

# The Challenges Faced in the Context of Information Technology Adoption by the Micro and Small Enterprises

Gaganpreet Kaur\*, Harvinder Singh\*\*

## Abstract

The prime aim of this study is to determine the challenges faced in the context of information technology adoption by micro and small enterprises. A sample of 500 respondent firms from Punjab, Haryana and Himachal Pradesh has been collected from the healthcare services and hospitality sector. To reach the target population judgmental sampling technique has been used. Exploratory factor analysis has been applied to analyse the results. The study has found that four factors, technical and human barrier, government interference and personal barrier, infrastructure barrier and lack of skills and resistance to change, has been extracted from nineteen variables. So, it is suggested that more and more investments in information technology significantly impact micro and small firms and also help in survival and generate profits.

**Keywords:** Entrepreneurial Intention, Theory of Planned Behaviour, Ethiopia, University

## Introduction

The digital handle and broadcast of information is now known as Information Technology (IT). The main demands of Information Technology are planning, installation, configuration, training and upholding of infrastructure. Information can be managed in a more efficient and effective way through information technology. Information Technology is now the strength of modern technological advancement and globalisation and is usually accepted as a main enabler of technical and economic growth. Information Technology adoption

has been revealed to force the economies of nations to superior productivity and creates jobs. The modern universal economy is built on Information Technology and telecommunication infrastructure, which now serves as a stage for universal growth. Information Technology has more possibility to get better business operations, education, technology and economic growth. This technology could assist in contributing to poverty minimisation in developing economies. But, in developed and developing countries, there is imbalanced access to Information Technology (Macharia & Gituru, 2006).

Most developing countries do not have adequate sources to advance information technology in their respective countries. Developing information technology mostly depends upon foreign aid. There are several factors that can prevent small firms from keenly adopting and using IT in their business. These reasons can significantly differ across different sectors, countries and size groups. The research conducted by Morawczynski and Ngwenyama (2007) concluded that everybody thinks that IT will surely give payback to SMEs, but the environment in which IT is adopted is not the same. The social, economic and technological factors are influencing the acceptance of IT. A computerised information system also requires skilled personnel for its effective operation. Training is one of the main aspects for the use of any new technology. According to Loing (2005), implementation of information technology is not an easy task for the firm; they need trained employees and also advanced infrastructure. Krieg (1999) disclosed that basic challenges or barriers to using information technologies include poor or insufficient infrastructure, inadequate access to the hardware and insufficient or poor resource allocation. According to

\* Assistant Professor, Department of Management Studies, Panth Rattan Jathedar Gurcharan Singh Tohra Institute for Advances Studies in Sikhism, Bahadurgarh, Patiala, Punjab, India. Email: [gaganmalhans@yahoo.in](mailto:gaganmalhans@yahoo.in)

\*\* University College, Benra, Dhuri, Punjab, India.

Sehgal and Rahim (2006) and Sehgal et al. (2002), other factors are also a barrier for firms to adopt new technology are; security issues, time constraints, business partners, electricity constraints, government interference, myths associated with computer installation, corruption, lack of openness and knowledge sharing, lack of understanding about data and analytical skills, resistance to change, an unreliable service provider, physical health and privacy and ethical issues on IT adoption.

Kaur (2021) described that the Micro, Small and Medium Enterprises (MSMEs) sector constitutes a significant segment of the Indian economy in terms of its contribution to production, exports, employment etc. So, it is regarded as the backbone of the current Indian Economy. As per the Micro Small and Medium Enterprises Act 2006, MSMEs are generally classified into two categories (a) Manufacturing sector and; (b) Services sector. Both categories of enterprises have been further classified into micro, small and medium and large enterprises. According to the MSMEs Act under the service enterprises category, a micro enterprise is an enterprise where the investment in equipment does not exceed Rs.10 lakh; a small enterprise is one where the investment in equipment is more than Rs.10 lakh but does not exceed Rs.2 crore; a medium enterprise is that where the investment in equipment is more than Rs.2 crore but does not exceed Rs.5 crore. While for enterprises engaged in the manufacture or production, processing or preservation of goods, a micro-enterprise is one where investment in plant and machinery does not exceed Rs.25 lakh. A small enterprise is one where investment in plant and machinery can be more than Rs.25 lakh but does not exceed Rs.5 crore. In a medium enterprise, the investment in plant and machinery can be more than Rs.5 crore but does not exceed Rs.10 crore.

In line with earlier studies, this study concentrated on the challenges faced in the context of information technology adoption by micro and small enterprises. The following hypothesis has been assumed for the study:

- Does a micro and small scale enterprise face the challenges in information technology adoption?

