Schriften des Instituts für Dokumentologie und Editorik — Band 12

Digital Scholarly Editions as Interfaces

edited by

Roman Bleier, Martina Bürgermeister, Helmut W. Klug,

Frederike Neuber, Gerlinde Schneider

2018

BoD, Norderstedt

Bibliografische Information der Deutschen Nationalbibliothek:
Die Deutsche Nationalbibliothek verzeichnet diese Publikation in der Deutschen Nationalbibliografie; detaillierte bibliografische Daten sind im Internet über http://dnb.d-nb.de/ abrufbar.

Digitale Parallelfassung der gedruckten Publikation zur Archivierung im Kölner Universitäts-Publikations-Server (KUPS). Stand 20. November 2018.

2018

Herstellung und Verlag: Books on Demand GmbH, Norderstedt
ISBN: 978-3-7481-0925-9
Einbandgestaltung: Julia Sorouri; Coverbild: “Desktop” von Franz Konrad
(www.franzkonrad.com/gallery/desktop-2008-2010) .
Satz: Roman Bleier und LuaTEX

Design as Part of the Plan: Introducing Agile Methodology in Digital Editing Projects

Ginestra Ferraro and Anna-Maria Sichani

Abstract

This paper aims to discuss where we currently stand with regard to design planning in digital scholarly editing from a project development perspective. In the last two decades, a huge number of digital scholarly editing projects have been developed by introducing and challenging different concepts, methods, workflows, tools, and techniques to and within the textual scholarship community. Although the majority of digital scholarly editions have been typically bound to a project-based logic, very few are actually developed and operate within a solid project management and product development framework. Such a behaviour, we claim, often has the result of limiting digital editing projects to the sheltered boundaries of the known environment, when it could potentially enhance the value of the final product and help it move towards a dynamic development framework such as the commercial world of web publishing and communication.

1 Introduction and context

In the past two decades, digital scholarly editing has been developed and established as an evolving and pivotal field of Digital Humanities and textual scholarship in general, as recent accounts argue (Pierazzo 2015; Driscoll & Pierazzo 2016). A significant and growing number of digital scholarly editing projects have been developed by challenging old and introducing new or different concepts, methods, workflows, tools, and techniques to the textual scholarship community. Digital scholarly editions (DSEs), among other resources, help those involved to shape a practical understanding of what it is to conduct research and produce scholarly output within the *digital paradigm* (Sahle 2016 28–33) while experimenting with operational procedures that exceed the traditional Humanities research agenda. Although the majority of DSEs, as it is common in Digital Humanities practice (Burdick et al. 124), have been typically bound to a project-based logic, very few of them succeed to be fully developed and operate within a solid project management and product development framework.[1]

[1] For a recent account and proposal on the topic of sustainability in digital editing projects, see also Czmiel 2016.

Digital Scholarly Editions as Interfaces, edited by Roman Bleier, Martina Bürgermeister, Helmut W. Klug, Frederike Neuber, Gerlinde Schneider. Schriften des Instituts für Dokumentologie und Editorik 12. Books on Demand, 2018, 83–105.

Within such an understanding of digital editing projects, usually discussions and decisions regarding (interface) design, functionality, and user needs come (if ever) as a final and mere presentational step. In addition, little time, budget and space for experimentation is left for design *per se* while the repertoire of possible interface choices or solutions might be further limited due to the technologies adopted in the process. Such behaviour often has the result of limiting digital editing projects to the sheltered boundaries of the known environment, although integral and innovative explorations could potentially enhance the value of the final product and help it move towards a dynamic development framework, similarly to what happens in the commercial world of web development, publishing, and communication.

This article aims to discuss and situate design planning within a robust while flexible project development framework for digital editing projects. Not surprisingly, in the last two decades, we have witnessed a remarkable growth of interest towards how computational technologies radically change the ways we structure, document, and process our scholarly editing data while revolutionising its scale (a good overview can, for example, be found in Driscoll & Pierazzo). Design, on the other hand, tends to be neglected despite the fact that it plays a vital role in Digital Humanities and the digital editing agenda as, from the outset, it communicates with technological evolution and enables user accessibility and engagement. Even if an experimental, interdisciplinary and collaborative ethos should be at the very epicentre of Digital Humanities scholarship, valuable and fresh approaches from the fields of project planning and development with regard to sustainability and user engagement are not usually part of the project planning.

In our paper, we propose to use *design* as a more comprehensive term than *interface.* Thus, we set to explore two central aspects the word *design* can represent in our case:

1. design as information architecture.
2. design as user interaction.

We will endeavour to explore the different aspects listed above, focusing on how planning enables sustainability, how content-driven design enhances the research subject and how usability and user input could contribute to the digital editing project itself in the long-term. Furthermore, by researching which workflow(s) could provide benefits to both the academic and the technical components of the project team, we will introduce an Agile-oriented workflow in our digital scholarly editing projects.

We will support our proposal by introducing the King’s Digital Lab (KDL) workflow for digital editing projects, which includes both the project management and the development sides. By using *The Value of French* (TVoF), a digital edition developed and maintained by KDL as a case study, we will discuss where and how information architecture (IA) and user experience (UX) come into action and, further, set the foundations for generating well designed, sustainable, and usable digital editions. It is to be said that what will be presented with regard to design and UX good practices is not exclusive to DSEs, it is, indeed, applicable to many web interfaces. We aim to highlight what the benefits are in particular for digital editing projects and why it is important to introduce such good practices at an early stage in the planning process.

1.1 Project development models

DSEs vary substantially as they may be composed of a heterogeneous set of outputs. Even if there have been several attempts to document and categorise existing digital editing projects,[2] there is no single model for developing and creating a digital edition. Differences may include the research questions, the nature of primary material, the standards and technologies employed, the budget, or the team size. Even if the actual development and delivery of each digital editing project is unique, all of them face the same project-based limitations: time, costs, and features. The ability to be flexible becomes the key when approaching a new research project. The main issue is the investment, more specifically time and money, which are often limited and represent the biggest constraint.

The **Waterfall approach** (fig. 1) is a project development methodology that has proven effective when all requirements are mandatory and described in detail, when funding is largely available and more money can be accessed if needed, and, finally, when time is not a strict limitation.

To set fixed features we would have to consider cost and time to be flexible. Based on the authors' personal project experience – and this is true for most projects that require any development – it would be naïve to think that, once funding and time run out, more work will be done without incurring further costs and obstructive issues (e.g. delays, personnel turnover, etc.).

It is evident that with research projects funded for a limited period, these conditions are not met, and this is why we think the **Agile approach** (fig.1) works better for DSE projects. Introducing the reverse Waterfall approach, intrinsic to the Agile methodology, in our management and development procedure will be beneficial to such projects.

2 Dynamic development framework – Agile in a nutshell

The Agile approach is a dynamic development framework for planning and guiding projects that support an iterative, flexible, and dynamic approach to development by

[2] Two model attempts of documenting digital scholarly editions are Patrick Sahle's *Catalogue of Digital Scholarly Editions v 3.0* and Greta Franzini's *Catalogue of Digital Editions*; both of them are intended to survey and document best practices.

