

# B2B E-Commerce Progression using Stage model in Malaysian SME

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## ABSTRACT

The implementation of business- to- business electronic commerce (B2B e-commerce) is being categorized as a system with high degree of difficulty since it involves complexity of the multiple relationships and interactions between trading partners. Thus, for Small Medium Enterprise (SME) to partake in the B2B e-commerce activities, they need to have attained some reasonable level of e-readiness measures. Measuring the e-readiness and identifying the elements that influenced the B2B e-commerce implementation are initial steps towards a better understanding of the technology successfulness and reduce the risk of its failure after introduction. Drawing from this, we present the e- readiness stage model which contains multi-dimensional perspectives of B2B e-commerce readiness influence factors. A well considered selection of individual, organizational and environmental indicators provides a more comprehensive understanding on the important elements of B2B e-commerce implementation success. Through survey on e-readiness assessment of 123 SME, the current state and position of an organization with respect to B2B e- commerce readiness has been analyzed and identified. The results explained the e- readiness progression characteristics at each stage, which can be used to provide practical guidance for SME to improve the adoption level as well as provide road map towards a better B2B e-commerce direction for business organizations.

**Key words:** B2B e- commerce, e- readiness, SME, and stage model

## 1. INTRODUCTION

The increasing importance of innovative inter-organizational system for business integration and collaborations has attracted attention from academicians and practitioners. In the B2B environment, e-commerce has played a significant role in changing the buying and selling processes of the organizations. In Malaysia, the growing importance of B2B e-commerce has been widely recognized especially with the introduction of the “Flagship application” of the Multimedia Super Corridor (MSC) in 1996. MSC has forced a lot of companies to explore the functionalities and the opportunities of e-commerce through the accessibility of international market for goods, labor and information as a chance to access wider markets, operate efficiently and compete fairly. However, considering the various constrains of SMEs compared to large organizations in terms of expert, financial and technological resources, failures of such a complex and expensive B2B e-commerce project might effect their businesses. This highlight how importance for SMEs to know the prerequisite factors before adopting the technology. Thus, the assessment of readiness for an innovation in B2B e-commerce can reduce the risk of its failure after introduction.

In addition, the dedicated B2B e- commerce readiness progression stage model able to diagnose e- readiness pattern of SMEs and propose the solutions strategically [1]. This is important to understand the B2B e-commerce attributes for each e- readiness adoption level as it could provide practical guidelines to firms. Although there are a

few e- readiness assessment models used in practice, relatively little is published in academic research journals on the issue of B2B e-commerce [2]. There is, for instance, still a dearth of research aimed at developing e- readiness models that would made it easier for B2B e- commerce practitioners to understand and create necessary business strategies, but the existing theories and models can only provide fragmented answers due to its limited perspectives.

## 2. THE STAGES OF GROWTH MODEL

Researchers in the field of Information System (IS) believe, technology implementation have sequence stages which normally started from the simple to the most sophisticated application based on the application complexity level [3]. The stages of growth model is a popular framework for describing the typical development patterns of organizational information systems in general [4]. It is assumed that the higher the stage that a company reaches, the greater will be the benefits obtained. The Stages of growth theories by Gibson and Nolan [5], Nolan [6], Earl [7], and Galliers and Sutherland [8] have been used widely as a basis to study the IS implementation through considering the growth, expansion and maturity of the technology over a period of time.

Other stages of growth models which used to provide understanding on the progression of e-commerce development are e-Procurement Implementation Stages [9], E-Commerce Maturity Model [10] and [11], the Commitment-Implementation Matrix Model [12], the E-Commerce Marketing Mix Levels [13], the E-Business Lifecycle Model [14], Intranet Maturity Model [15], E-Commerce Adoption Model [16], eBIS (e-business Information System) maturity model [17] and the Stages of Growth for e-Business (SOGe) model [14], [18] and [19], enterprise maturity models of ISO 9001, the CMMI (Capability Maturity Model Integration) and ISO/IEC 15504-7 standard [20]. Their studies combine different elements of organizational learning, practices, barriers, drivers and other e-commerce approaches which provide a significance contribution to the organization change process. In general, the models tend to cater on the various characteristics of the organizations through providing conceptual overview as well as the specific issues that should be addressed as part of e- commerce management.

