

An Overview of the Factors Affecting the E-commerce Readiness of SMEs in Sri Lanka

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Abstract

SMEs are considered the backbone of the Sri Lankan economy, and e-commerce can be viewed as a ladder for business growth. Therefore, it is important for SMEs to adopt e-commerce. Studies show that Sri Lankan SMEs do not use e-commerce to its full potential. Therefore, before adopting e-commerce-based tools and technologies, it is essential for SMEs to consider their readiness to adopt e-commerce. The research is conducted through a systematic literature review using the PRISMA framework. This study has identified several main factors affecting e-commerce readiness: availability of knowledge and skills, human resource availability and compatibility, management influence, perceived benefits, finance management, organizational culture, availability of IT infrastructure, compatibility of business processes, and organizational governance. The availability of IT infrastructure was the most considered factor, where organizational governance was the least considered factor compared to other factors, when assessing e-commerce readiness and adoption.

Keywords

E-commerce adoption, E-commerce readiness, IT infrastructure, Organizational readiness, and SMEs.

1. Introduction

According to Mesenbourgh (2001), Electronic commerce (e-commerce) is the value of goods and services sold over computer-mediated networks. An e-commerce transaction is considered completed when the two parties, the buyer and the seller come to an agreement regarding the ownership of the goods, rights, or services.

Even though e-commerce was initially identified as a means of buying and selling goods and services, it is now evolved as a medium for information exchanges. E-commerce is identified as processes and activities involved in exchanging both financial and non-financial information using an electronically mediated environment with different stakeholders via computer networks (Govinnage and Sachitra 2019).

E-readiness is defined as the availability of the ICT resources, the accessibility of the ICT resources to the people and the organizations, and the effectiveness of the regulatory frameworks regarding ICT, such as the e-governance policies (Averweg 2009). E-commerce readiness is a measure that indicates the ability of a person or a community to use the internet, and IT resources for online transactions, which are buying, selling, and payments. According to the definition, there is a similarity between the idea of e-commerce readiness and e-readiness. (Kamel 2010).

According to Vajjhala et al. (2020), e-adoption accepts and uses ICT and electronic means to accomplish work and tasks. Similarly, e-commerce adoption can be considered as accepting and using e-commerce for different tasks.

SMEs are considered the backbone of the Sri Lankan economy. Gunawardana (2016) stated that the SME sector had been highlighted as a critical sector in the country's economy, with more than 90% of businesses falling into this group. It is estimated that this sector employs 45 percent of the country's workforce. Micro, Small, and Medium-sized enterprises make up the SME sector, which has over one million businesses and employs around 2.25 million people in Sri Lanka.

Table 1, shown below, defines SMEs based on the organization's annual turnover and employees.

Table 1. SME Definition - Size/Sector, Source (Gunawardana, 2016)

| SIZE/SECTOR | CRITERIA | MEDIUM | SMALL | MICRO |
|-----------------------|---------------------|-----------------|----------------|------------------------------------|
| Manufacturing | Annual Turnover | Rs. Mn. 251-750 | Rs. Mn. 16-250 | Rs. Mn. 15 or less than Rs. Mn. 15 |
| | Number of Employees | 51-300 | 11-50 | 10 or less than 10 |
| Service Sector | Annual Turnover | Rs. Mn. 251-750 | Rs. Mn. 16-250 | Rs. Mn. 15 or less than Rs. Mn. 15 |
| | Number of Employees | 51-200 | 11-50 | 10 or less than 10 |

According to Hung et al. (2014), SMEs have a strong entrepreneurial spirit. They are more flexible, faster in decision making, and able to utilize their resources more efficiently. Due to these reasons, SMEs can build solid industrial networks. It is a vital part when developing e-commerce markets. Further using digital networks such as e-commerce SMEs can excel in the economy by overcoming constraints such as lack of resources.

The e-commerce sector in Sri Lanka has shown considerable growth for the past few years. According to Govinnage and Sachitra (2019), the e-commerce segment has been increased by around 34% for the year 2018. The e-commerce growth rate is expected to surpass the overall growth rate of the retailers in Sri Lanka for the upcoming years.

