THE RELEVANCE OF INFORMATION TECHNOLOGY TO THE MANAGEMENT OF MSMES IN INDIA – A CASE STUDY ON DODDABALLAPUR TEXTILE PARK

Kiran Kumar H*
Jayalaxmi P Shetty**

Abstract :

Information technology (IT) is the application of computers and telecommunications equipment to store, retrieve, transmit and manipulate data. Management comprises planning, organizing, staffing, leading or directing, and controlling an organization to accomplish the goal.

This study is aimed at understanding the relevance of information technology (IT) to the management of a textile cluster situated in Doddaballapur, rural Bangalore and thereby understanding the factors that influence the actual use of IT. It also enabled an understanding of the causes for hindrances in relating IT to other areas of management in addition to their core area which is production. This study employs regression methodology to determine the significance of the chosen variables with respect to technology intensity of the management. The study conducted among 41 respondents in the textile cluster of Doddaballapur Apparel Park revealed that two factors namely type of the organization and the level of IT in use had significance with actual usage. Perceived ease of use of IT also played a significant role in actual usage of the system. The result is not in line with potential suppositions.

Key words: *Information technology, textile clusters, perceived usefulness, perceived ease of use.*

INTRODUCTION

Computers got invented during 1950's while its growth started with Abacus and converged into a subject called Computer Science. Storing large amount of data, retrieving, manipulating, analyzing data has been a vital activity of an enterprise today. Be it a large organization or a small enterprise, high efficiencies, increasing productivity, quick decision making are the rules of a successful management. Therefore, firms may reduce the transaction costs of information-intensive activities by resorting to IT. These opportunities may favour small and medium enterprises (SMEs) that in most cases operate in a dense network of inter-firm relationships and consequently manage a great amount of information.

In due course, it was observed that the usage of the computers and its business applications in the SME segment was not actively promoted by Indian Government. In early 1980 and 1990s, Indian Government was looking at providing infrastructure such as industrial land and sheds, subsidized rates of power and economic zones with the vision of promoting SMEs to create employment.

This followed with focus on globalization of SME segment during which time manufacturing industry was fuelled to use automation, increase production capacities, improve efficiencies and productivity and reduce defects. Finished goods were in great demand in the international markets. Computer industry was also growing at lightning speed .IT tools such as DOS, Microsoft office tools, Power point presentations, Microsoft access etc came in as a boon to the growing industries .With the advent of internet the world became a small place .Enterprise level software with web developments and ERP enabled ease of operations in large enterprises, while small and medium enterprises were not beneficiaries to the advancements in IT due to resource and costs .However basic tools like PC, internet and web were in use. Thus Information and Communication technology took birth with MIS concepts, customized software and ERP to

Kiran Kumar H*, Sales Manager, Cyan Technology and Research Scholar BU., Email id : kini.suni@gmail.com
Jayalaxmi P Shetty**, Director, Grid Power Conversion Pvt. Ltd., Email id : jayashetty.shetty@gmail.com

serve the rapidly growing business.

If we look at the history of the textiles, the archaeological surveys and studies have found that the people of Harappan Civilization knew weaving and the spinning of cotton four thousand years ago. Reference to weaving and spinning materials is found in the Vedic Literature also. There was textile trade in India during the early centuries. A block printed and resist-dyed fabrics, whose origin is from Gujarat is found in tombs of Fostat, Egypt.[3] This proves that Indian export of cotton textiles to the Egypt or the Nile Civilization in medieval times were to a large extent. Large quantities of north Indian silk were traded through the silk route in China to the western countries. Indian silk were often exchanged with the western countries for their spices in the barter system. During the late 17th and 18th century there were large export of the Indian cotton to the western countries to meet the need of the European industries during industrial revolution. Consequently there was development of nationalist movement like the famous Swadeshi which was headed by the Aurobindo Ghosh. There was also export of Indian silk, Muslin cloth of Bengal, Bihar and Orissa to other countries by the East Indian Company.

