



RESEARCH ARTICLE

Analysis of organizational culture and e-commerce adoption in the context of top management perspectives

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Abstract

Objectives: The aim of this study is to examine the factors influencing e-commerce adoption (ECA) among small and medium enterprises (SMEs) and evaluate its impact on their business performance. The research employs a mixed-methods approach, combining quantitative surveys and qualitative interviews with SMEs owners and managers across diverse industries and geographical locations.

Methods: The analysis involved collecting and scrutinizing data from various organizations to provide a quantitative understanding of the relationship between organizational culture and ECA perceptions among top management. The factorability of the collected data was tested using the Bartlett's test of sphericity and the Kaiser-Meyer-Olkin (KMO) test, which are commonly used to assess the appropriateness of data for factor analysis.

Findings: This work underscores the importance of acknowledging the role of culture in ECA and emphasizes the significance of further research and strategies for fostering a culture that promotes and supports e-commerce within enterprises. Finally, barriers of ECA and Influencing and user satisfaction factors are identified and the conceptual framework of factors influencing ecommerce adoption in SMEs (Service sector) of ASSAM is developed.

Novelty: Applying these tests specifically to the context of ECA in SMEs is a novel application.

Keywords: E-commerce adoption, Small and medium enterprises, Technological readiness, Business performance, Third-party platforms.

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Introduction

There is no doubt that in recent years the internet has gained a lot of ground in the shopping area. It is true that e-commerce has brought great changes and has changed people's daily lives to a huge extent, which is why much research has been carried out about it. At the same time, in the last 2.5 years, the global economy has faced the pandemic and the damage it has caused to all its sectors is impressive. E-commerce seemed, if not necessary, to be the absolute benchmark for whether businesses would be able to "save" themselves in this economic crisis caused by the pandemic, due to confinement.

It is clear that the world is constantly expanding technologically and digitally interconnected. The evolution of the internet has made it possible to access information quickly, practically and efficiently, allowing computers to communicate over long distances. Its creation took place in remote times of the cold war to allow communication between the United States military. In Brazil, the emergence took place only in 1988, being used only in the educational area and in 1995, the Ministry of Telecommunications authorized the full use of the internet throughout the country, first having its scope news followed by research and commercial area, creating a connection with the "real" and virtual world.

Due to the reality and routine that is becoming more stressful and exhausting every day, customers tend to want to facilitate and speed up the relationship when purchasing, service or consuming content and the internet is the most practical way to make this process viable along with the increase in imports and export products with just one tap.

The internet market is developing into a rapidly growing market, a phenomenon which is observed both in Greece and globally.

This new reality that has been created regarding commercial transactions brings the consumer into contact with a multitude of goods, services and information since he can now compare a huge amount of prices and product features in literally real-time. At the same time, a constant trend of trust towards online stores has been observed, as more and more consumers choose almost exclusively the internet for purchasing products and services. It is common knowledge that marketing plays a key role in the market, providing high-quality services to satisfy the customer. Under these conditions, the entire cycle of the production system is examined, from the first stage, which is production, to the end, which is the consumer. The pandemic came to confirm all of the above to the greatest extent.

The Internet offers us many shopping options so that the customer has control over his transactions and also sale. Where there was a shortage of choices, there is now an excess of options (Hussain & Raghavan, 2017).

The findings of this study contribute to the existing literature on e-commerce adoption (ECA) by small and medium enterprises (SMEs) and offer practical insights for SME owners, policymakers, and researchers. By understanding the factors influencing adoption and the impact on business performance, stakeholders can make informed decisions to promote the growth and competitiveness of SMEs in the digital economy.

Literature Review

According to Alex (2016), electronic commerce offers a great competitive advantage to companies, especially SMEs, since it allows them to increase the size of the market niches in which they operate, and even allows the distribution channel to reach worldwide. Likewise, the Internet allows us to differentiate the product by offering personalized treatment to the customer.

