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ALCAIDE 2

ARCHAEOLOGICAL INFORMATION SYSTEM

CHARACTERISTICS AND TECHNICAL REQUIREMENTS

ABOUT THE DOCUMENT

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EXECUTIVE SUMMARY

Alcaide is a software application that aims to support technicians and specialists in the management of information produced during archaeological excavations.

This document describes the main characteristics, functionalities and advantages of the software Alcaide. It also describes the technological requirements for it to be installed on a production server.

ALCAIDE

Alcaide is a software that aims to help managers and technicians to collect and organize information produced during an archaeological excavation project.

The solution is based on sound archaeological practices, tested in the field and based on international standards.

ARCHAEOLOGICAL INFORMATION SYSTEM

MANAGING EXCAVATIONS

The software was developed alongside archaeologists from several countries taking advantage of their knowledge and expertise of the fieldwork to better identify the processes and optimize the software to make sure data input and consultation is done as easily as possible.

The software mirrors the natural workflow of archaeological activities and uses standardized terminology to describe each piece of information. The application allows users to record information with the level of detail that a research excavation demands, but also maintaining the speed that an excavation in the context of a construction site requires.

Regardless of how Alcaide is used, the data collected is quickly dispatched out of the working environment to avoid losses of information due to device failure or damage caused by accident.

All the data inserted is available online and can be be consulted in real time by all users, including excavation managers, being them on the excavation site or in their office.

Complete record of daily activities

Alcaide allows users to record and access the daily excavation journals. That way it is possible to know who did what, when and where.

This information is immediately available to the excavation manager, enabling her to produce sector journals and other essential managing reports by simply clicking a button.

Automatic generation of site plans and Harris matrices

Alcaide uses various visual metaphors to represent the excavation area, including the presentation of squares and their stratigraphic units.

That way it is possible to have an overview of the dig and the dimensions of the archaeological site.

Alcaide also generates Harris Matrices automatically, enabling everyone to understand it perfectly.

Support for Munsell colour system

Alcaide has a tool that allows users to introduce Munsell colour codes based on soil samples, without having to use *Munsell Soil Book of Colour*.

The application also allows the build of a colour map based on the stratigraphic units of the field and the respective excavation sector.

Standard workflow

Alcaide ensures that different stages of the archaeological research are carried out according to a well-established workflow that is both practical and efficient.

The application uses standard and precise terminology to make sure that all users speak the same "language".

The software simplifies the introduction of data by means of controlled vocabularies that promote the use of best practices.

Centralized management

Alcaide is 100% Web based. To use the software, users only need an Internet Browser. Data is always stored offsite to avoid data loss due to accidental device destruction, so typical in the field.

The software is mobile-friendly which means that archaeologists may use their tablets or smartphones to conveniently input and access all the data in the system.

ARCHITECTURE AND APPLICATION MODULES

Alcaide is composed of 6 functional modules, that range from the preparation of an archaeological excavation project to the research work done on top of the collected information about each particular excavation. Those modules are:

1. **Excavation management** – monitoring fieldwork progress and production of sector journals;
2. **Fieldwork** – register daily fieldwork activities;
3. **Logistics –** management of requests for additional materials, communication with the excavation team;
4. **Laboratory –** registration and analysis of materials found in the field;
5. **Administration –** Configuration and monitoring of the global system state;
6. **REST API –** Programmatic interface to enable the integration with third party systems.

The following figure depicts the different components and technologies used in Alcaide architecture.

