## DELIVERABLE

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**D3.1 - Personas, scenarios and use cases**

**Revision:** 2.7

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Executive Summary

This document describes the personas, scenarios and use cases that WP3 has focused on in the first six months of the first year of eCloud (M1-M6) and the first six months of the second year (M13-M18). This work has been undertaken in collaboration with the DM2E project (and more specifically the Wittgenstein archives at the University of Bergen), the Axiom philosophy group at the VU University Amsterdam (in year 1), and a research community of musicologists (in year 2).

Through the personas and scenarios, we have identified a set of core problems and classes of tools and services that can address these problems for our target communities of Humanities researchers that work with Europeana content.

In the follow-up phases for the first and second year of eCloud, we configure, integrate and evaluate specific tools from the classes identified so far. In this deliverable, an appendix lists the candidate tools for these phases. This follow-up work for the first year of eCloud has been reported in Deliverables 3.2 and 3.3. For the second year of eCloud, the follow-up will be described in updates to these Deliverables, due in M21 and M24.
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Europeana Cloud is co-funded by the European Union CIP-ICT Policy Support Programme
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1 Background and Context

The objectives of WP3 include (p.13 of 38 in the Description of Work):

- Development of services and tools that leverage Europeana content for use by researchers.
- Follow an iterative design process to identify typical personas and scenarios of thematic use of content that the Europeana Cloud tools and services as well as the Europeana Research Platform would be expected to support.

In order to reach these objectives, task 3.1 focuses on Personas, Scenarios and Use Cases:

In close alignment with the tasks in WP1 on user needs and existing tools, KU Leuven will lead on developing personas (descriptions of typical researchers that we address with this project), scenarios and use cases that describe in detail what kind of tool a researcher would typically use, and how that use would fit in his typical workflow. This will result in Deliverable 3.1 [M6, M18, M30]

This document is v.2 of deliverable 3.1, due in M18. It will be updated to reflect progress in our thinking as the project evolves again in M30. The basic idea is that we report here on personas and scenarios that we have developed in order to elaborate and consolidate our thinking on tools and services that leverage Europeana content for researchers.

A really nice, but rather lengthy, introduction to the use of personas and scenarios for this kind of purpose can be found in:


From that source:

Common understanding is that the persona is a description of a fictitious person […] In the design process, we begin to imagine how the product is to work and look before any sketch is made or any features described. If the design team members have a number of persona descriptions in front of them while designing, the personas will help them maintain the perspective of the users. The moment the designers begin to imagine how a possible product is to be used by a persona, ideas will emerge. Thus, I maintain that the actual purpose of the method is not the persona descriptions, but the ability to imagine the product.

A shorter introduction, with some examples, is:

The gist of the idea behind personas and scenarios is that they help us to focus on the intended user of the tools and services, rather than on the technical challenges of how to develop those tools and services. Thus, the likelihood that we develop tools and services that are actually useful for and usable by the target user increases.

The main aim of WP3 is to develop tools and services that allow researchers to make optimal use of Europeana content. In the first year, we have focused on developing tools that benefit researchers in philosophy and digital humanities. To this purpose, we have worked more closely with two concrete communities of researchers interested in using Europeana content:

- The DM2E project is also looking at “new tools and services for the re-use of Europeana data in the Digital Humanities”. Of particular interest for us is the Pundit, a ‘semantic annotation tool’ that enables the sharing of annotations between researchers. We have discussed (online and face-to-face) collaboration with this project and will focus in a first phase on a small community of researchers that focus on the Wittgenstein Archives at the University of Bergen.
- The Axiom group of history and philosophy of logic, semantics and axiomatics at the VU University of Amsterdam studies the ‘Semantics and Axiomatics from Bolzano to Tarski against the Background of the Classical Model of Science’. Also with this group, represented directly in eCloud through the participation of Stichting VU-VUMC, we have interacted both online and face-to-face.

On the basis of this early interaction with the DM2E and Axiom Group, we have identified three core problems that many of these researchers face:

(i) problems with navigating and identifying relevant (digital) content and with building corpora;
(ii) a lack of user-friendly computational tools for conducting fine-grained textual research;
(iii) a lack of appropriate tools and infrastructure that allow members of research groups to work collaboratively rather than individually.

In our work so far, we have identified

(i) search tools to find relevant content, and
(ii) visualization tools (geographical maps, timelines) that assist in overcoming problems (i).
(iii) annotation tools (see below), incorporating information extraction methods and Linked Data techniques, that help solve given problems (ii),
(iv) and social awareness and discovery tools (see below) that help tackle (iii).

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1. http://dm2e.eu
2. http://www.thepund.it
3. see http://wab.uib.no/wab_nachlass.page/
The appendix lists the relevant tools that we have considered. These tools have been further developed, linked to each other, and linked to Europeana content. This work has been extensively described in deliverables 3.2 and 3.3. As such, WP3 provides researchers in the Humanities with tools that assist them with various aspects of their work, ranging from the identification of textual resources to the analysis of these resources, and that allow them to fruitfully exploit content provided through Europeana.

In the second year of our work (M13-M18), we have focused on developing personas, scenarios, and tools for researchers working within musicology, specifically with Early Music. In the first phase of the second cycle (M13-M15), our aims were to understand the research practices and workflow of musicologists, and to identify digital tools and content employed by these researchers. To this purpose, we conducted desk research and organized numerous exploratory online meetings with Marnix van Berchum, a musicologist working on musical culture of the 15th and 16th century, and Marian Lefferts, a specialist in digital library content and cultural heritage. Both are involved in eCloud through activities in WP6 and WP4 respectively.

In the second phase of the second cycle (M16-M18), members of WP3 and Marnix van Berchum have organized three online meetings with a research community of musicologists interested in using digital tools and Europeana content. This community consists of the following researchers:

- Eliane Fankhauser (Utrecht University; working on late medieval polyphonic music from the Low Countries).
- Peter van Kranenburg (Meertens Institute; working on the Tunes & Tales project\(^5\)).
- Laurent Pugin (Swiss office of RISM\(^6\); works on Optical Music Recognition (OMR)).
- Reinier de Valk (City University, London; working on the computational extraction of polyphonic structures from sixteenth century lute tabulatures)
- Frans Wiering (Utrecht University; works on Music Information Retrieval (MIR)).

In our first and second online meetings (12 and 14 May 2014), we discussed the workflow of the musicologists, as well as computational tools and content they use. After these meetings, we identified a number of challenges these researchers face when conducting their work\(^7\). These challenges include:

\(^5\) http://www.ehumanities.nl/computational-humanities/tunes-tales/

\(^6\) http://www.rism.info/

\(^7\) In our work, we have significantly profited from Frans’s Wiering’s work on user needs and challenges in Digital Musicology. See: http://www.staff.science.uu.nl/~wieri103/presentations/WieringLondonDigitalMusicLabFinal.pdf.
(i) Problems involving data creation. Many musicologists require transcriptions of (historical) musical sources to modern scores in order to conduct their research. Although there are computational tools that allow users to create transcriptions and critical editions of musical sources, most transcriptions are done completely by hand. This is a laborious and time-consuming process.

(ii) Lack of digital corpora of music scores. Although there exist a number of initiatives aiming to create standardized digital and symbolic representations of music scores (e.g., http://music-encoding.org/home), as well as music libraries offering access to symbolic and encoded representations of music scores, many musicologists still lack appropriate digital corpora of scores.

(iii) Information exchange and linking of data. Musicologists often need to match and compare the original (historical) sources of music or music scores to existing transcriptions of these sources. For example, databases such as Europeana provide images of (historical) music sources (typically in PDF format). These databases typically do not, however, provide digital, symbolic, and encoded representations of music sources. Such representations are provided by other online databases (e.g., http://josquin.ccarh.org/). Linking these different types of data and data sources is a non-trivial task.

(iv) Retrieve and analyse contextual information. For contextualizing the music that researchers work on, information has to be gathered from multiple other sources, besides the representations of the original sources or transcribed scores. For example, apart from music sources and scores, musicologists require access to general bibliographical and historical information. It is difficult to process, compare, and analyse these different and heterogeneous information sources. These activities are, however, core to the work of many musicologists.

On the basis of this interaction, we identified tools that we thought would aid musicologists in their research, and we constructed personas and scenarios that describe how these tools could fit their workflow. The descriptions of these personas and scenarios have been evaluated by the research community of musicologists in a third online meeting (19 June 2014), and have been rewritten and improved on the basis of this evaluation.

