



Measuring the Readiness of Globalisation: A Metrics Based Approach

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ABSTRACT

The aim of this paper is to propose a metrics based conceptual framework for the assessment of enterprise globalisation readiness. The increasing adoption of information technology (IT) has become an imperative enabler for enterprises pursuing globalisation. However, a major concern—how the preparedness of globalisation would be measured—has received little attention from the research community. In order to identify and resolve this missing puzzle in enterprise globalisation, this study is initiated by reviewing the important globalisation issues, followed by the application of a metrics based measurement model. This would provide enterprises an assessment framework for evaluating their global readiness. Our model is based on a hierarchy of globalisation issues with their associated weighting factors. The factors and sub-factors are used to define their strengths weaknesses as in a particular context. The final output of the measurement framework will conclude with a degree of readiness of the globalisation process.

INTRODUCTION

Globalisation has increasingly been recognised as the crucial business strategy for enterprises to remain in the digital competitive era. Without a doubt, the information technology serves an imperative role in the enterprise's global transition process. Enterprises engaged in globalisation have been insinuated to deliberate a number of issues that are essential in the evolution. These fundamental issues are identified in the areas embracing business information systems management, people management, technology management, end user management, and culture. Nevertheless, most globalisation studies are principally spotlighted on the identification of issues, recommendation of resolutions, and construction of transition frameworks. However, there is virtually no indication of the measurement of the enterprise's globalisation attainment. This study combines the fundamental issues together with the measurement attributes, and attempts to construct a global readiness model that will provide an evaluation instrument to enterprises in assessing their global transition achievement. To measure the readiness of a globalisation goal, we use the classical factor criteria and metrics model (Cavano and McCall 1978). The readiness of a globalisation goal can be measured in terms of a set of criteria. Each criterion can then be quantitatively measured against a set of metrics. We will discuss the further in the subsequent section.

LITERATURE REVIEW

Speedy evolution of information technology enables the vision of enterprise globalisation becoming reality. However, many firms have misjudged the level of sophistication and complexity, and derived an incorrect interpretation of how information technology will assist the process of global transition. For example, firms are eager to develop corporate websites and implement e-commerce functions because it is believed that this is the only way of becoming competitive in the global market. Due to this incorrect belief, senior executives are often have the impression that building an e-commerce website is the only path towards globalisation, thus making inappropriate decisions. Enterprise globalisation is not merely constructing an online-transaction enabled

website. It involves understanding organisational structure, recognising and resolving global transition issues in relation to information technology, culture, human resources, business strategic planning, and a national and regional perspective. These issues have been carefully classified into five categories by one of the authors' recent work (Lan, 2002). The principal concept of categorisation of globalisation issues is to provide organisations with an abstract view of concerns with the global transition. Each of the five categories is outlined and briefly discussed as follows.

Information Technology Management

The implementation of global information systems is based on the coordination and inter-communication of software applications, hardware components, telecommunications, networks infrastructure, and network management in a cross-border business environment (Sankar & Prabhakar, 1992). Rapid evolution of technologies causes efficient and effective performance of global information systems as a result of real-time and accurate transborder data flows. Organisations need to realise and understand the technological issues involved in order to adopt the most suitable technologies for global information systems. The essential technological issues and implication of global transition that need to be considered are telecommunication availability, network infrastructure, security, systems equipment, data resources utilisation, systems standards, software applications availability, systems integration, and systems recovery.

Business Information Systems Management

In the process of globalisation, business and information system strategies are often the senior executives' major concern. The alignments of global information strategy and the new business visions are crucial to the success of global business operations. Areas in this category and the transition implication contain information systems planning, information systems organisation alignment, information systems effectiveness, productivity measurement, business reengineering, competitive advantage, information quality, office automation, identification of global business opportunities, systems reliability, availability, and transferability.

