE model", which is appropriate for the implementation of E-commerce and, as a result, adds to the enhanced performance of small and medium-sized organizations.

Furthermore, the considerable active and passive relationship with the consistent practice of E-commerce undoubtedly requires competent SME managers to pay attention to the accessibility of such valuable assets before deploying E-commerce in respective firms. As the desired result, this comprehensive study attempted to adequately describe the critical underlying characteristics and unique capabilities required to transition the organization from traditional business methods to click-and-mortar via electronic-commerce.

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