Through our collaboration with the musicologists, we have identified the following kinds of tools as particularly relevant to their work:

(i) Optical Musical Recognition tools that allow users to create transcriptions and critical editions of musical sources, and music notation software that allows users to create and edit sheet music. These tools assist in overcoming challenges (i) and (ii) above.

(ii) Search tools, digital repositories and archives, and visualization tools that allow users to identify and aggregate (metadata of) digital and symbolic representations
of music, and that can be used to link these representations to image files of music sources. These tools assist in overcoming challenges (ii) and (iii).

(iii) *Annotation tools, music analysis tools, and classification tools* that allow musicologists to analyse, process, classify, and enrich their data. These tools assist in overcoming challenge (iv).

Several of these tools will be further developed, linked to each other, and linked to Europeana content in the WP3 activities in the second part of the second year of eCloud (M19-M24).
2 Structure of the document

In sections 3 and 4, we list the personas and scenarios that we have developed in dialogue with our target user community of humanities researchers from the first and second year, respectively. Personas and scenarios are listed in no particular order and there is quite a bit of overlap in the scenarios: this is useful, as it helped us to identify the common issues mentioned in the previous section. Those common issues inform the next phase of WP3: the configuration, integration, and evaluation of specific tools. We conclude the sections by presenting the tools that will be used in the final phase of each year. In Section 5, we further analyse the process to follow in order to develop and adapt tools. This analysis is based on the scenarios presented in Section 3 and 4. Finally, Section 6 concludes this document and the appendix lists the candidate tools analysed for the different humanities researchers in the first and second year of eCloud.
3 Year 1: History of Philosophical Ideas

3.1 Personas and Scenarios

3.1.1 Anita and Muse

Persona
Anita is a post-doctoral researcher on Technology-Enhanced Learning in a computer science department of a European university. She is collaborating with colleagues from different European research units, in a Framework 7 EU project. She regularly travels to project meetings, workshops, and conferences throughout the EU. Anita is pretty tech savvy and works in a department that is well equipped with smartphones, laptops, large screens, and even a few multitouch tabletops.

Scenario
Anita is assisting her supervisor with the preparation of a new EU proposal. There are some partners that her team regularly collaborates with and they decide to invite three of those partners to join the proposal preparation. They then turn to the multitouch table and use Muse to explore whom else they have worked with, and, more importantly, whom their colleagues have worked with before. Together with her supervisor, she thus discovers a team that focuses on Computer-Supported Collaborative Learning (CSCL) in Norway. Anita remembers that she met one of members of that team earlier in the year. Through the visualisation, Anita and her supervisor discover that the Norwegian team has a close collaboration with the team in Lausanne that they had already invited for the new project. They thus decide to ask the Lausanne team about the Norwegian partners first. Moreover, her supervisor will travel to Madrid next week for a conference. With the tabletop visualization, they remember that they had previously worked with two research units in Madrid: Anita’s supervisor sends an email to both of them to set up a meeting to discuss the new project proposal.

3.1.2 Anna and Annotateit

Persona
Anna is a research associate at the department of philosophy in Cambridge, UK. She is preparing a thesis on Shakespeare's eighteenth-century reception in England and France. She is interested to explore and apply ICT-based methods and tools to enable new research questions and is eager to exchange knowledge, expertise, methodologies, and practices across domains and disciplines. She is an active member of the Open Humanities Working Group of the Open Knowledge Foundation that meets online weekly to discuss Shakespeare’s work and to explore new ICT-based research practices and tools for the digital humanities.

Scenario
For an essay on Shakespeare’s thoughts on urbanism and the city Anna needs to scan a lot of documents against the topics of interest for her essay and is therefore also interested in the
thoughts of like-minded colleagues. She and her colleagues have used the Annotateit tool to share annotations on online documents before, and she now invites her colleagues to help her scan through a series of relevant texts for the topics of interest for her essay and share their annotations, comments and tags with her.

### 3.1.3 Paul and Pundit

**Persona**

Paul is a post-doctoral researcher on philosophy at the Wittgenstein Archives at the University of Bergen (WAB) in Norway. The focus of his research is on the linguistic aspects of Wittgenstein's work. WAB has published 5,000 pages of the Wittgenstein Nachlass Open Access on the Web and developed a Wittgenstein domain ontology for these texts. WAB is part of a Framework 7 EU research project, called Digital Manuscripts to Europeana (DM2E), where Paul is involved in testing new technologies for collaborative work with semantic annotations online.

**Scenario**

Reading Wittgenstein’s work using Pundit allows Paul not only to annotate the texts, but also to look up various concepts and persons occurring in the texts. Pundit allows Paul to add and share simple comments as well as semantic links to the Web of Data (as Freebase or DBpedia) for fine granular cross-references and citations using the WAB’s Wittgenstein domain ontologies. Its named-entity recognition features allow for disambiguating linking of real world entities mentioned in texts to their entries in Linked Data sets and thus deriving more information on this entity as well as the possibility to further traverse the Web for more fine-grained information. Furthermore the annotations help finding other relevant texts on a specific topic or concept in Wittgenstein’s work.

### 3.1.4 Pam and GlaMMap

**Persona**

Pam is a 25 years old PhD-student at the department of philosophy at the University of Utrecht, the Netherlands. She has received her Master’s degree at the University of Groningen, where she has written a thesis on Kant’s use of the concept ‘transcendental logic’ in the second edition of the *Kritik der reinen Vernunft* (1787). Pam has enjoyed a classical training in the history of philosophy, which means that she has learned to provide highly detailed analyses of a very small number of texts. At Utrecht, Pam is a member of an NWO Vidi-project in which she is supposed to investigate how the concept of ‘logic’ is used within German philosophy books published around 1800.

Pam is ambitious, hard working, and desperately wishes to write a good dissertation. Like many of her colleagues at the philosophy department, she is an avid user of technology. She is
a member of various social media sites, she owns a smartphone and a laptop and she is constantly online. Pam is eager to use and explore ICT-based methods to push further her research and has recently developed an interest in digital humanities. Nevertheless, her knowledge of ICT-based methods and tools is quite limited. When conducting her research, Pam mostly uses Google Books and Google Scholar.

**Scenario**

Having just started research for her dissertation, Pam is overwhelmed by the number and complexity of the philosophical and scientific texts that she needs to read and understand. Although her knowledge of the works of Kant is adequate, she lacks an overview of the works on logic published around 1800 that are relevant for her research. In order to identify publications that are important for her research, Pam uses GlaMMap. Using this tool, she obtains an interactive geo-spatial visualization of bibliographic metadata of logic books published in Europe between 1795 and 1805. She uses the tool to identify and order various (types of) books that she needs to study for her dissertation. She identifies publications on ‘transcendental logic’ that have been published in Jena and Leipzig, she identifies traditional books on term logic published in Halle, and she identifies works on psychology, anthropology, and logic published in Heidelberg. Through exploring the visualization, Pam is also able to quickly distinguish between the relatively small number of books published by famous philosophers in this period, and the relatively large number of textbooks and lecture scripts concerning logic. Since these latter books are easier to read and have also been little studied, Pam decides to start her research by focusing on these books.

### 3.1.5 John and TiNYARM

**Persona**

John is a PhD candidate in the doctoral school of human sciences at the Vrije Universiteit Brussel. After finishing his master in arts, he just started to work pursuing a PhD degree in philosophy and history of education. During his master thesis work, he got familiar with tools used by researchers, such as: references managers (Mendeley and BibTeX) and digital libraries.

**Scenario**

John has a clear idea of his dissertation topic and started with the literature review about the subject. As he is new in the research community and he doesn’t know which colleagues from other European universities may be working on the same topic. Colleagues from his research team suggested him to use TiNYARM. His research group employs this tool to share publications read by them, to know what other research groups are reading, and his advisor uses it to suggest articles to his PhD students. As soon as he joined the tool, John saw a recent suggestion from Anna (a researcher from Germany) to one of his colleagues; this article was quite interesting for his research. He also opened the TiNYARM profile page of his advisor and skimmed the different papers his promoter read over the past months. John found some
John is a PhD candidate in the doctoral school of human sciences in the Vrije Universiteit Brussel. He is doing a PhD in philosophy and history of education. During his master thesis work and his first year in his PhD, he got familiar with tools used by researchers, such as: references managers (Mendeley and Bibtex), digital libraries, SlideShare, and academic social networks (LinkedIn, Academia.edu, and ResearchGate).