Further, according to the E-commerce Readiness Assessment Report Sri Lanka published by Commonwealth (2020), e-commerce has already been established in Sri Lanka to a certain level. However, the degree of penetration and adaptation is still limited. It is mentioned that currently, only around 10% of commerce is technology-driven which indicates that the country has a considerable potential to expand e-commerce, which remains untapped. Also, the overall e-commerce maturity level of Sri Lanka is level 2, where the highest level is level 4. Further, the business maturity level is also level 2. (Commonwealth 2020)

Hung et al. (2014) also noted that due to lack of resources and less market share, SMEs encounter difficulties competing with more established competitors. According to Commonwealth (2020), even though the IT infrastructure and laws and regulations in Sri Lanka are in a positive state, the business readiness to adopt e-commerce is relatively low.

The degree of adoption and penetration of e-commerce is still limited, especially among SMEs. Gunawardana (2018) noted that Sri Lankan SMEs only use basic, low-level e-commerce activities such as emails and internet browsing.

By adopting e-commerce, SMEs will be able to compete effectively in the market in which they operate. Using e-commerce SMEs can capture and expand their market share and expand their entry barriers which will help the SMEs sustain the competition (Sri et al. 2015).

Further, SMEs can experience the benefits covered by prominent players and will be able to overcome the challenges using e-commerce (Payne 2017; Sri et al. 2015). According to Herath and Fazeela (2006), adopting e-commerce will reduce costs, improve customer base, improve productivity, and aid in the development of new products and features. E-commerce is also a powerful way of communication between employees, customers, and suppliers.

The study was conducted mainly focusing on two objectives. First, the study will identify the readiness factors that will affect e-commerce readiness at the organizational level. Then the characteristics of SMEs will be identified, and the e-commerce readiness factors will be compared with the SMEs' characteristics to check the applicability of the e-commerce factors to SMEs in Sri Lanka.

2. Literature Review

2.1 E-commerce readiness factors Considered for Other Countries

Readiness factors can be identified in both organizational context and environmental context. Technology-Organizational-Environmental (TOE) framework is one of the frameworks that most e-commerce adoption and readiness studies have used. This framework has considered three aspects of technology adoption: technological, organizational, and environmental aspects. (Tornatzky and Fleischer 1990).

This framework has been used in studies both in the Sri Lankan context and in other countries. (Fazmeer 2014), (Korala and Fernando 2021), and other countries. (J. K. C. Chen et al. 2014) , (Lip-Sam and Hock-Eam 2011)

Chen et al. (2014) conducted the study to identify the criteria to assess e-commerce adoption in South-East Asian SMEs using the TOE framework and Asia-Pacific Economic Cooperation (APEC) E-readiness Assessment. Perceived relative advantages, compatibility of the innovation, complexity of the innovation, perceived risk were considered under technology factors. Then employees' knowledge of e-commerce, enterprise resources, strategic orientation, and globalization were considered under organizational factors. The environmental factors identified were competition intensity, support of government and industries, national IT infrastructure, and buyer and supplier behavior. Additionally, they have considered manager (internal) factors where management attitude towards innovation and IT and e-commerce knowledge are considered.

Lip-Sam and Hock-Eam (2011). They have examined the factors that influence the B2B e-commerce adoption in SMEs in Malaysia. They have identified that the attributes of the CEO, such as education and experience, have a significant influence on e-commerce adoption. Further, they have considered internet service quality, IT strategy, cost and security, organizational readiness, external pressure, external support as the factors to assess e-commerce adoption using the TOE framework.

Zain et al. (2020) have conducted the study to identify the factors affecting SMEs' e-commerce adoption in the service sector in progressively developing countries. The study identified external change agents, perceived relative advantage, e-commerce knowledge, expertise, compatibility, and competitors' pressure significantly influence e-commerce adoption, incorporating the TOE framework.

Another study incorporating TOE factors has assessed the factors that affect e-commerce adoption in SMEs in Medan city. Further, the study has found that the organizational readiness variable does not affect e-commerce adoption. Under organizational variables, they have considered the availability of financial resources, readiness to accept risks from e-commerce utilization, leadership commitment, and awareness of acceptance of change and development of information technology. Further technology readiness affects significantly and positively on e-commerce adoption where HR capabilities and skills, availability of e-commerce support (programs and systems software, website), compatibility between benefits and costs, and availability of information technology tools (computers and internet networks). Even though the effect of environment variables on e-commerce adoption is positive, it is not significant. (Nurlinda et al. 2020)

Al-Somali et al. (2015) identified three stages of e-commerce adoption: interactive, non-interactive, and stabilized while incorporating the TOE framework. Adoption cost, relative advantage, IT readiness, management support, learning orientation, strategic orientation, formalization level, market force influence, economic downturn, legal and regulatory environment, and technology consultant participation were the main identified factors influencing the e-commerce adoption in Saudi Arabian organization. They have also considered compatibility, security concern, language concern, receptivity towards change, decentralization level, competitive pressure, and national e-readiness other than the above factors.