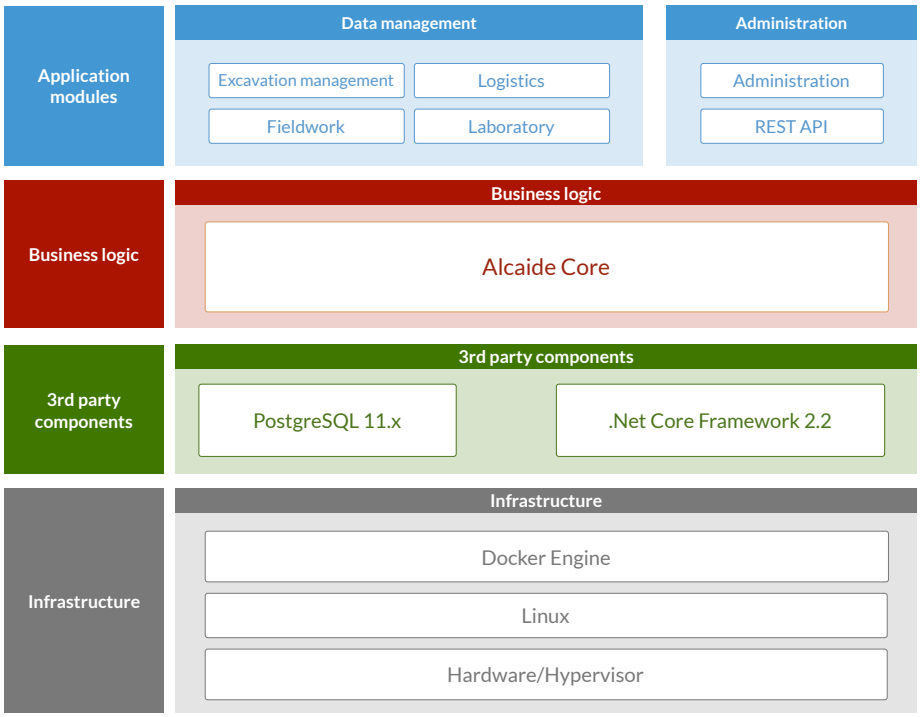

Figure 1 – Alcaide architecture.

EXCAVATION MANAGEMENT

In the Excavation management module, users are able to coordinate archaeological projects, excavation campaigns and archaeological sites. The excavation director can define the duration of a campaign and the sites to be worked on during that period. At any time, users can obtain statistical reports on the work done during the campaign.

The excavation director has access to all site journals as well as the ability to print them in combination with all sector and square journals made on a particular day.

The Excavation management module also has the ability to define the profiles and permissions of each participant in a given project. For example, the excavation director can define who has permissions to upload drawings and/or photographs, or who can enter sector journals. She can also limit who can see the fieldwork or lab information associated with a particular site.

FIELDWORK

In the Fieldwork module users may record the various activities performed during an archaeological excavation. The user can quickly and intuitively set up a sector plan, manage stratigraphic units, squares, diaries, bags, drawings and photos.

Sector journals are automatically compiled using all information produced by all the archaeologists that have worked on that sector during the day. A sector manager can also define which users have access to which information in their sector.

Alcaide automatically offers the ability to interactively create field plans by sector. These field plans allow users to easily configure the structure of the sector (e.g. area, square grid or inner squares) and define the stratigraphic units in each component. The same field plans facilitate the input of field data directly into the desired square, e.g. journal information, bags, etc.

In Alcaide, the extracted material can be associated with a bag. Automatic identifiers are created at the time of registration. Users may place a set of items in a bag. These items, depending on their nature, can later be marked and give rise to artefacts or samples. This data is available for further analysis, facilitating research work over these items.

Additionally, users may upload drawings and photos as well as other media files and share them with the rest of the team.

LOGISTICS

The Logistics module enables users to request additional material that is necessary on the excavation site. These include materials necessary for work, hotels, human resources, meals, repairs, transportation, etc. New requests go through a simple approval workflow before they can be fulfilled. This information can be consulted at any time by relevant staff and financial reports can be produced to allow excavation managers to get an overview of the costs incurred.

Alcaide also allows managers to communicate with their teams by posting messages that become visible on the user's personal dashboard. This way the entire team is synchronised and well informed of all ongoing activities.

LABORATORY

In the Laboratory module users can analyse the materials obtained in the field. Once collected and washed, bags containing these materials can be marked and, depending on the nature of the items within them, these can give rise to artefacts or samples that are automatically labelled and identified.

With a simple mouse click, users can know the bag, the square, and the stratigraphic unit from where a particular artefact or sample came from.

ADMINISTRATION

The Administration module allows the system manager to consult the overall state of the application, as well as configure and adapt the software to needs of its users.

