

Usability in Digital Humanities

Evaluating User Interfaces, Infrastructural Components and use of
Mobile Devices during Research Process

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Agenda

- Usability in DH and Common Problems
- UX Demonstrator Workflow
- Observations During the Process
- Summary and Discussion

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“Good design is actually a lot harder to notice than poor design, in part because good designs fit our needs so well that the design is invisible”
Donald Norman: The Design of Everyday Things. S. 1



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Usability

- Usability of software and their interfaces
- Basis for successful interactions between users and the system
- „A quality attribute that assesses how easy user interfaces are to use. “ (Nielsen)
- „The effectiveness, efficiency, and satisfaction with which specified users achieve specified goals in particular environments.“ [ISO 9241]

What do we mean by Usability in DH

- Usability of user interfaces
- User-centered interactions of the tools and the infrastructure components.
- Transparency of workflows within a tool
- Frictionless workflows which support the research process:
 - easy and comfortable switch between different tools and tasks in digital research processes
 - easy and comfortable switch between different end-user devices



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Usability in Digital Humanities

- Usability studies in DH regarding tools and infrastructure components seem to be rare
- Survey among developers of DH-Tools revealed 31% conduct usability studies (Schreibman & Hanlon, 2010)
- Usability is often only considered late in the development process (Kirschbaum, 2004)
- Qualitative and quantitative approaches to test usability
- Heuristics for testing the usability (e.g. by Nielsen or Shneiderman and Plaisant)



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Usability Studies in DH

- Evaluation of linguistic annotation tools revealed common and specific usability problems (Burghardt, 2012)
- CENDARI conducted participatory design studies (Boukhelifa et al., 2015)
- DH-Project “Welt der Kinder” used Participatory Design approaches to involve users during the software design phase (Heuwing & Womser-Hacker, 2015)
- Within DARIAH-DE, several usability studies were conducted



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Usability Problems in DH

- Heuristic evaluations and walkthroughs with experts
- Think loud and task-based evaluations with users

Catches most of the common usability problems which are not DH-specific:

- inconsistencies in the vocabulary, lack of transparency of system status, no documentation, missing strategies for error prevention



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But What is Missing?



- Usability in DH needs to acknowledge the research cycle
- There are rarely self-contained tasks
- Activities are fluent across different tools using different devices