The current scenario in textile industry is that the Ministry of Textiles in India has initiated many industrial policies, and committees, various organizations such as Public Sector Undertakings (PSUs), Export Promotion Councils, Advisory Bodies, Autonomous Bodies, Textiles Research Associations, Information technology, etc have been formed to support the Indian textile industries. Information technology is also one of the important functions under ministry of textiles to promote the usage of the IT in all these textile industries. They have also supported the Indian Textile industries by providing training and support to install the basic infrastructure such as computers, WiFi and small servers in textile sectors. However Indian textile sectors have realized the importance of IT application not only in their core area of production but also in other functional areas like accounting and finance, human resource and marketing. Hence most of the organization have developed customized ERP solutions and are intensive users of Tally packages .There is a need for integrating all functions of the organization for effective operations , but the process calls for huge investment in terms of infrastructure, implementation and integration.

Theoretical background

Earlier investment in IT is loosely defined as including computers and telecommunications equipment and their necessary hardware, software, and services (Dedrick, Gurbaxani, & Kraemer, 2003). Firms regularly invest in IT for such activities as payroll, human resources, accounting, supply chain management, and a host of other functions (Rao, Metts, & Monge, 2003). While smaller firms have been more reluctant to invest heavily in IT, larger firms have found it almost imperative and profitable (Stimmel, 2001). Of particular concern to smaller firms is the resource requirements associated with IT investment (Pool, et al., 2006).

The degree of sophistication of both information and planning and control systems is a prominent factor in determining the success or failure of business growth which becomes increasingly important as businesses grow larger and more complicated (Churchill & Lewis, 1983). In addition, these systems, such as information systems, must be acquired in advance of growth so that they are in place when needed. By using IT to automate business processes and to improve information gathering, access, and quality, small firms can transform their entire business (Dedrick, et al., 2003). Furthermore, as the phenomenon of multifactor productivity (MFP) maintains, these improvements can be gained without additional investment in resources. Over time, IT investment has been shown to be associated with a shift to higher skilled workers. In fact, Lester, et al. (2003) found information processing to be the strongest indicator of a

firm's life cycle stage.

The literature on IT investments by organizations have focused mainly on the antecedents of IT investment, that is, identifying the external, technological, and organizational factors that would persuade a firm to adopt IT. External forces include pressure from competitors, suppliers, and customers as well as the availability of government incentives and technology consultants (Aguila-Obra & Padilla-Melendez, 2006; Kim & Jee, 2007). Studies focusing on technological factors have examined the potential benefits and trade-offs of IT investments along with the influence of existing related technologies. Organizational support for IT investment can depend on the firm's structure, processes, size, culture and technological capabilities of various firm members, etc.

For some SMEs, few factors found to have a profound influence on IT investments are the perceived cost savings and income generation benefits, external pressure from rivals, suppliers, and buyers ,organizational readiness, and perceived ease of use (Grandon & Pearson, 2004; Mehrtens, Cragg, & Mills, 2001). IT investment in SMEs differs from IT investment in large firms because a smaller number of people have decision-making responsibility, standard procedures are not instituted, long-term planning is limited, and there is more reliance on external IT experts in SMEs (Premkumar, 2003). Nonetheless, IT capabilities may enable the long term survival of SMEs in a number of ways. They provide access to external knowledge and financial resources, create trust and legitimacy through widespread information dissemination, and generate more social network ties (Morse, Fowler, & Lawrence, 2007).