Most of the studies researched information technology investment in the manufacturing sector and in medium and multinational companies. A very limited number of studies have emphasised the challenges faced by micro and small-scale enterprises in information technology

adoption in the service sector, which will form the centrifugal point of the current study.

## Literature Review

### Adoption of Information Technology

Tan and Teo (1998) explained the three main reasons for adopting the Internet, convenient access to worldwide information, establishing a global presence and extending worldwide reach. Seyal and Rahim (2006) conducted a study on Electronic Data Interchange in Brunei and explained that organisations with more IT knowledge rapidly adopted EDI as compared to others. In external factors, government support and trading partners not significantly influenced the EDI adoption. Perceived direct benefits and perceived costs are direct motivators for EDI adoption. Hikmet et al. (2008) examined the role of organisational factors in the adoption of IT in healthcare in Florida hospitals. The research assessed the informational technology in hospitals by computerised physician order entry, electronic medical records and patient billing systems etc. Law and buhalis (2014) suggested that with the adoption of ICT, suppliers can expand their business, and entrepreneurs should apply technology in business activities to compete with a competitor and to increase revenue. Tran (2015) revealed that 65 per cent of micro-enterprises used social media, but 35 per cent did not use any social site. The most accepted types of social media used by the micro-enterprises were social networks, blogs and media-sharing sites. Ukpabi and Karjaluo (2017) shed light on consumers' acceptance of information and communications technology in tourism. The study examined that security, privacy and trust played important roles in consumers' booking, reservation and payment for tourism services on tourism and hospitality firms' websites.

### Challenges in Information Technology

Dubeloor et al. (2005) research indicated that the majority of companies were adopting e-business for customer satisfaction, improving process effectiveness, increasing income as well as company growth and enhancing value generation. Small offline firms that are trying to adopt e-business have faced difficulty in investment, technical skills and overall significance to their core

business performance. The research conducted by Arendt (2008) argues that the main cause of IT challenges in the successful and efficient adoption of IT in SMEs are lack of knowledge level, education and quality of skill level of internal stakeholders like promoter, CEO, Owner, managers and employees. Koellinge's (2008) findings of the study showed a major reason for the failure of IT adoption in healthcare was a lack of compatibility, integrity, security, interoperability and scalability. The study also proposed that the lack of compatibility could be improved with the help of standardisation. The study by David (2015) explored the major barriers to information technology adoption were security, privacy, lack of system reliability, lack of support by staff and technical barriers etc. the study also recommended that the healthcare industry is a major industry, so they should explore the multiple solutions to overcome these barriers. Deka (2016) investigated the challenges of ICT and e-governance in Assam. The study found a major barrier to ICT adoption was: inadequate infrastructure, internet connectivity, usage of the internet and knowledge of using ICT. Nkosana et al. (2016) highlighted the challenges of ICT adoption and utilisation faced by small rural restaurants in Punjab. The study revealed that in rural areas, they had no fixed address so, fixed telephone connectivity was a problem but, cell phone usage was high. The high cost of ICT adoption, owners' lack of familiarity with ICT, and lack of knowledge about the strategic use of ICT among people was the major barrier to the adoption of ICT.

Akinbile and Oni (2016) evaluated the barriers and benefits of information technology in the industry in the Oyo State of Nigeria. A well-structured questionnaire was developed to collect data from 150 respondents. The study revealed that information technology could provide numerous benefits like, developed productivity, a channel of information and improvement of knowledge. The barriers included costs of engaging computer professionals, electricity constraints, financial constraints and lack of training. Andipakula (2017) studied the barriers that inhibit the growth of information technology in a firm operating in the state of Nevada. The different constraints were highlighted in information technology adoption, such as financial constraints, time constraints, lack of support from top management, lack of training, the reluctance of employees to learn new technology and lack of technical support. Sehgal and Khanna (2017) explored the challenges faced by organisations in e-commerce

adoption by MSEs of Punjab. In Punjab, districts Jalandhar and Ludhiana were selected for the study. Organisational barriers, technical barriers, economic barriers, political barriers, legal barriers and sociocultural barriers were taken as the variable for the study. The result showed that for Ludhiana and Jalandhar, resistance to change and the inability to innovate (lack of information about e-commerce and lack of knowledge about hardware/software) were internal barriers to organisation that could be controlled, but lack of technical infrastructure and business support was an external barrier for e-commerce adoption. Tit et al. (2019) critically explored the individual factors, management factors, capital availability, and business environment. Kaur and Mand (2022) explored that exclusive IT tools, risk and security concerns, lack of technical expertise and customer relationship are the key reasons for IT adoption in SMEs.

## Research Methodology

### Sampling Technique

Broadly, two service sectors are used for this study; healthcare services and the hospitality sector. To increase the external validity of the research findings in health care services; data is collected from laboratories, diet clinics etc. also. In the hospitality sector, restaurants, hotels and tourism sectors are used for data collection. To reach the target population judgmental sampling technique has been used. It is a non-probability sampling technique.