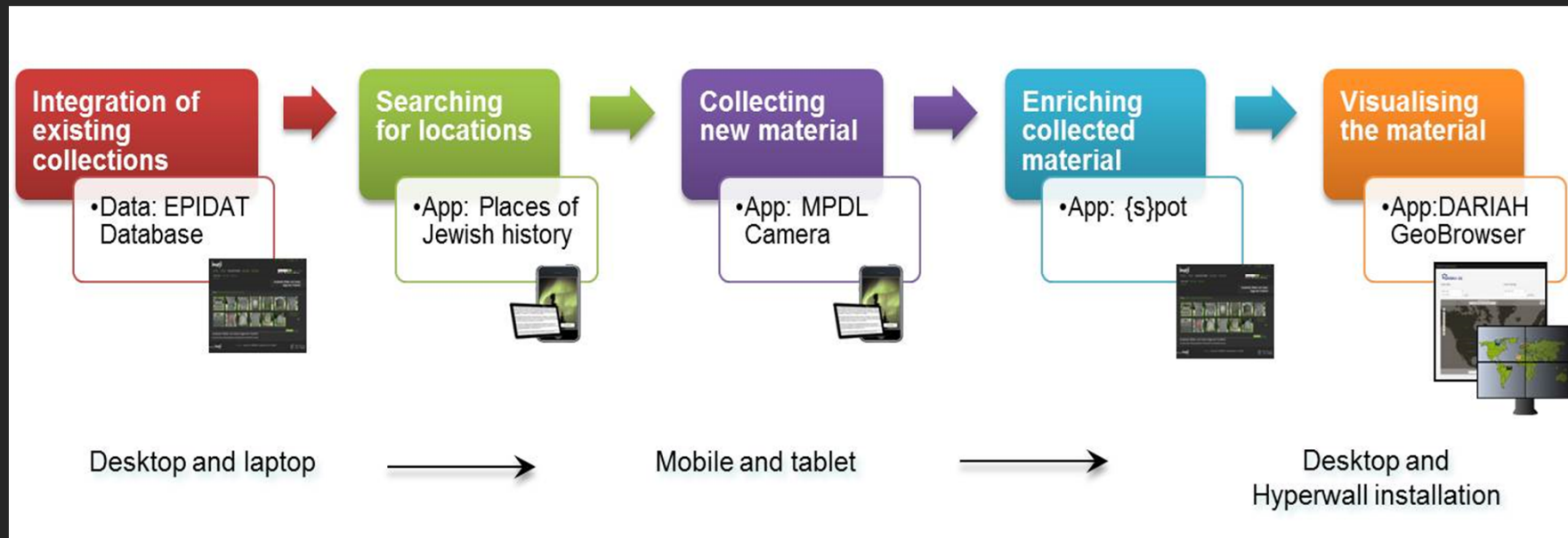
THE UX DEMONSTRATOR WORKFLOW

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UX Demonstrator Workflow

Implements a real-life scenario with different end-user devices



Integrate Existing Collections



Data

- Jewish epigraphy database (EPIDAT) provided by Salomon Ludwig Steinheim Institute of German-Jewish Studies
- 1500 black/white (dated 1980) and color (dated 2015) images + metadata selected and provided by researchers

Participants

- Junior researcher, Senior researcher, Data expert, Data infrastructure expert

Tools

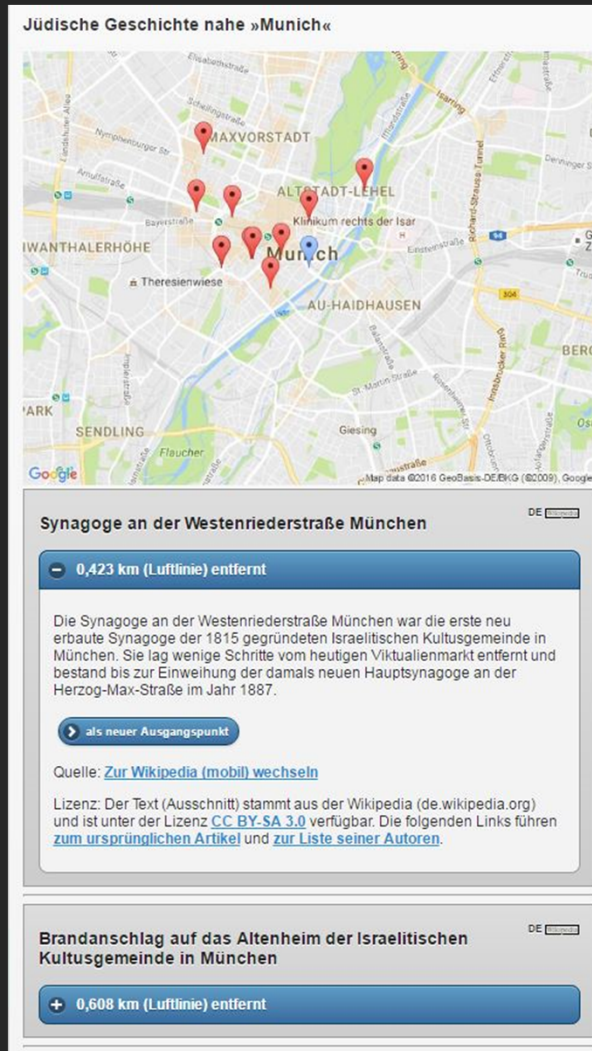
- Ad-hoc MATLAB Script
- {s}pot Service REST API based on *imeji* software