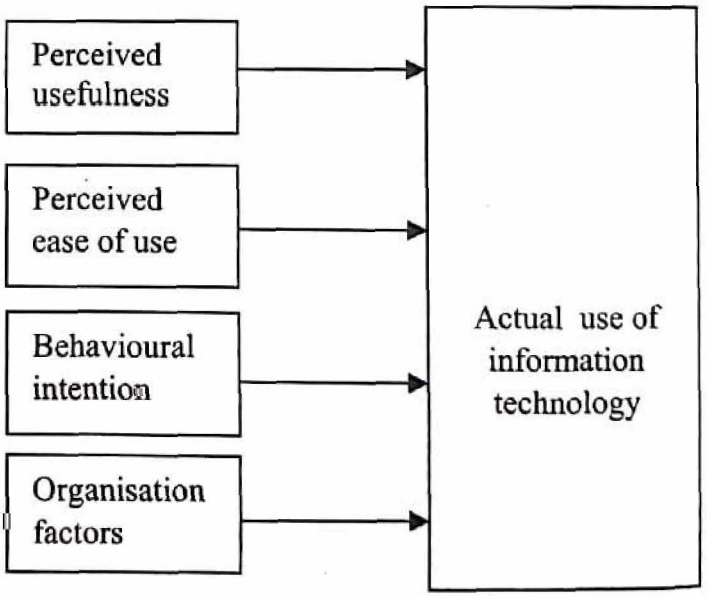
IT investment itself is a process that can occur in stages identified as: initiation, adoption, adaptation, acceptance, reutilization, and infusion (Aguila-Obra &

Copyright © 2008 Institute of Behavioral and Applied Management. All Rights Reserved. 76 Padilla-Melendez, 2006). An in-depth qualitative study by Bruque & Moyano (2007) found that the factors influencing IT investment (e.g., managerial support, firm growth, and firm size) have little or no role in its implementation. Other issues such as staff training, staff socialization, power structure, and hierarchies play a larger role in IT implementation. For SME executives, once an IT is adopted, other challenges remain including keeping current with changing IT, training and educating employees, and receiving timely and accurate information (Riemenschneider & Mykytyn, 2000). The same can be seen by Kazanjian's OLC and Crises Model.

Research Model

The study engages 24 variables that would contribute to the actual usage of IT in textile clusters, out of which 23 are taken as independent variables and 1 factor becomes the dependent variable. The dependent variable is defined as technology intensity as perceived by an individual, while the independent variables comprise of Organisational factors(O) , Perceived usefulness (PU) ,Perceived ease of use (PEU) and Behavioural intention (BIU) .All the factors are summarised into the conceptual model (refer Fig.1) .

F-1. Conceptual model



Determinants

Refer Table T-1

The measurement instrument consists of two sections. First section consists of PU, PEU and BIU which is based on the Technology Acceptance Model (TAM). Scales adapted are from Davis, at al (1989) and Venkatesh, at al (2003). All constructs in this model are operated using standard scales from past literature.

Perceived usefulness, Perceived ease of use and Behavioural intentions comprise of 5 variables each. All 15 variables measured the latent variables PE,PEU and BIU using Likert scale with five points positively packed , cNovember 5, 2014oded from 1 to 5 in sequence of strongly disagree , disagree , neutral , agree and strongly agree.

Organisational factors (OF) under section two which consists of 9 variables, sketch out the demography of SME in terms of its age, type as in micro, small and advanced, based on investment in plant and machinery, stage of the organisation, whether it is in expansion stage, consolidation or diversification stage, employee strength, percentage of qualified employees, level of IT and core area where used. Out of the 9 variables, O9 is taken as dependent variable, which measured technology intensity on three scales, novice, intermediate and advanced.

Figure 1 shows an overall design of a model to communicate the relevance of information technology through 4 factors i.e. PU, PEU, BIU and OF having significance on the actual use of the system. Use of TAM model is predicated on the management of textile clusters for understanding conceptual issues related to actual use of the system. PU refers to the users' belief that using IT would enhance his performance.PEU refers to the users' belief that IT would be free of cognitive effort. BIU refers to the users' attitude towards usage of IT.

The model leads to assumptions based on our research objectives and literature study to derive the following hypothesis

H1 - PU is significant to the actual usage of IT

H2 –PEU is significant to the actual usage of IT

H3 – BIU is significant to the actual usage of IT

H4 – OF is significant to the actual usage of IT

Research Methodology

This phase of study comprises of survey held amongst the textile cluster situated in Doddaballapur, rural Bangalore. These clusters were chosen because they were granted the SPV to enhance cluster modernisation and restructuring.

