Design and Implementation of an MIS for Specification Comparison: A Case Study of 3 Scoring Approaches

Chantana Chantrapornchai, Department of Computer Engineering Faculty of Engineering, Kasetsart University, Bangkok, Thailand
Wised Jongjam, Department of Computing, Faculty of Science, Silpakorn University, Nakorn Pathom, Thailand

ABSTRACT
Finding a satisfactory vendor or outsourcer for IT projects is a tedious task in typical public organizations. When there are many alternatives, it may be difficult to choose the right one. Thus, many selection criteria need to be used. In this paper, we present an MIS system that provides supported information for selecting the vendors. First, a standard specification is given to the system. Also, the scoring criteria is defined for each feature in the specification. Then, the vendors propose their product specification to the system. The system gives the summary reports comparing each vendor product and how much the criteria is met. Hence, the user can decide which vendor to choose. We present a case study of three scoring approaches, namely Percentage of Weight, Percentage of Price and Total Percentage, in one of a public organization.

Keywords: Decision Support, Information System, Specification Comparison, TOR, Total Percentage

INTRODUCTION
In a project management, there are many tasks involved, starting from building the team, analyzing project contents, defining a scope and preparing project parameters, work breakdown structures, planning and scheduling, management approval, designing control and reporting systems, organizing procurement, executing and controlling projects, and termination. Every phase is important and has relationships to the project performance especially from planning to the performance (Farooquie & Farooquie, 2009). Especially, for large organizations, the good project management is needed since they need to be competitive (Demirkan & Nichols, 2008).

In the early phase of the project management, besides the needs to define a scope, one needs to define infrastructures and tools for
the project. Some of these may be needed to purchase. Particularly, many specifications of such a hardware and/or software are required to explore for purchasing options. For each product, there are a variety of vendors. Each one may have different specifications. Then, when there are a lot of them, it is very difficult to decide which one is suitable.

For IT projects/products in public organization, just like other countries, we need to rely on outsourcers or vendors (Leeney, Varajão, Ribeiro, & Colomo-Palacios, 2011; Kefi, MLAiki, & Peterson, 2011). The public organizations in Thailand usually have troubles in comparing specifications of products to purchase in a project or a specification of a project to be outsourced. For example, when there is a requirement to buy a product, a specification of an IT product needs to be made. The specification may also include maintenance options. The purchasing department needs to write up this specification or Term Of References (TOR). This TOR is then distributed for the vendors or outsourcers. Then the vendor makes up his quotation including specification. The purchasing department needs to decide whether it is matched perfectly to the TOR or not. Often, the specification from the vendor is not matched exactly. The department needs to select the vendors that match best.

In order to help the purchasing department for this phase, in this paper, we develop a system which helps an organization department decide on the specification from vendors. Our system contains the database of vendors’ information and the product specifications. When there is a purchase, the department puts on the TOR and post the information. The criteria of factors are input as weight to the scores. Then a vendor puts on their information about the proposed product to the system. After that, the system calculates the scores for suitability of each vendor for a particular product. We put on three scoring techniques to the system as alternatives: Percentage of Weight, Percentage of Price and Total Percentage. The demonstrations of the calculation using real data in a public organization are presented.

**BACKGROUNDS**

Information systems are important for helping gathering, processing, storing, analyzing and presenting data in an organization. Information systems usually need inputs, processing and outputs. It is used by an organization depending on levels of management: operation level, management level, or strategic level. For executives to make a decision, information systems are required.

Usually a decision process is divided into 5 steps:

1. Specify purpose/goal: the goal should be precise, understandable, and achievable.
2. Propose design alternatives: one needs to come up with design choices that fit the needs, for instance to increase profits, to save cost etc.
3. Define limitations: define limitations and scope the system.
5. Decision: decide using the current goal.

The decision by executives is divided into three categories (Laudon & Laudon, 2007).

1. **Structured Decision:** It is a decision for a problem that is made every often, everyday, is predetermined. This is involved by operational managers.
2. **Unstructured Decision:** It is a decision that is not often the case. Experiences are needed to explore the problem and decide. This is often done by middle managers and executives.
3. **Semi-Structured Decision:** It is a mixed of structure and unstructured decision. Executives usually face this.

A problem of decision making plays roles in many years. There are the needs for decision support systems (DSS) in a public sector (Henderson & Schilling, 1985). They suggested that using DSS helps increase opportunities in

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