When discussing e-commerce security, the study Ngatcheu (2020) assessed the factors affecting e-readiness and e-commerce security for SMEs and identified legal, economic, and technological factors.

The study Seyal (2012) has investigated the CEO/entrepreneurs' viewpoint about the entrepreneurial perception regarding the organizational readiness, entrepreneurial attitude, and external pressures towards developing the perceived strategic value of e-commerce. Further, the study has identified that the organization's readiness is only significant to the perceived value of e-commerce readiness.

Yeni and Yasri (2020) analyzed the effect of organizational readiness on e-commerce adoption and e-commerce adoption on SME performance. According to them, the organization readiness and business environment positively and significantly influence e-commerce adoption, and e-commerce adoption influences SME's performance. Organizational readiness is determined using perceived benefits, resources, and organizational governance.

Lubis et al. (2020) has aimed to evaluate e-commerce adoption readiness in the tourism industry in North Sumatra. They have considered inventory management, business personalization, internet-based technology, and consumer behavior as the factors that affect e-commerce readiness.

A. O. Idris (2015) has considered people, management, technology, and process factors when developing a framework to assess the e-readiness of e-commerce in Nigerian SMEs. Under management factors, governance, vision, and commitment have been identified; support, policy flexibility, and infrastructure has been identified as the technological factors; awareness, commitment, and human resources have been identified as the people factors; business processes and change management were identified as the process factors.

Quangdung et al. (2014) has developed an industry-oriented e-commerce readiness model for the construction sector in developing countries. They have considered two main variables that are enterprise resources and managers' perception of the operating environment. Under enterprise's resources, human resource readiness, technological resource readiness, management resource readiness, business resource readiness, and information resource readiness were considered. Leadership and management infrastructure, information infrastructure, technology infrastructure, legal and regulatory infrastructure, supporting industries' infrastructure, and socio-economic knowledge infrastructure were considered under the manager's perception of the operating environment.

Astuti and Nasution (2014) conducted a study to assess the technology readiness and e-commerce adoption among SMEs in Indonesia. The study has identified optimism and innovativeness as technology readiness drivers and discomfort and insecurity as technology readiness barriers.

Tran et al. (2013) developed an assessment method to assess the e-commerce readiness of construction organizations in developing countries. Managerial resource, business resource, technological resource, human resource, information resource, and the organization's propensity were identified as the factors to assess e-commerce readiness. Further, to measure the organization's propensity advantages of e-commerce, disadvantages of e-commerce, requirements of partners, pressure from a competitor, managerial infrastructure, technological infrastructure, legal and regulations infrastructure, information infrastructure, and socio-cultural infrastructure were considered.

Janom and Zakaria (2011) developed an inter-organizational b2b e-commerce readiness model for SMEs. Personal traits, enterprise readiness, competency, technology, compatibility of business process, market forces, supporting industries, the government were identified as the factors to assess B2B e-commerce readiness. Goals and strategies, e-commerce governance, top management support, innovation culture were categorized under enterprise business readiness indicators. People capability, training and reward motivation, job specification on B2B e-commerce were identified as the indicators to assess competency.

Hajli et al. (2012) developed a model to assess the e-commerce pre-adoption of SMEs in developing countries. Both barriers and current development were considered when designing the model. The study has identified the organizational readiness and awareness are playing a significant role in e-commerce adoption. Under organizational readiness, ICT infrastructure, business culture, innovation, governance, commitment, and resources were mentioned. Among them, ICT infrastructure was considered as the essential factor.

Sujatha and Karthikeyan (2021) identified top management support, learning orientation, receptivity towards change, strategic orientation, IT readiness, cost, and relative advantage as the factors in determining the e-commerce adoption in Indian SMEs.

Barroso et al. (2019) created a framework to identify the e-commerce adoption of SMEs. They further identified website and digital platform, market, operational management, entrepreneur profile, marketing and promotions, and products as determinants of e-commerce adoption.

Karim and Gide (2018) identified the barriers to adopting e-commerce in SMEs in developed countries. They also considered the organizational, technological, and environmental barriers. They have determined that in Australia, organizations and managers' characteristics, perceived benefits, organizational culture, IT and technical competency, IT support, financial support, external pressure, management commitment/support, and cost of adoption are significant factors to predict e-commerce acceptance of SMEs. Furthermore, the above factors have a substantial relationship with e-commerce adoption.