Scenario
After his first PhD year, John and his advisor get a paper accepted in an international conference. This will be his first time attending a conference. On the first day, John gets the conference programme and tries to figure out which sessions to attend. While creating the list of sessions, he notices that a QR code is available in the conference programme. Using his smartphone, John scans this code and is redirected to the More! mobile web application showing different links to social networks that the presenter is actively participating in. After seeing the presenter profile and checking his publications and recent tweets, John gets a good idea of what the presenter worked on before and which are his current research interests. John decides to meet the presenter later and sends him a mail using More!. After using this application for a few presentations, he is a bit frustrated with some of the other sessions that do not provide a More! profile of the presenter and that he actually has to ‘google’ them for some minutes in order to obtain the same information as he gets from More!.

3.1.7 Hein and ARIADNE Finder + Textus

Persona
Hein is a post-doctoral researcher working on the history of philosophy, the history of biology and their interplay. In particular, he is interested in 18th century philosophical ideals of science and their influence on 18th century life sciences. His research has been recently focused on debates in philosophy of history and historiography, where he investigates and needs access to philosophical document and digital media corpora and their visualisations.

Scenario for ARIADNE Finder
Hein participates in a group of post-doctoral researchers and academics interested into the history and philosophy of logic, semantics, and axiomatics. This group explores the concept of semantics and axiomatics in the history of philosophy, exploring ideas coming from philosophers like Bolzano and Tarski against classical models of science. Hein has already been using some interesting visualisation tools for relevant document and literature corpora that are working over a bibliographic metadata aggregator/network that his group has set up.
He would like to enhance the web site of this group with a search interface that will allow the group to discover and navigate relevant digital resources that are coming from other large aggregators, such as: material on the history of philosophy collected by the Europeana aggregator (http://www.europeana.eu), relevant literature that has been indexed and aggregated from various European national libraries through The European Library (http://www.theeuropeanlibrary.org), as well as presentations, notes, slides, and other relevant educational resources that come from a global network of educational repositories called GLOBE (http://globe-info.org).

Hein would use the ARIADNE Finder technology to carry out the following steps:

- Define the metadata facets that his group would like to use in order to search and browse through the various digital resources on the history of philosophy, and define the desired properties of a local metadata index that will collect periodically relevant material that can be found in the various aggregators.
- Design the information architecture of the content search pages using a simple pre-existing template that will allow him to integrate the search functionalities into the look and feel of the group’s web site.
- Run the tool that will set up and create the local metadata index (also with a mechanism for periodic re-harvesting/ingestion and re-indexing from the various aggregators) running over a cloud-hosted virtual machine through a simple web-based interface. The tool will also allow him to select which thematic keywords or specific collections he would like to include when retrieving descriptions of content from the three external aggregators.
- Get as an outcome of the tool a simple HTML code that he can easily embed into his group’s web site in order to get the new ARIADNE-powered search pages easily set up and running with no further technical effort.

**Scenario for Textus**

Hein would like to incorporate in the web site of the group a functionality that would allow the post-doctoral researchers to select digital documents discovered through the ARIADNE Finder and to carry out further discussions and analyses using Web-based open annotation features - in a similar way that the OpenPhilosophy.org group (http://beta.openphilosophy.org) is working with public domain philosophy texts. For this purpose he incorporates the Textus tool into the web site in a way that allows the group to:

- Select/bookmark some interesting digital resource coming from one of the aggregators like Europeana or The European Library and add it to a shared common space.
- If its license scheme allows it, saving a local copy of the digital resource and opening it in the Textus viewer.
- Providing annotations on various parts within the text under analysis and saving them into the shared space together with the digital resource.
• Generate as a separate new document all the produced annotations in a digital format, including a reference to the original document into its metadata description - saving it in the group’s shared document repository.

• Enhance the metadata record ingested from an external source with the generated annotations of the group and saving the new version of the record into the group’s shared document repository (either as a new, enriched version of the original authority record or as a new metadata record that stores only annotations and other user actions using some scheme like CAM).

3.1.8 Pam and Textus

Persona
Pam is a 29 years old postdoc working at the department of history and philosophy of science at the University of Cambridge (UK). She has a Master’s degree in Computer Science and in Philosophy, both obtained at the University of Edinburgh (Scotland). In her doctoral dissertation Pam studied the philosophy of mathematics of the eighteenth-century mathematician Leonard Euler. At Cambridge, Pam is part of an ERC-Starting Grant Project that aims to provide a comprehensive overview of the history of 18th and 19th century philosophy of mathematics. For her research, it is essential that Pam collaborates intensively with philosophers, historians, and mathematicians from different European research units. She and her partners require easy access to historical documents and wish to collaboratively study such documents. Apart from doing her research, Pam also teaches an annual course on the history of mathematics at Cambridge.

Pam knows a lot about existing ICT tools and methods that can help with her research. Thanks to her efforts, her research group and various European partners use project management software (Basecamp) to coordinate projects, they use reference managers (Mendeley) to create shared bibliographies, and they compile large databases using digital resources obtained via Europeana, Google Books, archive.org, and other online repositories.

Scenario
Pam and one of her colleagues working at the University of Duisburg-Essen (Germany) decide to write a joint paper on the reception of Euler’s mathematical works at the end of the 18th century, focusing in particular on the work of Immanuel Kant. They decide to use TEXTUS in order to share, study, and collaboratively annotate historical documents that are relevant for their paper. Through their contacts at Duisburg-Essen, they obtain plain-text files of Kant’s published writings (http://www.korpora.org/kant/). After uploading these writings, they use TEXTUS to identify, annotate and discuss passages within the Kantian corpus that concern mathematical topics. Through sharing their annotations with other project partners and interested researchers, they further obtain valuable information and references that help them in writing their paper.
Apart from using TEXTUS for research purposes, Pam also uses the tool while teaching her undergraduate course. Students following her course are supposed to study historical texts by collaboratively commenting on these texts. They also have to correct and grade each others annotations. Pam notices that by working in this manner her students find it easier to read and understand scientific and philosophical texts.

3.1.9 Jeroen, ARIADNE Finder, GlaMMap, Pundit

**Persona**

Jeroen is a 25 years old PhD student at the department of philosophy at the Vrije Universiteit Amsterdam. He has Master’s degrees in philosophy and intellectual history, both obtained at the University of Groningen. In Amsterdam, Jeroen is a member of an NWO VICI Project that aims to rewrite the history of eighteenth-century philosophy of biology. Jeroen and his colleagues need to identify many unknown historical documents and they wish to collaboratively study such documents. The members of Jeroen’s research group are pretty tech savvy. They use Whatsapp to communicate, they use Document management & Intranet software (Papyrs) to coordinate projects and write papers, they use reference managers (Zotero) to create shared bibliographies, and they compile large databases using digital resources obtained via Europeana, Google Books, archive.org and other online repositories. Jeroen is keen to use ICT tools while conducting his research and he hopes that they enable him to work in a more efficient manner.

**Scenarios**

**Compiling and organizing primary sources (step 1)**

Jeroen and several other PhD students have to write a paper on methodological debates within eighteenth-century natural history. In order to write this paper, they need to compile a database of relevant primary sources i.e., books on natural history published in the eighteenth-century. When compiling his database of primary sources, Jeroen uses the ARIADNE Finder, a search interface that allows him to discover and navigate digital resources that have been collected by the Europeana aggregator, The European Library, digital resources compiled by Google Books, and resources contained within other repositories. For his paper, Jeroen decides to search for the term “Natural History” from 1700-1800 within the European Library. He obtains over 9000 metadata records of books on natural history published in the eighteenth-century. Using the ARIADNE Finder, Jeroen exports these records to Zotero and compiles a large database of primary sources.

**Navigating the primary sources (step 2)**

It is difficult to navigate 9000 works. After having obtained his 9000 metadata records, Jeroen downloads these records and feeds them to GlaMMap in order to obtain an interactive geographic visualization of these bibliographic metadata. He uses the tool to navigate the metadata and he orders books on the basis of time and place of publication. By doing this he can
identify various (types of) books that he needs to study for his paper. After ordering his books, he decides to write a paper on the species concepts of Linnaeus and Buffon.