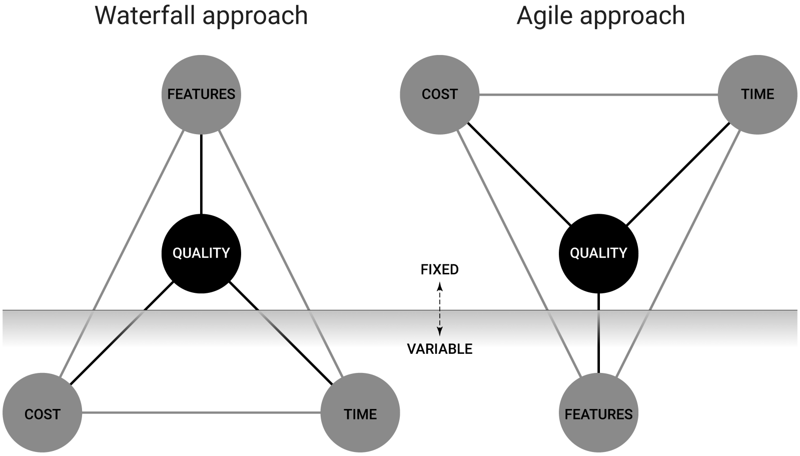


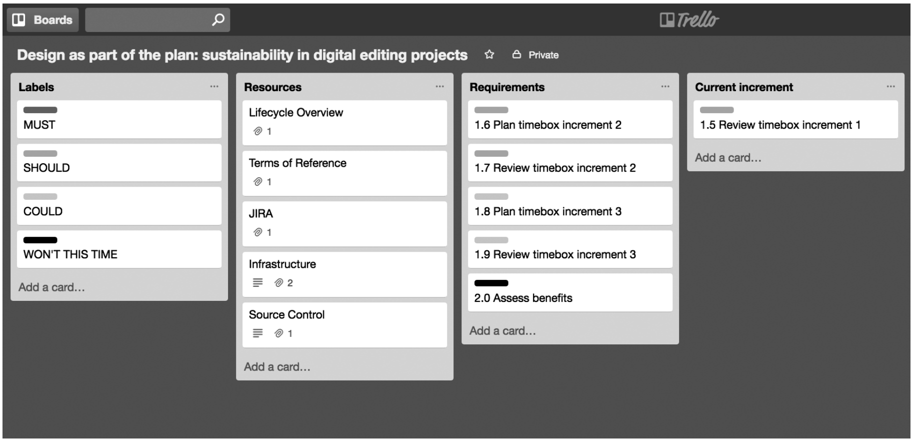
Figure 1: Waterfall approach (left) vs. Agile approach (right).

splitting the work into smaller tasks and assigning them different priorities. This dynamic development framework was adapted from the software development industry where it was first conceptualised in the '60s and established in the '80s as the Agile Methodology (Denning 2015).

The Agile way includes accepting limitations, variables which cannot be altered or fought against at times, and work with those variables which we can control without compromising quality. Reversing the Waterfall approach and fixing cost and time early would allow to focus on the scope of the research project, defining what the final *product* 'must, should, could, and won't' be (more on this when we explain *MoSCoW* prioritisation later in this paper).

If a priority list of features is not generated, there is a risk of under-committing, or worse: over-committing. The result would be an unfinished project, likely to remain incomplete until forgotten. Moreover, such a list is useful to define project stages, product releases, to set targets for the future, including following bids for more funding and further research ideas. It ensures the project is on track, meeting its deadlines, and the overall quality requirements are met.

By prioritising features, the development team builds a framework that guarantees the deployment of a Minimum Viable Product (MVP), so that, even in the worst case scenario, a working application is still produced. If the research and associated development process progress seamlessly without taking unanticipated turns, all features are developed and the product is built in the best possible way. In order to guarantee



Design as part of the plan: sustainability in digital editing projects

Labels
- MUST
- SHOULD
- COULD
- WON'T THIS TIME

Resources
- Lifecycle Overview 1
- Terms of Reference 1
- JIRA 1
- Infrastructure 2
- Source Control 1

Requirements
- 1.6 Plan timebox increment 2
- 1.7 Review timebox increment 2
- 1.8 Plan timebox increment 3
- 1.9 Review timebox increment 3
- 2.0 Assess benefits

Current increment
- 1.5 Review timebox increment 1

Figure 2: Example of a Trello board displaying work in progress on a project approached with the Agile method.

quality, it is a necessity to be transparent from the begining and acknowledge that some features are more important than others. The key ones will form a solid core and building around them should lead to a product that is not only viable, but also scalable.

Project managers have adopted Agile to support a more flexible approach allowing for faults to be discovered early in the process and ensure a successful and functional final product. Agile is very much en vogue now (Ambler 2013; Hastle & Wojewoda 2015), whilst the Waterfall model has been widely abandoned in project management and product development procedures (fig. 2).

As mentioned above, Agile is not a new technology and its success is well documented in the Agile manifesto (Beck et al.) as well as in Larman and Basili's paper about "Iterative and Incremental Development" (IID) (2003), where various examples are listed. They also highlight the importance of iterative design and, even more so, user centred design:

> The paper [i.e. Basili & Turner 390–396] detailed successful IID application to the development of extendable compilers for a family of application-specific programming languages on a variety of hardware architectures. The project team developed the base system in 17 iterations over 20 months. They analyzed each iteration from both the user's and developer's points of view and used the feedback to modify both the language requirements and design changes in future iterations. (Larman & Basili 50)

The *DSDM Agile Project Framework Handbook* lists the following key aspects of Agile development:

- *Iterative design or incremental design:*
  The ability to break a big problem (a project can be seen as the *big problem,* the end deliverable) into smaller tasks that can be solved/developed quickly and often by independent parties, allows for quick evaluation, as long as frequent checkpoints are in place along the path. (See *Face2face collaboration* below.) This is valuable especially for collaborative projects, where being able to progress separately is sometimes necessary. An increment is the set of functionalities/tasks that are to be developed in the time allocated to the iteration. While the scope of the entire project is defined and analysed at a high-level degree in the early stages, iterations are planned little in advance, leaving room for adjustments, should the project need to modify its course (DSDM 21, 62).
- *Willingness to explore and adapt:*
  We could argue that this concept is naturally embedded in research, hence technical development conducted within the research context will follow the same process, whereby tools are built around the necessities yielded by the content and tested by the end users, rather than the other way around (i.e. shaping the content to fit an existing container that might not be fit for this purpose), then we can see the potential gain for both technology discoveries and for content enhancement (DSDM 144).
- *Responding to change:*
  At the end of every increment, there should be an evaluation phase to determine whether the progress made is in line with expectations or whether adjustments need to be made when that is not the case. While working on ongoing exploratory subjects, it is not uncommon to discover the initial plan does not fit anymore, for example because one aspect emerges as more relevant than another. Ignoring it, leaving it unexplored, could damage or at least limit the outcome of the project. As mentioned above, iterations are a list of functionalities that need to be implemented in each increment. The fact that every iteration is a small part of the project gives room to steer direction, adapt, with little waste of time and resources (DSDM 45, 72).
- *Face2face collaboration:*
  Agile recommends daily, short meetings among team members, called *Stand-ups*, to share individual workload and identify potential conflicts or expose issues in solving tasks. Meeting in person is recommended, but technology has reached a point where tools can make it reliable to create virtual meeting rooms and ensure the communication channels are effective (DSDM 133).

- *Valuable product:*
  Whether in its rawest or most elaborate form, from downloading data and source code to interacting with complex search dashboards, a DSE requires a user interface to be displayed or explored in more nuanced ways. The attempt is to always reach a point, after every iteration, where a usable product is available, something that can eventually be improved and expanded but ultimately possesses the key features to stand on its own. This is called a Minimum Viable Product (MVP), a product that is functional and valuable because the minimum requirements are always satisfied (if not, the project fails). And this is why prioritisation is so important (DSDM 121).

Surveys from Ambysoft (Ambler 2013) and CHAOS (Hastle & Wojewoda 2015) are backing up the trend, showing a higher success rate for projects approached with the Agile methodology. Nevertheless, there are a couple of issues still at stake:

- *Scalability* is an issue identified by the software development community as one of the main drawbacks of Agile.
  Scaling Agile is indeed a problem, because the Manifesto doesn't scale in the first place. It was *intended* to describe small projects, not large enterprises. However, *agility* of complex systems is nothing new. [...] It is not people over processes but bottom-up rules over imposed constraints. Not working software over documentation but holistic development over schismatic thinking. Not collaboration over negotiation, but positive communication over negative assumptions. It is not responding to change over following a plan but scaling out over scaling up. (Appelo)
  Where projects have a list of very detailed features, and they are all required for the product to be acceptable and functioning, it is quite clear that there is no contingency other than the time to build them all. In this situation, Agile would not be required. The argument between fixed and flexible aspects of a product is not the only one to make a case against Agile. The effort required from the staff of every team involved should not be underestimated. Every individual has to understand the process, at least broadly, and actively participate and contribute.
- *Collaboration* is a recurring word when addressing issues and it is, in fact, key to the success of any project. Technology offers a wide range of tools to support collaborative work: from cloud-based platforms to sharing tools, video/audio conferencing applications and so on. That said, not all work environments and not all projects allow for collaborations; there could be physical limitations, time limitations, policies that would make it very difficult to follow the process described above.