### Sample Size

Considering the suggestions, a representative sample of 500 micro and small firms from Punjab, Haryana, and Himachal Pradesh data has been collected from the service sector, i.e. hotel & restaurant and health care services. 180 respondents were from Punjab, 175 respondents were from Haryana, and 145 respondents were selected from Himachal Pradesh.

### Data Collection

Primary data has been collected through questionnaires and interview methods. Owners, managers and employees of enterprises have been selected to know the effect of information technology on a firm's performance.

## Data Analysis

To find out the barrier to information technology adoption, exploratory factor analysis has been used. With the help of exploratory factor analysis, the study can extract the important factors that are barriers to information technology adoption in micro and small enterprises from various variables.

**Table 1: KMO and Bartlett's Test to Identify the Barriers for Total Sample**

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	0.947
Bartlett's Test of Sphericity Approx. Chi-Square	3467.32
Degree of freedom	499
Significance	0.000

Source: calculated through SPSS at 1 percent significance level.

The result of the KMO and Bartlett test of the total sample is shown in Table 1. The value 0.947 of KMO indicates that the data is suitable for the study and fit to go with factor analysis. Bartlett's test of sphericity value of chi-square ( $\chi^2$ ) = 3467.32, significant at a 1 per cent level, indicates that there is a correlation among variables

**Table 2: Communalities to Identify the Barriers**

Variables	Initial	Extraction
Lack of Infrastructure on IT adoption	1.000	0.740
Internet access on IT adoption	1.000	0.819
Lack of awareness on IT adoption	1.000	0.895
Unskilled employees on IT adoption	1.000	0.864
Security issue on IT adoption	1.000	0.579

**Table 3: Total Variance Explained to Identify the Barriers**

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Sr. No.	Total	Per Cent of Variance	Total	Per Cent of Variance	Cumulative per cent	Total	Per Cent of Variance	Cumulative Per Cent
1	7.288	57.877	57.877	11.709	61.627	61.627	6.828	35.936	35.936
2	1.072	8.512	66.389	0.929	4.889	66.516	4.383	23.067	59.003
3	0.821	6.519	72.908	0.934	4.917	71.433	1.982	10.433	69.436
4	0.757	6.009	78.917	0.881	4.638	76.071	1.261	6.635	76.071
5	0.616	4.895	83.812						
6	0.457	3.627	87.439						
7	0.385	3.054	90.493						

Variables	Initial	Extraction
High costs of IT on IT adoption	1.000	0.962
Time constraints on IT adoption	1.000	0.978
Business partners on IT adoption	1.000	0.911
Electricity constraint on IT adoption	1.000	0.707
Government interference on IT adoption	1.000	0.902
Myths associated with computer installation on IT adoption	1.000	0.577
Corruption on IT adoption	1.000	0.786
Lack of openness and knowledge sharing on IT adoption	1.000	0.840
Lack of understanding about data and analytical skills on IT adoption	1.000	0.636
Training on IT adoption	1.000	0.871
Resistance to change on IT adoption	1.000	0.691
Unreliable service provider on IT Adoption	1.000	0.910
Physical health concerns on IT adoption	1.000	0.614
Privacy and ethical issues on IT Adoption	1.000	0.572

Extraction method: principal component analysis.  
Source: calculated through SPSS.

The barriers to information technology adoption in the context of the total sample represented in Table 2 shows the communalities using principal component analysis ranging from 0.572 to 0.978. If communalities for a particular variable are between 0.0-0.4, then that variable will struggle to load significantly on any factor. All the factors having loaded more than 0.4 have been considered good and indicate that the variables are significantly loaded on factors extracted.

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings			
	Sr. No.	Total	Per Cent of Variance	Cumulative Per Cent	Total	Per Cent of Variance	Cumulative per cent	Total	Per Cent of Variance	Cumulative Per Cent
8	0.299	2.377	92.870							
9	0.210	1.666	94.536							
10	0.172	1.369	95.906							
11	0.133	1.055	96.961							
12	0.102	0.809	97.770							
13	0.096	0.760	98.529							
14	0.070	0.552	99.081							
15	0.049	0.386	99.467							
16	0.023	0.181	99.648							
17	0.018	0.147	99.795							
18	0.015	0.120	99.914							
19	0.011	0.086	100.000							

Extraction method: Principal component analysis.

Source: calculated through SPSS.