Jameel and Ahmed (2018) identified ease of use, customer need, the willingness of the manager, and cost as the factors that affect e-commerce adoption in Ebril SMEs. While (Sultan et al., 2019) have identified in Iraq SMEs. The relative advantage and compatibility were identified as the most significant factors under the technological factors affecting e-commerce adoption.

Hussein and Ahmad (2017) identified financial support, information intensity, IT competency, and relative advantage as the factors affecting the continuance intention to adopt e-commerce for Jordanian SMEs. IT competency and relative advantage were identified as significant factors.

Shemi (2012) developed a conceptual framework to assess the e-commerce adoption in Botswanan SMEs. Managerial characteristics, managerial e-commerce perception, availability, and quality of the internet, skilled ICT personnel, the cost implementation and maintaining, organizational culture, access to payment facilities, government role as customer, supplier and customer preferences, local business environment, security concerns, and the global economic recession were identified as the factors affect e-commerce adoption.

S. Z. Ahmad et al. (2015) identified perceived relative advantage, managers/owners' knowledge and expertise, management characteristics, compatibility, and external change agents affect SMEs' e-commerce adoption in the Malaysian context.

Poorangi et al. (2013) have developed an e-commerce adoption model based on Roger's five-factor theory. The study identified that observability and trialability influence management confidence, and company culture influences employee resistance that influences e-commerce adoption, whereas management confidence and employee resistance influence e-commerce adoption. The relative advantage also influences e-commerce adoption, but complexity does not significantly influence e-commerce adoption.

Nezakati et al. (2012) assessed the e-commerce adoption of SMEs in Thailand, Malaysia, and Singapore in the service and manufacturing sectors. They have considered technology knowledge, perceived ease of use, and perceived usefulness as the indicators of e-commerce adoption. Further, they have identified that technical knowledge and skills are significant for all three countries.

2.2 E-commerce Readiness Factors Considered for the Sri Lankan Context

When considering the factors that affect e-commerce readiness in the Sri Lankan context, Korala and Fernando (2021) have analyzed the factors that affect the B2B e-commerce sector of the food and beverages industry in Sri Lanka. They adopted the TOE framework (Tornatzky and Fleischer 1990). Further, they identified technology readiness, technology integration, and data security as technological factors; perceived benefits and top management support as organizational characters; pressure from competitors from customers, and user satisfaction as environmental characteristics.

Silva et al. (2019) also incorporated the TOE framework and identified factors affecting SMEs' e-commerce readiness. They also have included knowledge factors and discussed perceived risk as a moderator between the variables above and e-commerce adoption. They have proved that the technological factors that affect e-commerce adoption and perceived risk moderate the relationship between knowledge factors and e-commerce adoption and environmental factors and e-commerce adoption.

Gunawardana (2018) considered IT adoption, management involvement, and legal requirements to assess the relationship between organizational factors and e-commerce adoption.

Govinnage and Sachitra (2019) focused on finding the factors that affect e-commerce adoption in SMEs in the retail sector. They discovered that computer literacy, government support, and technological infrastructure significantly impacted e-commerce adoption, whereas perceived benefits had a lesser impact.

Arawwawala and Gunawardane (2017) identified customers' attitudes towards e-commerce usage, ICT security, and government support that affect e-commerce as the challenges and barriers when implementing e-commerce. Even though they have considered the ICT skills, the study has proved it does not relate to e-commerce implementation. Cultural type, PCs per employee, backup facility presence, Availability of technical officers, website presence, Internet access method, and top management opinion were also considered influencing factors when considering the challenges of e-commerce adoption. (Senarathna and Hettiarachchi 2012). However, only the adhocracy culture and top managers' opinions were identified as the factors influencing e-commerce adoption. Further, it is also stated that e-commerce is not about new technology; it is about treating the customers and suppliers in a new way.

Fazmeer (2014) has identified that having a trustworthy online website, competitive pricing strategy, availability, major product categories, customer retention, multi-channel marketing, branding, and online shopping cart Experience are critical success factors of e-commerce in the retail sector. Financial achievements, organizational support, managerial productivity, decision aids, organizational readiness, compatibility, managers' attitudes, perceived ease of use, usefulness, entrepreneurial orientation, and political pressure are the critical success factors affecting e-commerce readiness.

As mentioned above, there can be readiness factors that are related to the external context and the internal context of the SME. However, most of the time, the factors identified for external context are government readiness, market forces, supporting industries (Janom and Zakaria 2011), legal factors (Tran et al. 2013), and customer orientation and support (Arawwawala and Gunawardane 2017).