There is one important point to be made here: although procedures need to be in place and documentation has to be written for products to be maintainable, the time spent on quantifying how long those tasks will take, should not outgrow the time spent on actual research and development. To produce documentation is a necessity in higher education and cultural heritage institutions, and in general, wherever public funding is the main source for financial support. Workflows and templates attempt to relief and smoothen the process, optimising time and resources available to focus on the core development of the product. It is important to notice that, although every DSE is unique, there are similarities among projects, recurring features for instance, that, once developed, could be reused as modules on different products.

As for the prioritisation of tasks in an Agile framework, the MoSCoW approach is adopted. MoSCoW stands for 'Must, Should, Could, Won't do this time' and it defines the priority levels assigned to tasks at every increment. It's a method developed by Dai Clegg (1994) while working on Rapid Application Development at Oracle UK and was soon adopted in project management.

Going through the list of requirements and adding priorities to each element highlights what the final product should be able to do at its core. Anything other than *Must*s should be considered contingencies. It is still important to know which features would contribute the most to the overall experience, and stress they *should* be implemented to add value to the final product; which attributes would be a nice addition, but do not affect the product's performances, and finally, what vision the project has for further development of the application (development of extended features can, for instance, be included in new funding proposals). What the Agile approach suggests is a rough split of 60% *Must*, 40% *Should*, 20% *Could*. (*Won't have this time* is not considered when balancing priorities) (DSDM 118–119).

3 Design planning and Agile workflows in digital editing projects

We propose that by adopting an Agile-oriented workflow in our digital scholarly editing projects we could implement a robust and flexible design strategy for our digital editions: discussions towards design specifications will normally arise from the very beginning through a medium/technology agnostic approach, succeeding thus to focus on what the target audience actually needs and wants to do with the resource, through an iterative development process based on task prioritisation. Such an undertaking liberates the digital editing activity and its outcomes from technological dependencies, facilitates its (future) repurposing for different audiences and uses while ensuring its viability in the long term. Furthermore, in an Agile workflow, there is plenty of room for experimentation; testing, customisation, and user feedback play a vital role in the whole process.

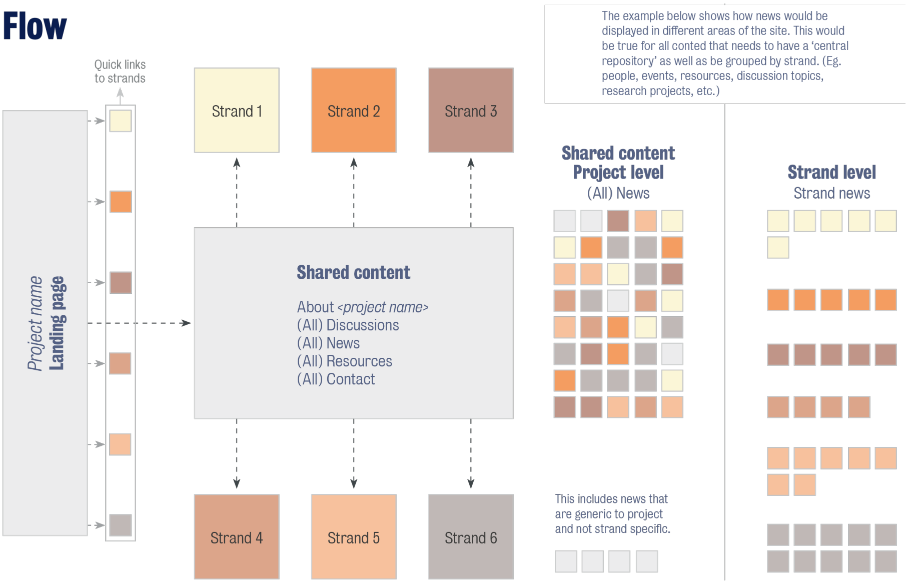

Flow
Quick links to strands
Project name
Landing page
Strand 1
Strand 2
Strand 3
Shared content
About <project name>
(All) Discussions
(All) News
(All) Resources
(All) Contact
Strand 4
Strand 5
Strand 6
The example below shows how news would be displayed in different areas of the site. This would be true for all conted that needs to have a 'central repository' as well as be grouped by strand. (Eg. people, events, resources, discussion topics, research projects, etc.)
Shared content
Project level
(All) News
This includes news that are generic to project and not strand specific.
Strand level
Strand news

Figure 3: Content flow and distribution: mapping the content and analysing how grouping changes in relation to users' selection.

3.1 Information architecture

For any product to succeed with its intended users, it has to be clear what it does and how it is to be consumed. Information architecture (IA) helps define what users are expected to do with the content delivered and how to interact with it. It is rare to find a single person to take on the role of an IA designer; more often, this profile is covered by multiple team members partially overlapping and creating the structure for the project to build upon. Content analysts and designers, user interactions designers, and software developers work closely with project investigators to frame the objectives set in the funding proposal and build an IA around the content (fig. 3).

The word *users* is intended in a broad sense here: users can be the group of people taking part in the research process and using tools developed to generate the desired output, but also the general public exploring the publication after its release. For instance, ingesting data from a source might require performing custom operations (adding metadata, reordering, cleaning up formatting, annotating, etc.), hence a tool is developed to satisfy the requirements for the researchers (*users*) to complete those actions or a dashboard to allow the general public (still *users*) to query a dataset.

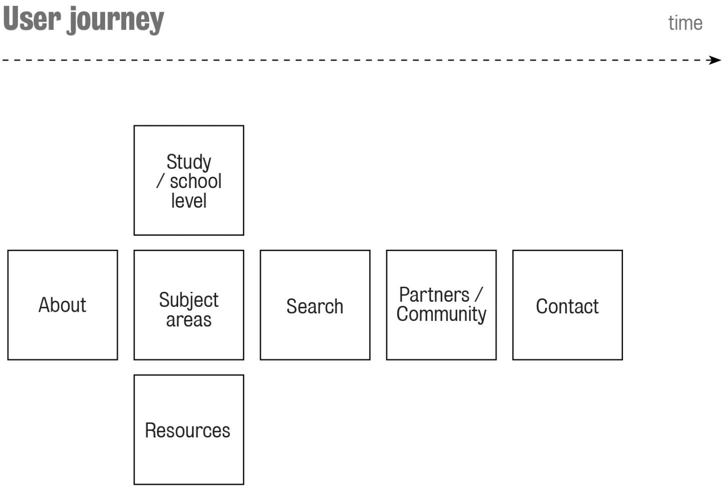


Figure 4: An example of user journey to identify content areas a specific persona could be interested in.

There are multiple ways to dynamically develop and design an IA for a digital edition. For instance, it is useful to present content maps and conceptual designs early in the process, generally in the first increment of the evolutionary development. Workshops are a good means to achieve both a shared understanding and establish focus.

Products such as a list of personas, user journeys, as well as content maps and conceptual designs (from mood boards to content flow diagrams) are the outcome expected from such workshops. Creating personas is a way to validate whether the imagined target audience is indeed the right match for what the project is offering. The user journey is a thread across the project concept, the choice of language, and the design that will provide the interaction – in other words, it is how the messenger delivers the message successfully (fig. 4).

The benefits of starting design early are multiple, but the most important are:

- Shared understanding of what the final product is expected to be.
- Focus on content and users.
- Build-in layers (using MoSCoW prioritisation).

