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Excavations at Tel Kabri, Israel: A Case Study in Data Management for Archaeological Research

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Excavations started in the 1980s, and apply a range of technologies and methods to gain a holistic understanding of daily life and trade at Kabri. Tel Kabri was a Middle Bronze Age palace near the Mediterranean coast. The project is a case study in data management for archaeological research by examining one project’s current practices. This case study aims to identify data management needs in the data lifecycle.

**ARCHAEOLOGICAL DATA WORKFLOW**

*Data Collection In the Field*
- Locus data recorded in Excel, accessed on a tablet and stored in the cloud
- Artifacts are excavated, numbered, and drawn to scale
- Files are synced twice per day using mobiles as hotspots for offsite collaborators to use
- High-resolution images (up to 1,000/day) are taken and later transferred to portable hard drives
- Artifacts are collected, labeled, and sent to onsite lab
- Samples for residue analysis, floatation, and dating are collected, labeled, transported to the onsite lab

*In the Onsite Lab*
- Graduate students build excel spreadsheets to catalog artifacts
- Artifacts pre-processed for laboratory analysis

*Post-Excavation*
- Artifacts processed, packed for storage and preservation
- Selected vessels reconstructed
- Data from across seasons is reviewed, compared, and analyzed

*Consultation*
- Specialists produce additional data from remote sensing, chemical analysis, 3D modeling, and dating

*Publication*
- Preliminary field report written and published on institutional website
- Season reports and copies of collected data submitted to Israel Antiquities Authority as required by permit
- Articles written and submitted for publication
- Data made available to other researchers upon request
- Funding applications for the next season submitted

**ARCHAEOLOGICAL RESEARCH PRODUCTS**

- **Documents**
  - Field reports
  - Articles and presentations
  - Lab notes
- **Data Sets**
  - Artifact catalogs
  - Locus sheets
  - C-14 dating results
  - Chemical analysis results

- **Images**
  - Photographs & orthophotographs
  - Technical drawings
  - Artifact illustrations
- **Virtual Archaeology**
  - Remote sensing data (e.g., LiDAR)
  - 3D scans and models
  - GIS datasets
- **Cultural Material**
  - Pottery sherds
  - Mosaics
  - Reconstructed vessels

**CONTEXT**
Tel Kabri was a Middle Bronze Age palace near the Mediterranean coast. Excavations started in the 1980s, and apply a range of technologies and methods to gain a holistic understanding of daily life and trade at Kabri.

**OBJECTIVE**
This case study aims to identify data management needs in archaeological research by examining one project’s current practices.

**MODULES FOR RESEARCH DATA**

- **Types, Formats, and Storage of Data**
  - Data stored in paper notebooks, databases, and spreadsheets
  - Extremely large quantities of raw and processed data
- **Data Storage, Backup, and Security**
  - Strict long-term data storage requirements from Israel Antiquities Authority, which pose access issues
- **Data Sharing & Reuse Policies**
  - Use of cloud-based applications for data sharing
  - Need to digitize data from 30+ years and standardize formats
  - Material will be permanently held by foreign government agency

**METHODS**
An interview instrument, based on the Digital Curation Centre’s Checklist for a Data Management Plan 4.0, was developed and used in an interview with lead staff to focus on understanding the project’s data workflow throughout the data lifecycle.

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**CONCLUSIONS**
Archaeology as a discipline is centered on the importance of context and data preservation. Partnering with archaeologists may allow LIS professionals to pursue a model for global data services that addresses the complexities of collecting data in foreign countries, incorporating legacy data, and preserving multiple data types.

**RECOMMENDED DATA MANAGEMENT PLAN**

- **Types, Formats, and Stages of Data**
  - Data will be imported to software that can manage multiple file types, assign metadata, and provide versioning control
- **Data Storage, Backup, and Security**
  - All data will be duplicated and stored in a U.S.-based repository or cloud-based storage service
- **Data Sharing & Reuse Policies**
  - Re-use is subject to approval of the PIs and may be requested by contacting the PIs or the Israel Antiquities Authority
- **Repositories, Archiving & Preservation**
  - Data in paper notebooks will be digitized
  - Data will be stored in open-source formats where possible
  - Israel Antiquities Authority will be responsible for storing, archiving, and preserving all materials