The latest statistics show that electronic commerce exceeded \$1.3 trillion, with most of this trade focusing on the United States and China; The digital platform is transforming the flow of goods and services, reducing costs and generating a greater flow of information in the global market (Chen, 2013).

In the case of Latin America, growth is also accelerated although at very low volumes, for example for Argentina or Mexico, only 39% of electronic purchases are made by all Internet users; Among the problems that most arise in

this commercial channel, there is weakness and incipient legislation, legal problems such as electronic signature and invoice, reduced levels of security and digital protection, great differences in logistics infrastructures, few means of electronic payment, cultural aspects of Internet diffusion and lack of government policies, among others (Ghobakhloo, 2013, Amaranatha Reddy *et al.*, 2020).

In Colombia, for example, 99% of all companies are SMEs and according to Osorio-Gallego, *et al.* (2016), for the last aggregate Figure, only 60.6% used the internet for purchases of supplies, financial and commercial transactions; These authors also conclude that there are major adoption problems related to information security, implementation and management costs, although the perception of its strategic benefit is a good incentive for its implementation.

This is why, given the complexity of the adoption of electronic commerce in SMEs, it is pertinent to know the studies that have been carried out in this context. Therefore, the objective of this presentation has been to carry out a review of the existing literature in the line of research on the adoption of e-commerce in SMEs at a global level.

Data Analysis and Interpretation

Survey Response

Data was collected from SMEs through a questionnaire survey. In 258 questionnaires were distributed and data was collected through personal visits. Responses were gathered from 258 SMEs in Assam. Out of which responses of 17 questionnaires were ambiguous and were removed from the analysis. Finally, a set of 211 usable questionnaires were taken for analysis, as shown in Table 1.

Demographic Characteristics of Respondents

This section discusses the frequency and percentage of the demographic variables of gender, age, education, and experience.

- Age of the respondents is shown in Figure 1.
- Gender of the respondents is shown in Figure 2.
- The education level of the respondents is shown in Figure 3.
- The experience of the respondents is shown in Figure 4.

Results: Empirical Data Analysis

The objective wise, results of empirical findings are discussed below:

Table 1: Summary of survey responses

<i>Data collected from SMEs</i>	<i>No. of surveys</i>
Questionnaire distributed	258
Questionnaire returned from survey	228
Ambiguous questionnaire	17
Usable questionnaire from survey	211
Total usable questionnaire for analysis	211