3.2 User interaction design

Designing and developing ad hoc software is a considerable undertaking. Off the shelf tools are available in the market nowadays; it is difficult to imagine having to build something from scratch. However, it is easy to fall into a deep spiral of customisation as soon as the adopted tool does not offer the exact functionalities needed.

The development team makes decisions to balance out different issues: not wasting time creating something that already exists on the one hand, and, on the other hand, making sure the content is fully enhanced and supported. Creating experiences is what user interaction designers do when they add colours, shapes, animations, and actions to the concepts initially presented in content maps, user journeys, and conceptual designs. The architecture is in place and it is time to *translate* it to an interface and to add new layers.

While the gathering of research data and creation of models to make sense of it is undoubtedly the priority and the core of the research, the user interaction stage is when the results and resources become available. Data needs to be displayed in a way that users can understand, search, and explore in order to gain insights of what the research has achieved: that is what a user interaction design and its main output, an interface, usually do.

We have already discussed the concept of building modularly for both self-containment and reusability purposes. Interaction design is no different: components can be identified, prioritised, designed, developed, tested, deployed and *reused.*

> Being an effective designer means more than just creating great designs for the user. You need to learn to create the right design for your users *and* your team. Over time the effective designer learns to evaluate their work not by the quality of their design, but by the impact of what actually ships. That's what makes the effective designer valuable, because a great design that sits on the shelf doesn't solve real problems. (Barnard 2015)

We argue that the quality of design benefits from the impact the product itself achieves on its users, but overall, the authors agree with Leon Barnard, and suggest that getting the design right first is a *Must*, making it great or enhancing functionalities is a *Should* or *Could* where resources are available.

Design happens and interlaces across many phases during the development workflow. Moreover, roles from different teams are involved in the process. By introducing and implementing a multifaceted, flexible and iterative design strategy during a digital editing project, we are working towards the creation of a scholarly product that is usable, fulfils the various user requirements and can introduce multiple navigation and processing paths for the user.

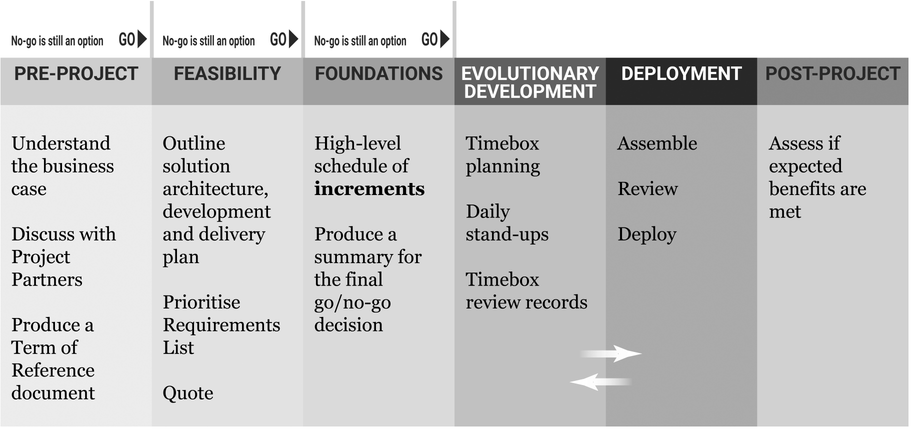
An iterative design approach further enhances a digital edition to be maintained in the long-term. For Jerome McGann, "'sustainability' is a dark but potent word in the field of digital humanities. It signals a broad set of concerns – they are both technical and institutional – about how to maintain and augment the increasingly large body of information that humanists are both creating and using" (McGann 5). The iterative development process and the easiness to respond and adapt to change could be seen as crucial components of a sustainability plan for a digital editing project. As the majority of the digital editions are developed within strict funding time frames, the proposal of employing an Agile approach for their design, both in terms of the information architecture and its interface, ensures that the digital edition can be efficiently adapted to technological advances or data changes. Design planning helps create digital editions that are useful, usable, and used even after the funding period.

4 KDL workflow applied to DSEs and other projects

In order to better explain our argument, we are going to focus on the King's Digital Lab's workflow for digital editing projects. King's Digital Lab was established at King's College London in 2015; the team includes analysts, designers, and research software engineers whose main focus is to liaise and contribute to a variety of projects across (but not limited to) the Faculty of Arts & Humanities, with a strong tie-in with Digital Humanities in the first place. KDL mainly develops research solutions iteratively, using a range of tools and processes that can handle the most common challenges of digital research in the humanities and social sciences. The lab builds resources designed to address research questions, store content, publish results, and push the boundaries of computationally-intensive research.

KDL has adopted the DSDM Agile methodology which, although not suitable for every project, has proven to be effective for all the ones we considered viable. The workflow (fig. 5) is a tailored version of the Agile approach previously mentioned in this paper and identifies the various phases we use to keep a project healthy and on track:

- *Pre-project* determine whether a proposal is of interest to the lab.
- *Feasibility*: analyse requirements at a high level to check whether they are cost effective.
- *Foundation*: expand the requirements, define the roles of the people involved, and start planning the first increment.
- *Evolutionary development*: develop iteratively and build incrementally, with constant communication between the parties involved, making sure the development is user centred and content driven. Should the focus of the project shift slightly,



No-go is still an option GO	No-go is still an option GO	No-go is still an option GO			
PRE-PROJECT	FEASIBILITY	FOUNDATIONS	EVOLUTIONARY DEVELOPMENT	DEPLOYMENT	POST-PROJECT
Understand the business case Discuss with Project Partners Produce a Term of Reference document	Outline solution architecture, development and delivery plan Prioritise Requirements List Quote	High-level schedule of **increments** Produce a summary for the final go/no-go decision	Timebox planning Daily stand-ups Timebox review records	Assemble Review Deploy	Assess if expected benefits are met

Figure 5: A simplified version of King's Digital Lab Agile workflow.

this phase allows for adjustments. Reacting to change without dismissing new opportunities or losing sight of the project's objectives becomes easier and constructive when 'health checks' are performed frequently.

- *Deployment*: at the end of every increment, test the feature(s) developed and, depending on the status of the project, consider a product release. Issues arising in the current iteration should also be recorded and evaluated to check whether they will affect the future increment(s).
- *Post-project*: work in collaboration with project partners to assess if the desired benefits are met (measure success).

For KDL, the Agile framework ensures a sustainable development cycle for DSE and other digital projects alike:

- Setting up an iterative workflow and following up with an evolutionary process helps assessing the status of the project, hence its sustainability.
- Focusing on incremental design to produce modular components that can eventually be abstracted from the specific project and reapplied to (or readapted for) other products.
- Responding to change dynamically and adapting to avoid mummification and obsolescence. Application Lifecycle Management is envisioned as a central element of the KDL Software Development Life Cycle (SDLC), e.g. by including a 'Forward Planning' section in our product quotes that define possible future archiving options or ensuring our SDLC includes post-project maintenance.

The lab ensures that every project enters the cycle in a healthy state, meaning that it has successfully passed the pre-project phase and is ready for evolutionary development. While that is possible for every new project, KDL did inherit a long list of legacy projects from its previous presence as part of the Digital Humanities Department (former Centre for Computing in the Humanities). Thus, the topic of design as part of the plan and as a means and an important factor for sustainability has to be considered. What follows is a case-study of a DSE project showing the KDL team efforts towards the application of design planning and into an Agile framework.

4.1 *The Value of French* (TVoF), a case study

> *The Values of French* examines the nature and value of the use of French in Europe during a crucial period, 1100–1450, less in terms of its cultural prestige (the traditional focus of scholarship) than of its role as a supralocal, transnational language, particularly in Western Europe and the Eastern Mediterranean. (TVoF, About)

The challenge for the *TVoF* project (ERC advanced grant) with regard to DSEs is to design a text viewer allowing both scholars and the general public to browse and compare transcripts of manuscripts side by side as well as to displaying notations and highlighting and synchronising changes across versions and so on. The design has to reflect the editorial choices made by the team of scholars and enable users to access the considerable and detailed amount of information available. It is also important to support the perspective under which the subject is treated as well as to ensure consistency and integrity to lay the basis for further research on the topic. When the initial proposal is evaluated in the *pre-project* phase, both the technical and the editorial aspects represent an opportunity for KDL to explore new ways for side by side text display with the aim of discovering patterns or highlighting inconsistencies in the manuscripts.