**Identifying secondary sources (step 3)**

Having identified his primary sources, Jeroen needs to identify relevant secondary sources, i.e., works on the history of biology published in the twentieth-century. He again uses the ARIADNE Finder in order to aggregate metadata of contemporary (20th century) books discussing Buffon and Linneaus. He collects metadata from the Europeana aggregator, the European Library, Pubmed, Worldcat, Google Scholar, and other possible sources. He selects all the relevant literature and exports his selections to Zotero. He has now created his database of secondary sources.

**Navigating the secondary sources (step 4)**

Having obtained metadata records of his secondary sources, Jeroen visualizes these records using GlaMMap (the procedure is identical to step 2). He obtains an interactive geo-spatial visualization of his bibliographic data. He now has two visualizations: one of his primary sources and of his secondary sources. Jeroen is able to compare both visualizations and is able to find several interesting relations between them.

**Studying the relevant literature (step 5)**

After identifying the specific literature that is to be studied, Jeroen and his colleagues decide to use Pundit to collaboratively study a number of selected texts. They obtain texts of Buffon and Linneaus and semantically annotate them by relating sections of these documents to Linked Data resources such as DBpedia and Wikidata. They use named-entity recognition in order to identify names and concepts occurring in the text, and link these items to important online resources. Thus, for example, fragments of Buffon’s Natural History are related to relevant Wikipedia articles, to more technical articles on the history of biology in the Stanford Encyclopedia of Philosophy (e.g., evolution – see http://plato.stanford.edu/entries/evolution/), and other educational resources (e.g., history of biology – see http://www.ucmp.berkeley.edu/help/topic/history.html). In this manner, Jeroen and his colleagues can easily navigate and study numerous quite technical texts.

### 3.1.10 Arianna, Hein, the ARIADNE Finder and Pundit

**Persona**

Hein is a post-doctoral researcher working on the history of philosophy, the history of biology and their interplay. He is interested in 18th century philosophical ideals of science and their influence on the 18th century life sciences. Arianna is professor of philosophy of language and conducts research on the history of logic, metaphysics and digital humanities. Arianna and Hein are members of a research team investigating the history of logic and science. Both use a variety of digital tools to enhance their research, such as reference managers (Zotero), WhatsApp, and various other tools.
**Scenario**

Arianna and Hein have, for research purposes, scraped over 7,000 bibliographic records from Wilhelm Risse’s Bibliographica Logica (http://www.olms.de/). As a result, they have obtained bibliographic metadata of over 7,000 books concerning logic published between 1700 and 1940. Both are currently attempting to obtain a comparable database of logic books by aggregating metadata from Worldcat, Europeana, The European library, and other repositories.

Arianna and Hein wish to write a paper on logic books that have been little studied by researchers on the history of logic. In order to write this paper, they need to compare the historical data from Risse (or similar data obtained via other large aggregators) to bibliographic data and references contained in philosophy repositories (e.g., Philpapers – see http://philpapers.org/), entries on history of logic published within Wikipedia, entries in the Stanford Encyclopedia of Philosophy (http://plato.stanford.edu/), the Internet encyclopedia of Philosophy (http://www.iep.utm.edu/), and possibly results provided by Google Scholar and Worldcat. Arianna and Hein use the ARIADNE Finder to obtain bibliographic metadata of thousands of logic books published from the 18th to the 20th data. Using Pundit, they link this data (e.g., name of author) to resources found within Wikipedia, the Stanford Encyclopedia of Philosophy, the Internet Encyclopedia of Philosophy, Wikidata and other Linked Open Data sets. In this manner, they are able to reconstruct which logic books are often mentioned in popular resources and which logic books are rarely mentioned. This allows them to give a reasoned estimate on which logic books have been little studied by contemporary researchers.

**3.1.11 John and Researchr**

*Persona*

John is a PhD candidate in the doctoral school of Human Sciences at the Vrije Universiteit Brussel. After finishing his master in arts, he just started to work pursuing a PhD degree in philosophy and history of education. During his master thesis work, he got familiar with tools used by researchers, such as: references managers (Mendeley and Bibtex) and digital libraries.

*Scenario*

John has to start doing his literature review about the subject. He has downloaded a lot of PDFs (usually with generic or unidentifiable names) and started to take notes using different software and on papers. After realizing the challenges of organizing these, he got really interested in how to improve the management all the PDFs, citation metadata, clippings, notes, and ideas. He started to use Researchr, which was an aggregation of different tools such as: BibDesk (to manage citations), Skim, (to make comments and highlight text), DokuWiki (to manage notes), and scripts; and use it as his personal open publications management system. John uses the uses different scripts of Researchr (via keyboard shortcuts) to: import citations from the browser directly to BibDesk; or send notes, highlights, and images from Skim to DokuWiki.
3.2 Selected scenario, tools, and workflow

As mentioned in section 1, we have identified three core problems for the researchers working on the history of philosophical ideas:

1. problems with navigating and identifying relevant (digital) content and with building corpora;
2. a lack of user-friendly computational tools for conducting fine-grained textual research;
3. a lack of appropriate tools and infrastructure that allow members of research groups to work collaboratively rather than individually.

In the first year of eCloud we aimed to address these problems through a combination of the following tools (a more technical explanation of these tools is present in the Appendix):

1. Search tools to find relevant content: a specifically configured version of the ARIADNE Finder is one candidate that we have started to experiment with – see illustration below. The Finder lets users search content and browse the results of different repositories, hiding protocols and standards from them.

![Figure 1: The ARIADNE Finder](image)

2. Visualization tools (geographical maps, timelines) that assist in exploring the search results. For this purpose, we have experimented with geo-spatial visualizations, such as Muse and GlaMMap; which present co-authorship on a multitouch tabletop and bibliographic metadata from books in logic from 1700-1940 on an interactive map, respectively. Also, we experimented with a timeline visualization of a term or word. Early experimentation screenshots are shown below.
3. Annotation tools, incorporating information extraction methods and Linked Data techniques, in order to help researchers to share detailed comments and annotations. We have experimented with AnnotateIt and Pundit, which are web applications that allow users to easily annotate web content. As an extra feature, Pundit also allows the creation of semantically structured data that will enrich the Web of Data. Finally, we also evaluated TEXTUS, a web platform that allows the creation of shared and collaborative annotations between researchers. Again, we include some screenshots of our early experimentation in this area.
Figure 5: AnnotateIt: the Javascript annotator

Figure 6: Pundit
4. Social awareness tools: enable researchers to be more aware of the research activities of their colleagues and peers – see below for an early experimentation screenshot with the use of activity streams listing the behaviour of users.
A generic workflow for these tools could be the following: a Humanities researcher wants to find more about ‘Bolzano and Tarski’ and uses the ARIADNE Finder to get content to be studied. After that, he tries to visualize them on a timeline or using a interactive map (or other visualization tools) to further filter the content and get a better overview of the different resources found on Europeana. After selecting the most interesting resources, these could be annotated using Pundit (or other). Finally, all the different actions made during this process (search, visualize, explore, annotate, download) are captured and presented via the Activity Streams tools.

In the second part of the first year of eCloud (M7-M12), we have linked several of these tools to each other, and to Europeana content. More specifically, we have created a mash-up of the ARIADNE Finder (a search tool), TimeMapper (a visualization tool), and Activity Stream (a social awareness tool). This mash-up was positively evaluated and was taken to assist researchers with (i) accessing known relevant research content or resources; (ii) with discovering new research content or data; and (iii) with working collaboratively rather than individually. We eventually did not include annotation tools in our mash-up since the philosophers often lacked corpora that allow for annotation by means of tools such as Annotator and Pundit. Work on the mash-up is described in more detail in deliverables 3.2 and 3.3, and in a forthcoming publication8.

4 Year 2: Early Music Tools

4.1 Personas and Scenarios

4.1.1 Mike and Doug working on Orlandus Lassus and Philippus de Monte

Persona
Mike is a musicologist who is working as a post-doc at the University of Leuven. He is particularly interested in Orlandus Lassus and Philippus de Monte. Doug is a doctoral student at the University of Utrecht who is focusing on the same two composers. Mike and Doug both participate in a small EU project with additional partners in Spain and Poland.