People Management

People are major players in designing, implementing and utilising information systems. When investigating the human resources management in the global business environment, a number of areas need to be considered as crucial to the success of globalisation. These areas are recruiting, training, organisational learning, cross-cultural skills development, and global team development.

End User Management

End users are the ultimate group of people using the global information systems on a regular basis. The task of managing and supporting end user groups is not only in maintaining business information operations but is the

Table 1. GISM issues: category and associated subcategories

GISM issues main category	Subcategories
Business information systems management	Strategic planning, Reengineering and change, Managing IT quality, Productivity, Systems development and implementation
People management	Role of senior management, Staff recruitment and training, Benefits and compensation
Information technology management	IT infrastructure, Business applications, Telecommunications network, Data and information systems improvement
End user management	Organisation learning, Operation and support
Culture	Education, Demographics, Individual and interpersonal perspectives, Geography and economy

key to evaluating and improving the global information systems. The fundamental concerns of the end user management category in globalisation context include managing end user computing facilities, end user computing education, introducing and learning new global information systems, help desk support, and end user involvement in global information systems development.

Culture

When addressing information systems and technology globally, culture is an important aspect to be considered as it influences the success or failure of global transformation. In the new challenge of globalisation the reality of cultural diversity is not avoidable. Instead, organisations should be encouraged to embrace diversity and turn the multicultural characteristics into strategic advantages. Understanding this diversity is crucial to conducting any global business. As Kincaid correctly points out (Kincaide, 1999) doing business “requires a deep respect of the country’s culture, religions and institutions”.

In order to group global transition issues more precisely each of these categories are further grouped into a number of subcategories. Table 1 summarises these subcategories under their associated main categories.

GLOBAL READINESS METRICS DEVELOPMENT

Developing and implementing an appropriate global transition measurement will provide benefits to companies in various aspects. Firstly, the measurement is to help the company understanding basic behaviours of the business system, exploring and discovering the relationships between business and information systems; secondly, it is to evaluate the status of projects and their relationships to business plans. This evaluation is used to judge progress toward corporate or business unit strategic goals or specific initiatives; and thirdly, it is to identify opportunities for future improvement.

In order to construct such appropriate and precise measurement for evaluating company’s global achievement, it is crucial to develop the measurement model in a systematic manner. We have used the classical factor criteria metrics (FCM) model (Cavano and McCall, 1978) as a tool for our purpose. We believe that globalisation readiness is also a quality issue that is measurable. FCM has been widely used to measure software quality attributes. It is based on a simple structure, which contains a globalisation readiness goal, a set of criteria for the goal, and a set of metrics.

Enterprises first need to set a globalisation goal. The measurement of the goal could be based on a set of criteria. Each of these criteria could be quantified in terms of a set of metrics. This hierarchical structure goes from a high level issue to more specific measurable issues. A goal could equate a main category or a subcategory as defined in Table 1.

Generally, the measurement model development starts with determining what to measure. In the context of globalisation, the objects to be measured are the five categories of global transition issues mentioned earlier. However, due to the broad coverage of individual category, each of these is further classified into various subcategories. There are 18 subcategories and they are referred as the measuring factors (see Measurement factors and criteria section below).

The second step of the model development deals with defining measurement criteria. Based on the definition of each factor (subcategory), numerous issues can be identified and transformed into the measurement criteria, which the organisations have to accommodate during the process of global transition. Consequently, a measurement technique should be designed to assess these criteria. In this study, the measurement technique is designed in a 100 percent scale, which is partitioned in ten measurement blocks (0 – 9), thus block 0 embraces 0 % – 10%; block 1 for 11% – 20% and so forth.

MEASUREMENT FACTORS AND CRITERIA

Once the measurement objects, criteria and measuring techniques are defined, the measurement model is ready in its implementation position. The rest of this section outlines measuring factors and the associated measuring criteria of each GISM issue category.