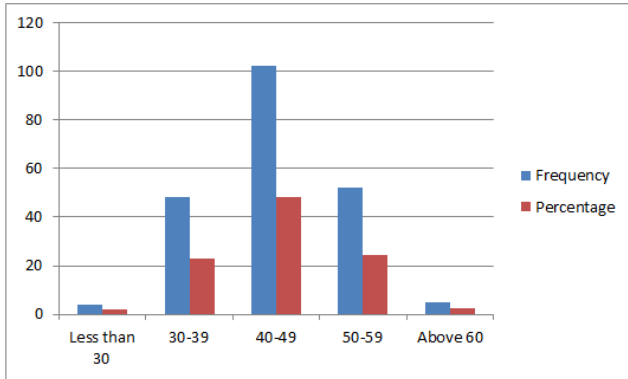


Figure 1: Age of respondents

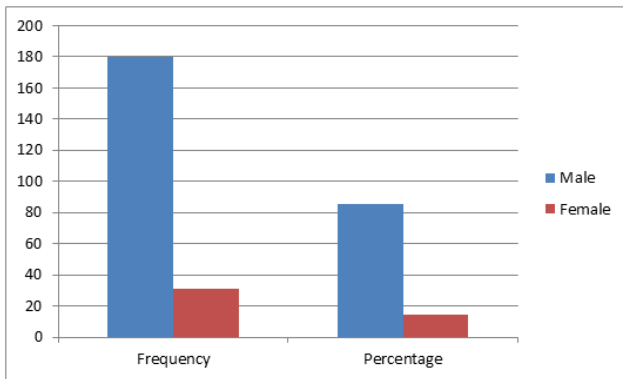


Figure 2: Gender of respondents

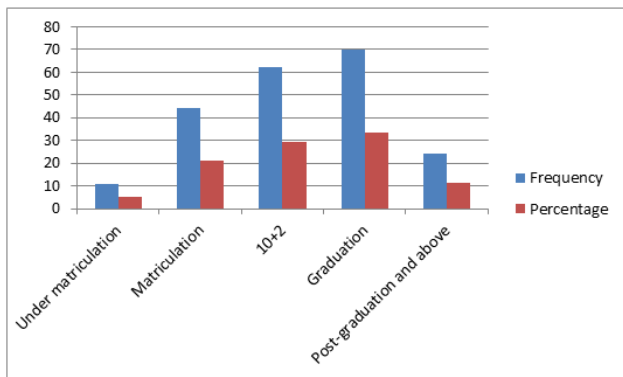


Figure 3: Education level of respondents

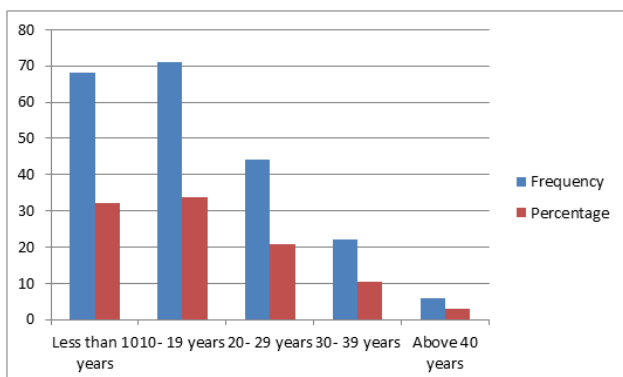


Figure 4: Experience of respondents

Analysis of the Demographic Composition of Top Management Team of SMEs and Organizational Culture in ECAs

To examine the demographic characteristics of SMEs’ top management and organizational culture that have a direct influence on ECAs, five hypotheses were proposed and these hypotheses were tested using the Pearson Chi-square test as described below:

Hypothesis testing

The null hypothesis is an assertion about the value of a population parameter. It is an assertion that holds true unless sufficient evidence to conclude otherwise and the researcher try to reject the null hypothesis (if any) (Moizer, 2007; Aczel and Sounderpandian, 1999).

For this study, hypotheses H1, H2, H3, H4 and H5 are considered on the basis of literature and the result of the tests are discussed below:

H1: There is relationship between ECA and gender

The steps for H1 are given in Table 2.

The *p-value* is 0.2909. Therefore, the test result failed to reject the null hypothesis (Ifeanyichukwu, 2016).

H2: There is the relationship between ECA and age

The steps for H2 are given in Table 2.

The *p-value* is $< 2.2e-16^{**}$. Therefore, the test result rejected the null hypothesis.

H3: There is relationship between ECA and education

The steps for H3 are given in Table 2.

The *p-value* is $4.702e-07^{**}$.

H4: There is relationship between ECA and experience

The steps for H4 are given in Table 2.

Table 3 shows the *p-value* of Pearson’s Chi-squared test of another variable i.e. organization culture of e-commerce is $4.025e-05^{**}$. Therefore, the result rejected the null hypothesis (Lertwongsatien and Wongpinunwatana, 2003; Twati and Gammack, 2006; Senarathna, Warren, Yeoh and Salzman, 2014).

Finally, from Table 3, it can be interpreted that most of demographic variables influence e-commerce. (Awa *et al.*, 2015; Akman and Rehan, 2010).