Scenario
Mike has been working on a manuscript he discovered recently in the library of Bologna. He has a hunch that the manuscript may be an unknown piece by Lassus or De Monte or a contemporary. The manuscript is just a fragment of a large piece. Mike has obtained high-resolution photos of the manuscript while he was in Bologna for a research stay.
This morning, Mike uploads the photos to the eCloud environment. A first rough transcription into musicXML\(^9\) is created automatically and Mike inspects the transcription through MuseScore\(^10\). Mike then searches for similar transcriptions in the AriadneFinder. The results are displayed on a map, on a timeline and as a Google-like list of results. Mike filters the results to the time period that interests him and discovers that there are three existing manuscripts that may be of relevance, one of which was created in Munich, where Lassus lived.
Mike uses Aruspix\(^11\) to compare the different original manuscripts as well as their transcriptions. For two manuscripts, a sound recording is available: listening to these recordings helps Mike to get a clearer mental picture of the music represented in the manuscripts.
While he is doing this, he receives a message from Doug, who had discovered what Mike was doing through the eCloud activity stream. Mike is excited about his findings and sends a message back to Doug about his hypothesis that three of the fragments may be part of the same original piece. In a brief videoconference, they discuss how they could validate this hypothesis.
Mike needs to wrap up as he has a lunch appointment. He uploads the Bologna manuscript to IMSLP\(^12\), so that his peers can also make use of the results of his work.

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\(^9\) [http://www.musicxml.com](http://www.musicxml.com)
\(^10\) [http://musescore.org/](http://musescore.org/)
\(^11\) [http://www.aruspix.net](http://www.aruspix.net)
\(^12\) [http://imslp.org/](http://imslp.org/)
4.1.2 John and Music-Mapper

Persona
John holds PhDs from the University of Edinburgh in Artificial Intelligence and in Musical Composition. His research career covers computational linguistics, computational logic, computational modeling of music perception and cognition, and computational creativity.

Scenario
During his PhD, John created a personal collection of his transcriptions from 15th century music using CMME-XML, as his favorite tool to work with was the CMME software. Currently, he wants to collaborate with other researchers and provide access to his collection, but they only use the Music Encoding Initiative (MEI) schema. Thus, he decided to try a tool suggested by one of his colleagues, the Music-Mapper, which will transform his CMME-XML files (using the up-to-date XSLT transformations) to the MEI schema. By transforming the XML files, he discovered some missing features, and wrote the appropriate XSLT templates and contributed his code to the Music-Mapper.

4.1.3 Johnny and Music21-Online

Persona
Johnny is a PhD candidate in the School of Music from the University of Victoria. In the past month, he finished his master and now he just started to work, pursuing a PhD degree in musicology. During his master thesis work, he completed a thesis on hexachordal segmentation of Italian madrigals. His current research interests include musical segmentation and categorization, form, and schema theory.

Scenario
For his PhD, Johnny is trying to analyze music in symbolic form, obtained from his PhD promotor. While his colleagues use Music21 for such task, he does not have a strong background in programming languages, such as Python. One of his colleagues mentioned that there is a Music21 online project that he may want to try. Music21-Online provided him with the possibility to just upload his XML files via the tool and try different Music21 scripts already created by the community of musicologists using the tool. By trying a couple of scripts, he noticed that, in order to find modal and hexachordal patterns within polyphonic structures, he needed a combination of three available scripts, so he decided to merge them and create his own, which he later submits to the database of available scripts, so that colleagues can take advantage of his work.

13 http://imslp.org/
14 http://music-encoding.org
15 http://web.mit.edu/music21/doc/about/index.html
4.1.4 Karin and Ariadne Finder

Persona
Karin is a 20 year old BA student of musicology at the University of Amsterdam. She is interested in historical musicology, especially in the history and development of baroque music. Like most students, she owns a laptop, a smartphone, and she is a member of various social media sites, such as Facebook and Academia.edu. Nevertheless, Karin has little knowledge of ICT tools and methods that may help her with her studies and research. Her use of ICT tools when studying is often limited to standard word processors (Microsoft Word), reference managers (Zotero), and Google, which she uses to find books and articles.

Scenario
Karin is conducting a research assignment on baroque music. For this assignment, she needs to identify and transcribe a number of eighteenth-century music scores of works by composers such as Bach, Händel, and Scarlatti. Karin needs to identify historical prints of works composed in the eighteenth century, but she also wishes to know whether the works she is studying have been included in modern scholarly or critical editions. Identifying historical prints of works and matching these prints to works contained in critical editions is a time consuming affair. Karin uses the Ariadne Finder, a personalized micro site that can be used to search and discover resources, to help her with these tasks. The Finder contains predefined search categories linking to (i) historical music sheets of works by the baroque composers she is interested in (records contained, e.g., in Europeana or RISM), and (ii) links to critical editions containing works of these composers (records provided, e.g., through Google Books and Oxford Music Online). By comparing the search results of (i) and (ii), Karin can match scholarly editions to historical prints more quickly than she could before.

4.1.5 Maarten and Aruspix

Persona
Maarten is a PhD student at Oxford University and specializes in musical culture of the sixteenth and seventeenth century. He obtained his Master degree in digital musicology at King’s College London and has only recently started work on his PhD thesis. In Oxford, Maarten is part of a research group that studies written renaissance music. Maarten is tech savvy. He has expert knowledge on popular tools and toolkits used in musicology, such as Humdrum\(^{16}\) and Music21, and he is familiar with programming languages such as PHP and Python.

Scenario
In order to apply computational tools to written renaissance music, Maarten requires appropriate digital corpora. Such corpora are, however, hardly available. Historical music sources are provided online as digital images, and these images are often of low quality.

\(^{16}\) [http://www.humdrum.org/](http://www.humdrum.org/)
Maarten uses Aruspix to build his corpus of renaissance music. Aruspix allows Maarten to upload images of music scores, to clean these images, to apply OMR to the cleaned image, and to quickly correct errors that have arisen during the OMR process. As such, Maarten quickly obtains a digital version of the music scores he needs.

4.1.6 Erik, Aruspix, and the Europeana Virtual Transcription Library

**Persona**

Erik is a professor in digital musicology at the University of Leiden, The Netherlands. He has just received the “spinozapremie” from NWO, and wants to start a large scale transcription project of masses and motets written within the renaissance period. This will allow him to apply a broad range of computational tools to a large corpus of music scores and to detect musical patterns over large periods of time.

**Scenario**

For his research project, Erik needs to transcribe more than one thousand written music scores. Erik wants to use Aruspix to build his corpus, which allows him to upload images of music scores, to clean these images, to apply OMR to the cleaned image, and to quickly correct errors that have arisen during the OMR process. Erik does not, however, have the time to transcribe all this work himself. Inspired by the Virtual Transcription Laboratory, Erik decides to build a virtual transcription laboratory for music scores, which uses Aruspix for OMR. In this virtual environment, musicologists from around the world can upload images, OCR these images, and edit the resulting transcriptions. All transcriptions, including transcriptions in progress, are saved and stored within this environment, and users can also edit and manually enrich the metadata of projects they have been working on. By using this environment, Erik is able to quickly build a high quality corpus, to easily collaborate with research partners abroad, and to share and disseminate research products.

4.1.7 Klaas and MusicRadar

**Persona**

Klaas is a Postdoc focusing on early music by Josquin des Prez and others, who tries to classify music, find related work and patterns, and share his insights with his fellow musicologists.

**Scenario**

Klaas wants to find out if a motet by Josquin des Prez he found has been described by other researchers. He therefore first tries to identify relevant scores on ISMPL. As he doesn’t find the

[17]https://confluence.man.poznan.pl/community/display/WLT/Introduction+to+Virtual+Transcription+Laboratory
score for his motet in that repository, he develops the encoding in MusicXML himself. Once he has finished the transcription of the motet, he uploads it to IMSLP, and then runs a classification job from his own music software library. The classifier has access to not only the motet chosen by Klaas but also his other music, the IMSLP, Europeana and other libraries. Internally, the classifier uses one or more components in Weka\(^\text{18}\), which Klaas trained before. He finds works by Franchinus Gaffurius and Serafino dall’Aquila and the classifier suggests him clusters of works. Klaas then tags the groups and chooses to share his findings. He furthermore adds some manual tags and notes to the results. His software converts his annotations into an EDM metadata blob and writes it to the Europeana API. As such, his software, which he calls MusicRadar, allows musicologists to share and see metadata with provenance information (author, tool, etc.) from the various tools and research tasks.