Typically, focusing on content, a team of developers, designers, and scholars discusses the requirements (features) and assigns priorities. From a design point of view, “a mobile-first workflow helps us to prioritize content, since there’s not enough room on a small screen for non-critical content” (Wroblewski 28; Jehl 55) (see fig. 6).

As a DSE, *TVoF* aims to answer the researchers’ questions, but also allows them and other users to explore patterns in the corpus. The user interface has to facilitate the ability to confirm or disprove theories by visually displaying various versions side by side, toggle annotations and comments, and allow for critical analysis.

Following the *evolutionary development* phase mentioned before, few increments of design take place. Scholars and the UX team work closely together to test the

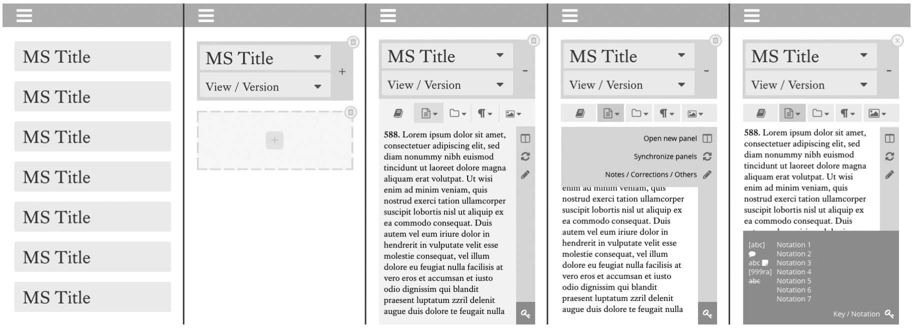
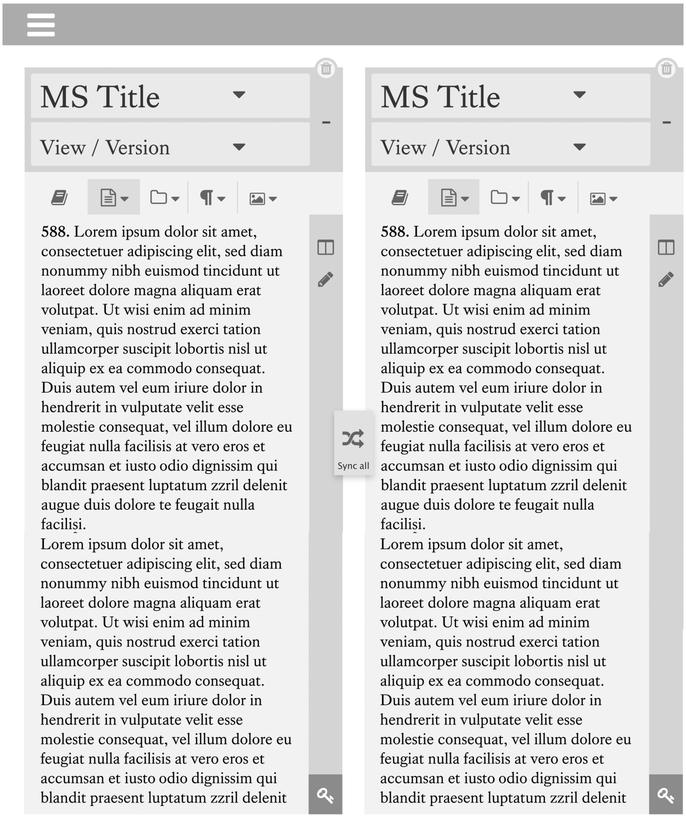


Figure 6: First, exploratory design draft. The *mobile first* approach helps focussing on content and key features for the Minimum Viable Product.

interface. Based on user feedback, elements are added to or removed from the design so that the application satisfies the user interaction required.

The view is customised as soon as users interact with it, offering a personalised experience. This level of options will account for a wide range of uses of the product as well as different types of users. While a simple alignment of paragraphs as recorded in two different versions might be useful when explaining to early career scholars how editions change in time, a more sophisticated audience will be interested in textual elements omitted and corrections made in subsequent releases, word repetitions, spelling evolution, etc.

Making the UI appealing and easier to use for the aforementioned types of audiences does not mean removing or hiding the complexity of the work done 'behind the scenes'. The purpose of this online product is to engage its users and offer different entry points or angles of examination. Accounting for user interaction while ensuring the look and feel is also taken care of leads to a somewhat parallel progress of graphic and software design. Once both aspects reach a satisfactory level of development, the application is ready for the first round of deployment, bringing the design mock-up to life (fig. 7 and fig. 8). In an Agile environment, deployment does not coincide to the product launch for public consumption until the last iteration, but allows for evaluation before the next round of changes takes place. Bugs are fixed and adjustments are made early, making it possible to trace back the evolution of the product.



588. Lorem ipsum dolor sit amet, consectetuer adipiscing elit, sed diam nonummy nibh euismod tincidunt ut laoreet dolore magna aliquam erat volutpat. Ut wisi enim ad minim veniam, quis nostrud exerci tation ullamcorper suscipit lobortis nisl ut aliquip ex ea commodo consequat. Duis autem vel eum iriure dolor in hendrerit in vulputate velit esse molestie consequat, vel illum dolore eu feugiat nulla facilisis at vero eros et accumsan et iusto odio dignissim qui blandit praesent luptatum zzril delenit augue duis dolore te feugait nulla facilisi.
Lorem ipsum dolor sit amet, consectetuer adipiscing elit, sed diam nonummy nibh euismod tincidunt ut laoreet dolore magna aliquam erat volutpat. Ut wisi enim ad minim veniam, quis nostrud exerci tation ullamcorper suscipit lobortis nisl ut aliquip ex ea commodo consequat. Duis autem vel eum iriure dolor in hendrerit in vulputate velit esse molestie consequat, vel illum dolore eu feugiat nulla facilisis at vero eros et accumsan et iusto odio dignissim qui blandit praesent luptatum zzril delenit

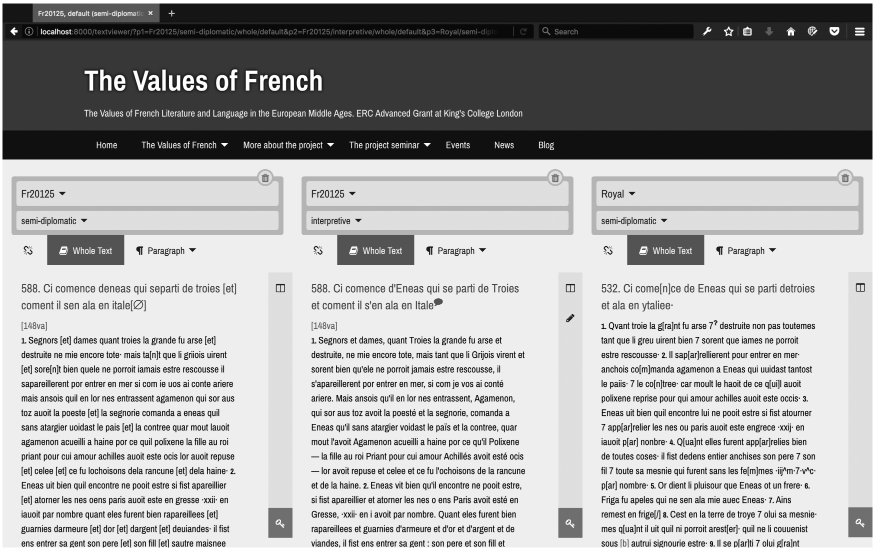
588. Lorem ipsum dolor sit amet, consectetuer adipiscing elit, sed diam nonummy nibh euismod tincidunt ut laoreet dolore magna aliquam erat volutpat. Ut wisi enim ad minim veniam, quis nostrud exerci tation ullamcorper suscipit lobortis nisl ut aliquip ex ea commodo consequat. Duis autem vel eum iriure dolor in hendrerit in vulputate velit esse molestie consequat, vel illum dolore eu feugiat nulla facilisis at vero eros et accumsan et iusto odio dignissim qui blandit praesent luptatum zzril delenit augue duis dolore te feugait nulla facilisi.
Lorem ipsum dolor sit amet, consectetuer adipiscing elit, sed diam nonummy nibh euismod tincidunt ut laoreet dolore magna aliquam erat volutpat. Ut wisi enim ad minim veniam, quis nostrud exerci tation ullamcorper suscipit lobortis nisl ut aliquip ex ea commodo consequat. Duis autem vel eum iriure dolor in hendrerit in vulputate velit esse molestie consequat, vel illum dolore eu feugiat nulla facilisis at vero eros et accumsan et iusto odio dignissim qui blandit praesent luptatum zzril delenit