Table 2: Steps in H1, H2, H3, H4

Steps in H1, H2, H3, H4	
Step 1	Null: No difference between ECA and gender, alternate hypothesis: Difference between ECA and gender exists
Step 2	Alternate hypothesis is in the form of inequality
Step 3	Level of significance $\alpha = 0.05$
Step 4	Test statistic and <i>p-value</i>

Table 3: Pearson’s Chi-squared test on organization culture

Organization culture	<i>x-squared value</i>	<i>p-value</i>
	23.007	$4.025e-05^{**}$

Significance level 0.05^{**}

Barriers on SMEs in ECA Decisions

This section highlights the factors which had a negative effect in ECA adopted by SMEs by answering research question R1. To explore the major barriers on SMEs in ECA decisions, exploratory factor analysis is run to simplify the data and reduce many individual variables into a fewer number of dimensions and variables. The analysis is conducted in two stages. Initially, the factorability of the collected data is tested with the Bartlett test and Kaiser-Meyer-Olkin test and then finally, factor analysis is carried out.

Bartlett test

Before conducting factor analysis, the first step is to check the inter-correlation of all the variables. The test of correlation is done by assessing the observed correlation matrix against an identity matrix. A factor analysis can be employed only if the result of the test is significant. This test is conducted with Bartlett’s test of sphericity (Field, 2009, Anand K Jaiswal *et al.*, 2010).

Table 4 shows that the *p*-value of the Bartlett test on barriers variables is less than 0.5 and therefore, the test is statistically significant. In other words, Bartlett’s test suggests that there is a correlation between some variables.

Kaiser-Meyer-Olkin test

For factor analysis, the sample size of the data must be adequate for conducting a reliable analysis. The KMO test is done to establish the adequacy of the sample and to dig out the reliable factors. The KMO value for minimum acceptance is 0.5, but most authors recommend a value of more than 0.5 as a precondition for factor analysis (Field, 2009, Venugopal *et al.* 2018).

KMO evaluates an overall measure of sampling adequacy (MSA) for each item. Figure 5 indicates that the overall KMO test of the barrier variable is 0.94, which is acceptable for carrying out factor analysis.

Factor analysis

Scree plot: Figure 6 shows that only one factor may be extracted for factor analysis as one eigenvalue is above the straight line, where eigenvalues are equal to 1 (Costello and Osborne, 2005).

Figure 7 highlights that ‘lack of information technology’ (-0.019) has a negative value and therefore, it cannot be accepted as the value is below 0.6. Therefore, the variable ‘lack of information technology (IT)’ is omitted for the study.

Ranking of barriers

In order to most and least important barrier variables, ranking of the variables was done as shown in Figure 8.

According to the findings, the most important factors, hindering the Assam SMEs ECA were shown in Figure 8 (Honjo and Harada; 2006).