4.1.8 Hugo working on Ottaviano Petrucci

**Persona**

Hugo is a ‘traditionally’ trained musicologist, teaching Early Music at Utrecht University. He has a special interest in music prints from the first decades of the sixteenth century. Hugo recently discovered the richness of the Internet in doing his research. In the past, he mainly used the physical books of his institution library (e.g. the volumes of the Grove music encyclopedia, printed facsimiles of sources of early music and the editions of the Corpus Mensurabilis Musicae), but now he turns his attention more and more to digital resources and tools. Hugo doesn’t consider himself to be very technical, so a friend of his – a bioinformatics professor – helps him in assessing the resources and tools he find.

**Scenarios**

**Metadata mash up (step 1)**

A colleague of the media department pointed Hugo at the Europeana portal, where he searches on one of the first printers of music, Ottaviano Petrucci. On the results page, Hugo sees a lesser-known print: the *Motetti de la corona – Libro tertio*\(^\text{19}\). He takes a closer look at the metadata provided and starts combining it with biographical and bibliographical information (titles of pieces/composers, printers surrounding, handbooks) he gathers from the Oxford Music Online\(^\text{20}\), the digital edition of Stanley Boorman’s Ottaviano Petrucci:


\(^{19}\) [http://europeana.eu/portal/record/03486/urn_resolver_pl_urn_urn_nb_n_de_bvb_12_bsb00077434_2.html?start=13&query=petrucci+music&startPage=1&rows=24](http://europeana.eu/portal/record/03486/urn_resolver_pl_urn_urn_nb_n_de_bvb_12_bsb00077434_2.html?start=13&query=petrucci+music&startPage=1&rows=24)

\(^{20}\) [http://www.oxfordmusiconline.com](http://www.oxfordmusiconline.com)
Catalogue Raisonné\textsuperscript{21}, the open data of RISM\textsuperscript{22} and several smaller databases on Early Music (like CMME\textsuperscript{23}, the Josquin Research Project\textsuperscript{24} and the Motet Database Online\textsuperscript{25}). He gathers, arranges, and saves all the information in a spreadsheet in Google Drive. In a later stage, he plans to make the document available for his students.

**Transcription & analysis (step 2)**

After finishing his bibliographical research on the Motetti de la corona print, Hugo continues working on the musical content of this source. He downloads the image files of the print\textsuperscript{26} and feeds them into Aruspix, recently installed on his computer by his friend. The software produces rough editions of the music, which Hugo analyses making use of the tools of Music21 (which makes a comparative analysis of the styles of the composers involved: how dissonance is treated, distribution voices, the use of pre-existing models). He notices that one of the pieces attributed to Johannes Mouton has features not complying with the style of this composer. He adds his findings to his own spreadsheet, and via the API of Europeana uploads his editions and annotations to the cloud.

**Encoded music files matching**

A colleague of the music library pointed Hugo at the Europeana portal, where he found a lot of digitizations of early music sources. Hugo recognizes several compositions he saw earlier on the websites of the Josquin Research Project (JRP) and CMME projects. His bioinformatics friends helps him to harvest the files from both projects and advises to contact the informatics people at Utrecht University, who work on Music Information Retrieval (MIR) research. Together with a professor and PhD student of the Interaction Technology department, Hugo is able to extract titles, composer names and incipits from the JRP and CMME files and matches them with the metadata from Europeana, referring to the source images. He uploads the matched encoded files to the Europeana Cloud, linking them with the image files.

\textsuperscript{21} http://books.google.nl/books?id=xgW4C5Xp2SgC&printsec=frontcover&dq=boorman+petrucci&hl=nl&sa=X&ei=lwq9U662I-XI0wW-i4CIBQ&redir_esc=y#v=onepage&q&f=false  
\textsuperscript{22} http://opac.rism.info/index.php?id=8&id=8&L=1  
\textsuperscript{23} http://www.cmme.org  
\textsuperscript{24} http://josquin.ccarh.org  
\textsuperscript{25} http://www.arts.ufl.edu/motet/default.asp  
\textsuperscript{26} http://stimmbuecher.digitale-sammlungen.de/view?id=bsb00077434
5 From Personas to Tools

The main objective of this deliverable is to identify the personas, analyze the scenarios, and present specific use cases for the tools that will be developed or adapted in the context of WP3. To achieve this goal, a specific process is followed in order to connect the work described in this document with the development and adaptation of the tools. This process, also called user-centered design, involves the continuous communication and collaboration of both, developers and researchers from the humanities.

The first two steps in this process are described in previous sections. These steps involve the workflow identification of (specific) researchers in the humanities and the preparation of scenarios where the different tools can be used. After writing the scenarios, a process is followed in which, on the one hand, developers continuously update the scenarios, create mock-ups and use cases for the modelled tool, while, on the other hand; researchers continuously provide feedback on their needs and requirements. This continuous communication between the two groups is needed in order to cover the needs of the researchers and final users of the tool. The final steps are the development of a pilot and a demo of the tool. A schematic representation of this process is shown in the figure below.

![Figure 9: The main workflow followed for the development of the tools](image)

To further analyse this process we will describe the work that has been conducted in the first year of eCloud (M1-M6) for the development of an ARIADNE Finder for the Axiom group of
the VU University Amsterdam. This work is based on the scenario “Hein and the ARIADNE Finder” presented in the previous section.

The first step in our process is persona identification. In our case Hein, a member of the Axiom Group, is a post-doctoral researcher working on the history of philosophy, the history of biology, and their interplay. After analysing the profile of the persona, we proceed with a generic analysis of a scenario for the tool to be developed: Hein could use the ARIADNE Finder technology to embed a search tool in the site of his research group to quickly search and browse through the various digital resources on the history of philosophy and biology. After the creation of the first generic scenario, feedback from Hein (as the Axiom group representative) was requested to better understand his needs and requirements.

Based on the persona and the described scenario, the following step is the creation of the first use case scenario. In our case, the following use case description was developed.

<table>
<thead>
<tr>
<th>Use Case Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
</tr>
<tr>
<td>Description</td>
</tr>
<tr>
<td>Legal foundation(s)</td>
</tr>
<tr>
<td>Pre-condition</td>
</tr>
</tbody>
</table>

**Flow of Events - Basic Path**

- **Step 1**: A researcher is visiting the axiom group site
- **Step 2**: He is entering a search query or using the browse functionalities
- **Step 3**: A results set is shown to the researcher
- **Step 4**: The researcher can use specific facets to narrow down the results set
- **Step 5**: The researcher clicks on specific results to show more information and to access the resource

**Post-condition**: All the metadata of resources are aggregated, indexed and provided through a single API

### 5.1 Actors
- **End-users**: Researchers
- **Information provider(s)**: Europeana, European Library, GLOBE, YouTube, Flickr

### 5.2 Expected added value
- Researchers will be able to search simultaneously in many external sources with different type of content e.g. books,
Table 1: The use case description for the scenario of “Hein and the ARIADNE Finder”

The following step required the development of the first mock-ups, shown in the figures below. The mock-ups provide an illustration of what the final tool could look like based on the analysis of the scenario. Since the ARIADNE Finder is a technology that is embedded in an existing site, the first version of mock-ups included the following pages:

- A main page, shown in Figure 10a, where users can search the repositories for data. Additional buttons are included to quickly access predefined searches, specific resources or the local repository of the group.
- A second page, shown in Figure 10b, with a number of the philosophers the group investigates, links to a search for their biographies and work, and access to the group’s work on a specific philosopher,
- A search result page, shown in Figure 10c, with a faceted search to quickly filter the results with a number of different criteria,
- A view more information on a specific resource page, shown in Figure 10d, where all the metadata of the resource are shown and the user has the option to either view the original resource or save a copy of the resource for annotation (enabled based on the copyright).

<table>
<thead>
<tr>
<th>Table 1: The use case description for the scenario of “Hein and the ARIADNE Finder”</th>
</tr>
</thead>
<tbody>
<tr>
<td>publications, maps</td>
</tr>
<tr>
<td>- the results will include only relevant resources to the user query</td>
</tr>
<tr>
<td>- the user will be able to make complex queries</td>
</tr>
<tr>
<td>- discovery of relevant resources with very good performance that will improve the user experience</td>
</tr>
</tbody>
</table>

(a) (b)
This set of first mock-ups was distributed among the eCloud WP3 group and an online meeting, open to all members of the WP3 group, was arranged with Hein, the main persona, to discuss them. The feedback gathered from this meeting led to a second version of the mock-ups and to respective changes in the use case description. Apart from comments made by the user-researcher Hein, feedback was also given by other members of the WP3 group, mainly on the technical side for the tool to be developed. The second version of the mock-ups, shown in Figure 11, had the following additional features:

- A bar to quickly add a time period in any search,
- A button to search for the group’s work in Mendeley or Zotero,
- A button to view specific and selected resources (essential work),
- More collections to search,
- When viewing a resource, the options to download, export, or view related resources in Mendeley or Zotero are available.
As explained earlier, we continuously gather feedback from users in order to update the use case scenarios and mock-ups until we reach a desired outcome and the pilot can be developed. During the first days of July 2013, the eCloud WP3 group arranged a meeting with Hein and the axiom group to discuss, among others, the ARIADNE Finder demos. The mock-ups were presented to the group along with a number of questions to guide the users in providing feedback for the technical team through a presentation that was later distributed to all the members of the WP3. Hein and the rest of the group members decided to gather additional
feedback from other members of the group not present in the meeting before continuing. When all the feedback was gathered, the third and final version of the mock-ups was developed and discussed with members of the Axiom Group.