1. Category: Business information systems management

1.1 Factor: Strategic planning

Measuring criteria:

- 1.1.1 Applying information systems for global business opportunities and competitive advantage
- 1.1.2 Alignment of information systems and business objectives
- 1.1.3 Understanding of information systems roles, contribution and justification of information systems investments

1.2 Factor: Reengineering and change

Measuring criteria:

- 1.2.1 Business processes are reengineered through the adoption of IT
- 1.2.2 Developing necessary procedures and programmes for managing business reengineering changes
- 1.2.3 Applying quality assurance scheme for organisational management
- 1.2.4 IT professionals possess business-oriented competence when developing global information systems

1.3 Factor: Managing IT quality

Measuring criteria:

- 1.3.1 The global information system is reliable, available and transferable within the organisation
- 1.3.2 Applying appropriate quality control mechanisms for inputs and outputs of information systems
- 1.3.3 Applying software quality assurance standards in the development and maintenance of global information systems

1.4 Factor: Productivity

Measuring criteria:

- 1.4.1 Developing an appropriate measurement and improvement of information system productivity and effectiveness
- 1.4.2 Full utilisation of data resources

1.5 Factor: Systems development and implementation

Measuring criteria:

- 1.5.1 The new global information system has been constructed, implemented and managed
- 1.5.2 Implementing office automation

2. Category: People management

2.1 Factor: Role of senior management

Measuring criteria:

- 2.1.1 Possessing quality skills in people management
- 2.1.2 Developing training programmes for senior management in IS and cross cultural skills

2.2 Factor: Staff recruitment and training

Measuring criteria:

- 2.2.1 Retaining, recruiting, and training IT personnel
- 2.2.2 Sufficient and availability of IT staff
- 2.2.3 Organising and managing expatriated employee and assignments

2.3 Factor: Benefits and compensation

Measuring criteria:

- 2.3.1 Incorporating multinational compensation schemes into the company’s policy
- 2.3.2 Company’s travel activities are minimised to reduce unnecessary costs

- 3. Category: Information technology management
 - 1.1 Factor: IT infrastructure
 - Measuring criteria:
 - 1.1.1 Appropriate computer hardware and operating systems have been selected and the management and support procedures are clearly outlined
 - 1.2 Factor: Business applications
 - Measuring criteria:
 - 1.2.1 Appropriate software applications have been identified, constructed, implemented, and managed
 - 1.2.2 Information systems are integrated across all business functions
 - 1.3 Factor: Telecommunications network
 - Measuring criteria:
 - 1.3.1 Appropriate management, planning, support, and availability of telecommunication infrastructure and technology
 - 1.4 Factor: Data and information systems improvement
 - Measuring criteria:
 - 1.4.1 Procedures for continuous Improvement of data, information and knowledge quality
 - 1.4.2 Developing security, control, and disaster recovery capabilities
 - 1.4.3 Integration of databases for data mining ability
- 4. Category: End user management
 - 1.1 Factor: Organisation learning
 - Measuring criteria:
 - 1.1.1 Procedures for facilitation and management of organisational learning
 - 1.1.2 Enhancing staff absorption of the new information systems
 - 1.1.3 Procedures and facilities for end user computing
 - 1.2 Factor: Operation and support
 - Measuring criteria:
 - 1.2.1 Procedures for managing IT operations
 - 1.2.2 Developing help desk support
- 5. Category: Culture
 - 1.1 Factor: Education
 - Measuring criteria:
 - 1.1.1 Investigation of the level of general education of people at the region or nation
 - 1.1.2 Investigation of the level of computer knowledge of people at the region or nation
 - 1.2 Factor: Demographics
 - Measuring criteria:
 - 1.2.1 Investigation of regional or national gender perspective
 - 1.2.2 Investigation of age distribution of the region or nation
 - 1.2.3 Investigation of regional or national religion
 - 1.3 Factor: Individual and interpersonal perspectives
 - Measuring criteria:
 - 1.3.1 Investigation of leadership style of the region or nation
 - 1.3.2 Investigation of values and goals of individuals and groups of the region or nation
 - 1.3.3 Investigation of interpersonal communications of the region or nation
 - 1.4 Factor: Geography and economy
 - Measuring criteria:
 - 1.4.1 Investigation of currency stability
 - 1.4.2 Coping with time-zone difference