2.3 Summary of the Identified Factors

Table 2 shows mostly identified internal (organizational) level e-commerce readiness factors and relevant literature that identified these factors. Greyed squares in the table indicate the elements that are included in the corresponding paper.

Table 2. E-commerce readiness factors and related studies.

| Paper | Factors | | | | | | | | |
|--------------------------------------|----------------------|------------------------------|----------------------|--------------------|------------------------|--------------------|-----------------------------------|---------------------------|---------------------------|
| | Knowledge and skills | Human resources availability | Management influence | Finance management | Organizational Culture | Perceived benefits | Availability of IT infrastructure | Compatibility of business | Organizational governance |
| Korala and Fernando (2021) | | | | | | | | | |
| Kuruwitaarachchi (2020) | | | | | | | | | |
| K. D. Gunawardana (2018) | | | | | | | | | |
| Govinnage and Sachitra (2019) | | | | | | | | | |
| Silva et al. (2019) | | | | | | | | | |
| Arawwawala and Gunawardane (2017) | | | | | | | | | |
| Fazmeer (2014) | | | | | | | | | |
| Senarathna and Hettiarachchi (2012) | | | | | | | | | |
| Senarathna and Wickramasuriya (2011) | | | | | | | | | |
| Seyal (2012) | | | | | | | | | |
| Priambodo et al. (2021) | | | | | | | | | |
| Ngatcheu (2020) | | | | | | | | | |
| Yeni and Yasri (2020) | | | | | | | | | |
| Lubis et al. (2020) | | | | | | | | | |
| Abbas et al. (2016.) | | | | | | | | | |
| A. O. Idris (2015) | | | | | | | | | |
| Quangdung et al. (2014) | | | | | | | | | |
| Astuti and Nasution (2014) | | | | | | | | | |
| Tran et al. (2013) | | | | | | | | | |
| Janom and Zakaria (2011) | | | | | | | | | |
| J. K. C. Chen et al. (2014) | | | | | | | | | |
| Hajli et al. (2012) | | | | | | | | | |
| Lip-Sam and Hock-Eam (2011) | | | | | | | | | |
| Sujatha and Karthikeyan (2021) | | | | | | | | | |

| | | | | | | | | | |
|---------------------------|--|--|--|--|--|--|--|--|--|
| Zain et al. (2020) | | | | | | | | | |
| Nurlinda et al. (2020) | | | | | | | | | |
| Barroso et al. (2019) | | | | | | | | | |
| Karim and Gide (2018) | | | | | | | | | |
| Jameel and Ahmed (2018) | | | | | | | | | |
| Sultan et al. (2019) | | | | | | | | | |
| Abdulhakeem et al. (2017) | | | | | | | | | |
| Hussein and Ahmad (2017) | | | | | | | | | |
| Shemi (2012) | | | | | | | | | |
| Al-Somali et al. (2015) | | | | | | | | | |
| S. Z. Ahmad et al. (2015) | | | | | | | | | |
| Poorangi et al. (2013) | | | | | | | | | |
| Nezakati et al. (2012) | | | | | | | | | |

According to the table, 17 papers has identified knowledge and skills, 10 papers had identified human resources availability, 23 papers had identified management influence, 11 papers had identified finance management, 8 papers had identified organizational culture, 16 papers had identified perceived benefits, 26 papers had identified availability of IT infrastructure, 10 papers had identified compatibility of business processes, and 7 papers had identified organizational governance as the factors affect the e-commerce adoption and readiness.

3. Method

A systematic literature review was conducted using the Preferred Reporting Items for Systematic Reviews and Meta-analysis (PRISMA) approach (Moheret. al 2009).

3.1 Inclusion and Exclusion Criteria

The articles were searched in the Google Scholler and Emerald databases. The keyword search was conducted using the below keywords. "allintitle: "Sri Lanka" OR "developing countries" OR SME OR businesses OR organizations OR enterprises OR adoption OR readiness AND "E-commerce"". The papers published since 2011 will be considered for the study. Only English papers were considered for the study. The documents that were only the abstracts were available, and paper-by-paper reviews were also removed. Further, the studies focused on SMEs' e-commerce readiness and adoption were selected, and studies conducted for Sri Lanka and other developing countries were given prominence.