The following table summarizes all the steps that were followed for the above example in the first seven months of eCloud.

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>Persona identification</td>
<td>28th March 13</td>
</tr>
<tr>
<td>Step 2</td>
<td>Initial scenario development</td>
<td>15th April 13</td>
</tr>
<tr>
<td>Step 3</td>
<td>Feedback from Axiom group representative</td>
<td>27th May 13</td>
</tr>
<tr>
<td>Step 5a</td>
<td>Use case development</td>
<td>13th Jun 13</td>
</tr>
<tr>
<td>Step 5b</td>
<td>Initial mock up</td>
<td>13th Jun 13</td>
</tr>
<tr>
<td>Step 6</td>
<td>Interview with Axiom group representative and WP3 members</td>
<td>19th Jun 13</td>
</tr>
<tr>
<td>Step 7</td>
<td>Revised mock up</td>
<td>5th July 13</td>
</tr>
<tr>
<td>Step 8</td>
<td>Presentation of mock up to the whole Axiom group</td>
<td>8th July 13</td>
</tr>
<tr>
<td>Step 9</td>
<td>Final mock up &amp; specs for implementation</td>
<td>31st July 13</td>
</tr>
<tr>
<td>Step 10</td>
<td>Prototype development – First version</td>
<td>15th September 13</td>
</tr>
<tr>
<td>Step 11</td>
<td>Prototype development – Final version</td>
<td>15th December 13</td>
</tr>
</tbody>
</table>

Table 2: Summary of the work for the case of “Hein and the ARIADNE Finder” in M1-M7

After presenting the first prototype of the ARIADNE FINDER to the Axiom Group, the philosophers provided monthly feedback on the tool. This feedback was considered for the next iterations. The same procedure was adopted for the testing and evaluation of the mash-up of tools (described in section 3). Once the philosophers had access to the tools of the mash-up, they were asked to provide expert feedback on whether and how these tools could support their research and workflow. A more detailed description of the mash-up of tools and its evaluation is provided in deliverables 3.2 and 3.3, and in a forthcoming publication.

6 Conclusion

WP3 aims to develop services and tools that leverage Europeana content to be used by researchers. In this deliverable, we focus on the first step before the development of the tools, which is to understand and analyse the user needs by developing personas, scenarios and use cases; and to present a number of different existing tools that can be combined, expanded, and integrated to cover the needs of researchers. In addition, we introduced the process to be followed in order to connect these scenarios with tools development. This document is the second version of the Deliverable 3.1, which will be updated further during the project lifetime to reflect progress of our thinking as the project evolves.

During the first eCloud year, we have identified three core problems for the researchers in philosophy and digital humanities:

- problems with navigating and identifying relevant (digital) content and with building corpora;
- a lack of user-friendly tools for conducting fine-grained textual research;
- and a lack of appropriate tools and infrastructure that allow members of research groups to work collaboratively.

We have addressed these problems through a combination of search, visualization, and awareness tools and the integration of those in the Europeana environment. The results are presented in Deliverables 3.2 and 3.3.

During our second year, we have identified 4 core problems for musicologists:

- Problems involving data creation.
- Lack of music scores.
- Information exchange and linking of data.
- Retrieval and analysis of contextual information.

In the remainder of Year 2 (M19-24), we will address a number of these problems through a combination of tools that are already in use by musicologists as well as a set of new tools. This work will be reflected in updated versions of Deliverables 3.2 and 3.3.
7 Appendix: Tools for researchers in the Digital Humanities

7.1 Search tools

7.1.1 ARIADNE Finder

Lightweight search interface (implemented as an HTML page with some Javascript) that works on top of a Solr index. The Solr index is built using a number of metadata facets that can be used to navigate metadata records aggregated through different sources. Ingests metadata records of relevance to the specific users, by a number of ingestion mechanisms/APIs that are creating the Solr index behind the particular search page.

**URL**

http://ariadne-eu.org/wiki/

**contact**

nikosm@ieee.org
stoitsis@ieee.org

**licence**

LGPL for older versions, still undefined for current/working ones (but will be a xGPL one)

**programming language**

HTML and Javascript

**current use**

at least 5 deployments of beta versions, with estimated usage by >200 users

http://ariadne.cs.kuleuven.be/finder/ariadne/ [looking into the GLOBE aggregator]

http://laflor.laclo.org [looking into the Latin America learning repository aggregator]

http://greenlearningnetwork.com/ [looking into the Green Learning Network OER aggregator]
7.2 Visualization tools

A good overview on visualisation methodologies / tools by functionality:
http://www.visual-literacy.org/periodic_table/periodic_table.html

Data visualization guidelines, by Gregor Aisch:
http://schoolofdata.org/2013/04/26/data-visualization-guidelines-by-gregor-aisch-
international-journalism-festival/

7.2.1 TimeMapper

A visualization tool making timelines and timemaps using Google spreadsheets.

Description of functionality
http://timemapper.okfnlabs.org/

Contact info@okfn.org

License MIT licence

Programming language
Java Script and other open-source components including TimelineJS, ReclineJS,
Leaflet, Backbone and Bootstrap

Deployment
Example of an implementation on Medieval Philosophers:
http://timeliner.okfnlabs.org/view/?url=https://docs.google.com/spreadsheet/ccc?key=0Al6mO9_3Hrl2PdGZnRjEwUWxOekhreTNZEFEMWRZbkE - 2
On the Open Parliament Declaration
http://www.openingparliament.org/about
7.2.2 RelFinder

The RelFinder extracts and visualizes relationships between given objects in RDF data and makes these relationships interactively explorable. Highlighting and filtering features support visual analysis both on a global and detailed level. The RelFinder is based on the open source framework Adobe Flex, easy-to-use and works with any RDF dataset that provides standardized SPARQL access.

**description of functionality**
The RelFinder extracts and visualizes relationships between given objects in RDF data and makes these relationships interactively explorable. Highlighting and filtering features support visual analysis both on a global and detailed level. The RelFinder is based on the open source framework Adobe Flex, easy-to-use and works with any RDF dataset that provides standardized SPARQL access.

**URL**
http://www.visualdataweb.org/relfinder.php

**contact**
contact@visualdataweb.org

**licence**
GNU General Public License

**programming language**
Adobe Flex

**deployment**
University of Leipzig,
http://catalogus-professorum.org/tools/relfinder/RelFinder.swf
Ontotext
http://linkedlifedata.com/relfinder


7.2.3 Muse

![Muse image](image)

**description of functionality**
geo-spatial visualization of co-authorship on a multitouch tabletop

**URL**

**contact**
erik.duval@cs.kuleuven.be

**current use**
evaluated at ECTEL2010 and Hypertext2011

**Bibliography**

Nagel, T., Duval, E.: *Interactive Exploration of a Geospatial Network*

7.2.4 MappingPhilosophy/GlaMMap

description of functionality
Geo-spatial visualization of bibliographic metadata (place of publication, author, title, year) from books in logic from 1700-1940 on an interactive geographical map of Europe

URL
http://axiom.vu.nl/MappingPhilosophy.html

contact
ariannabetti@gmail.com
hein.van.den.berg2@gmail.com

programming language
HTML5, CSS, and JavaScript

current use
early prototype (internal use)

deployment
no users apart from developers
7.3 Awareness tools

7.3.1 TiNYARM

<table>
<thead>
<tr>
<th>Description of functionality</th>
<th>Web application to make researchers aware of what their peers are reading</th>
</tr>
</thead>
<tbody>
<tr>
<td>URL</td>
<td><a href="http://atinyarm.appspot.com/">http://atinyarm.appspot.com/</a></td>
</tr>
<tr>
<td>Contact</td>
<td><a href="mailto:gonzalo.parra@cs.kuleuven.be">gonzalo.parra@cs.kuleuven.be</a></td>
</tr>
<tr>
<td>Licence</td>
<td>Free</td>
</tr>
<tr>
<td>Programming language</td>
<td>Java (GAE)</td>
</tr>
<tr>
<td>Current use</td>
<td>HCI group KUL</td>
</tr>
<tr>
<td>Deployment</td>
<td><a href="http://atinyarm.appspot.com/">http://atinyarm.appspot.com/</a></td>
</tr>
</tbody>
</table>

Bibliography


7.3.2 More!

A social discovery tool for researchers

URL
https://sites.google.com/site/kulmoreapp/

contact
gonzalo.parra@cs.kuleuven.be

licence
Free

programming language
Java, PHP

current use
Currently not used

deployment


7.4 Annotation tools

7.4.1 AnnotateIt

The Annotator is an open-source JavaScript library and tool that can be added to any webpage to make it annotatable. Annotations can have comments, tags, users and more. Furthermore, the Annotator can be easily extended with new features.