For example, in the Administration module one can define user profiles as well as tailor the terminology used in the application to meet customer needs.

It is also possible to adjust colours and the overall branding of the application.

REST API

Alcaide delivers a well-documented REST API that enables third party applications to integrate with it and make use of its data.

Real time reports

Alcaide's reporting capabilities are exceptional! The system implements a set of reports that reflect the most demanding reporting needs.

The excavation manager may at any given time issue site, sector and square journal reports. It can also produce sector, stratigraphic unit, bag, artefact, sector plan, Harris matrix, financial reports and campaign statistics.

Task optimisation

Because all the information is introduced in a distributed way across the various excavation participants, gathering information and subsequent reporting is immeasurably simpler and faster.

The system enables each user to perform the operations appropriate to their activity profile, allowing the registration of information to be a collaborative activity with the contribution from all professionals.

Easily find relevant information

A specific item can be stored in a bag out of hundreds. Finding information is sometimes a lengthy and complex process.

In Alcaide, users can find items by simply searching for pieces of information. The system will find the required information wherever it is stored, regardless of their type or excavation project.

Information always available

The information submitted to Alcaide is always stored offsite on the server minimising the chances of data loss due to device damage or accident.

Anytime and anywhere, users can manage archaeological activity using any device with Internet access.

Mobile Compatible

We know that it is not always easy to take a computer to the excavation site, so Alcaide allows you to use any tablet or smartphone to enter and read information.

The information is always available to everyone, anytime and anywhere.

WEB CONTENT ACCESSIBILITY

The Web Content Accessibility Guidelines (WCAG) 2.0 are a set of recommendations issued by W3C that aim to make Web content more accessible. Compliance with these guidelines makes Web content accessible to people with disabilities, including blindness and low vision, deafness and low hearing, learning disabilities, cognitive limitations, movement limitations, speech disability, photosensitivity, and others. Following these guidelines also allows web content to become more usable by general users and mobile devices such as smartphones, tablets or wristwatches.

Given the importance of this issue, legislation was created to promote the adoption of these guidelines throughout the Portuguese State. The National Digital Interoperability Regulation (RCM No. 91/2012 of 8 November) clarifies the obligation to comply with WCAG 2.0 level AA guidelines by all State websites that provide online services. Article 2 of Law No. 36/2011 provides that the law applies to:

- Sovereign Bodies;
- Central government services, including public institutes and deconcentrated state services;
- Regional public administration services;
- State business sector.

KEEP SOLUTIONS supports this initiative and ensures that all of its products are fully compliant with the AA+ level of the Web Content Accessibility Guidelines (WCAG) 2.0.

Focused on **information security**

Alcaide incorporates a set of features that make it a highly secure system. These include: 1) data exchanged between client and server applications is encrypted using the HTTPS/TLS protocol; 2) access is restricted through permissions to access features and records; 3) In cloud mode, the system is subject to daily backups.

TECHNICAL REQUIREMENTS

SERVER

RAM	4 GB 8 GB recommended for contexts with over 20 users
CPU	Intel Dual-Core or superior
Hard drive	200 GB It depends on the volume of digital objects and their growth rate.
Operating system	Linux Kernel 5+
Software	Docker engine
Network	10 Mbit/s or superior

CLIENTS

RAM	4 GB
CPU	Intel Dual-Core or superior
Monitor	1280x768 pixels or superior
Operating System	Windows, macOS, Linux, Android, iOS, etc.
Software	Updated web browser
Rede	40 Mbit/s or superior (equivalent to a 4G network)

KEEP SOLUTIONS

KEEP SOLUTIONS is a company whose mission is to provide advanced solutions for information management and digital preservation.

Our approach consists in providing software and services to allow our customers to make a more efficient management of their information assets.

The company started its activity in 2008, having acquired the status of academic spin-off of the University of Minho, for being a business initiative with strong bonds with research centers and departments from this institution.

Our clients are mainly in the public sector, in the cultural, educational, heritage and scientific fields, specifically in the archive, library and museum areas.

We invest in the continuous development of innovative solutions. For this, we remain active in the production of scientific knowledge, actively participating in R&D projects in cooperation with national and international institutions.

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