

**AN INTEGRATED WEB-BASED DECISION
SUPPORT SYSTEM FOR TENDERING PROCESSES**

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AN INTEGRATED WEB-BASED DECISION SUPPORT SYSTEM FOR TENDERING PROCESSES

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Abstract

Contemporary managers are making critical technical and business decisions to improve their organisational processes, and decision-making is a central managerial activity. It remains an immensely challenging role of managers in any organisation. Decision-making in tendering processes is one such crucial task in any public enterprise. A Decision Support System (DSS) is an interactive computer-based system that helps decision makers (DMs) utilise data and models to solve complex and unstructured problems. Procurement or the tendering process is a decision problem of paramount importance for any business. A critical and vital procurement task is to select the best contractor during the tendering or bidding process. A case study is drawn from the construction business in order to demonstrate the applicability of our approach.

Advancing the application of IT in tendering is a major international research and innovation endeavour for both scientific establishments and industry. The aim of this work is to implement and evaluate an architecture for modelling and coordinating decision-making activities in tendering processes.

Process modelling techniques are used to capture human behaviour, interactions with computer systems and flows of information through tendering processes. The constructed process models are implemented using a Process Support System (PSS). They are used to facilitate the understanding and communication of electronic tendering processes to stakeholders such as construction managers and contractors. The Integrated Web-based DSS is based on a framework for a generic process approach and it is intended to be used as a general decision-making aid and as a general framework for other similar models.

The main contribution for this research is developing an Integrated Web-based DSS that comprises a Web-based DSS, a Process Modelling for Online Communication System (PMOCS) and a Decisioning for Decision Support in Process (D2P). We proposed a generic architecture by using the techniques of process modelling and implemented it in the

Web-based domain. The novelty of the work lies with the comprehensive support for tendering processes by employing a Web-based DSS, functioning as a data acquisition module. It has been developed to collect information about the clients, contractors, and project details. It manages and facilitates the tendering activities. The PMOCS coordinates the participants of tendering processes and supports the communication and collaboration necessary in preparing tender documents. The D2P coordinates and supports the decision-making phases. The D2P is also a generic model and is easy to configure for different contexts that support the process of making decisions. It uses a meta-process (a process about processes) for supporting tendering activities. It aids DMs in choosing from competitive bids for building projects.

This work has been evaluated by Malaysian people who are currently involved with tendering processes and the results show that by using the Integrated Web-based DSS for tendering processes it increases the efficiency of selecting the best contractor in the construction domain. It increases the transparency of the tendering processes, improves understanding and increases confidence in the decisions taken.