Exploratory research is done in attempting to understand practical problems at the small and medium enterprises at micro level, the level of innovation and the need for advancement in technology .A sample of 41 SME respondents of the textile cluster in Doddaballapur Apparel Park and Doddaballapur Integrated Textile Centre were considered for the study. Responses were collected using electronic questionnaire on a one to one basis .Telephonic responses were also obtained from those who had headquartered out of the integrated park. A structured questionnaire of 24 questions sought response through single choices and five point Likert scale on a sequence of strongly disagree, disagree, neutral, agree and strongly agree.

The research methodology is conducted in two sections

1. Confirmatory factor analysis of variables of section 1 followed by linear regression.
2. Ordinary least square regression - stepwise regression of variables of section 2 using backward elimination.

The first step involved a) Drawing out descriptive statistics of 24 variables b) Reliability test using Cronbach Alpha coefficient c) Confirmatory factor analysis by forcefully loading items onto latent variables , PU,PEU and BIU. d) Factor scores thus obtained ,were subjected to linear regression on the dependent variable O9(technology intensity).

The second step performed a stepwise regression where all independent variables under organisation factor were added to a single regression model by selection method. This method engages Ordinary least square regression.

Results

Table 2 (T-2) revealed descriptive statistics of all 24 variables , where the mean midpoint is 4.24 and the standard deviation is wide spread between the range of 0.374 and 1.341. Table 3 (T-3) established validity and reliability of the model with the help of Cronbach's Alpha co-efficient (0.792 > 0.7).

Table 4 (T-4) revealed that factor 2 is significant ,consequent to its p value being 0.00119 (<0.05) .Perceived ease of use is the only factor that fits its data to the model. Result from table 4 (T-4) indicate that the scales are not reliable and only PEU can be considered to be influencing the actual usage of IT . The ease of operation of IT , the ease to interact with IT tools with clarity and understanding , the flexible interaction and easy to be skilful in usage , all contribute to impact the actual use of IT . The study did not find significant relations between Perceived usefulness and Behavioural intentions which were otherwise found to be consistent by our survey findings though.

Table 5 (T-5) identified factor O3 at p value 0.002 and O7 at p value of 0.003 to be influencing O9 . The predictive abilities of Type of the organisation and Level of IT play a role in actual use of IT. The study rendered all other organisation factors as insignificant. Though our study revealed that most factors did not influence the usage of IT , potential suppositions did not fall in line with the findings.

Discussions of findings

Turnover of firms and age of firms do not have a good significance and it does not make sense here, since high turnovers are not typical of relevance of IT. 63% of the textile clusters are over a decade old in the industry , a few being in the range of 25 years to 50 years. Organisation stage of the clusters were categorised largely into expansion mostly followed by clusters in consolidation and diversification stages. Textile being labor intensive industry , employee strength largely fell into the range of greater than 250 employees . 93% of the clusters used IT in their core area of production only. This is explained by significance of O3 , i.e. type of the organisation , whether micro, small or medium . Software usage was noticed even in micro industries .O7 , another significant factor is the level of IT in use . 93% of the clusters use low end ERP and customised software to automate their production machineries. Hence under section 2, H4 remains invalid disapproving our assumption that organisation factor is significant to the actual use of IT. It has to be understood that though software is in use in the production area , the management has not taken up integration of information technology in other supporting areas of the enterprise like Finance , HR , Marketing etc.

The factors PU and BIU under section 1 are a doubtful prediction. It suggests that most SMEs are not in sync with the belief that IT would enhance performance nor are they being driven by their attitude towards usage of IT. Perceived usefulness is not showing relevance here.

No significant influence on intention to use might possibly be because of not perceiving usefulness. ERP has a monolithic structure that is not suitable for most SMEs who are limited by resources like money, staff and IT skills.

Factor PEU is showing strong significance conveying that the belief in IT easing cognitive effort and ease of use can have relevance in its usage. The final model suggests that actual use of IT can be rendered relevant only with perceived ease of use of the system.

Ekaterina & Victor (2011) revealed that existing researches indicate strong positive correlation between ICT and economic efficiency and competitiveness of SMEs.