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Search for Locations to Gather New Material



Steps

- Use mobile device to identify places of interest near the device's geolocation and display on a Google Map
- Link and display contextual information from various data sources (Wikipedia, EPIDAT, Getty Thesaurus and others)
- Visit the locality of interest

Participants

- Junior Researcher, Senior Researcher

Tools

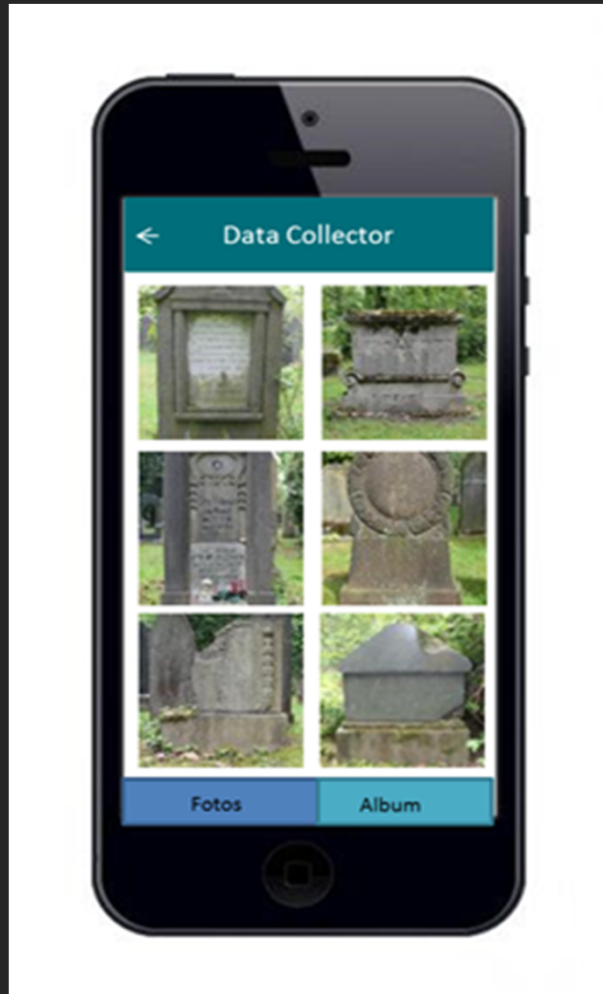
- App "Places of Jewish History" (H. Lordick, Steinheim Institute, DARIAH-DE Project)



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Collect new material with mobile devices



Devices

- Tablet
- Digital Camera

Steps

- New pictures were taken at the Segesroth cemetery in Essen
- Pictures were either stored on device or automatically uploaded to the {s}pot service

