

Chapter 29

An Integrated Information System for Monitoring Construction Works

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ABSTRACT

There is a global tendency towards implementing centralized project monitoring with the use of advanced information systems in large projects. This trend is mandated by issues such as the geographical dispersion of projects, the number of contractors and the total amount of works. In this respect, the integrated information system that has been utilized to monitor the construction works of the Egnatia Motorway project in Greece is presented. Reference is made to the software, hardware, information technology architecture, quality procedures and personnel training for the successful implementation of the system. Special mention is made to the data structures that are utilised (enterprise project structure, organizational breakdown structure, resource breakdown structure, and work breakdown structure). In addition, comments are made from the experiences drawn from the implementation of the system. Overall, it is concluded that the integrated system constitutes a central focal point for corporate scheduling and cost control.

INTRODUCTION

Integrated Information Systems

The application of cost control and scheduling is a priority in project management. At the same time, the centralized management of corporate information has been made possible by the rapid developments in the fields of information technology and telecommunications which have connected many parts of

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enterprises. In particular, the information volumes and types associated with construction projects make information management a difficult task while the uniqueness of civil engineering projects makes the effort for information standardization arduous. Hence, effective communication requires the existence of structured and reliable information. Therefore, as construction projects become larger and more complex, an efficient way to provide such information is through the use of information management systems (Chassiakos & Sakellariopoulos, 2008). Also, in many construction projects, project teams are increasingly geographically dispersed working across time zones, numerous organizational boundaries and a variety of cultures. These teams are often quickly brought together to deliver a construction project within limited time and resources. At the same time, the construction processes that the team members are engaged in have increased in complexity in the recent years and have become more information-intensive. Very often, team members are involved in several projects at the same time. Recent trends towards the convergence of wireless communications and internet-based technologies have the potential to open new avenues of mobile collaboration, thereby minimizing the impact of the physical dispersion of team members (Aziz et al., 2006). In the contemporary environment projects involve larger capital investments, embrace several disciplines, involve widely dispersed project participants, require tighter schedules and demand stringent quality standards. These factors coupled with high-speed developments in Information and Communication Technology (ICT) have influenced project management practices to take a new turn towards taking advantage of newly developed management tools and the latest technology (Alshawi & Ingirige, 2003). In the construction industry, the use of Information Technology improves coordination and collaboration between firms participating in a construction project, leading to better communication practices. Its benefits include an increase in the quality of documents and the speed of the work, better financial control and communications, simpler and faster access to common data as well as a decrease in documentation errors (Nitithamyong & Skibniewski, 2004). Undeniably, the global trend in centralized project management stems from the fact that corporations manage many projects at once that can be dispersed over several regions (Petrovic & Jovanovic, 2004). All in all, the application of an integrated system for monitoring construction works can prove to be an absolute necessity and is a means by which an organization can establish a competitive advantage. This paper will describe how such a system was implemented on the project of the Egnatia Motorway and how it assisted the organization in charge of the project in attaining its strategic goals. Since the project was in fact a “mega-project” it required the use of the most advanced project information systems.

The Egnatia Motorway and Its Significance

The Egnatia Motorway is a 670 km long motorway, laying on the northern part of Greece, stretching from the eastern border of Greece with Turkey to the western gateway port of Igoumenitsa to Italy. It is part of the Trans-European Transport Network and is one of the priority projects of the European Union. Furthermore, it acts as a collector route of the Pan European Corridors IV (Dresden – Thessaloniki), IX (Helsinki – Alexandroupolis) and X (Salzburg – Thessaloniki). It connects the main cities of Northern Greece serving 5 ports and 6 airports and it is a project of a great geopolitical significance in the Balkans and Southeast Europe. The total budget of construction works amounted to 5.5 bil. € (with VAT) and the project was financed by national and community resources, i.e. the European Regional Development Fund, the Cohesion Fund, the European Investment Bank and the Community Budget of the Trans-European

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