Second Order Interactive End User Development Appropriation in the Public Sector: Application Development Using Spreadsheet Programs

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ABSTRACT

This paper seeks to respond to the research question: How does appropriation take place in the public sector in the development of end user applications by civil servants? Appropriation is defined as taking advantage of opportunities related to the development and use of applications, when the developer has in-depth knowledge of the problem domain and is also the primary user of the application. The author’s results showed that public servants who have deep problem domain knowledge can take advantage of end user tools (e.g. spreadsheet programs) in the problem-solving process to solve vaguely defined problems. Appropriation is manifested in the continuous development of various ICT applications. In this paper, the author differentiates between first- and second-order appropriation. First-order appropriation takes place when the potential of the development tool is appropriated by the end user. Second-order appropriation takes place when an application is continuously developed and refined in parallel with the end user’s learning process and the development of organizational requirements.

KEYWORDS

Appropriation, E-Government, End User Development, EUD, Public Sector, Spreadsheet

1. INTRODUCTION

Information systems are crucial to any organization, private as well as public. Traditionally, information systems are developed by experts within an ICT department or from some external consultancy. End User Development (EUD) implies the decentralization of systems development in an organization, rather than centralized development managed by an ICT department. Instead of the ICT department organizing systems development, individuals at various organizational levels can, within given constraints, decide for themselves when and how to develop a system meant to support the individual in his/her work. EUD takes place in private and public organizations. The use of ICT in the public sector is called eGovernment. The World Bank (2011) defines eGovernment as “the use by government agencies of information technologies that have the ability to transform relations with citizens, businesses, and other arms of government”. The public sector differs from the private sector with respect to how it is owned (mostly by citizens), funded (mostly by tax), and controlled (mostly by political forces) (Perry and Rainy, 1988). These aspects of EUD in the public sector give rise to conditions that are different to those found in the private sector. Civil servants in a municipality are...
accountable to the citizens of that municipality. Consequently, they have to adjust their deeds and applications to conform to the policies of the current political majority.

EUD can be defined as “… a set of methods, techniques, and tools that allow users of software systems, who are acting as non-professional software developers, at some point to create, modify or extend a software artefact” (Lieberman et al., 2006). This implies that workers in an organization develop ICT applications for their own needs. These end users are experts in their own specific part of the organization. They use all sorts of tools and applications to carry out their work, including spreadsheet programs, CAD tools and database tools. ICT tools may be used because of a need for decision support, to double check and search for new procedures, to avoid backlogs, and to rationalize or simply explore and develop an end user’s role in an organization (Fahy & Murphy, 1999; Avdic, 2009; Pankowska, 2011). Whilst any kind of ICT tool can be used in EUD, the most common is the spreadsheet program and the most commonly used spreadsheet program is MS Excel. Exact numbers are hard to find, but in Sweden where this study took place, MS Excel is completely dominant. In the USA alone there were 13 million spreadsheet end users in 2005 (Scaffidi et al., 2005). The number of MS Excel users around the world is huge. Firman (2015) has claimed that it could be as many as 750 million.

Above, we have identified some of the reasons why EUD occurs. Alternatively, EUD may be necessary because of problems that arise when using existing programs and systems. Most organizations today offer ERP systems to their employees. Some of these systems are huge, rigid, complex and perceived as being less usable than other systems by their users. Indeed, some users hesitate to adopt them, choosing instead to develop “feral” applications. This is the case even when the ERP includes modules that would fulfil the users’ needs (Houghton & Kerr, 2006). Users may choose not to use a central system such as ERP (and eventually EUD) for organizational, cultural or social reasons, such as inconsistent procurement policies. Buonanno (2005) stated that business complexity and organizational structure could prompt end users to choose EUD instead of an ERP system (Buonanno, 2005).

To date, research into the use of EUD in the public sector has mainly dealt with end users, rather than EUD, itself. Searches of research databases, including Summon, ACM Digital Library and Google Scholar, using different combinations of terms such as e-government/electronic government/digital government AND end user development/end user computing/end user software engineering, have elicited hits that are about end user participation (e.g. Karlsson et al., 2012), end user satisfaction (e.g. Goel et al., 2014), suggested frameworks (e.g. Meyer et al., 2012), or web publishing (e.g. Fogli et al., 2010). A prominent eGovernment journal like Government Information Quarterly publishes papers on end user satisfaction, usability and end user acceptance. However, the closest it has come to discussing EUD is to look at user participation. This implies a need to research and understand EUD in the public sector.

The existence of ICT departments in the public sector has not been brought into question; rather, the issue is whether or not EUD should be allowed. Centralization does have some disadvantages. In particular, the centralization of application development tends to formalize the development process, which can lead to greater inertia and inflexibility than would be the case for EUD. According to Pankowska, “Drawbacks of centralized ICT resources management result in the separation of ICT functions from the business, increase of back-up costs and lack of appropriate recognition of the end user requirements” (Pankowska, 2011, p 225). A complex ICT environment generally means that the development process is also complex. Thus, ICT specialists are needed to develop and maintain applications. Occasionally, ICT specialists are also business experts, although this is not often the case. ICT staff tend to observe the organization through the lens of ICT development rather than from the perspective of users or employers/decision takers. In particular, “… ICT-driven research as well as ICT-driven governmental change often lead governments to divert their attention to technologies per se rather than to the ways in which these tools can assist them to carry out their main public
Participating in the Enterprise Web 2.0 Platform: The Influence of Trust
www.igi-global.com/article/participating-in-the-enterprise-web-20-platform/154001?camid=4v1a

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