To Study the Capability Model for Sustainable E –Business Environment in Construction Industries in Maharashtra Region

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Abstract : This paper focuses on studying a capability model for an individual firm in relation to e business in construction industries within Maharashtra region. The paper describes a framework for theorization of adoption of e- business overcoming different barriers faced by them. Capability model though it comes from the field of software development, it is also used as a general model to aid in business processes. The adoption of e- business is considerably less in small and medium enterprises due to barriers like lack of knowledge, lack of trust, lack of fund which requires attention. This research study confirms this lacking and focuses on providing solution through capability frame work.

Keywords— E-business, capability model, SMEs, framework, construction industries

I. Introduction

'The Maharashtra Small Scale Industries Development Corporation Limited' (MSSIDC), wholly owned by the Government of Maharashtra. MSSIDC is born - On October 19, 1962 MSSIDC was registered as a private limited company. Established in 1962, Maharashtra Small Scale Industries Development Corporation Limited (MSSIDC) was initially envisaged as an agency to supply raw materials and to extend marketing assistance to small scale units. Its basic objective was to help the small scale Industries to develop and grow to the fullest extent (www.mssidc.org/)

However, over the years, MSSIDC has become India's leading corporation, continuously responding to the expanding and diversified needs of Small Scale Industries. It is increasingly assisting SME & rural industries and providing support services like consultancy, counseling, marketing, training, import-exports, entrepreneurship development program, etc.

Maharashtra has been in the forefront of industrialization. The state has always followed progressive industrial policies and industry– friendly measures. Though much advancement is achieved by SMEs yet there progress is restricted by certain barriers. These barriers vary in different degrees. There are difficulties which are faced by SMEs, some of which emerge as social-cultural practices, economic barriers, organisational – structural, influences and pressures to adopt business strategy. When taken a deeper look into the difficulties faced by SMEs are nothing but gaining commercial efficiencies through effective design, construction information management and procurement and contract management. These barriers are caused by lack of proper communication, lack of awareness, lack of security, uncertainty regarding the financial returns from investments and lastly by resistance to innovation.

II. E-business in SMEs

Although there is no universally accepted definition, researchers, governments and business organisations have suggested various target ranges of enterprises that can be classified as e–business. The term *"e-business"* is commonly used to describe Internet-enabled systems that provide information, facilitate transactions or provide shared business processes (Bloor Research, 2005). The Department of Commerce argue that e-business technology typically supersedes either paper-based systems or Electronic Data Interchange (EDI) to provide an improved communication channel between business partners.

E-commerce is essentially a part of e-business concerned with financial transactions and therefore does not require shared or redesigned business processes. It is further argued that by integrating business processes, then consultants, contractors and the wider supply chain can perform more efficiently and reliably; supply chains can be consolidated; and the long term relationships between participants in the construction process can be enhanced. For the purposes of this research we have adopted the NOIE (2001c) definition for e-business namely "the facilitation and integration of business processes". (E-Business Adoption in Construction: International Review on Impediments 2003).

Below seven relevant examples of E-business in the construction industries are given:
1. Project webs
2. E-procurement (including e-ordering)
3. E-tendering
4. Knowledge management
5. Document management
6. Supporting the principal
7. Approaching the individual customer

It is been made clear that e business not only provides industries with increase in their productivity but also improved efficiency. If traditional methods are replaced with modern tools, then works can be completed at a faster rate. It also proves beneficial in reducing the confusions, misplacement of data, miscommunication.

III. Capability Model

This research aims to develop an "e-business Capability Model (CM)" as a tool for step-wise improvement of capability to carry out construction e-business activities. The benefit of such tool is to help construction organisations to know how to move from one level to the other by improving their e-business capabilities and thereby improving organisational processes.

The Capability Maturity Model was originally developed as a tool for objectively assessing the ability of government contractors' processes to perform a contracted software project. The model is based on the process maturity framework first described in the 1989 book managing the Software Process by Watts Humphrey.

Rather than just collecting a bunch of tasks that the performer should be able to do, the capability model formats them out in a more manageable framework in order to gain an understanding of what exactly makes an effective performer.

A maturity model can be viewed as a set of structured levels that describe how well the behaviors, practices and processes of an organization can reliably and sustainably produce required outcomes. A maturity model can be used as a benchmark for comparison and as an aid to understanding.

IV. Research Methodology

A methodology will be designed to understand the need analysis of the e -business sector of SMEs in Maharashtra in order to determine if there is an area that requires urgent attention. This research is carried out to determine and evaluate e- business skills needed by the SME sector in Maharashtra using a capability model.

The objectives of this thesis are:-

1. Defining an SME in the context of business environment in India.

2. Analysing the local business environment in Maharashtra and to determine the performance of the sector, with a view to identify some of the problems encountered by SMEs in the state.