In addition, most of the existing research used the concept of linearity model which the

companies have to follow the sequence of focusing on simple tasks then move to external forms of integration or more complex tasks. However, the existing researches does not focus on providing an understanding of the actual requirement of B2B e-commerce readiness per se. It is believed that such understanding is not only important for practitioners, but also offers a significant insight into the complexity of the B2B e-commerce.

## 3. RESEARCH METHODS AND MATERIALS

Due to the wide acceptance of SOGe model among IS researchers [18][4][19] in describing the current state and position of an organization regarding information system and e-business implementation progress, the model has been adapted as a basis to develop B2B e-commerce readiness progression staged model. However, it should be noted that the process of constructing B2B e-commerce staged model is complex and consists of several phases. The phases involved the identification of B2B e-commerce readiness indicators based on dimensions defined in Table 1. Using Analytical Hierarchy Process (AHP) the relative weights for each indicator and range of index score for each e-readiness staged level were identified. Due to space constraint, we only include the range of index score for each e- readiness stage as shown in Table 2. Further explanation on the methodology involved for each phase can be defined in Zakaria and Janom [21]. Based on the e- readiness index score formulation, questionnaire was used to elicit responses from CEO or owner of the organizations with the objective of assessing the availability of e-readiness elements in the organizations. The relative weights of all selection criteria were used to calculate the scores for B2B e- commerce readiness of the organization using a 5 point likert scale of: 1. strongly not agree 2. not agree 3. neutral, 4. agree , and 5. strongly agree, and calculated the final score for e-readiness measurement. The scores for all the indicators gathered from the responses to the questionnaire were then tabulated according to the B2B e- commerce readiness staged index score as shown in Table 2. The questionnaires were distributed to 500 SMEs, however, only 123 SME replied to the questionnaires.

**Table 1: Quantity Assessed in B2B e- commerce Readiness Progression Model**

Aspect	Conceptual definition
Personal traits	Personal traits address the motivation, personality and characteristics of owner/ top management regarding the adoption of B2B e-commerce. Specifically it assess the optimism, innovativeness, and other entrepreneurial attitudes.
Organizational features	This is based on availability of organization to fulfil the requirements of B2B EC (e-commerce) in terms of technology affordability, policies and procedures, innovation culture, strategies and visions, governance as well top management commitment.
People competencies	This consider the social and cultural aspects encompasses of competencies, relationships, exposure and skills of employees in organization with regards to B2B EC technology
Technological resources	The variables include the availability of technology infrastructure and the flexibility and the capability of existing system.
Business process	This cover the practices, actions, business process, the flexibility, working rules, collaborations and communications, procedures that compliment and accommodate the B2B EC technology activities within and between organizations.
Market forces	This construct includes the e- readiness assessment on related suppliers and competitors with regards to B2B EC. The constructs include the integration, collaboration and cooperative norms among trading partners.
Supporting industries	The attributes involve the support of industries on the availability of telecommunications, financial, trust enablers, IT industry and consultant services.
Government	This involves the conduciveness of the B2B EC climate, economic, financial support, national infrastructure conditions and e-government initiatives

#### 4. RESULTS

The breakdown of the percentages of SME readiness level for each dimension is shown in Table 3. The stages include four phases, of stage 1, stage 2, stage 3 and stage 4. Based on the personal traits aspect, none of the organization at initiation level (0%), 17 organizations at stage 2 (13.82%), ninety three organizations are at stage 3 (75.61 %) while the other thirteen organizations are at maturity stage (10.57%). With respect to organization features

aspect, the results are quite similar which majority of the organizations are at stage 3 (72.36%) and only 15.45% of the organizations have reached maturity level. In terms of competencies, the results are quite similar, except that about 25 organizations already at stage 4 compared to only 19 organizations at the same stage in organizational features aspect. The other perspectives of technology, business process, market forces, supporting industries and government, shows that there are not much differences in terms of organization distributions in all e- readiness stages. From the findings majority of organizations (more that 65%) have reached stage 3, and only about 8% to 15% have reached maturity stage.