Figure 7: The mock-up represents the first design based on user experience comparing text sources side by side.

4.2 Visual vs. Text

Designers make informed decisions whenever they *impose* their visual representation of data on users, but sometimes it is recommended to at least broaden the spectrum of perspectives and offer the users an array of multiple options (fig. 9, fig. 10, fig. 11).

There are situations which call for allowing users to be in charge: choosing a specific display might have to do with disability and/or technical reasons. For example, a person affected by dyslexia might find it easier to search a map or explore a graph, whilst a visually impaired user would benefit from aids such as screen readers reading lists and other textual representation. In a situation where network coverage or


Fr20125, default (semi-diplomatic
localhost:8000/textviewer/?p1=Fr20125/semi-diplomatic/whole/default&p2=Fr20125/interpretive/whole/default&p3=Royal/semi-diplo
Search
The Values of French
The Values of French Literature and Language in the European Middle Ages. ERC Advanced Grant at King's College London
Home
The Values of French
More about the project
The project seminar
Events
News
Blog
Fr20125
semi-diplomatic
Whole Text
Paragraph
Fr20125
interpretive
Whole Text
Paragraph
Royal
semi-diplomatic
Whole Text
Paragraph

588. Ci comence deneas qui separti de troies [et] coment il sen ala en itale[∅]

[148va]

1. Segnors [et] dames quant troies la grande fu arse [et] destruite ne mie encore tote· mais ta[n]t que li griiois uirent [et] sore[n]t bien quele ne porroit iamais estre rescousse il sapareillerent por entrer en mer si com ie uos ai conte ariere mais ansois quil en lor nes entrassent agamenon qui sor aus toz auoit la poeste [et] la segnorie comanda a eneas quil sans atargier uoidast le pais [et] la contree quar mout lauoit agamenon acueilli a haine por ce quil polixene la fille au roi priant pour cui amour achilles auoit este ocis lor auoit repuse [et] celee [et] ce fu lochoisons dela rancune [et] dela haine· 2. Eneas uit bien quil encontre ne pooit estre si fist apareillier [et] atorner les nes oens paris auoit este en gresse ·xxii· en iauoit par nombre quant eles furent bien rapareillees [et] guarnies darmeure [et] dor [et] dargent [et] deuiandes· il fist ens entrer sa gent son pere [et] son fill [et] sautre maisnee

588. Ci comence d'Eneas qui se parti de Troies et coment il s'en ala en Itale

[148va]

1. Segnors et dames, quant Troies la grande fu arse et destruite, ne mie encore tote, mais tant que li Grijois virent et sorent bien qu'ele ne porroit jamais estre rescousse, il s'apareillerent por entrer en mer, si com je vos ai conté ariere. Mais ansois qu'il en lor nes entrassent, Agamenon, qui sor aus toz avoit la poesté et la segnorie, comanda a Eneas qu'il sans atargier voidast le païs et la contree, quar mout l'avoit Agamenon acueilli a haine por ce qu'il Polixene — la fille au roi Priant pour cui amour Achillés avoit esté ocis — lor avoit repuse et celee et ce fu l'ochoisons de la rancune et de la haine. 2. Eneas vit bien qu'il encontre ne pooit estre, si fist apareillier et atorner les nes o ens Paris avoit esté en Gresse, ·xxii· en i avoit par nombre. Quant eles furent bien rapareillees et guarnies d'armeure et d'or et d'argent et de viandes, il fist ens entrer sa gent : son pere et son fill et

532. Ci come[n]ce de Eneas qui se parti detroies et ala en ytaliee·

1. Qvant troie la g[ra]nt fu arse 7$^{?}$ destruite non pas toutemes tant que li greu uirent bien 7 sorent que iames ne porroit estre rescousse· 2. Il sap[ar]rellierent pour entrer en mer· anchois co[m]manda agamenon a Eneas qui uuidast tantost le paiis· 7 le co[n]tree· car moult le haoit de ce q[ui]l auoit polixene reprise pour qui amour achilles auoit este occis· 3. Eneas uit bien quil encontre lui ne pooit estre si fist atourner 7 app[ar]relier les nes ou paris auoit este engrece ·xxij· en iauoit p[ar] nonbre· 4. Q[ua]nt elles furent app[ar]relies bien de toutes coses· il fist dedens entier anchises son pere 7 son fil 7 toute sa mesnie qui furent sans les fe[m]mes ·iij^m·7·v^c· p[ar] nombre· 5. Or dient li pluisour que Eneas ot un frere· 6. Friga fu apeles qui ne sen ala mie auec Eneas· 7. Ains remest en frige[/] 8. Cest en la terre de troye 7 olui sa mesnie· mes q[ua]nt il uit quil ni porroit arest[er]· quil ne li couuenist sous [b] autrui signourie estre· 9. Il se p[ar]ti 7 olui g[ra]nt

Figure 8: First release of the text viewer user interface, comparing different versions and synchronising paragraphs.

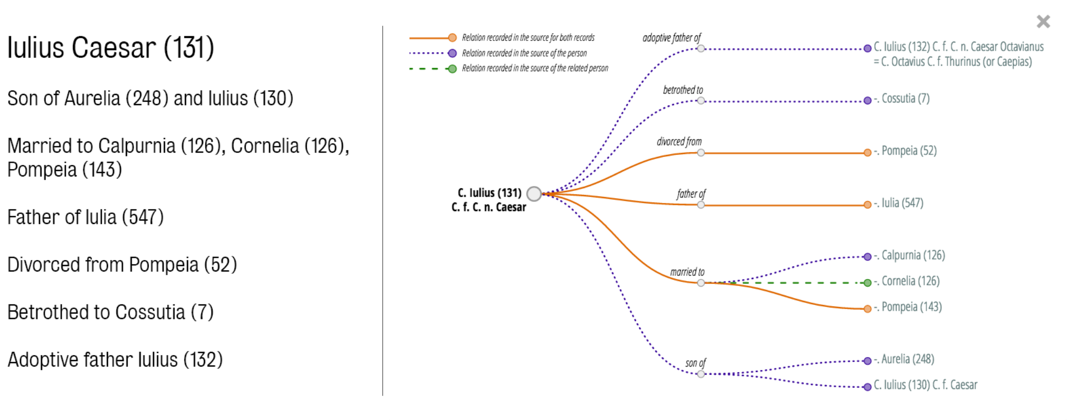
data transfer are limited, a textual representation would load quickly and use fewer resources whilst still providing the user with a fully functional experience of the application. Finally, even DSEs might need to go back to a paper format when a user finds it necessary to print out some material. Some flexibility should be left to the user to decide which output to rely on in specific contexts (e.g. searching vs. reading).

