

Adoption of Information Technology by MSEs in Rural Areas and its Effect on Operational Performance

Gaganpreet Kaur^{1*} and Harvinder Singh Mand²

¹Assistant Professor in Management Studies, Path Rattan Jathedar Gurcharan Singh Tohra, Institute of Advance Studies in Sikhism, Bahadurgarh, Patiala, Punjab, India. Email: gaganmalhans@yahoo.in

²Assistant Professor in Commerce, University College Benra, Dhuri, Sangrur, Punjab, India.

Email: hsmmand27@gmail.com

*Corresponding Author

Abstract: Micro and small enterprises are influenced a lot due to the adoption of information technology in terms of performance. So, the prime aim of the study is the adoption of information technology and its effects on operational performance of micro and small enterprises in rural areas. A sample of 500 respondent firms from Punjab, Haryana and Himachal Pradesh has been collected from health care services and hospitality sector. To reach the target population judgmental sampling technique has been used. Multiple regression technique has been applied to analyse the results. The study found that the independent variable investment in information technology has positive impact on the operational performance. So, it is suggested that more and more investments in operational performance enhance entrepreneurial performance and also help in survival and generate profits.

Keywords: Information technology, Micro and small firms, Operational performance.

I. INTRODUCTION

Information technology is playing a major role in the growing economies of the world. Today, in the era of information technology, the world is witnessing tremendous advancements in technology every day (Khatri, 2019). It can be viewed in terms of sophistication, which has changed the entire world a lot. It has made everyone's life easy, fast and full of challenges. It has impacted all segments of society. According to Harindranath, Dyerson and Barnes (2008), Information Technology can increase micro and small enterprises efficiency and effectiveness in various ways, including making technical improvements and dropping transaction costs and enable them to improve performance and maximise firm benefits. Kambil, Brynjolfsson and Gurbaxani (1994) defined it as a technology that facilitates society to collect, create, merge, manage,

communicate and process information in multimedia and a variety of digital formats for different purposes. Technologies like personal computers, cable TV, mobile phones, the internet etc. all are part of information technology. Governments are also adopting IT to provide superior services to their citizens. Entrepreneurs now realise that information technology can be used as an engine to speed up processes, eliminate or reduce paperwork, increase the quality of output and service delivery, decrease storage costs, and enhance information sharing and communication. The rich diversity of different perspectives toward factors that affect the IT adoption process is available in huge body of literature. The review of previous research has identified several influencing factors. There is a vital need for micro and small-scale firms in rural areas to employ information technology to take advantage of substantial economic benefits (Charles and Frank, 2012). According to Slack *et al.* (2003) characteristics of rural communities are small population and geographic distance, but additionally add certain economic features including small markets and labour supply, lack of economic variation, and higher manufacture and servicing costs compared to urban areas. In line with earlier studies, this study concentrated on the impact of information technology investment on operational performance of MSEs in rural areas by using following research questions.

- Does information technology investment increase operational performance?

Most of the studies researched on information technology investment in the manufacturing sector and in medium and multinational companies. A very limited number of studies have emphasised the relationship between investment in information technology and the performance of micro and small enterprises in the service sector, which will form the centrifugal point of the current study. Most studies discussed only operational performance of urban area firms, but this study will discuss the operational performance of rural areas.

II. LITERATURE REVIEW

An earlier study by Heizer (2008) concentrated on operational performance capacity of a company in reducing management costs, order time, lead-time, getting better the effectiveness of using raw material and distribution capacity. Operational performance is highly significant because it effects the commercial success of a business. Bhimani (1993) investigated the various internal and external factors affect the operational performance of a firm: product quality, customer satisfaction, employee morale, efficiency and utilisation. Information technology is an important element in getting better the firms' operational performance so that the firm's goals can be achieved at the highest level. With the adoption of information technology accounting records can be kept accurately and the problem of duplication can be eliminated. Information technology helps firms to advertise their product at the global level. With the help of online retailing firms can enter the new market easily. Firms can take competitive advantages by using websites. Good customer relationship is the key to the success of every firm through e-mails or any other online modes firm can manage customer complaints and can build long-term relationships with customers and improve customer satisfaction and loyalty. According to Qi (2009), technology can be a driver of long-term competitive advantage, using quickly responding competitive conditions can be changed. A study of Peng and Lou, 2000 and Lee *et al.*, 2009 reveals that the significant factors of operational performance are deduction of the duplicate process, improvement of processing speed, increase new customer, keep an existing customer, easiness of customer data management, ties with other managers, ties with government officials, effective advertisement, entered new market quickly, bought new product in the market faster than competitor and increase the quality of information output.