Our study shows low level of diffusion in IT

integration in the management of SME clusters. This paper depicts that the real needs of SME clusters are different from possibilities. A growing number of SME clusters have expressed their readiness to invest in information technology but the clusters in study are not yet ready for the technology upheaval. Traditional disadvantages due to size limitations drive them to remain on sustenance levels than dive into expansion plans, frequently bogged down by capital limitations and challenges in technical knowhow.

In our study we are not analysing the success rate of IT solutions. The paper has chosen variables based on several studies and TAM model .It has aimed at finding which variable can impact relevance of IT to the management of SME clusters. We wish to state that our sample size is small and confined to a particular geographic region in rural Bangalore,. The inferences provoke further study to reach out to more clusters that are launched on the Special Purpose Vehicle.

The limitations to this study are firstly peculiarities of each cluster. Though macro environment will remain the same, micro environment can differ depending on the type of cluster. Additional research needs to be done in this area. Secondly, the construct is composed of individual perception of personal phenomenon work in future can be aimed at being more objective in analysis of behaviour and perceptions.

Future research can also engage study of adaptability of techno commercial solutions like cloud computing for the growing SME segment, by extending TAM model.

References

- Adizes, I. (1979). Organizational passages: Diagnosing and treating life cycle problems in organizations. Organizational Dynamics, 8, 3-24.
- Aguila-Obra, A.R. & Padilla-Melendez, A. (2006). Organizational factors affecting internet technology adoption. Internet Research, 16 (1), 94-110.
- Bruque, S. & Moyano, J. (2007). Organisational determinants of information technology adoption and implementation in SMEs: The case of family and cooperative firms. Technovation, 27, 241-253.
- Churchill, N., & Lewis, V. (May-June, 1983). The five stages of small business growth. Harvard Business Review, 61, 30-50. Copyright © 2008 Institute of Behavioral and Applied Management. All Rights Reserved. 85
- Dedrick, J., Gurbaxani, V., & Kraemer, K. (2003). Information technology and economic performance: A critical review of the empirical evidence. ACM Computing Surveys, 35 (1), 1-28.
- Drazin, R., & Kazanjian, K. (1990). Research notes and communications: A reanalysis of Miller and Friesen's life cycle data. Strategic Management Journal, 11, 319-325.
- Grandon, E.E. & Pearson, J.M. (2004). Electronic commerce adoption: an empirical study of small and medium us businesses. Information & Management, 42, 197-216.
- Kazanjian, R. (1988). Relation of dominant problems to stages of growth in technology-based new ventures. Academy of Management Journal, 31, 257-279.
- Kim, M-K, & Jee, K-Y. (2007). Factors influencing strategic use of information technology and its impact on business performance of SMEs. ETRI Journal, 29, 497-506.
- Lester, D., & Parnell, J. (2006). The complete life cycle of a family business. Journal of Applied Management and Entrepreneurship, 11 (3), 3-22.
- Lester, D., Parnell, J., & Carraher, S. (2003). Organizational life cycle: A five-

stage empirical scale. International Journal of Organizational Analysis, 11, 339-354.

- Mehrtens, J., Cragg, P.B., & Mills, A.M. (2001). A model of internet adoption by SMEs. Information & Management, 38, 165-176.
- Miller, D., & Friesen, P. (1984). A longitudinal study of the corporate life cycle. Management Science, 30, 1161-1183. Copyright © 2008 Institute of Behavioral and Applied Management. All Rights Reserved. 87
- Morse, E.A., Fowler, S.W., & Lawrence, T.B. (March, 2007). The impact of virtual embeddedness on new venture survival: Overcoming the liabilities of newness. Entrepreneurship Theory & Practice, 139-159.
- Oviatt, B. & McDougall, P. (1995). Global start-ups: entrepreneurs on a worldwide stage. Academy of Management Executive, 92, 30-43.
- Pool, P., Parnell, J., Spillan, J., Carraher, S., & Lester, D. (2006). Are SMEs meeting the challenge of integrating e-commerce into their businesses? A review of the development, challenges and opportunities. International Journal of Information Technology and Management. 5 (2/3), 97-113.
- Premkumar, G. (2003). A meta-analysis of research on information technology implementation in small business. Journal of Organizational Computing and Electronic Commerce, 13, 91-121.
- Rao, S., Metts, G., & Monge, C. (2003). Electronic commerce development in small and medium size enterprises. Business Process Management Journal, 9 (11), 11-32.
- Rasheed, H.S. (2005). Turnaround strategies for declining small business. Journal of Developmental Entrepreneurship, 10, 239-252.
- Riemenschneider, C.K. & Mykytyn, P.P. Jr. (2000). What small business executives have learned about managing information technology. Information & Management, 37, 257-269.
- Smith, K., Mitchell, T., & Summer, C. (1985). Top level management priorities in different stages of the organizational life cycle. Academy of Management Journal, 28, 799-820.
- Davis et all (2009)
- Venkatesh et all (2009).
- http://en.wikipedia.org/wiki/Textile_industry_in_India