Table 4: Bartlett test on barriers variables

X-squared value	p-value	Degree of freedom	Significant
3600.002	0	211	Yes

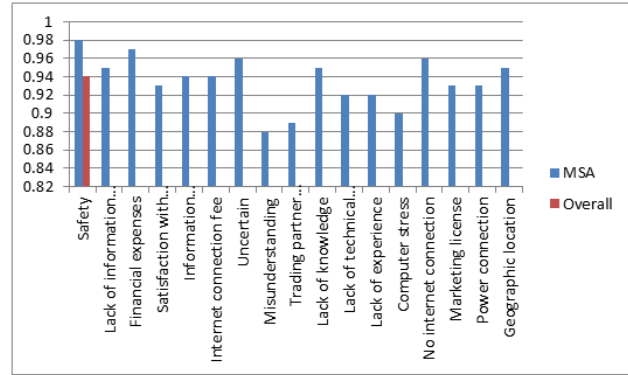


Figure 5: KMO test on barriers variables

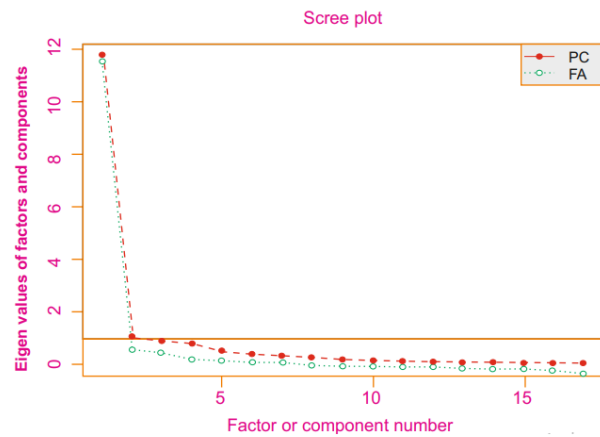


Figure 6: Scree plot on barriers variables

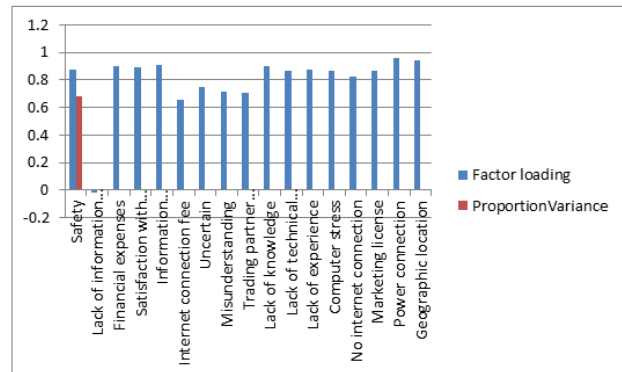


Figure 7: Factor loading on barriers variables

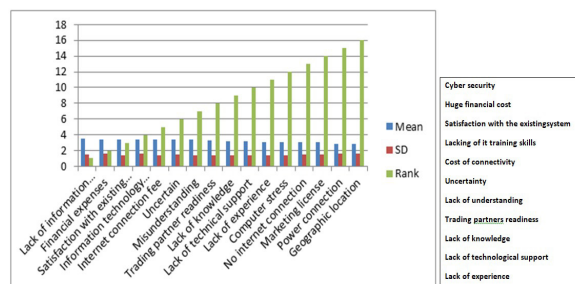


Figure 8: Ranking of barriers variables

Influencing Factors for ECA Decisions Across Manufacturing and Service Sector of SMEs

Bartlett test

In order to explore these benefits or major influencing factors on SMEs in e-commerce adoption decisions, exploratory factor analysis was run to simplify and reduce to significant individual variables. The factorability of collected data is tested with a) the Bartlett Test and b) KMO (Kaiser-Meyer-Olkin) test and then finally factor analysis test is conducted.

Table 5 shows the Bartlett test on influencing factors for the manufacturing and service sector. The *p-value* for manufacturing is '0' and for service is '6.315529e-47' which is less than 0.5. Hence, the test is statistically significant for both sectors.

Kaiser-Meyer-Olkin

Figure 9 indicates that the overall MSA of KMO test for each item in the manufacturing and service sector. The test results for manufacturing and service is acceptable as both are above 0.5 level, which are 0.96 and 0.68. Therefore, factor analysis for manufacturing and service can be carried out.

Factor analysis of influencing factors of the manufacturing sector

Factor analysis is conducted by extracting three factors (factor 1, factor 2, factor 3) as shown in Figure 10. The factor loadings of all influencing variables for the manufacturing sector are more than 0.5 except 'positive attitude (0.228) in case of factor 1. Therefore all variables contribute substantially in influencing ECA. However, in the case of factors 2 and 3, the factor loading of all the variables are insignificant as these are less than 0.5. Thus all variables are categorized into one dimension (one factor) as an influencing factor for the manufacturing sector.