URL  http://annotateit.org/
contact  hello@aroncarroll.com
         rufus.pollock@okfn.org
         nick@whiteink.com
licence  GNU GPLv3 or MIT
deployment  http://annotateit.org/

7.4.2 TEXTUS

In a nutshell TEXTUS is an open source platform for working with collections of texts. It enables students, researchers and teachers to share and collaborate around texts by annotating them.
Pundit enables users to create structured data annotating web pages or images, collect annotations and share with others to create collaborative structured knowledge. Furthermore, Pundit already has a built in entity extraction feature which annotates the texts using knowledge bases like DBpedia or Freebase.

**URL**
http://thepund.it/

**contact**
pundit@netseven.it

**current use**
Wittgenstein group in Norway (via DM2E project)

**deployment**
http://release-bot.thepund.it/latest/examples/authors_index.html

**bibliography**


A collaboration tool that aims:

- To facilitate the emergence of a Web and Resource-centric interoperable annotation environment that allows leveraging annotations across the boundaries of annotation clients, annotation servers, and content collections. To this end, interoperability specifications will be devised.
- To demonstrate through implementations an interoperable annotation environment enabled by the interoperability specifications in settings characterized by a variety of annotation client/server environments, content collections, and scholarly use cases.
- To seed widespread adoption by deploying robust, production-quality applications conformant with the interoperable annotation environment in ubiquitous and specialized services, tools, and content used by scholars -- e.g.: Zotero, AXE, LORE, Co-Annotea, Pliny; JSTOR, AustLit, MONK.

URL  
http://www.openannotation.org/
### 7.4.5 DocumentCloud

**Overview**
A tool for journalists, a document catalog, both.

**Search**
Our catalog has thousands of public documents.

**Open Source**
Our work is open source. Contribute your ideas.

**Get Help**
Learn about DocumentCloud’s advanced features and API.

**Who We Are**
Meet the people making this happen.

#### description of functionality
DocumentCloud is a tool for annotating documents and sharing those annotations on the web. DocumentCloud runs every document you upload through OpenCalais and extracts entities (people, places and organizations) mentioned in it.

#### URL
[https://www.documentcloud.org/](https://www.documentcloud.org/)

#### contact
support@documentcloud.org

#### deployment
[https://www.documentcloud.org/](https://www.documentcloud.org/)

### 7.4.6 Researchr

**description of functionality**
Academic information management workflow, which is at the same time individual and happens on the local computer, but also set up to be easily shared with others. It’s really a whole framework with a bunch of applications (the key ones being BibDesk, Skim, DokuWiki, Chrome).

#### URL
[http://reganmian.net/wiki/researchr:start](http://reganmian.net/wiki/researchr:start)
contact    shaklev@gmail.com
licence    Free
deployment  http://reganmian.net/wiki/research:start
8 Appendix: Additional tools for musicologists

8.1 Search tools

8.1.1 IMSLP Petrucci Music

The Petrucci Music Library (after publisher Ottaviano Petrucci) is a virtual library of public domain music scores. Since its launch on February 16, 2006, over 258,000 scores and 23,000 recordings for over 73,000 works by 7,000 composers have been uploaded (December 2013).

URL: http://imslp.org/wiki/
Licence: (CC BY-SA 4.0)
Deployment: http://imslp.org

8.1.2 Digital Image Archive of Medieval Music (DIAMM)
**description of functionality**

DIAMM (the Digital Image Archive of Medieval Music) is a resource for the study of medieval manuscripts. The project presents images and metadata for thousands of manuscripts. DIAMM also provides a home for scholarly resources and editions, undertakes digital restoration of damaged manuscripts and documents, publishes high-quality facsimiles, and offers expertise through consulting.

**URL**

http://www.diamm.ac.uk/  http://imslp.org

**contact**

http://www.diamm.ac.uk/about/contact-diamm/

**license**

http://www.diamm.ac.uk/about/copyright/

**deployment**

http://www.diamm.ac.uk/  https://www.documentcloud.org/

8.2 Creation of music sheets

8.2.1 MuseScore
MuseScore is a free and open source music notation software for Windows, Mac and Linux. It is easy to use and makes beautiful sheet music. MuseScore is often praised as a cost effective alternative for Sibelius and Finale.

URL: https://musescore.com/
Contact: https://musescore.com/contact
Licence: Copyright ©
Deployment: https://github.com/musescore/MuseScore
8.2.2 CMME

CMME offers software for creating, editing and viewing encoded score files of mensural notated music (roughly from the 15th and 16th century). The software is written in Java, and platform independent. The underlying encoding scheme is CMME-XML, a variant of the MusicXML format. On its website, CMME offers a corpus of free scores with additional metadata.

URL  
http://www.cmme.org

contact  
http://www.cmme.org/contact

license  
GNU General Public License

deployment  
https://github.com/tdumitrescu/cmme-editor
https://www.documentcloud.org/
8.3 Optical Music Recognition

8.3.1 Aruspix

Aruspix is a software application for the optical recognition, the superimposition and the collation of early music prints (16th century). The optical recognition part of Aruspix uses an innovative technique in OMR based on Hidden Markov Models to identify and classify the particular musical characters found in early music prints, after an initial pre-treatment phase performed on scanned images of microfilm and facsimiles. The integrated music editor allows corrections of recognition errors. One original aspect of Aruspix is that it learns and optimizes itself dynamically as soon as a page is processed and corrected by the user.

**URL**
http://www.aruspix.net/index.html

**contact**
lxpugin@gmail.com | laurent@music.mcgill.ca

**license**
N/A

**deployment**
N/A http://www.documentcloud.org/
8.4 Classification tools

8.4.1 WEKA

Weka is a collection of machine learning algorithms for data mining tasks. The algorithms can either be applied directly to a dataset or called from Java code. Weka contains tools for data pre-processing, classification, regression, clustering, association rules, and visualization. It is also well suited for developing new machine learning schemes.

URL
http://www.cs.waikato.ac.nz/ml/weka/

contact
http://list.waikato.ac.nz/mailman/listinfo/wekalist

license
GNU General Public License

deployment
http://weka.wikispaces.com/wiki/changes
https://www.documentcloud.org/
### 8.5 Music Analysis

#### 8.5.1 Music21

Music21 is a Python-based toolkit for computer-aided musicology. Applications of this toolkit include computational musicology, music information, musical example extraction and generation, music notation editing and scripting, and a wide variety of approaches to composition, both algorithmic and directly specified.

**URL**

http://web.mit.edu/music21/doc/about/index.html

**contact**

http://web.mit.edu/music21/doc/about/about.html

**license**

GNU Public License

**deployment**

### 8.5.2 The Humdrum Toolkit

**description of functionality**  
Humdrum is a set of command-line tools that facilitates musical analysis, as well as a generalized syntax for representing sequential streams of data. As a set of command-line tools, it is programming language agnostic. Many have employed Humdrum tools in larger scripts that use PERL, Ruby, Python, Bash, LISP, and C++.

**URL**  

**contact**  
[https://groups.google.com/forum/#!forum/starstarhug](https://groups.google.com/forum/#!forum/starstarhug)

**license**  
N/A

**deployment**  
[https://www.documentcloud.org/](https://www.documentcloud.org/)