Chapter 4.15
Databases for Multiple Archaeological Excavations and Internet Applications

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INTRODUCTION

The science of Archaeology has been in existence for a long time and the way an archaeological excavation is conducted hasn't changed much. However, the way archaeological data is recorded has changed dramatically by the progress of technology and the widespread use of computers. Nowadays, almost any archaeological excavation uses databases to record not only the objects which have been found, but also the various data which come up during the excavation process (Lock, 2003).

Many remarkable researches have been conducted by archaeologists who developed standards and methods for recording the data which was produced during an archaeological excavation. Although many excavators use particular standards and methods for data recording, these usually cannot be completely implemented and have to be adapted to the particular requirements of the excavation. The reasons why this is happening are the various differences excavations have; in how archaeologists excavate a site, which data is recorded and how the data is characterized (we will discuss further this topic in the following chapters).

Therefore, databases that have been used have been developed by archaeologists and database developers, in order to satisfy the particular data recording requirements of each excavation. To achieve this, databases are commonly developed completely from scratch and separately for each excavation, in order to come up with the different needs archaeologists have. It is obvious that different databases have different structures, which basically means that they consist of different tables with different columns.

In order to create a database which can handle multiple excavations, the above differences make it necessary to provide archaeologists the capability of recording data according to their needs. Therefore, a database should be indirectly modified by archaeologists in order to meet their needs, without changing the database structure. This means that archaeologists do not intervene within the database structure in order to modify it, which results in the structural integrity of the database (we will discuss further this topic in the following chapters).

The main purpose of such a database is to improve the capability of sharing archaeological data and knowledge of different excavations with other archaeologists, scientists and generally with other people. Also, a multiple excavation database can improve the collaboration between archaeologists, by letting them work on a specific database structure which can be indirectly modified (Burenhult, 2001). Another issue is the compatibility between databases and other information systems. By using different databases, existing systems like GIS systems, Internet applications or simple database queries have to be modified in order to work or may even not work due to the different database structures. Having a database with distinct structure, information systems can be developed once and reused for any other excavation with its corresponding data (Richards, 1998).

In the following sections, we make a brief introduction in archaeological excavations. We describe first the analysis that has been done to create a database which can record multiple archaeological excavations, second how the database was realized and finally how the archaeologists can be assisted in their work by using the capabilities Internet provides.

INTRODUCTION TO ARCHAEOLOGICAL EXCAVATIONS

As mentioned before, archaeological excavations may vary in different ways, but the principles of archaeological working methods remain generally the same. In this chapter, we have an introduction of how a site is excavated and which data come up during this process.

Let's begin with the most important spatial entity of an archaeological excavation, which is the section. At this point, notice that not all archaeologists use the term section, but they may use other terms to describe this entity (the same applies for the following entities). Sections are the parts of an excavation site which have been removed and studied. We can think of them as the soil that has been removed from the excavation during a digging process. Those part's dimensions can vary and they usually have the shape of a square, but they can also have any other shape. A section is defined by the points which define its shape and the depth of each point. Obviously, archaeologists record the coordinates of these points and the depth.

A section gives specific information about a particular part of the excavation that has been removed, for example, what type of soil and objects have been found. Additionally, a section can belong to a phase, to a layer and to a construct. These are entities that define chronologically and spatial an excavation (we will discuss this entities later on). Any objects that have been found in a section do "belong" to this section and inherit many of its chronological and spatial information. So when an archaeologist knows a section or an object, he can gain additional information on a specific part of the excavation. This gives the section a key role, which enables the archaeologists to create spatial and chronological analysis on the entire excavation or on objects which have been found. Also, sections enable archaeologists to keep track of the excavation progress. Notice at this point that the way sections are created may vary, depending on the excavation (Figure 1).

We mentioned before the term layer. The layers are 2-dimentional or 3-dimentional representations of the excavation, which have been defined by the archaeologists. Layers are used by archaeologists to define characteristics and consequently information for particular parts of

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