Factor analysis of influencing factors of service sector

Similarly, in case of service sector also factor analysis is conducted by extracting three factors (factor 1, factor 2, factor 3) as shown in Figure 11. The factor loading for factor 1 component shows that the influencing variables such as direct and indirect benefits (0.615), firm size (0.632), organization readiness (0.500), top management support (0.795), positive attitude (0.563) and social system (0.550) are significant as the values are more than 0.5. However, influencing variables such as perceive usefulness (0.896) and ICT usages (0.630) are a significant influencing factor for the ECA in case of factor 2 components. Lastly, in case off actor 3, the loading of two variables, i.e., perceived ease of use (0.896) and facilitating condition (0.630) are significant. The significant variables in factors 2 and 3 are clubbed into one dimension which is user perception factor as the variables are related to user perception. Thus in case of service factors, two categories of variables have emerged from the empirical findings and these are 1) technical factors 2) user perception factors.

Table 5: Bartlett test on influencing factors

Sector	X-squared value	p-value	Degree of freedom
Manufacturing	2288.646	0	159
Service	465.9292	6.315529e-47	52

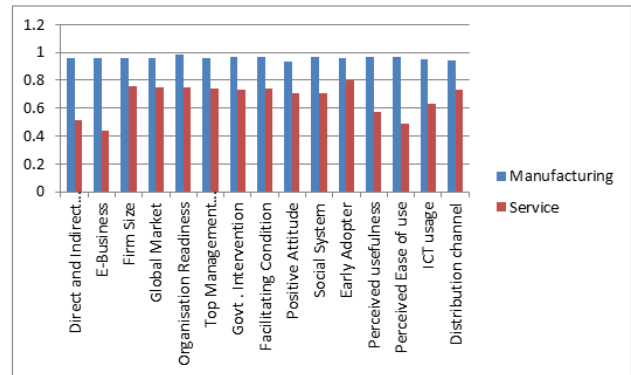


Figure 9: Overall MSA of KMO test for each item

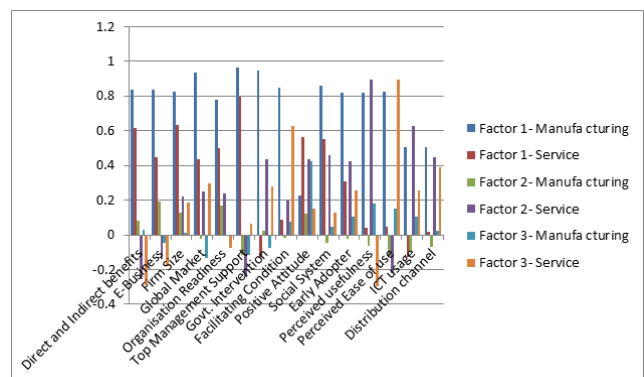


Figure 10: Factor loading for manufacturing and service sector

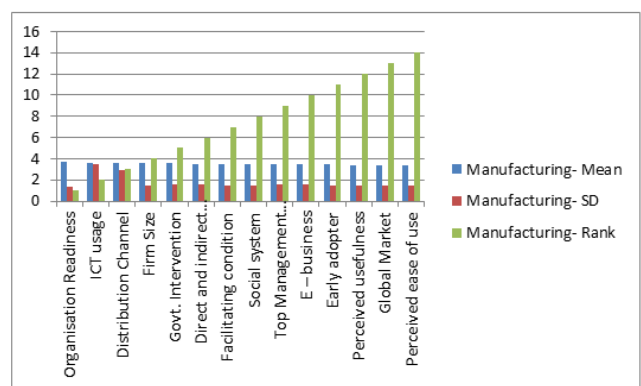


Figure 11: Ranking of influencing factors (manufacturing)

Ranking of influencing variables

Finally, the ranking of the significant variables is done to find the most important influencing factors. Figure 11 shows that the most significant influencing variables for the manufacturing sector.

Similarly, Figure 12 shows that most significant influencing variables for the service sector are ICT usage (4.38), facilitating condition (4.21), perceived usefulness (4.12), positive attitude (4.06), social system (4.04), firm size (3.98), perceived ease of use (3.96), organizational readiness (3.92) and top management support (3.88).

