

4-3-2009

# Knowledge Sharing in a Cultural Heritage Context: An Exploratory Study

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## Recommended Citation

Braccini, Alessio Maria and Federici, Tommaso, "Knowledge Sharing in a Cultural Heritage Context: An Exploratory Study" (2009).

*All Sprouts Content*, 269.

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## Knowledge Sharing in a Cultural Heritage Context: An Exploratory Study

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### Abstract

Once discovered, an archaeological find starts a sort of new "life-cycle", throughout which it will cross several events sometimes repeatedly. Just for its discovery, each find brings with it several information. Each event it may cross (restoration, study, exhibition etc.) generates as well additional information. Despite the fundamental role in such domain, information is often considered as individual knowledge, not specifically managed, and then not available to persons different from the ones implied in each single event. This work therefore introduces an exploratory case of study whose main goal is the analysis of the ArcheoTRAC information system and its supporting role in knowledge management processes involving cooperation among different subjects and organizations. In particular, the study will focus on the role of the ArcheoTRAC system in fostering knowledge creation and knowledge transformation processes and in exploiting available knowledge in these processes.

**Keywords:** information system development, archaeology, participatory action research,

**Permanent URL:** <http://sprouts.aisnet.org/9-14>

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**Reference:** Braccini A.M., Federici T. (2009). "Knowledge Sharing in a Cultural Heritage Context: An Exploratory Study," Proceedings > Proceedings of ALPIS itAIS, Italy . *Sprouts: Working Papers on Information Systems*, 9(14).  
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## INTRODUCTION

Once discovered, an archaeological find starts a sort of new "life-cycle", throughout which it will cross several events sometimes repeatedly. Just for its discovery, each find brings with it several information. Each event it may cross (restoration, study, exhibition etc.) generates as well additional information. All the information generated is useful, and often crucial, in order to deepen the scientific contribution received by the find, to make every time the best decision about its management, and, in the end, to give a proper sense to its discovery and to its expensive conservation.

Despite the fundamental role in such domain, information is often considered as individual knowledge, not specifically managed, and then not available to persons different from the ones implied in each single event. The problem is further increased by the presence throughout the life-cycle of several professionals (archaeologists, restorers, storekeepers, archivists...), that usually work separately, even when their activity involves the same finding.

After the recovery on site and for a long-lasting period (often forever), the find is merely known by the person who discovered it. Retrieval and collection of data related to the finds does not follow standardized procedures: they are highly diversified, and specific for each agency, organization, or even individual that works on the finds. Rarely such data are stored on a computer, however in personal files with different formats and supports. In such scenario, the informative potential embodied by each find is lost (usually forever) making the recovery and the storage of a scientific "dumb" object useless. Despite these limitations, in the last ten years, no software appears targeted to the finds life-cycle management.

## THE giSAD PROJECT AND THE ArcheoTRAC SYSTEM

The Monuments Department of the Italian autonomous Region of Valle d'Aosta promoted a project named "giSAD - Recouvrement du Potentiel Informatif des Sites Archéologiques Démontés". The project had the purpose to design and produce an Information System (named ArcheoTRAC - "Information System for the Tracking, Recovery, Assessment and Conservation of the Archaeological and Documental Heritage") to address the described problems.

The project was started in partnership with other regional Monuments Departments (both Italian and European) and with the support of the European Union which co-financed it. The aims were the definition of an integrated, shareable and transversal operative methodology and the creation of an interdisciplinary information system, capable of supporting everyday archaeological activities. The project has to address three classes of objectives:

- *strategic*, with regard to:
  - the exploitation of informational potential of the huge amount of finds not studied (Nonaka 1994);
  - the opportunity of improving resources usage (Nonaka and Takeuchi 1995, Nonaka et al. 2000, Prahalad and Hamel 1990), by estimating interventions cost, and planning them on the basis of the information contribution;
- *organizational*, referred to the achieving of higher finds protection, improved management, reduced costs, and increased involvement of all professionals;
- *scientific*, in term of research progresses achievable through the availability of more information, and a greater exchange of knowledge among diverse disciplines (El Sawy et al. 1996, Stein and Zwass 1995).

The project involved all the partners and professionals (archaeologists, restorers, archivists) acting along the finds life-cycle. The project had a first long phase devoted to declare, and analyse the practices adopted by each type of professional, in order to find a common methodology that could suite everyone's culture and could be applicable to everybody.

The development of ArcheoTRAC was started in 2005. The system was designed in order to maximize

data sharing and interrelating (respecting the different needs of each professional at the same time), and to guarantee the traceability whatever and whenever of each object.

*Figure 1: Different view for each professional, but sharing the same data.*

ArcheoTRAC is a totally web-based open-source licensed system, and largely uses advanced technologies (UMTS connections, UHF RFID tags, handhelds, access control, and so on). However, for our purposes, the main characteristics we are interested on are: interdisciplinary collaboration, adaptability to different needs and cultures, knowledge maps of a find.

ArcheoTRAC lets all the professionals use the same Information System and share the same database (see fig. 1), promoting a continue interdisciplinary co-operation among experts (Tuomi 1999). Any professional has the possibility to adapt the system by:

- choosing the view (see fig. 1) that better suites his/her needs and preferences (Walsham 2001), showing only the relevant information for him/her;
- including in the system other non-standard information which only he/she will store and read, because he/she is used to collect and make use of, minimizing a possible barrier that may prevent the use of the system (Chua 2004).

Finally, by recording all the events of any sort, ArcheoTRAC can trace the entire objects history after their discovery building a timeline map for each find, and a relationships network of interrelated finds (see fig. 2, where finds are identified by a code).

*Figure 2: Relation network among single finds.*

## **METHODOLOGY**

This work therefore introduces an exploratory case of study (Yin 2003) whose main goal is the

analysis of the ArcheoTRAC information system and its supporting role in knowledge management processes involving cooperation among different subjects and organizations. In particular, the study will focus on the role of the ArcheoTRAC system in fostering knowledge creation and knowledge transformation processes (Nonaka 1994, Nonaka and Takeuchi 1995) and in exploiting available knowledge in these processes (Tuomi 1999).

The methodology adopted for this study is a participatory action research. In action research projects, researchers usually collaborate with practitioners to solve practical problems while expanding their scientific knowledge (Jönsson 1991, Baskerville & Myers 2004). Citing Blum (1955), Baskerville and Myers (2004) argue that action research is a two-stage process: first theories concerning the research domain are formulated and afterwards changes are introduced and their effects studied. Participatory action research extends traditional action research approaches (Baskerville 1999). In participatory action research the responsibility for theorizing is attributed both to practitioners and researchers; practitioners have the status of “co-researchers” as they “bring situated, practical theory into the action research process” (Baskerville 1999).

## DISCUSSION

The ArcheoTRAC system represents, according to our opinion, an interesting case to be studied. First of all, because the adoption of information systems in support of archaeological activities is a quite neglected field of research. Therefore, the ArcheoTRAC system offers the opportunity to investigate and observe the adoption of an information systems in a “virgin” context. Finally, this system is also of interest to be studied due to its success. After the conclusion of its development (2007), an experimental programme for its adoption was launched. Even though the lapse of time is still short, the first users have adopted it in a short time, and they state that their work it is having a sort of bootstrap.

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