3. Research and consideration of the specific e business skills needed by the small business sector in Maharashtra.

4. Analysing the availability of e-business skills in the SME sector in Maharashtra by empirical research and to evaluate whether there is a need to improve the e-business skills in the state.

5. Establishment of the effect of the identified e business skills factors have on productivity of SMEs.

6. Recommendation of strategies of e business skills using capability model that will improve productivity of SMEs.

There are two main approaches to researching and obtaining data on the subject matter being analysed. The first method is a positivist approach a quantitative approach and the other main approach is qualitative approach.

It is a difficult task to identify an appropriate sample frame related to SME sector since there is a lack of comprehensive database of SMEs in the state. In addition, there are many businesses that may have failed due to insufficient knowledge on e-business. There may also be several SME companies that are not using e- business at all. These SME companies cannot stand the competitive market due to lack of e- business advancements.

This research is therefore carried out on with a sample size which was determined through statistical methods. However, distribution of questionnaires was done through random distribution. The questions were developed from information gathered from the review of literature and preliminary survey.

A sample size of thirty industry experts, entrepreneurs and academics was utilised for the research as this is considered an appropriate sample size to obtain diverse feedback from experts.

A questionnaire was developed which was divided into four sections. The first section A focused on gathering demographic information of the interviewee, section B focuses on gathering information on shortcoming of SMEs in Maharashtra. Section C is for understanding e- business requirements in SMEs. Section D is to evaluate whether introduction of capability model in SMEs will act as a solution for SMEs growing needs.

The survey is carried out by mailing the questionnaire to the interviewee and also by direct researcher to respondent conversations in person or by phone and recording answers. The interview conducted is structured interview. The Likert Scale was used in the investigation whereby the respondents were required to pick a number from the scale to show how much they agreed or disagreed with the statement/question.

V. Data analysis

Different analytical tools will be used to analyse the responses from the survey. These are index and correlation analysis.

- Index

Frequency index explains the usual occurrence or exhibiting of the characteristics of the factors. The nearer the value of frequency index of the factor is to unity (1). A ranking of frequency indices were done to ascertain the most frequent factors.

$$\text{Frequency index (F.I.)} = \frac{3n_1 + 2n_2 + n_3}{3(n_1 + n_2 + n_3)}$$

Where: n_1 – number of respondent answered 'high'

n_2 – number of respondent answered 'medium'

n_3 – number of respondent answered 'low'

Important index facilitate the identification of tactical approaches to increasing productivity. The nearer the value of importance index of the identified factor is to unity (1), the more significant, a greater impact on e business productivity.

$$\text{Important index (I.I.)} = \frac{5n_1 + 4n_2 + 3n_3 + 2n_4 + n_5}{5(n_1 + n_2 + n_3 + n_4 + n_5)}$$

Where: n_1 – number of respondent answered 'strongly significant'

n_2 – number of respondent answered 'significant'

n_3 – number of respondent answered 'average'

n_4 – number of respondent answered 'not significant'

n_5 – number of respondent answered 'strongly not significant'

Severity index gives the analytical explanation of the critical effect and significance to productivity. It gives the aggregate effect. When a severity index approaches unity (1), it gives the explanation of how severe the factors are to e business and productivity.

Severity index (S.I.) = Importance index × Frequency index

- **Correlation analysis**

A Pearson-Moment rank correlation was employed to determine the effect of e -business on productivity. Hence the frequency and importance indices were used to establish the relationship between e − business and productivity. Below is the mathematical determination of Pearson rank coefficient R.

$$R = \frac{S_{xy}}{\sqrt{(S_{xx} S_{yy})}}$$

$$= \frac{\sum (x - x)(y - \bar{y})}{\sqrt{(\sum(x - x)^2 \sum(y - \bar{y})^2)}}$$

Where S_{xy} = standard deviation of x and y
S_{xx} = standard deviation of x
S_{yy} = standard deviation of y
x = mean of x
y = mean of y

R ranges between -1 and 1 i.e. $-1 \leq R \leq 1$. The nearer and positive the value of R, the stronger the influence the independent variables (frequency index) have on the dependent variable (important index) positively. On the other hand, the opposite of the above explanation occurs when R is negative.

VI. Conclusion

The data will be analysed using index method and correlation analysis method. Depending upon the results obtained, a capability model frame will be established for a individual industry, depending upon the contributing factors which act as a barrier to the e business use in construction industry. Thus capability model will lead integration within the industry among work chains as well as lead to growth of work chain between different industries. This further will lead to increase in productivity of construction industries and overall growth of the same. Thus SMEs in the state will contribute more effectively and efficiently to the economic stability of the state.

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