Development of the Conceptual Model for ECA of SMEs in Assam

In this section, a new theoretical model for ECA technology in SMEs in an Indian context is suggested to achieve objective 4. In the absence of e-commerce model or theories in the Indian context in general and the Northern-Eastern region in particular, a conceptual model is suggested after exploring available literature on IT adoption and empirical findings of the study, a conceptual model, is aimed to understand the ECA particularly to the ECA by SMEs in Assam.

As per the data collected from the SMEs in Assam, e-commerce is increasingly attracting SMEs around Assam to access internet in their day to day business. Though the adoption of e-commerce is in a blooming state with limited exposure but have high aspiration. Considering, the variables such as demographic characteristics, barriers, influencing factors both in manufacturing and service sectors of SMEs and also the existing organization culture, obtained from objectives 1, 2, and 3, respectively which result in ECA, a conceptual model is established as an alternative way to understand the e-commerce adoption in SMEs of Assam.

Conceptual model of factors affecting ECA in SMEs of Assam

In order to understand the factors that inhibit the ECA in Assam, a conceptual framework was developed from the empirical findings of the study as well as findings from other studies in the literature reviewed. Two models are developed; one for the manufacturing sector and other for the service sector. For the manufacturing sector, factors are classified under four categories: a) Influencing factors; b) Barriers factors; c) Demographic factors; and d) Organisation culture as shown in Figure 13. In case of service sector factors are classified under five categories: a) Influencing factors; b) User perception factors; c) Barriers factors; d) Demographic factors and; e) Organisation culture, shown in Figure 14. The constructs formed the model are elucidated in the sections below.

• *Demographics characteristics*

Demographics characteristics such as gender, age, education, and experience are considered in the conceptual model as per the findings of the study and these variables were also justified by various researchers (Chatterjee, Grewal and Sambamurthy, 2002; Legris, Ingham and Collette, 2003; Lotti, Santarelli and Vivarelli, 2009; Lopez-Nicolas & Meroño-Cerdán, 2009; Ifeanyichukwu, 2016).

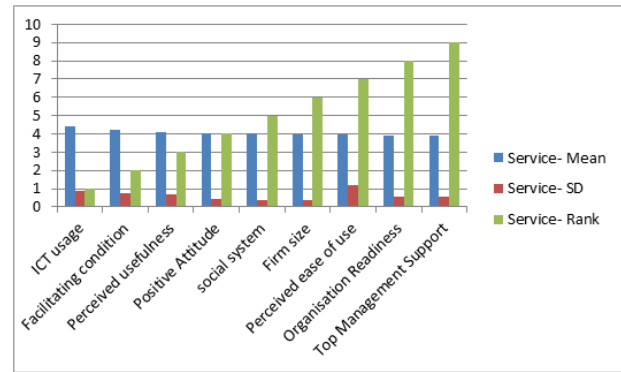


Figure 12: Ranking of influencing factors (Service)

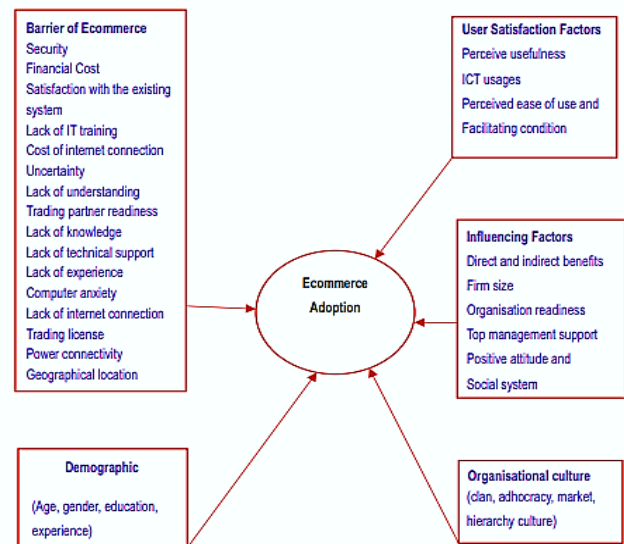


Figure 13: Conceptual framework of factors influencing e-commerce adoption in SMEs (Service sector) of Assam