In the context of the total sample, Table 3 shows that eigen value of four factors is greater than one. These four factors explain 76.071 per cent variance, which is more than 60 per cent. In unrotated loading, the first factor includes six variables lack of infrastructure, lack of awareness, unreliable service, time constraints, corruption, lack of understanding about data and analytical skills are explained by a 61.627 per cent variance. A variance of 4.889 per cent is explained by the second factor, including six variables security, high costs, government interference,

physical health concerns, privacy and ethical issues, and lack of openness and knowledge. In the third factor, three variables, electricity constraint, internet access and training, presented a 4.917 per cent variance. In the fourth factor, resistance to change, unskilled employees, and business partners, variables are included and explain 4.638 per cent variance. In rotated loading, the first factor describes a 35.936 per cent variance, the second has 23.067 per cent, the third has 10.433 per cent, and the fourth has a 6.635 per cent variance.

**Table 4: Rotated Component Matrix to Identify the Barriers**

Variables	Factors			
	1	2	3	4
Lack of Infrastructure on IT adoption	0.626			
Lack of awareness on IT adoption	0.690			
Unreliable service provider on IT adoption	0.669			
Time constraints on IT adoption	0.488			
Corruption on IT adoption	0.613			
Lack of understanding about data and Analytical skills on IT adoption	0.782			
Security issue on IT adoption		0.574		
High costs of IT on IT adoption		0.505		
Government interference on IT adoption		0.708		
Physical health concerns on IT adoption		0.819		
Privacy and ethical issues on IT adoption		0.863		
Lack of openness and knowledge sharing on IT adoption		0.685		
Electricity constraint on IT adoption			0.619	

Variables	Factors			
	1	2	3	4
Internet access on IT adoption			0.837	
Training of IT adoption			0.819	
Resistance to change on IT adoption				0.713
Unskilled employees on IT adoption				0.823
Business partners on IT adoption				0.673
Myths associated with computer installation on IT adoption				0.625

Source: calculated through SPSS.

## Labeling of Factors

To find the barriers to information technology adoption, the results of the total sample shown in Table 4 present that four factors are extracted from nineteen variables after the factor analysis explaining 76.071 per cent of the variance. Eigen values of these four factors are more than one. On the basis of the result, extracted factors are named: technical and human barriers, government interference and personal barrier, infrastructure barrier and lack of skills, and resistance to change.

### Factor 1: Technical and Human Barrier

Factor one, the technical and human barrier, is a combination of six variables, lack of infrastructure, lack of awareness, unreliable service provider, time constraints, corruption, and lack of understanding about data and analytical skills on IT adoption. The conclusion of the current study is similar to Ramana and Rao (2003), which found that the top issue in IT implementation is the non-availability of IT-trained human resources.

### Factor 2: Government Interference and Personal Barrier

Factor two is a combination of six variables, namely security issues, high costs, government interference, physical health concerns, privacy and ethical issues, and lack of openness and knowledge sharing on IT adoption. A group of variables is named government interference and personal barrier. The result of this study is parallel with Besyal et al. (2017), which concluded that employee resistance to change, government interference, and organisational, human, economic, social, and cultural issues are still a problem for technology adoption for a variety of organisations.

### Factor 3: Infrastructure Barrier

Infrastructure barriers factor loaded three variables, namely: electricity constraint, internet access and training of IT adoption. The results of the current study, consistent with Oduwole (2005) and Younis (2005), have shown that continual power cuts, lack of infrastructure and lack of maintenance are the major barriers to IT adoption by the majority of firms.

### Factor 4: Lack of Skills and Resistance to Change

Factor four- lack of skills and resistance to change factor; is a combination of four variables consisting of resistance to change on IT adoption, unskilled employees, business partners on IT adoption, and myths associated with computer installation on IT adoption. The findings of the current study coincided with Ani et al. (2005), which concluded that insufficient funds and the non-existence of trained personnel are the major challenges in IT adoption.

## Conclusion

To understand the awareness and adoption pattern of information technology by micro and small enterprises, exploratory factor analysis has been conducted. Four factors, namely: connection with related parties, core business activities, effective communication and record maintaining and social networking, have been extracted from nineteen variables which account for 71.341 per cent of the variance, and eigen value is greater than one. The first factor has explained 20.795 per cent variance, 20.062, 17.205 and 13.278 per cent variance has been explained by the second, third and fourth factor, respectively. Eigen values of these four factors are more than one. The result of the present study agreed with the result of Andersan and Segan (2001), who found that information technology

plays an important role in effective communication. So, the hypothesis is proved that micro and small firms face challenges in information technology adoption.

## Agenda for Future Research

The study is restrained to the micro and small enterprises context, and thus the findings are confined to this context only. Further studies are required in medium and large enterprises to get a better understanding of the effect of information technology on a firm's performance. The scope of the study is confined to the hospitality sector and healthcare services only. More studies are required in varied sectors like the educational sector, transport sector and other sectors providing miscellaneous services to gain a better understanding of the service sector association with information technology.

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