

# Assignment 1

Business, Decision Making



Assignment 1 ERP Software Selection Process BAO 6714 Abstract There are various software vendor selection models. Hence, it is crucial for organisation to select the right Enterprise Resource Planning (herein named as “ ERP”) system that best fits their existing business model in the initiation phase of an ERP project. A comprehensive framework for evaluating the three ERP software vendors is proposed. This framework is based on analytic hierarchy process methodology which comprises of criteria sets from product and management aspects respectively.

1. Introduction ERP is an enterprise application where business functions like accounting and logistics are integrated. It is a software architecture that facilitates flowing of information and allows collaboration of information. Hence, enabling visibility across the enterprise by integrating process-to-process, person-to-process and person-to-person. Ultimately, it helps the organization to improve customer response time and enhances cohesive connection with external stakeholders. In a way, achieving sustainable competitive advantage through quicker, better and cost-effective service and management decision process. ERP is positioned as a strategic project that is capable of operating business functions within the organization. Several software selection models are evaluated for selecting the right ERP system. The right software selection model is recommended in this paper to select the right ERP system that fits the organization the most. The proposed ERP selection model involves identifying criteria in both product and management aspects.

2. Software vendor selection models — literature review There are numerous selection models of ERP system either qualitative or quantitative. Verville and Haltingen (2003) suggested a six-stage model to evaluate ERP software.

While Schniderjans and Wilson (1991) recommended the adoption of an analytical tool, Analytic Hierarchy Process (herein named as “ AHP”).

2. 1. Six Stage model According to Verville (2003), the Six Stage model comprises of planning, information searching, selection, evaluation, choice, and negotiations.

2. 2. Analytic Hierarchy Process (herein named as “ AHP”) model The concept of AHP was developed by Thomas Saaty (Saaty, 1986). It is computed based on mathematical algorithm structure of matrices that generate approximate weights with the association of right eigenvector’s ability. AHP is an analytical tool and functions more than just a methodology for choice. Generally, AHP structures complexity, measures on a ratio scale and synthesizes. It involves structuring of criteria into hierarchy of clusters. The individual criterion is assessed with importance rating. The AHP structure comprises of the goals and weighted criteria (evaluation parameters). The importance of each criterion is compensated by assigning a weight to each criterion under the individual branch. The overall score is then computed with the weighted criteria under the individual branch. AHP provides a proven, effective means to deal with complex decision making. Besides, AHP allows clear and efficient identification and presentation of selection criteria via weighting and analysis. Hence, this model helps organization to make critical decision in term of selecting ERP solution.

2. 3. ISO 9126 model The identification of the selection criteria of ERP system plays an important role in selecting and qualifying the right ERP system. The price and delivery time frame are both key factors when implementing an ERP project. The initial investment cost of implementing ERP project, the annual maintenance cost and manpower cost are also the potential recurring

expense for organization, according to Butlar and Bingi et al. (1999).

Realistically, the following evaluation criteria sets shall be considered as key drivers for qualifying the ERP software vendors. Functionality - Ease of Use -

Technical Attribute - Reporting and Workflow Capability. Technical

Architecture - Platform - Scalability - Manageability Service and Support -

Type of Support (Local or Oversea) - Real Time Updates - Bug Fixes Viability -

Good Past Performance Records - Extensive experience in implementing

similar solution Business Value - Simplicity on replacement and reduces

complexibility in acquiring, deploying and operating infrastructure - Product

Licensing - Business Model - Predictable - Control over variables such as

licensing, planning and deployments - Extensibility - Ease in Integration with

other system Time-to-Market - Allows projects to be completed in a shorter

time with fewer resources The ISO 9126 model (International Standard 9126,

1991) was developed by the International Organization for Standardization

(herein named as “ ISO”). It comprises of a set of six characteristics and each

individual characteristics set was further divided into sub-characteristics

which encompasses more than the criteria sets as indicated above. The ISO

9126 software quality model was also recommended to be the rightful model

to evaluate the software product characteristics of the ERP system based on

the below criteria. 2. 3. 1. Functionality This attribute is defined as the

compliance level of the software functions and meeting the requirements. It

is sub-divided into five sub-characteristics mainly, accuracy, interoperability,

compliance and security. 2. 3. 2. Reliability This attribute is defined as the

capability of software that could maintain its level of performance under

stipulated conditions for a stipulated time frame. It is sub-divided into three

sub-characteristics as follows: maturity, fault tolerance and recoverability. 2.

3. 3. Usability This attribute is defined as the ease of use of the software and branches into three sub-characteristics as follows: understandability,

learnability and operability. 2. 3. 4. Efficiency This attribute is defined as optimal usage level of the system resources. It is sub-divided into two sub-characteristics as follows: efficiency of time behavior and efficiency of resource behavior. 2. 3. 5. Maintainability This attribute is defined as the support level and sub-divided into four sub-characteristics as follows:

analyzability, changeability, stability and testability. 2. 3. 6. Portability This attribute is defined as capability of the software can be transferred from one environment to another. It is sub-divided into four sub-characteristics as follows: adaptability, installability, conformance and replaceability. 3.

