

Temporal Visualization and Data Analysis of Archaeological Finds: Case FindSampo

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Conference on Cultural Heritage and New Technologies (CHNT 25), Nov 4-6, 2020, Vienna, Austria

<https://seco.cs.aalto.fi/projects/suult/>, <https://blogs.helsinki.fi/suult-project>

FindSampo is a framework that caters for the collecting, sharing, publishing, and studying of archaeological finds discovered by the public through a citizen science approach. Here we present the prototype of a portal part of FindSampo which is to be used to publish, study and share the collected finds. This presentation focuses mainly on the temporal dimension of the finds data. The prototype includes a user-centric faceted search engine combined seamlessly with data analysis tools for visualising archaeological finds.

Research Goals

1. Support the metal detectorist community in learning archaeology and their hobby
2. To help the Finnish Heritage Agency in recording the finds in their databases
3. To support Digital Humanities researchers (DH) by helping them to study the data with data-analytic tools

Research Questions

How to visualize the temporal spread of records on a timeline by object type, material used, find name, and geographical locations ?

1. How to perform semantic search involving temporal data?
2. How to represent time and imprecise time semantically in an interoperable way?
3. How to visualize and analyse data from a temporal perspective?

Challenges

- Acquiring and converting the tabular data to linked open data.
- Selecting the appropriate data dimensions to use in the facet search engine.
- Representing period on the timeline, especially when the periods overlaps.
- Representing the finds on the timeline.

FindSampo Solutions

1. A **linked open data model** that describes the finds in terms of values taken from a set of (hierarchical) ontologies, such as object types, materials, and time periods. The finds are interlinked with the MAO/TAO ontology and the time period ontology interlinked with the PeriodO.
2. A **faceted search engine** based on prominent dimensions of the finds data: find name, object type, material type, period, location.
3. A **timeline visualisation** capable of the following:
 - showing the distribution of the finds overtime
 - showing another dimension of the data through grouping. For example the finds shown on the timeline can be grouped by material used, this provides the user with a new kind of perspective to the material distribution of the finds in time.
 - Support exploration through zoom and click.

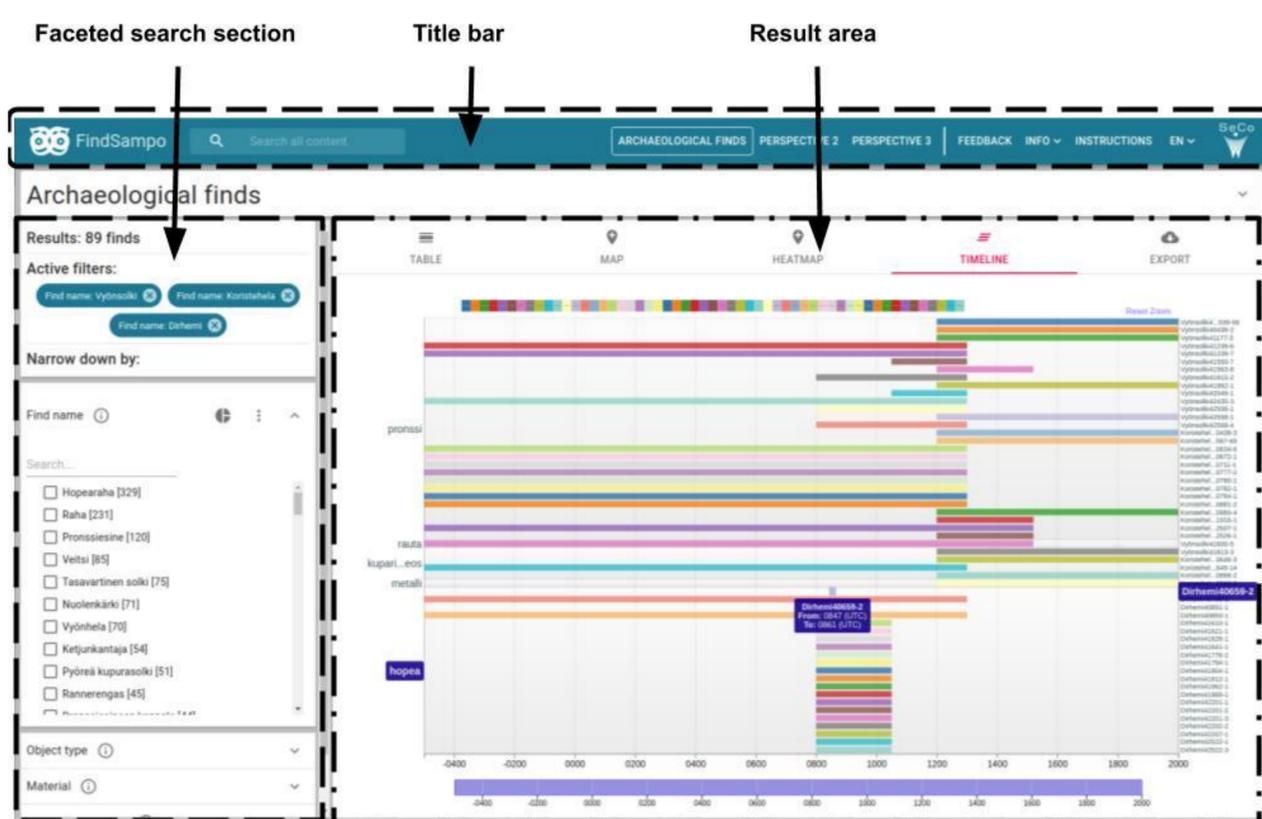


Fig. 1. The novel timeline visualization in the FindSampo portal's user interface, in which the faceted search filters the result set to be visualized.

The portal can be divided into 3 parts:

1. Title bar
2. Faceted search section
3. Result area

The **Title bar** Contains the portal's title, perspectives, navigation options to other pages, and language change options.

The **Faceted search section** feature 5 main facets: *find name, object type, material, period(ontologised) and Place*.

The **Result area** contains a tab view to show the results from the facet search. For example one could search for all coins found in the Helsinki(Uusimaa) region. A find's home page can also be accessed by clicking the find.