Participants

- Junior Researcher, Senior Researcher

Tools

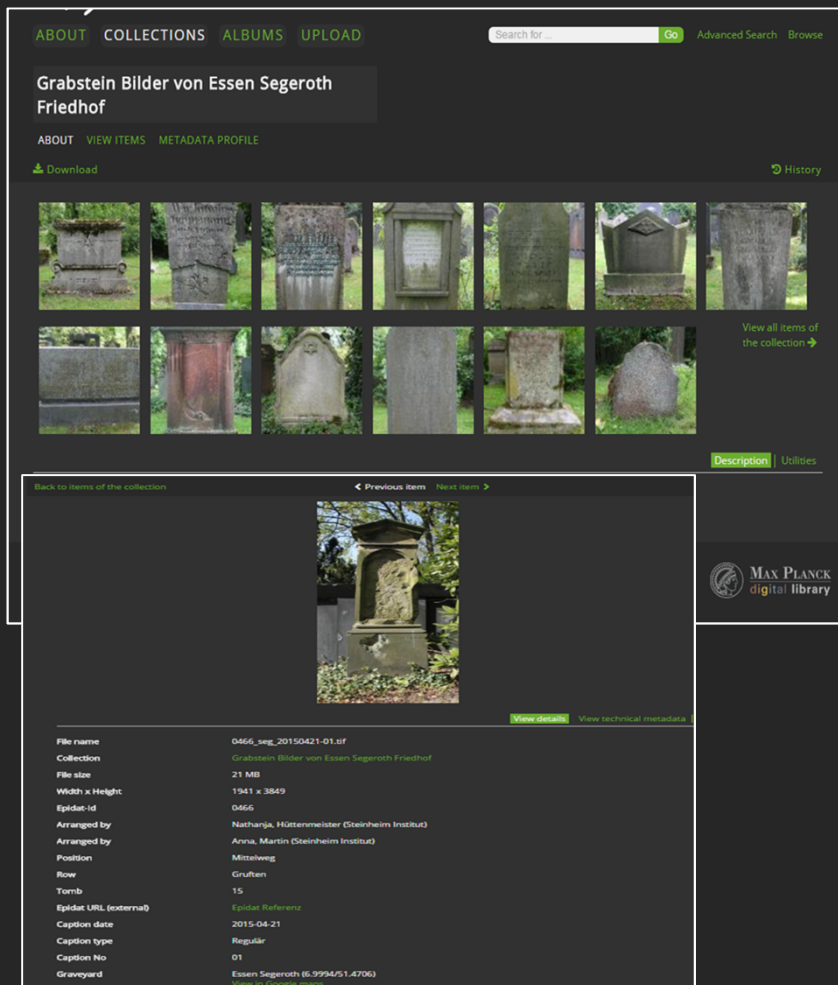
- App “LabCam” (Max Planck Digital Library)
- {s}pot Service REST API based on *imeji* software



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Enrich Collected Material



Devices

- Desktop, Laptop

Steps

- Enrich uploaded material with further information
- For single photo or in a batch mode

Participants

- Junior Researcher, Senior Researcher

Tools

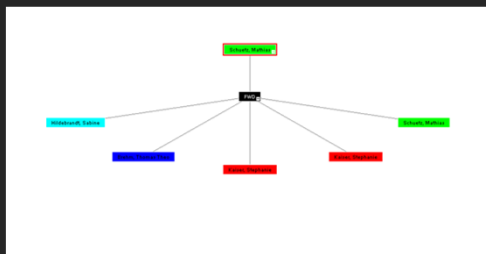
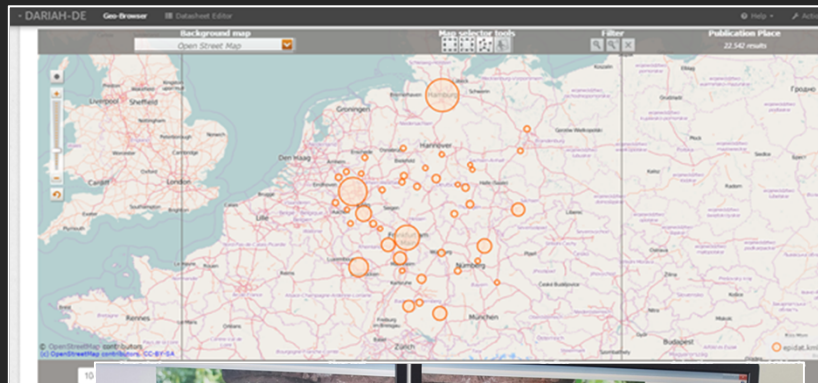
- {s}pot Service web interface based on *imeji* software



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Visualize Collected Material and Literature



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Devices

- Laptop, Desktop
- Hyperwall - an installation of 4x4K Monitors to show images and videos with high resolutions, tested separately with several controllers (XBox 360. Keyboard and mouse or a tablet device)

Visualization of

- metadata with the DARIAH-DE GeoBrowser, tombs in Germany and dates of their construction
- data and pictures on the Hyperwall
- Web of Science Citation Maps