MECHANISM FOR CALCULATING GLOBALISATION ACHIEVEMENT

After the evaluation, a calculation mechanism should be applied to conclude the globalisation achievement. This calculation mechanism is described as follows. The first calculation item is the achievement of each measurement factor. It is derived from the average of the associated measuring criteria. For example, the “strategic planning” measurement factor consists of three measuring criteria (1-3), and their measuring results are 9, 8, and 8 respectively. Thus the achievement level of “strategic planning” is 8.3 (or equivalent to

Table 2. Sample numeric weightings of GISM issue categories

	Multinational	International	Global	Transnational
Information Technology Management	0.22	0.22	0.21	0.20
Business Information Systems Management	0.22	0.21	0.22	0.24
End User Management	0.20	0.19	0.19	0.20
People Management	0.19	0.20	0.20	0.20
Culture	0.17	0.18	0.18	0.16

83% according to the 100% scale defined earlier). After the achievement levels of all measurement factors are determined, each GISM issue category can be evaluated. Once again, this is calculated from the average of associated measurement factors.

The final step of calculating the achievement level of the entire global IT transition is determined by amalgamating all calculated achievement levels of GISM categories and the GISM issues priority model. Depending upon the type of MNC organisational structure, each GISM issue category is assigned a numeric weighting, which is decided in accordance with the level of importance in GISM issues priority model identified by Lan (2002). Table 2 illustrates sample numeric weightings of GISM issue categories of four multinational organisational structures. For instance, if a company’s organisational structure is “global” type, thus the numeric weightings of the GISM issue categories are 0.21 for “information technology management”, 0.22 for “business information systems management”, 0.19 for “end user management”, 0.20 for “people management”, and 0.18 for “culture”.

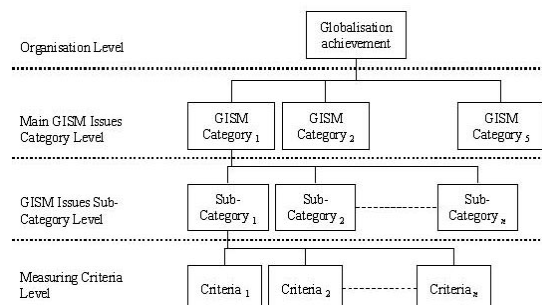
The measured results indicate not merely the company’s achievement level in globalisation; they also specify the less emphasised aspects, which the company has to pay more attention for future improvement. A detailed conceptual model of measuring global IT transition achievement is illustrated in Figure 1.

CONCLUSION

Global transition is a long-term and costly project. Organisations involved in this transformation activity should have a mechanism to measure the entire globalisation process. In order to indicate the level of global transition achievement in any stage of transformation process, it is essential to develop a precise metrics that allows organisations to adopt and maintain the evaluation protocol.

In this study, a factor criteria metrics model or FCM model defined by Cavano and McCall is applied for the development of achievement model for measuring the readiness of globalisation. According to the structure of the FCM model, the components related to the measurement of global transition achievement are identified. The measurement factors are based on the categories and subcategories of global information systems management issues; and the criteria are defined in accordance with the fundamental issues of each

Figure 1. Conceptual model of globalisation achievement measurement



factor. To determine the level of achievement, a calculation mechanism is designed in conjunction with the weightings of GISM issue categories.

Although this model represents the conceptual framework of measuring global transition achievement, it is expected in future that the model would be applied to the industrial methodological exercise. Further, this can be achieved by a more conclusive study for generalising the model in mathematical or logical orientations.

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