• *Barriers of ECA*

SMEs mainly in developing countries are likely to face problems which is far diverse from those in developed countries and they also differs in their adoption strategy and the benefits acquired from e-commerce too differs (Poon and Swatman, 1999). However, ECA depends on factors such as technological, organizational, environmental, and regional. The empirical study also confirms that application security, financial cost, satisfaction with the existing system, lack of IT training, cost of internet connection, uncertainty, lack of understanding, trading partner readiness, lack of knowledge, lack of technical support, lack of experience, computer anxiety, lack of internet connection, trading license, power connectivity, geographical location and these are partially similar to the findings of the earlier studies (Al-Qirim and Corbit, 2002; Nathan, 2008; Alshehri, Aldabbas, Sawle and Baqar, 2012; Johnson, 2012; Zaied 2012; Iglesias, Pascual, Hernández and Chaparro, 2013; Kumar and Maan 2014; El-fitouri, 2015). Thus in the conceptual model, these variables are considered.

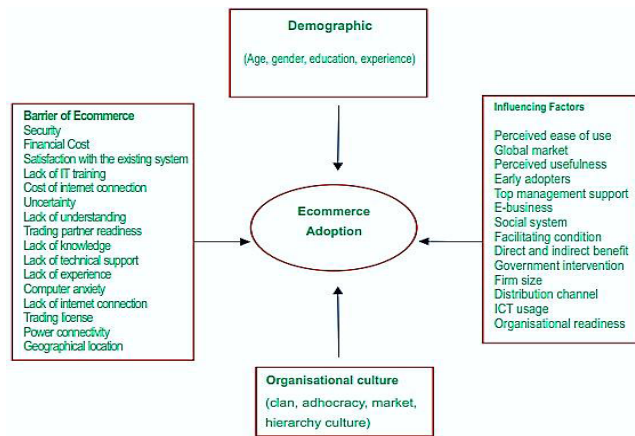


Figure 14: Conceptual framework of factors influencing e-commerce adoption in SMEs (Service sector) of Assam

- *Influencing and user satisfaction factors*

Earlier researchers (Zhu, Kraemer and Xu, 2006; Kwadwo, Martinson, Evans and Esther, 2016; Zaied, 2012; Kaynak, Tatoglu and Kula, 2005) have studied the business processes and concluded that e-commerce adoption in SMEs is to speed up and make easy the flow of information, permit the contribution of information and knowledge and as a result generate new opportunities intended for growth and development of new relationships between the various trade partners around the globe. These researchers, as well as empirical finding based on Assam, confirmed that perceived ease of use, global market, perceived usefulness early adopters, top management support, e-business, social system, facilitating condition, direct and indirect benefit, government intervention, firm size, distribution channel, ICT usage and organizational readiness are the factors which influence ECA in SMEs.

Conclusion

The analysis of organisational culture indicated that special types of enterprise lifestyle impact ECA as perceived through top management of the businesses. But, it is determined that most of the SMEs in Assam are unstructured in nature and require differences to standard business enterprise lifestyle types for the adoption of new era. A look at (Lopez and Merono, 2009) additionally states that one-of-a-kind organizational lifestyle sorts (marketplace, adhocracy, extended family and hierarchy) are associated with special IT blessings, such as pride, useful, organizational and competitive benefits. With admiration to the second one goal, component evaluation was accomplished to reduce the seventeen variables (boundaries) to a particularly wide variety of sizable boundaries in SMEs of Assam. The scree plot discovered that the simplest one aspect changed into statistically tremendous, with each variable having an eigenvalue of at least one (Figure 6). Eventually, based on empirical findings, a conceptual model was developed indicating the factors affecting ECA in Assam.

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