5 Concluding remarks

Of course the approach presented in the paper can also be applied to non-DSE projects, but it is the intention of the authors to contribute in the search for answers to some of the questions posed in Sahle's paper, in particular:

> Does the edition follow a digital paradigm? Does it make use of the possibilities of digital technology and media? Is it not printable without a major loss of content and functionality? (Sahle 13)

We claim that by integrating design, both as a conceptual framework and as a methodological awareness, early in the development process of a Digital Humanities project and, more specifically, a digital editing project, we can succeed in the creation of high



Iulius Caesar (131)

Son of Aurelia (248) and Iulius (130)

Married to Calpurnia (126), Cornelia (126), Pompeia (143)

Father of Iulia (547)

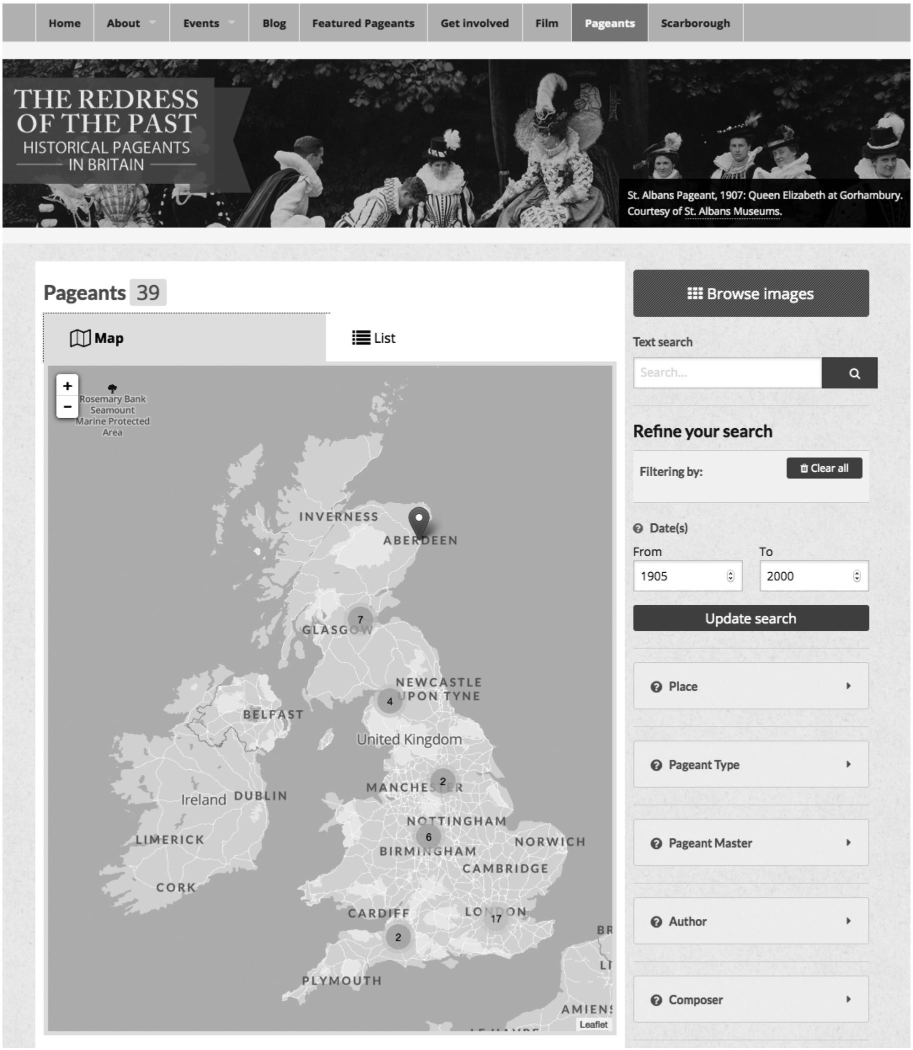
Divorced from Pompeia (52)

Betrothed to Cossutia (7)

Adoptive father Iulius (132)

Relation recorded in the source for both records
Relation recorded in the source of the person
Relation recorded in the source of the related person
C. Iulius (131)
C. f. C. n. Caesar
adoptive father of
betrothed to
divorced from
father of
married to
son of
C. Iulius (132) C. f. C. n. Caesar Octavianus
= C. Octavius C. f. Thurinus (or Caepias)
-. Cossutia (7)
-. Pompeia (52)
-. Iulia (547)
-. Calpurnia (126)
-. Cornelia (126)
-. Pompeia (143)
-. Aurelia (248)
C. Iulius (130) C. f. Caesar

Figure 9: Text and graphic representation of Iulius Caesar’s family network based on data extracted from Digitising the Prosopography of the Roman Republic.

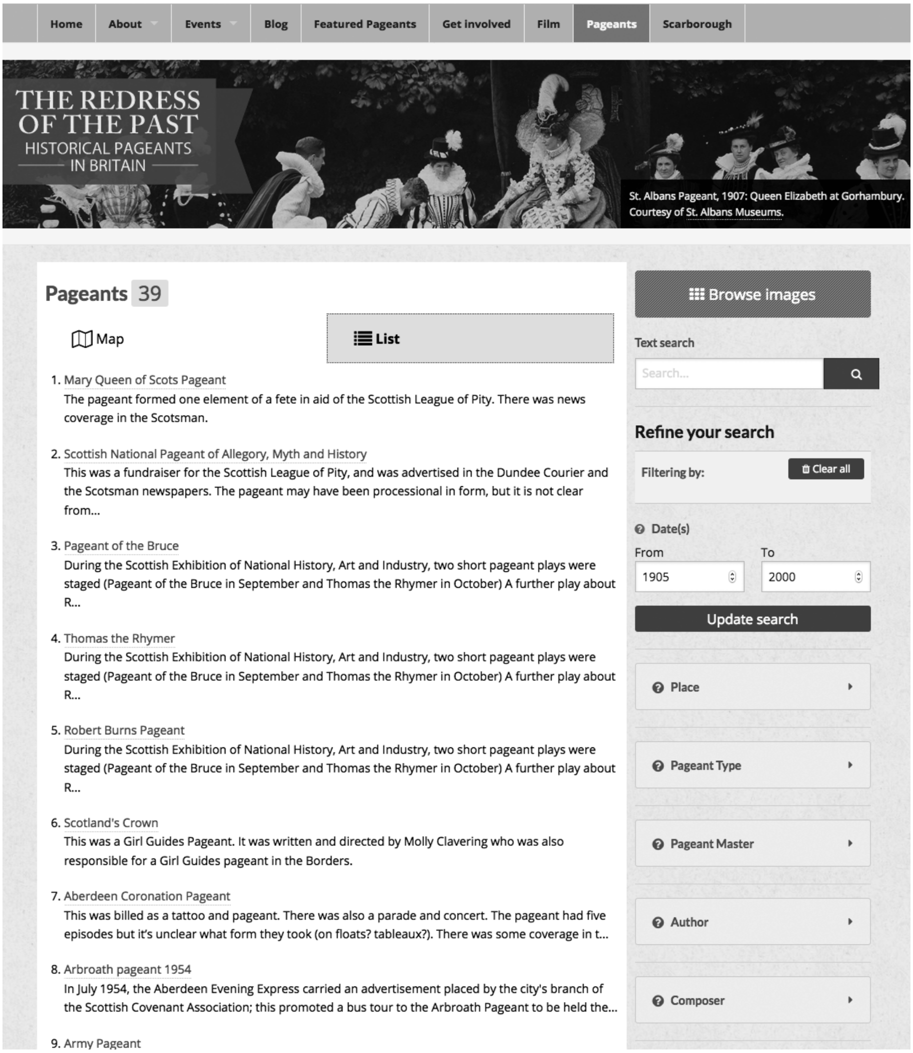


St. Albans Pageant, 1907: Queen Elizabeth at Gorhambury. Courtesy of St. Albans Museums.

From 1905

To 2000

Figure 10: Map view.



St. Albans Pageant, 1907: Queen Elizabeth at Gorhambury. Courtesy of St. Albans Museums.