In general, the results provide understanding on the B2B e- commerce readiness pattern of SME in Malaysia. With refer to the findings, only 1 SME was still at stage 1 in terms of business process and market forces. This shows that the company has very limited use of IT and face many barriers including product complexities and lack of undertanding among trading partners regarding B2B e-commerce benefits. For stage 2, eventhough some of the e- readiness indicators seems to be available, the existing barriers involving B2B system security and system integration, product complexity, trust, technical infrastructure, standard, and guidelines on B2B e-commerce, unstable economic and political climate, overseas trade and access barriers, are significantly affected the readiness level of the organization. However, at stage 3 there are sufficient resources and support inside and outside organisations in terms of top management support, appropriate strategic and skills and easy integration of various business operations to B2B e- commerce application. However, there are still few barriers regarding feeling of doubt and discomfort, lack of appropriate tools for investment justification on cost and benefits and lack of people competencies. Thus, there are still certain areas need to be work on as mentioned above. Last but not least, organizations at stage 4 already have all the requirements in place and should be fully ready to implement B2B e- commerce. B2B e-commerce initiatives are considered an important component of the organization's business. Thus, direction for the development of B2B e- commerce initiatives in organization and its trading partners is becoming more business-focused to gain strategic advantage. Understandably, all barriers listed are seldom encountered by SMEs at this level. Since majority of the organization surveyed have not

reached maturity level of B2B e-commerce readiness, it can be concluded that most SME in Malaysia is currently not ready to implement B2B e-commerce

## 5. CONCLUSION

The research intends to provide e-readiness model as a practical guidance to other researchers. The model was generated in conceptual form, which was subsequently developed through a rigorous empirical investigation of SMEs in Malaysia. Though the SMEs is still at exploring stage, the future success of B2B e-commerce is undeniable. It is necessary to make a lot of work on the e-commerce's standard, safety, and law, etc. Factors specific to the nature of products and service characteristics that require physical contact must be overcome before success may be attained. Based on the e-readiness assessments level of SMEs, we can conclude that

there are some obvious indicators that need extra attention from SMEs which are the optimistic attitude of decision makers on B2B e-commerce benefits, availability of B2B e-commerce technical support, security and systems, strong relationships with industry leaders and industry domain experts, and the participation of local IT industry and government in providing services and infrastructure related to B2B e-commerce development. Hopefully, with a better understanding of the holistic perspective of B2B e-commerce readiness maturity characteristics, organizations can use it to assess their capability or to improve their weakness before going for B2B e-commerce. The model can assist organization in identifying their readiness to undertake implementation, measure change during implementation, and identify areas where internal and external assistance, and support are needed.

**Table 2: Range of Index Score**

Dimension/ Stages	Personal traits (-4 < x < 4)	Organization al features (-1 < x < 19)	Competencies -2 < x < 14	Technology -2 < x < 14	Business process -4 < x < 4	Market forces -4 < x < 4	Supporting Industries -3 < x < 9	Government -4 < x < 4
Stage 1	Below (-2)	Below 4	Below 2	Below 2	Below (-2)	Below (-2)	Below 0	Below (-2)
Stage 2	(- 2.01 ) - 0	4.01- 9	2.01 – 6	2.01 – 6	(- 2.01 ) - 0	(- 2.01 ) - 0	0.01- 3	(- 2.01 ) - 0
Stage 3	0.01- 2	9.01- 14	6.01- 10	6.01- 10	0.01- 2	0.01- 2	3.01 – 6	0.01- 2
Stage 4	2.01- 4	14.01- 19	10.01- 14	10.01- 14	2.01- 4	2.01- 4	6.01 - 9	2.01- 4

**Table 3: SMEs Frequency based on Readiness Level**

Dimension/ stages	Stage 1		Stage 2		Stage 3		Stage 4		Total	
	(%)	Freq.	(%)	Freq.	(%)	Freq.	(%)	Freq.	(%)	Freq.
Personal traits	0.0	0	13.82	17	75.61	93	10.57	13	100%	123
Organizational features	0.0	0	12.2	15	72.36	89	15.45	19	100%	123
Competencies	0.0	0	7.32	9	72.36	89	20.33	25	100%	123
Technology	0.0	0	11.38	13	73.98	91	14.63	19	100%	123
Business process	0.08	1	21.95	27	68.29	87	8.94	8	100%	123
Market forces	0.08	1	17.89	22	69.92	86	11.38	14	100%	123
Supporting Industries	0.0	0	8.13	10	77.24	95	14.63	18	100%	123
Government	0.08	1	19.51	24	71.54	88	8.13	10	100%	123

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