Advantages/Disadvantages of models The following models are identified and widely adopted by organizations. i,§ Six Stage model i,§ Analytic

Hierarchy Process (AHP) model i,§ ISO 9126 software quality model 3. 1. Six

Stage model 3. 1. 1. Advantages This model adopted a systematic process approach in the aspect of the evaluation stages. This help the organization to better organize the evaluation processes. 3. 1. 2. Disadvantages However,

this model may require more time, resources and efforts in the evaluation phase. 3. 2. Analytic Hierarchy Process (AHP) Model 3. 2. 1. Advantages AHP

is a fast decision-making methodology for multi-attributes. Thus, it is mostly appropriate to use this methodology during a software selection process. It captures both subjective and objective evaluation measures, providing a useful mechanism for checking the consistency of the evaluation measures and alternatives suggested by the team thus reducing conflicts in decision

making. AHP model helps organizations to minimize decision making process, such as lack of focus, planning, participation or ownership, which ultimately is costly distractions that can prevent teams from making the right choice.

3. 2. 2. Disadvantages The shortfall for AHP model is the complexity of the computation of weighting, scoring and algorithm approach in comparing the alternatives. Expert software is required for the organisation to perform the computation of the evaluation scoring. Project fund is required to be allocated for this aspect. Organisation shall indeed consider the value proposition for acquiring the software for computational purpose.

3. 3. ISO 9126 software quality model

3. 3. 1. Advantages Unlike AHP model, the ISO 9126 model is a software quality model that identifies six main quality characteristics with relative weights allocated, namely; Functionality; Reliability; Usability; Efficiency; Maintainability and Portability. These characteristics are dissected into five sub-characteristics. This model is regarded as the most comprehensive model to evaluate product features and quality of the system. It also covers a wider spectrum as indicated in section 2.

3. 3. 3. 2. Disadvantages The main focus and strength of this model is mainly in qualifying the product capability aspect. It lacks qualifying criteria on management aspect for allowing the organization to make critical business decision.

4. Recommendation The complete procedure of our proposed ERP selection model involves two evaluation stages. During the project initiation phase, the business needs shall be discussed. These business needs formed the basis for the vendor evaluation during the selection process. The first stage of the evaluation involves identification of the evaluation criteria set for product and management aspects respectively.

It is an important driving factor for the system to be both scalable and of high performance. High performance implies that the system has to be able to handle organisation's requirements with limited hardware resources. Scalable means that as new hardware is added to the system also the performance ( throughput) will increase, preferably, in a linear fashion. Hence, the ISO 9126 software quality model is recommended to evaluate the ERP system by the product characteristic with the evaluation parameter as indicated in section 2. 3 that effectively identifies six key attributes to qualify the ERP software in product aspect. This shall then be compared with criteria sets in management aspect. Vendor, time and cost are the key factors that dictate the evaluation outcome in this aspect. The vendor factor shall be branched into market share and reputation, industrial credential, service and support. Choose a system vendor that is seeking a long-term partnership. Equally important, it is to choose a systems' vendor that is economically stable enough to provide long-term partnership. In addition, the time factor shall be sub-divided into planning and preparation, business process re-engineering. The cost factor shall be further broken down to initial implementation software and hardware cost, training cost and recurring maintenance cost. Once the system has been implemented, the main cost drivers are the efforts for operating the system and configuring it to meet the changing demands of the business. The AHP model is recommended to be applied to compute the relative weighted scoring for the criteria sets defined in the ISO 9126 software quality model. The ERP software vendor with the best scores shall then be chosen. For this case study, the SAP vendor was chosen to be the right fit for the organization.

5. Conclusion This

study proposes a systematic model for organization to select an appropriate ERP system effectively and efficiently. The ISO 9126 software quality model is to help the organization qualify the product characteristics of ERP system with establishing the criteria, score each vendor, product, or service against the criteria. This assists in evaluating vendors objectively, and determines the decisive criteria. AHP method is also applying to evaluate the ERP system alternatives with 32 criteria from both the product and management aspect, respectively. Word Count: 1697 Reference(s) 1. Butler, J., (1999). " Risk management skills needed in a packaged software environment". Information System Management 16(3), 15-20. 2. International Standard 9126, (1991). " Information Technology-Software Evaluation". Quality Characteristics and Guidelines for their Use, ISO. 3. Saaty,(1986). " Fundamentals of Decision Making and Priority Theory With The AHP or Analytic Hierarchy Process ". " The father of AHP" 4. Schniederjans, M. J. and Wilson, R. L.,(1991). " Using the analytic hierarchy process and goal programming for Chi-Tai Lien and Hsiao-Ling Chan 72. 5. Verville, J. and Halington, A., (2003). " A Six-Stage model of the buying process for ERP software". Industrial Marketing Management 32, 585-594.