

# Design of an Integrated Project Management Information System for Large Scale Public Projects: Iranian Case Study

*Mona Taghavi, University Kebangsaan Malaysia, Malaysia*

*Ahmed Patel, University Kebangsaan Malaysia, Malaysia, and Kingston University, UK*

*Hamed Taghavi, Iranian Strategic Information Solutions Company (ISISCO), Iran*

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## ABSTRACT

*Due to the unprecedented growth of outsourcing ICT projects by the Iranian government, a critical need exists for the proper execution and monitoring of these projects. In this paper, the authors propose a web-based project management system to improve the efficiency and effectiveness of the management processes and accelerate decision making. Based on the requirements and information flow between various units involved in the complete life-cycle of ICT project management, a functional model and system architecture with various underlying structures has been designed. The functional model contains two sub-systems: process management and information service. The proposed system structure is based on a four-layer client-server computing model. As a part of a publically available ICT system, it must be secure against cybercrime activities. This system can bring efficiency in managing the projects, improve decision making, and increase the overall management process with total accounting and management transparency. The proposed system overcomes the problems associated with a central system and traditional management processes, as is currently the case in Iran.*

*Keywords: Business Management, Client-Server Computing, Government Projects, ICT Project Management, Information System, Privacy, Security, Web-Based Management System*

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## INTRODUCTION

In recent decades, it has become increasingly obvious that ICT projects tend to be more large-scale and complex (He, Jiang, Li, & Le, 2010), thus creating new challenges, especially for developing countries. Furthermore, the

existing commercially available project management software tools have many limitations and drawbacks which are particularly unsuitable for handling large and complex projects (White & Fortune, 2002; He et al., 2010). Hence, these commercial software tools are proven to be unsatisfactory in terms of the functional coverage scope, flow process adaptation and collaboration arrangements to meet the complicated management demands of large-scale

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ICT outsourced projects (Tseng, 2006; Budhakuksomsiri, 2006). This is particularly true in the case of Iran, since at present, there are no matured techniques both domestically and abroad to be borrowed for practice in respect of the business and capital flows descriptions, public and private collaboration towards multi-purpose decision-making based on multi-source data flows for effective and efficient management of large-scale ICT projects (Simon, 2006; Crawford, Pollack, & England, 2006).

Two studies (Zhang, Li, & Tam, 2006; Olson, 2006) indicate that any project participant can only hold less than 65 percent of the project information at the closure phase because of the multiple player and asymmetrical timelines. These problems pose serious constraints to the development of large-scale information-based management of ICT projects. Crawford et al. (2006) have found variation in project management knowledge and practices between industries, countries and application areas as well as the amount of attention with focus on construction industry. Due to this variation in understanding and application of project management, it is useful to investigate its application in developing countries which are trying to close the digital divide by performing more large and complex ICT projects through government and private sector partnerships.

Iran is a classic example of this partnership. It is at the threshold of closing the digital divide by making ICT official government policy to achieve a knowledge-based economy and society in a relatively short time. The Web-based project management of ICT projects outsourced by the government to external contractors one such example. It is also geared to overcome inefficiencies in managing large-scale projects.

## Background-Problem Statement

Like any other developing country, Iranian ICT public projects are growing rapidly in all forms in government businesses ranging from financial services to social and public services (Jahangard, 2004). The government usually experiences huge problems trying to

manage outsourcing of large ICT projects. Traditional outsourced project management methods are inadequate and fragmented. Project management systems are already ineffective for public projects that are causing numerous work bottlenecks, overloading workers, and inefficiencies from human-centered management systems and processes (Karami, 2003). The huge variety and quantities of paper and document handling make management persons very confused, which degrades over time to the point where good personal are not readily available, resulting in over-stretched management teams and the overall smooth functioning of the institution (Ahamdi, Ghazanfari, Aliahmadi, & Mohebi, 2003). These practices showed that the traditional management theories and methods for a simple and single project are not adequate or appropriate any more, when applied to large complex projects. In this day and age, one would expect a web-based project management utility that is simple and offering tools to managing teams and institutions to provide optimum project management and with transparency.

Furthermore, Iran's General Policies affirm constitutional and twenty year principles which refer to developing modern technologies, creating an effective IT system, using advanced technologies in education and research, and emphasizing private sector development. The Iran Strategic document on Information and Communications Technology affirms the need for balanced development in all dimensions of the Information Society with emphasis on ICT's function in facilitating, enabling and improving (Supreme Council of Information and Communication Technology, 2008). Therefore, certain prominent issues arose when the Iranian government chose to procure ICT services and systems from private sector providers based on their new regulatory reforms and policies regardless of boundaries. Control and supervising of the projects outsourced to third parties is a big challenge due to slow information flow and decision making process between the different units which serve as a knowledge network to the various units. Also, the exchange of information between major players such as project managers,

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