III. DEVELOPMENT OF SAMPLING FRAME

The survey research is valuable to study sensitive opinions, attitudes, preferences, and behaviours of MSEs, this study applied survey research (a non-experimental field study design) to collect data from 500 owners of Punjab, Haryana

and Himachal Pradesh MSEs. According to the Companies Act, 2013 in the case of manufacturing enterprise, micro-enterprises investment is up to 25 lacs and in small enterprises, the investment in plant and machinery is greater than 25 lacs but up to 5 cr and in service enterprise, in micro-enterprises, it is up to 10 lacs and in small enterprises, it is greater than 10 lacs but up to 2 crore. Broadly, two service sectors are used for this study; health care services and the hospitality sector. These two sectors are the crucial sectors that contribute enormously to the progress of the Indian economy.

IV. EMPIRICAL MODEL AND ANALYSIS OF OPERATIONAL PERFORMANCE

Operational performance is used as the dependent variable and to measure operational performance of a firm variables are, deduction of duplicate process, increase in a new customer; easiness of customer data management, fast new market entry, and effective advertisement has been used. The independent variables are investment in IT (INVIT), assets (ASSETS), industry (IND), internal financing sources (IFS), gender (GENDER), age (AGE), owner education (EDUCATION), owner experience (EXPERIENCE) and a number of employees (EMPLOYEES) have been used to investigate the impact on the dependent variables. A regression equation is used to test the hypothesis and multiple regression is used to conduct the analysis. The following regression model is estimated for empirical analysis.

$$OP = \alpha + \beta_1 INVIT_1 + \beta_2 ASSETS + \beta_3 IND + \beta_4 IFS + \beta_5 GENDER + \beta_6 AGE + \beta_7 EDUCATION + \beta_8 EXPERIENCE + \beta_9 EMPLOYEES + \epsilon_i$$

In the above models, I refer to the micro and small enterprise, OP represents the operational performance of a firm, and ϵ_i represents individual control variables corresponding to micro and small enterprise i.e. is a normally distributed disturbance term. In the estimated model, $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6, \beta_7, \beta_8,$ and β_9 measure the magnitude at which independent variables change the dependent variables of micro and small enterprises. The result of the regression analysis for measuring the operational performance is as follows:

TABLE I: REGRESSION ANALYSIS FOR OPERATIONAL PERFORMANCE IN RURAL AREAS

| VARIABLES | DDP(Y_1) | INC(Y_2) | ECDM(Y_3) | FNME(Y_4) | EA(Y_5) |
|---------------------|--------------|--------------|---------------|---------------|-------------|
| INVIT(X_1) | 0.560* | 0.591* | 0.570* | 0.547* | 0.602* |
| ASSETS(X_2) | 0.120** | 0.103 | 0.123** | 0.115** | 0.116** |
| IND(X_3) | 0.251* | 0.262* | 0.180* | 0.224* | 0.233* |
| IFS(X_4) | 0.334* | 0.298* | 0.354* | 0.304* | 0.313* |
| GENDER(X_5) | 0.120 | 0.216* | 0.123 | 0.226* | 0.275* |
| AGE (X_6) | 0.115* | 0.143* | 0.149* | 0.168* | 0.163* |
| EDUCATION(X_7) | 0.253* | 0.244* | 0.226* | 0.241* | 0.226* |
| EXPERIENCE(X_8) | 0.242* | 0.271* | 0.261* | 0.241* | 0.231* |
| EMPLOYEES(X_9) | 0.152** | 0.182* | 0.175* | 0.164** | 0.168* |

| VARIABLES | DDP(Y ₁) | INC(Y ₂) | ECDM(Y ₃) | FNME(Y ₄) | EA(Y ₅) |
|----------------|----------------------|----------------------|-----------------------|-----------------------|---------------------|
| CONSTANT | 1.263 | 1.405 | 1.437 | 1.305 | 1.445 |
| N | 200 | 200 | 200 | 200 | 200 |
| R ² | 0.602 | 0.612 | 0.603 | 0.696 | 0.702 |

Notes: **p < 0.05, and *p < 0.01; Dependent variables include Deduction of duplicate process (*DDP*), Increase in new customer (*INC*), Easiness of customer data management (*ECDM*), Fast new market entry (*FNME*), Effective advertisement (*EA*) Independent variables are investment in IT (*INVIT*), assets (*ASSETS*), industry (*IND*), internal financing sources (*IFS*), gender (*GENDER*), age (*AGE*), owner education (*EDUCATION*), owner experience (*EXPERIENCE*), number of employees (*EMPLOYEES*).

