

Lightweight Interventions for Reflective Documentation

Leslie Bloomfield

Lightweight Interventions for Reflective Documentation

Leslie Bloomfield, Master of Design 2015

Aisling Kelliher, Advisor

A thesis submitted to the School of Design, Carnegie Mellon University,
for the degree of Master of Design in Communication Planning and
Information Design

© 2015 Leslie Bloomfield

Abstract

Reflection is an essential part of iterative creative work and documenting process is constructive to that practice. However, there are many misconceptions about what it means to document process and it is often considered in opposition to productivity. How can design help with documenting and making reflection explicit during process? What is the best approach for designing reflective features for the sake of reflection?

Table of contents

1. Introduction

2. Design process/approach

3. Exploratory research

3.1 What is documentation?

3.2 What does documentation look like?

3.3 How is process documented?

3.4 What is documentation used for?

4. Generative research

4.1 How can design make implicit documentation practices visible?

5. Ideation and concept development

5.1 Why are we obsessed with productivity?

5.2 Why not reflection?

5.3 Lightweight design solutions

5.4 Reflective interventions

6. Final design

6.1 Lightweight Interventions for Reflective Documentation

7. Reflection and evaluation

8. Conclusion

9. References

1.

Introduction

We live in a society that values productivity and efficiency in the workplace and at home. Our expectations for productive tools often blur into our expectations for productive selves. This focus on efficiency has had negative impacts on how we value qualitative and internal activities. While these things have not been eliminated, they have subsumed into other practices and are often treated as implicit to larger processes. Documentation is one such example.

Documentation practices occur throughout the lifecycle of iterative creative work. It is both a process and an outcome, though it is often generated through activities driven by a goal other than the act of documenting. Documentation is facilitated by inherent and implicit reflective practices that are embedded into thought process.

Makers often do not interpret their project assets in this way. Instead, “documentation” is often misconceived as comprehensive and cumulative rationale about decisions that led up to the final design. While that is one type of documentation, the large majority of practitioner’s do not document in this way because it is not seen as productive to moving forward.

The way both documentation and reflection were treated as implicit processes and outcomes during process interested me. Both of these things are important not just in the way they help move a project towards a final solution. I wanted to explore approaches for design that treats documentation and reflection during process as explicit and valuable in themselves.

2.

**Design
process/
approach**

This project is a culmination of research done over two years. The investigation of my topic began as directed research before it became my thesis and this is evident in the exploratory nature of my design process. Five phases of research and development were conducted before evolving into my final design.

- ① During my exploratory research, I put together literature and historical reviews, conducted initial interviews, and analyzed my findings. I used case studies, semi-structured interviews, and contextual inquiry as methods for gathering data. I used open coding and affinity diagramming to analyze and interpret my data. Finally, I synthesized the key findings of my research in order to inform design for inquiry.
- ② My generative research focused on making as a method of inquiry. I designed and evaluated prototypes using the methodological approach of technology probes and user enactments. I conducted a pilot study, and analyzed the results using affinity diagramming. The goal this research was to extract knowledge in order to determine opportunity spaces moving forward.
- ③ As I moved into ideation and concept development, I refined the goal and context of my project based on the nature of feedback generated during the previous phase. I synthesized key findings from all my research up to this point in order to propose a final approach and concept.
- ④ Finally, I refined my concept and developed prototypes as examples and suggestions for my final design.

3.

Exploratory Research

3.1 What is documentation?

The development of modern science heralded the emergence of rigorous approaches to documentation aimed at representing the veracity of objective knowledge [1]. Though knowledge was understood as contained within collections of documents, the concept of documentation as a fluid entity did not begin to form until libraries began adopting more modern approaches in the early 1900s.

Led by visionaries such as Suzanne Briet, the modern library movement redefined the concept of document beyond physical form to include anything recorded or represented as evidence [2]. Thus documentation was positioned not only as the collective cultural process of producing, organizing, and using knowledge, but also the outcome of that process.

More recently, formalized procedures for documentation have developed within specific industries. In corporate work practices, documentation is used to support communication and management goals, such as establishing best practices, increasing accountability, and making informed decisions.

In software engineering, documentation captures information including but not limited to function, operation, technical details, and design. The emphasis on working product over comprehensive documentation has caused debate over value, practice, and methodology.

Finally, in commercial design documentation is often used as a means to demystify the creative process or provide rationale for product specifications. As part of research through design methodology in human computer interaction, documentation is used to establish a protocol for evaluating contributions [3].

3.2 What does documentation look like?

I created case studies of documentary artifacts in order to gain practical insight into what documentation looks like and what it's used for.

These case studies validated many of the insights from my literature review, particularly the concepts of documentation as both a process and an outcome. For example, Le Corbusier and Leonardo Da Vinci both used journals for recording observations, ideas, and visual studies across project lines. The act of journaling is a documentation act because it is inherently archival but the journal itself also serves as documentation.

The case studies showed a range of documentation that occurred at different times, for different purposes, and recording different kinds of information. I took these insights into account when moving forward to conduct my interviews.