Participants

- Senior Researcher, Junior Researcher, Data infrastructure expert

Tools

- DARIAH-DE GeoBrowser
- Digilib viewer
- Native system image viewers

Goals of the UX Demonstrator Workflow



To address usability requirements from cross-infrastructure-components perspective i.e. while using different and not always compatible devices, tools and equipment

To understand researchers' willingness to work with multiple (new) devices during research

To understand the impact on implementation efforts



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Observations

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Transition between different devices is feasible

- Due to lower image quality, devices can be used to create “draft” pictures of primary objects
- Confirmed willingness to use mobile devices during research
- Need automatically generated metadata e.g. geo-coordinates



Devices need to be practical for use

- Camera is handy for taking pictures of primary objects, although quality is not sufficient in some cases
- Tablet is ergonomically not appropriate to take pictures effectively (e.g. different angles and positions, rough terrain)
- Tablet is very convenient to add metadata to (tag, describe) the pictures right on-site



Depending on Research Additional Devices may be Needed

- Professional camera and lightning for high-quality images
easy replacement of “draft” images with professional images
preserve metadata during replacement
- Tachymeter to measure distance, position and dimensions of primary objects
- ...



Complexity of Interactions Differs

- Desktop and web applications are more complex
 - assume researchers need more functionalities
 - assume researchers will learn and perform more tasks easily
- Complexity not desirable for mobile apps
 - should provide higher level of automation
 - should integrate several web application functions into a single one
- Data views differ between web applications and mobile devices



User Expectations wrt. to Mobile & Web Apps Differ

- Data upload
Web application: fast and complete
Mobile app: automatically generate metadata e.g. width/height of the tombstone,
distance to the next tomb, exact geo-coordinate of the tomb
- Data editing
Web application: detailed data descriptions features are “must-have”
Mobile app: easy adding a tag/comment sufficient
- Headache for developers - multiple implementations of equivalent functions



Large Displays not Always Better to Visualize Data

- Large images were displayed very well (native system viewer, Digilib viewer)
- Web of Science Citation Map display did not scale
 - some information was not readable at all
- Hyperwall controllers need to be optimized
 - Tablet - easy for users
 - Keyboard and mouse - mouse pointer was hard to spot
 - Xbox Controller - need some upfront experience or short introduction



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Data Experts for Input, Quality Assurance and Data Enrichment

- Integration of EPIDAT images into {s}pot service was performed by a Data expert (DE)
 - shortly: a person with technical skills to process data and transform them from one to another format;
- An ad-hoc script to validate, correct, enrich and upload data to {s}pot service
- Benefits for researchers
 - do not have to learn rarely used features
 - can use tools they are mostly comfortable with (e.g. Excel)
 - “human interface” - personalized support for all questions
- Overall benefit
 - DE documents the process
 - DE uses tools/methods s/he is comfortable with
 - DE does not have to be aware of the overall infrastructure



können wir hier noch kürzen . sehr viel Text

Juliane Stiller;

Various Data Formats for Better User Experience

Researchers were willing to provide their data if:

- they can access and get metadata in formats such as JSON, CSV (along with the raw data)
- access data and metadata via REST API
- get data in familiar downloadable formats (e.g. ZIP archive)
- present and reuse their data in different contexts
“data branding”, visualization, linking from institutional home page, etc.)



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SUMMARY & DISCUSSION

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Summary

- DH-Tools and infrastructural components suffer from usability problems which are often not DH-specific
- Lack of resources spent on usability result in poor user experiences
- Finding the balance between specialization of the tool and interface design is key
- Researchers use different devices and they want to switch seamlessly between them
- They approach different devices and their apps with certain expectations on functionalities

Discussion

- Role of usability in tool and infrastructural developments needs to be expanded
- Early iterative cycles of testing should be implemented to avoid common usability fails
- Understanding the research process is essential to built workflows
- It is often more revealing than making the interface “perfect” especially for infrastructures which support various domains, tools and applications

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