The above Table I shows the coefficient of the determination (R²) of the model is 0.602. It explains that 60.3 per cent of variation in a deduction in the duplicate process is attributed to the variations in all explanatory variables. These variations are known as random variations. A variation of 61.2 per cent, 60.3 per cent, 69.6 per cent and 70.2 per cent is explained by an increase in a new customer, easiness of customer data management, fast new market entry, and effective advertisement.

DDP represents the deduction in the duplication process and reveal that change in one unit of investment in information technology (X₁) leads to a 56 per cent decreases in the duplication process. This shows that when micro and small-scale enterprises increase investment in information technology then it also decreases the duplication process in the work of a firm. Likewise, the regression coefficient of X₂, X₃, and X₄ reveals that investment in assets, type of industry and internal financing sources leads to a 12 per cent, 25.1 per cent and 33.4 per cent reduction in the duplication process. The one unit of change in age (X₆) of the respondent leads to 11.5 per cent change in the duplication process. With more years of owner education (X₇), owner experience (X₈) and more employees in the firm (X₉) leads to a 25.3 per cent, 24.2 per cent, 15.2 per cent reduce in the duplication process. The control variable change in gender is statistically insignificant.

INC signifies the increase in new customers and indicates that a change in one unit of investment in information technology (X₁) shows a 59.1 per cent increase in a new customer. This defines that with more and more investment in information technology the number of customers in a firm also increases. The other regression coefficient shows that type of industry (X₃), internal financing sources (X₄), change in gender (X₅) of respondents, with the one unit change in age (X₆) of the respondent, with more years of owner education (X₇), owner experience (X₈), and more employees in the firm (X₉) shows a 26.2 per cent, 29.8 per cent, 21.6 per cent, 14.3 per cent, 24.4 per cent, 27.1 per cent and 18.2 per cent increase in a number of the customers. The control variable investment in assets is statistically insignificant.

ECDM indicates easiness in customer data management and indicates that a change in one unit of investment in information technology (X₁) shows 57 per cent easiness in customer data management. This defines that with more and more investment in information technology a customer data management becomes so easy for a firm. The other regression coefficient

shows that more investment in assets (X₂), type of industry (X₃), internal financing sources (X₄) with the one unit change in age (X₆) of the respondent, with more years of owner education (X₇), owner experience (X₈) and more employees in the firm (X₉) reveals a 12.3 per cent, 18 per cent, 35.4 per cent 14.9 per cent, 22.6 per cent, 26.1 per cent, and 17.5 per cent easiness in customer data management. The control variable change in gender is statistically insignificant.

FNME shows fast new market entry and indicates that change in one unit of investment in information technology (X₁) shows a 54.7 per cent change in a new market entry. This defines that with more and more investment in information technology the firm can fast enter a new market. The other regression coefficient shows that more investment in assets (X₂), type of industry (X₃), internal financing sources (X₄), change in gender (X₅) of respondents, with the one unit change in age (X₆) of the respondent, with more years of owner education (X₇), owner experience (X₈) and more employees in firm (X₉) reveals a 11.5 per cent, 22.4 per cent, 30.4 per cent, 22.6 per cent, 16.8 per cent, 24.1 per cent and 24.1 per cent and 16.4 per cent change in a new market entry.

EF represents effective advertisement and indicates that change in one unit of investment in information technology (X₁) shows 60.2 per cent change in the advertisement of a firm. This defines that with more and more investment in information technology the firm can effectively advertise its product and services. The other regression coefficient shows that more investment in assets (X₂), type of industry (X₃), internal financing sources (X₄), change in gender (X₅) of respondents, with the one unit change in age (X₆) of the respondent, with more years of owner education (X₇), owner experience (X₈) and more employees in the firm (X₉) reveals 11.6 per cent, 23.3 per cent, 31.3 per cent, 27.5 per cent, 16.3 per cent, 22.6 per cent and 23.1 per cent and 16.8 per cent change in the advertisement of a firm.

V. DISCUSSION, CONCLUSIONS, LIMITATIONS AND RECOMMENDATIONS FOR FUTURE RESEARCH

This study's primary purpose was to test the impact of information technology investment in operational performance of MSEs in rural areas. The observed findings based on research participants' perceptions indicate the positive impact of information technology investment on performance of MSEs in rural areas. In the perspective of rural areas, independent

variables, investment in IT, change in industry, a unit of change in internal financing sources, a unit of change in age, level of education, year of experience, and a number of employees have shown statistically association with all dependent variables and significant at 1 per cent and 5 per cent level. The independent variable, investment in assets is not significantly related with increase in new customer. The independent variable, change in gender is also not statistically associated with deduction of duplicate process.

So, it is suggested that more and more investments in operational performance enhance entrepreneurial performance and also help in survival and generate profits.

VI. FUTURE RESEARCH

The study is restrained to 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 better understanding the effect of information technology on firm's performance.

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