3.2 Data Collection

Here 1707 records were obtained after database search. Ninety-seven duplicate records were removed, 729 were removed as they were published before 2011, and 881 were obtained for the second screening. Then 88 records were removed that were not written in English, and 128 records were not available. Six hundred sixty-five records were obtained for the third screening. Then after going through the titles and abstracts removed 657 records and retrieved 98 records. After scanning the abstracts and complete text, 38 records were considered for the literature review.

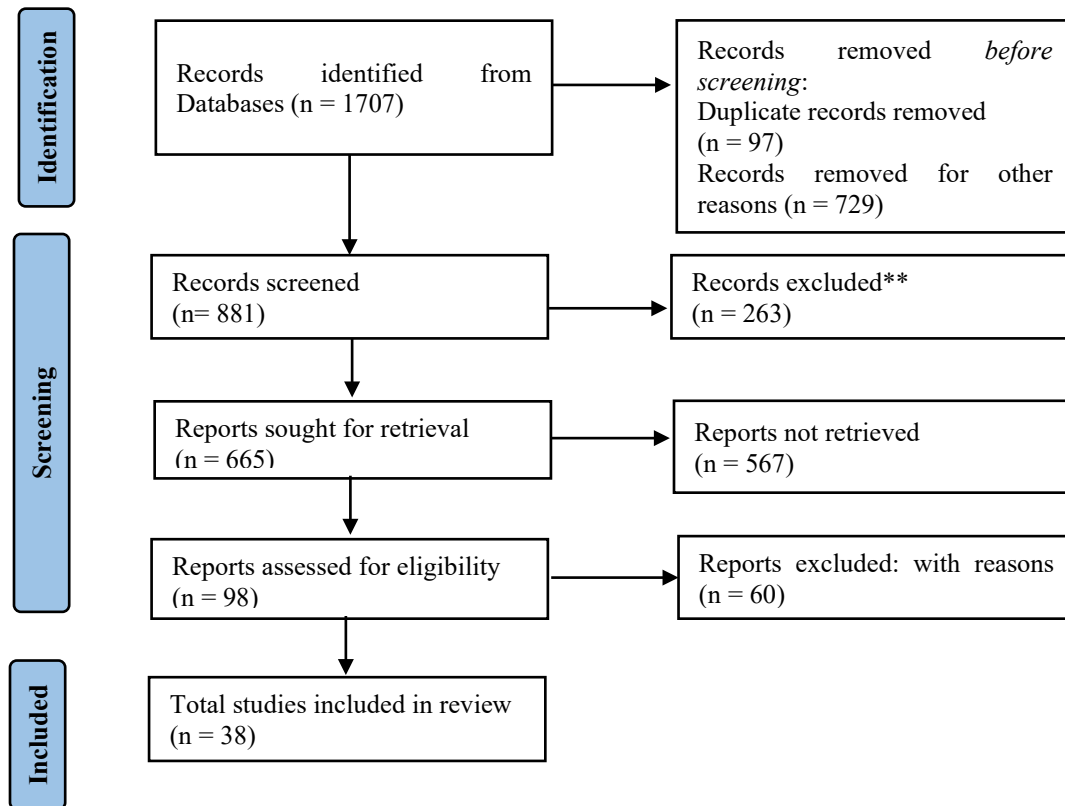


Figure 1. PRISMA flow chart

4 Discussion

This study mainly focused on the internal organizational factors regarding e-commerce readiness. The factors were identified from a critical literature review on e-commerce readiness and e-commerce adoption. The identified readiness factors are knowledge and skills, human resources availability, management influence, perceived benefits, availability of IT infrastructure, finance management, organizational culture, compatibility of business processes, and organizational governance. (This is mentioned under 2.3. Summary of the Identified Factors) Among them mainly discussed factors were management factors and availability of IT. Then knowledge and skills and management influence were given the next priority. The least concerned factors were organizational governance and organizational culture. When considering only the Sri Lankan context, the most discussed factor was the availability of IT resources. Moreover, organizational governance was not addressed, and finance management and compatibility of business processes were also given a low prominence.

5 Conclusion

Even though several studies were conducted on e-commerce readiness and adoption in the past ten years, the factors were identified for internal and external contexts. This study aimed to determine the readiness factors that are directly relatable to the organization. The study consisted of papers from Sri Lanka and other developing countries, which focused on SMEs' e-commerce adoption and readiness. The PRISMA framework helped to identify the most suitable papers for the study. Since the number of studies conducted for Sri Lanka is low, the studies conducted for other developing countries were also considered. The availability of IT infrastructure was given the highest prominence both in Sri Lanka and other countries; furthermore, less importance was given to organizational governance.

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