Appendices

Table-1. Factors influencing actual usage of IT

Sl. No	Factors	Item numbers
SECTION 1		
1	Perceived usefulness (PU)	PU10 to PU14
2	Perceived ease of use (PEU)	PEU15 to PEU19
3	Behavioural intention to use (BIU) the system	BIU20 to BIU24
SECTION 2		
4	Organisation factors	O1 to O9

Table-2 Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error
Age of the firm	41	1	4	3.05	1.341	-1.283	.724
Turnover	41	1	4	2.32	1.213	-1.475	.724
Organisation type	41	1	3	2.44	.709	-.454	.724
Stage of organisation	41	1	4	2.44	1.001	-.954	.724
No of employees	41	1	4	2.98	1.107	-.740	.724
Percentage qualified	41	1	4	1.83	.892	-.942	.724
Level of IT	41	1	4	3.85	.573	17.996	.724
Core area of usage	41	1	3	2.90	.374	18.072	.724
IT knowledge	41	1	3	2.46	.596	-.530	.724
Accomplishes tasks	41	2	5	4.51	.746	4.467	.724
Increases productivity	41	3	5	4.56	.634	.342	.724
Enhances effectiveness	41	3	5	4.37	.698	-.685	.724
Make job easier	41	1	5	4.10	1.091	.320	.724
Increases profits	41	1	5	3.68	.986	.892	.724
Easy usage	41	3	5	4.24	.624	-.507	.724
Disseminates information	41	1	5	3.76	.888	.992	.724
Interaction clear and understandable	41	2	5	3.78	.881	-.605	.724
Interaction flexible	41	3	5	3.85	.760	-1.195	.724
Easy to be skilful	41	3	5	4.17	.771	-1.230	.724
Intend to use for expansion	41	4	5	4.63	.488	-1.754	.724
Intend to use in core area	41	3	5	4.54	.674	.188	.724
Intend to use often	41	3	5	4.63	.581	.972	.724
Intend to use in future	41	3	5	4.49	.675	-.169	.724
Expect usage in future	41	3	5	4.61	.628	.913	.724
Valid N (listwise)	41						

Refer to IBM SPSS Base

Table-3 Cronbach's Alpha Reliability Co-efficient

Cronbach's Alpha	N of Items
.792	15

Table - 4 Result of linear regression after applying confirmatory factor analysis

Coefficients:				
	Estimate	Std. Error	t value	Pr(>|t|)
(Intercept)	2.463415	0.082865	29.728	< 2e-16 ***
fact1	-0.001886	0.083451	-0.023	0.98209
fact2	0.349248	0.099479	3.511	0.00119 **
fact3	-0.122816	0.096330	-1.275	0.21028

Table - 5 Result of ordinary least square regression using backward elimination.

Coefficients:				
	Estimate	Std. Error	t value	Pr(>|t|)
(Intercept)	0.20688	0.49429	0.419	0.67797
data$O3	0.42951	0.13367	3.213	0.00272 **
data$O5	-0.15431	0.07963	-1.938	0.06030 .
data$O7	0.43286	0.13636	3.174	0.00302 **