The Interplay between Practitioners and Technological Experts in the Design Process of an Archaeology Information System

Tommaso Federici, Università degli Studi della Tuscia, Italy

Alessio Maria Braccini, Università LUISS Guido Carli, Italy

EXECUTIVE SUMMARY

This case describes the design and development process of a computer-based information system for the management of archaeological finds and related documents. Adaptive Structuration Theory is used as the conceptual framework to analyse the role and actions of different people involved in the design and development process, during the different stages of the case. The case addresses key issues, such as an initiative taking place in an organizational context where users show different needs, profiles and levels of information technology literacy. It focuses primarily on the interactions between practitioners and technological experts during the design and development process. Another matter of interest comes from the fact that, in this sector, no other information system for finds management was already available. Moreover, this case targets the domain of archaeology that has not received so much attention by Information Systems literature to date.

Keywords: *Adaptive Structuration Theory, Document Management, Experts-Users Interplay, Finds Management Systems, Information Systems and Archaeology, Information Systems Design*

ORGANIZATIONAL BACKGROUND

The case presented here concerns a project to design and develop an Information System (IS) to support all the management activities of archaeological finds and their related documents. This is a domain where technology has rarely been employed for such usage (Braccini & Federici, 2010, p. 139) and where several different professionals usually work separately. In order to achieve the best possible results, the promoters planned the project to take into account the

DOI: 10.4018/jcit.2012010103

novelty of the projects aims, as well as the preliminary need to share knowledge and exigencies among all the involved professionals.

The project was then based on two fundamental choices: the participation of most of the final users, first in the requirements definition, and later in the design discussion; and the adoption of an iterative process along which the many different cultures (of archaeologists, restorers, storekeepers and technological experts) may eventually converge on a solution able to answer to everybody's requirements.

The designed IS has a wide scope and adopts advanced technologies and solutions that will be described in the paper. Nevertheless, the main theme of this case is the presence of many different actors and the interplay among them during the long process of designing and developing the system. To investigate this phenomenon, we applied Adaptive Structuration Theory (AST) which is devoted specifically to describing the social aspects of human interactions in a technological context.

Even though this case deals with the field of finds and document-management systems in archaeology, arguably a neglected topic in IS studies, some considerations regarding the system and its development process also hold true for other domains. In particular, some specific problems addressed by the system described in this paper are linked directly to the nature of the objects (finds and related documents) and are close to those experienced in other domains that manage perishable and valuable assets, such as ancient books, paintings or artworks in museums. Moreover, the issues faced in the development process, regarding the roles and actions of final users and technology experts, are in our opinion also applicable to generic development processes that try to design an operational IS to support managerial operations, particularly when the multi-disciplinarity of the users and novelty of the solution come into play.

General Problems Regarding Finds Management

The management of archaeological finds is a process that encompasses all the activities performed on a find, including excavation, restoration, study, conservation and exhibition (Braccini & Federici, 2010). To perform all these activities, information is crucial but it is often not managed properly.

Each object that comes out of the soil during an excavation is not only a discovery of the past but also a potential valuable source of information. Just for the fact of being discovered in a certain place, at a certain depth, close to certain other objects, each find is a testimony of the presence and activities of mankind in that location. However, not every find is an object worth displaying in an exhibition. The largest part of finds is formed merely by small fragments that can only in a few cases be used to rebuild (virtually or physically) a partial or complete object. Their contribution to the unveiling of cultural heritage is still crucial since they bring with them valuable informative potential. For example, in 1900, the discovery of a part of a gear-wheel-based mechanism in the shipwreck of *Antikythera,* built approximately between 80 and 50 B.C., significantly contributed after decades of study to shift the date of the workmanship of complex mechanical machines from the first century B.C. to the fourteenth century A.D. This discovery that deeply altered our knowledge about the technological level of the ancient Greeks was achieved even though the mechanism discovered was only partial, and its original form, function, and shape could not be rebuilt with the parts discovered from the shipwreck. They were derived thanks to the contribution and information exchange of many scholars (de Solla Price, 1975; Edmunds & Morgan, 2000).

Each archaeological find, starts a new life cycle through which it will cross several stages (among them storage, cleaning, restoration, study, exhibition, grouping or consolidation),