

Web-Based System to Improve Resource Efficiency in University Departments

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ABSTRACT

This paper presents the main features, characteristics and benefits of an economic and financial information management system that has been introduced in several departments at the University of Granada (Spain). The system is web-based and intended to optimise efficiency in the management of public resources, according to e-government approach and principles. It is based on a combination of expressive, yet intuitive, query language, and faceted search, and has meant an important advance by comparing its performance with that achieved by other approaches. To assess the usefulness and functionality of this web-based system, in-depth interviews were conducted of different types of users. The methodological approach followed to address the analysis of this type of qualitative information is Constant Comparative Analysis from which it is derived a casual network whose main outcome is the improvement of economic and financial efficiency in the department. To encourage widespread use of the system, the application is open source software.

KEYWORDS

Academic Departments, E-Government, Economic and Financial Efficiency, Information Management, Open Source Software, Optimising Efficiency, Qualitative Analysis

INTRODUCTION

Although there is no direct relationship between an increase (or decrease) in public resources and productivity (Seddon & O'Donovan, 2011), restrictions would force public sector organisations to take greater note of citizens' requirements, forcing them to operate more effectively and efficiently. One of the main tasks of management is how best to manage resources, but an immediate concern is to solve problems that arise and to fulfil the commitments made. Optimising efficiency in the management of public resources is a requirement at all levels of administration, and to do so information must be properly managed, a task that in today's world is inescapably linked to the field of information technology.

Various studies have addressed the question of challenges and innovations facing the public sector (Ebrahim & Irani, 2005). Among the transformations considered is that of enhancing information management to achieve greater transparency, both to facilitate decision-making for other social agents and to improve the organisation's internal functioning (Rodger & Pendharkar, 2007; Rodger, 2010). In this respect, White (2007) provides a detailed analysis of information management in the public sector. However, the success of this process will also depend on the acceptance of Information and Communication Technologies (ICT) at individual and organisational level, which is necessary to build a culture of transparency (Bertot, Jaeger, & Grimes, 2010).

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In this paper, we describe a web system, designed and developed by the authors, for economic and financial control for cost centres to help achieve best practices in the field of university management. The first section presents the main characteristics and the structure of the proposed software. In Section Two, we discuss the results achieved by this innovation. Finally, the main conclusions obtained from this study are presented in Section Three.

A PROPOSAL TO IMPROVE ECONOMIC INFORMATION MANAGEMENT IN ACADEMIC DEPARTMENTS¹

University departments, together with many public and private organisations, subscribe to the fundamental concept underlying new technologies that potential benefits may be derived from their use. This type of assessment (i.e., proof of concept) may result from preliminary internal testing, from information regarding success in this respect achieved by similar organisations or from a good match between the task to be performed and the technology proposed (Agarwal, Tanniru, & Wilemon, 1997). The fit between task and technology has been analysed since the mid-1990s, when various authors (Aljukhadar, Senecal, & Nantel, 2014; Goodhue & Thompson, 1995; Goodhue, 1995; Zigurs & Buckland, 1998) examined the key factors determining the appropriate use of technologies. This theory, termed Task-Technology Fit, is one of the most important developments in information system theory and has been applied in many contexts, including the economic and financial management of university departments (Melchor-Ferrer & Buendía-Carrillo, 2014). Two levels of feedback can be considered: i) the manager evaluates the task-technology fit and in view of the results, redefines the task characteristics and the software used; ii) the community improves the technology, making use of an open source licence.

In accordance with this theoretical background, we designed specific software to be implemented as a ubiquitously-accessible web-based query application, which provides timely and accurate information on the department's financial situation. A prototype-based test run was initially conducted as a proof of concept in 2010, and its subsequent everyday use is contributing to further improve the application. The prototype was implemented under the guidance of the authors in several departments at the University of Granada (UGR) to confirm its viability and to detect possible mistakes or improvements. The system is currently in use and is licensed for distribution as open source software, which could be implemented by any or all of the 123 departments that comprise the UGR.

The system is web-based and intended to optimise efficiency in the management of public resources in education, and particularly within university departments. This outcome is achieved by providing each department member with more and better information for cost control and budget allocation. This is a novel approach to managing economic and financial information in university departments, one that is based on a combination of expressive, yet intuitive, query language, and faceted search. A comparison of its performance with that of existing approaches used in our university confirmed its greater effectiveness and efficiency.

Justification and Objectives

The UGR, and especially the departments with a strong economic orientation, cannot ignore the imperative demand for greater efficiency provoked by the current economic crisis. However, the main departments of the Faculty of Economics have traditionally lacked expenditure control systems, even though their teaching and research specialisation would readily enable such systems to be developed. In the best of cases, the only control consisted of a spreadsheet in which each teacher was assigned a column, but for which either there were no clear, explicit criteria for distributing the budget available (such as item limits, spending ceilings per teacher, the use made of budget surpluses, etc.), or if there were, they were unknown to many staff members (Melchor-Ferrer & Buendía-Carrillo, 2014).

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