Pageants 39

From 1905

To 2000

1. Mary Queen of Scots Pageant
The pageant formed one element of a fete in aid of the Scottish League of Pity. There was news coverage in the Scotsman.

2. Scottish National Pageant of Allegory, Myth and History
This was a fundraiser for the Scottish League of Pity, and was advertised in the Dundee Courier and the Scotsman newspapers. The pageant may have been processional in form, but it is not clear from...

3. Pageant of the Bruce
During the Scottish Exhibition of National History, Art and Industry, two short pageant plays were staged (Pageant of the Bruce in September and Thomas the Rhymer in October) A further play about R...

4. Thomas the Rhymer
During the Scottish Exhibition of National History, Art and Industry, two short pageant plays were staged (Pageant of the Bruce in September and Thomas the Rhymer in October) A further play about R...

5. Robert Burns Pageant
During the Scottish Exhibition of National History, Art and Industry, two short pageant plays were staged (Pageant of the Bruce in September and Thomas the Rhymer in October) A further play about R...

6. Scotland's Crown
This was a Girl Guides Pageant. It was written and directed by Molly Clavering who was also responsible for a Girl Guides pageant in the Borders.

7. Aberdeen Coronation Pageant
This was billed as a tattoo and pageant. There was also a parade and concert. The pageant had five episodes but it's unclear what form they took (on floats? tableaux?). There was some coverage in t...

8. Arbroath pageant 1954
In July 1954, the Aberdeen Evening Express carried an advertisement placed by the city's branch of the Scottish Covenant Association; this promoted a bus tour to the Arbroath Pageant to be held the...

9. Army Pageant

Figure 11: List view.

quality digital scholarly outputs which are accessible and sustainable. Embracing the Agile philosophy from the start means not only adopting a management option, but also embracing an operational mindset and a set of procedures committed to collaboration (ask for feedback early and frequently), iterative development (apply changes based on feedback), flexibility (embrace change), direct communication, and creativity (all parties involved need to feel comfortable in contributing to the product). By approaching a project with such a mindset, we believe the resources available will be optimised and focused on the core of the research: exploration and result analysis.

As exposed in the case study through the phases presented in the workflow, different roles are involved in various stages. The advantages of reasonably quick iterations and deployments (from two to four weeks) as well as an open communication channel allow for a fast evolution of the tool, moving constantly forward with the occasional step back and redesign of details when user testing fails. An example in our case study is represented by the synchronisation button (fig. 7), not included in the first deployment (fig. 8) after testing showed that the DSE behaviour did not match the user expectations. It might be implemented in future developments or dropped completely depending on prioritised requirements as well as time and funds available.

Due to the interdisciplinary nature of Digital Humanities projects, this approach allows for a better understanding of all roles involved and helps building a common vocabulary where all parties can fully contribute to the success of the research process. Technology should eliminate barriers (not be one), act as enhancer and facilitator, and be shaped by the content rather than box it with limitations. Furthermore, the interaction ultimately generated by users is an important outcome that could move the research forward and become part of a constant evolution (e.g. interaction generating data to be included then in the project itself, whether for subsequent phases or for results evaluation).

Finally, the proposal of introducing Agile methodology in digital editing projects is placed in the epicentre of and celebrates the collaborative and interdisciplinary ethos of Digital Humanities. From the IT industry, we do not just borrow the methodology, but also their 50+ years of experience with it. This approach will not be applicable to all projects, but there is enough evidence to consider the methodology a valuable option to be applied to DSE projects.

Bibliography

Ambler, Scott. *2013 IT Project Success Rates Survey Results.* Ambysoft, 2014, ambysoft.com/surveys/success2013.html. Accessed 30 Aug. 2017.

Appelo, Jurgen. "No. Agile Does Not Scale. (but agility scales quite well, thank-you-very-much)". *Medium*, 5 March 2015, medium.com/@jurgenappelo/no-agile-does-not-scale-98df99da3ff3. Accessed 30 Aug. 2017.

Barnard, Leon. "Soft Skills for UX Designers", *Treehouse*, 30 Dec. 2015, blog.teamtreehouse.com/soft-skills-ux-designers. Accessed 30 Aug. 2017.

Basili, Victor R., and Albert J. Turner. "Iterative Enhancement: A Practical Technique for Software Development". *IEEE Trans. Software Eng.*, Dec. 1975, pp. 390–396.

Beck, Kent, et al. *Manifesto for Agile Software Development.* 2001, agilemanifesto.org. Accessed 30 Aug. 2017.

Burdick, Anne, et al. *Digital_Humanities.* MIT Press, 2012, mitpress.mit.edu/sites/default/files/-titles/content/9780262018470_Open_Access_Edition.pdf. Accessed 30 Aug. 2017.

Clegg, Dai, and Richard Baker. *Case Method Fast-Track: A Rad Approach.* Addison-Wesley Longman Publishing, 1994.

Czmiel, Alexander. "Sustainable publishing – Standardization possibilities for Digital Scholarly Edition technology." *Digital Humanities 2016: Conference Abstracts*, Jagiellonian University & Pedagogical University, 2016, pp. 167–168.

Denning, Steve. "Agile: The World's Most Popular Innovation Engine". *Forbes*, 23 July 2015, www.forbes.com/sites/stevedenning/2015/07/23/the-worlds-most-popular-innovation-engine/#2494d2e87c76. Accessed 30 Aug. 2017.

Driscoll, Matthew James, and Elena Pierazzo, editors. *Digital Scholarly Editing: Theories and Practices.* Open Book Publishers, 2016. doi:10.11647/OBP.0095.

DSDM Agile Project Framework Handbook. Agile Business Consortium, 2014, www.agilebusiness.org/resources/dsdm-handbooks/the-dsdm-agile-project-framework-2014-onwards. Accessed 30 Aug. 2017.

Franzini, Greta. *Catalogue of Digital Editions.* Österreichische Akademie der Wissenschaften, 2012–2017, dig-ed-cat.eos.arz.oeaw.ac.at. Accessed 30 Aug. 2017.

Hastle, Shane, and Stéphane Wojewoda. "Standish Group 2015 Chaos Report - Q&A with Jennifer Lynch." *InfoQ*, 4 Oct. 2015, www.infoq.com/articles/standish-chaos-2015. Accessed 30 Aug. 2017.

Jehl, Scott. *Responsible Responsive Design.* A Book Apart, 2014, abookapart.com/products/responsible-responsive-design. Accessed 30 Aug. 2017.

King's Digital Lab. "What we do." www.kdl.kcl.ac.uk/what-we-do. Accessed 30 Aug. 2017.

Larman, Craig and Victor R. Basili. "Iterative and Incremental Development: A Brief History", *IEEE Computer*, issue 6, June 2003, pp. 47–56, www.cs.umd.edu/7basili/publications/journals/J90.pdf. Accessed 30 Aug. 2017.

McGann, Jerome. "Sustainability: The Elephant in the Room". *Online Humanities Scholarship: The Shape of Things to Come. The Papers, Responses, and Proceedings of the Online Humanities Scholarship.* The Shape of Things to Come Conference, held at the University of Virginia on March 26–28, 2010, cnx.org/exports/01e04a51.../sustainability-the-elephant-in-the-room-2.pdf. Accessed 30 Aug. 2017.

Pierazzo, Elena. *Digital Scholarly Editing. Theories, Models and Methods.* Ashgate, 2015.

Sahle, Patrick. *Catalogue of Digital Scholarly Editions v 3.0.* 22 March 2017, www.digitale-edition.de. Accessed 30 Aug. 2017.

—. "What is a Scholarly Digital Edition?" *Digital Scholarly Editing Theories and Practices,* edited by Matthew James Driscoll and Elena Pierazzo, Open Book Publishers, 2016, pp. 19–39, doi:10.11647/OBP.0095.

Wroblewski, Luke. *Mobile First.* A Book Apart, 2011, abookapart.com/products/mobile-first. Accessed 30 Aug. 2017.