3.3 How is process documented?

I conducted a qualitative interview study to assess the nature of process documentation in diverse disciplinary work contexts and to characterize methods and approaches.

Eight adults (4 female and 4 male) from fields including art, design, and computer science were recruited through personal contacts. The semi-structured interviews took place in person or over the phone (5) and lasted approximately 40 minutes. Participants were asked questions about their creative process and methods of documenting work, including when it occurred, the role it played, and its impact on practice. Contextual inquiry into specific project examples was used as a method for capturing information about how documentation activities support different stages of process.

I learned that process documentation is commonly perceived as a document about process, that is, a comprehensive reflection on the stages of process that informed the final outcome. Documentation is seen as something that occurs after process, as opposed to being part of process. Based on this definition, most of the participants denied having a documentation practice.

Working through process specific to a single project helped the participants externalize what activities occurred when and why. Through guided discovery many were able to reframe their process within the scope of documentation and provide tacit knowledge about assets generated during stages of creation.

This revealed that documentation is largely made up of the physical and digital artifacts generated during stages of process through activities informed by goals.

3.4 What is documentation used for?

Participants provided a variety of rationales for their documentation activities during process.

Documentation to generate new work

The outcome of documentation was used as a methodology for generating new work. This outcome varied in participants' approaches towards documentation as media or documentation as process. For example, one created new video work using progress photographs they had taken during previous projects; another wrote letters as an activity that helped inform the book they were writing, without using the letters themselves.

Documentation to generate synthesis

Documentation often plays a valuable role in generating synthesis for and about work. For many participants this was often dependent on building a corpus of created and collected artifacts. This approach was used for writing papers, where creating a comprehensive overview of what was done was useful towards articulating why it mattered. However, this also occurred during initial research and exploration where documentation was collected and used to inform ideas and create context.

Documentation to instruct

Participants discussed documentation as a tool for teaching others, often but not always in the context of academia. Documentation was used to exemplify abstract information, provide instructions about what to do and how to do it, and capture feedback.

Documentation to remember

Many participants used digital or physical memory devices. Usually these were intended for some immediate use by the individual only, and not as an enduring record of their process. For example, one used photos of performance spaces as reference when working away from the venue at the beginning of a project.

Documentation to be remembered

The purpose of documentation and for whom it is useful is more built in to the functions of the art industry than the work environments of practitioners in other disciplines. Because of this, participants described documentation to be remembered as a behavior (“leaving a trail of work”) that affords future conservation and restoration. This behavior is conscious but often background to other goals of documentation and their value during process.

Documentation to be memorable

Several participants discussed the use of process documentation in the construction of their forward-facing identity. Examples of work and process were used as evidence of skills to potential clients or employers. Two participants in the arts used documentation as a statement of intent about the process or qualities of their work that may not be evident in the final form.

Documentation to move on

Only one participant put together detailed documentation about their process at the end of a project. This kind of documentation had value not only in its final form, but also as an emotional process for tying ends together, organizing remaining thoughts, and letting go of responsibilities.

Documentation to preserve

Which assets were retained and which were erased varied from person to person. One participant threw out notes and preserved only the original document because they felt each draft reflected a record of their decisions, whereas another kept everything relevant to a project, including working notes and activity logs. “I always sort of want to delete those files after the really beautiful thing is done,” explained one participant, “but I know that the secret to why it feels organic or humanistic is somehow in there.”

Documentation to recreate

Documentation used to reverse-engineer making, particularly for work where the final piece is a set of instructions as opposed to the physical manifestation of those instructions. This kind of documentation was not pre-meditated and often involved a process of distilling the desired information from existing documentation where the knowledge is present but not revealed.

Documentation to re-use

Participants discussed reusing digital project files as building blocks for new or expanded work. Some leveraged working programs as the foundation for new code or inserted art assets as placeholders, but most discussed reuse practices in the context of formal writing produced throughout the lifecycle of a project. As they moved through proposing future work, generating research, and synthesizing the contribution and significance of that work, participants would often edit existing documents to reflect the current iteration. “I always try to leverage old content, so I go back to the document that I’d written a few months ago

and then I'll copy from it and realize [it] isn't exactly right and change it."

Documentation to show progress

Several participants reported having to submit materials for review at least once a year. Both visual and written assets from current projects were aggregated as evidence of progress, as well as used to generate new self-assessment and goals moving forward.

Documentation to translate

In-action documentation of difficult-to-communicate ideas created to gain understanding between people. Many participants discussed situations where abstracting information from language-based interaction was a successful or necessary part of the process. For example, sketching was used to express how something should feel, and movement through space was used to define units of narrative.

4.

Generative Research

4.1 How can design make implicit documentation practices visible?

I used the stages and end goals from my previous research as the basis for informing design explorations. These three system prototypes investigate approaches for making documentation activities involving the generation of project assets more visible during process. The prototypes were presented as novel desktop environments in order to represent information space as on-going activities and integrate both system- and user-supported goals of documentation with workflow. Each prototype investigates whether the general notion of what process documentation is can be re-defined by creating opportunities for in-action awareness simultaneous to creation.

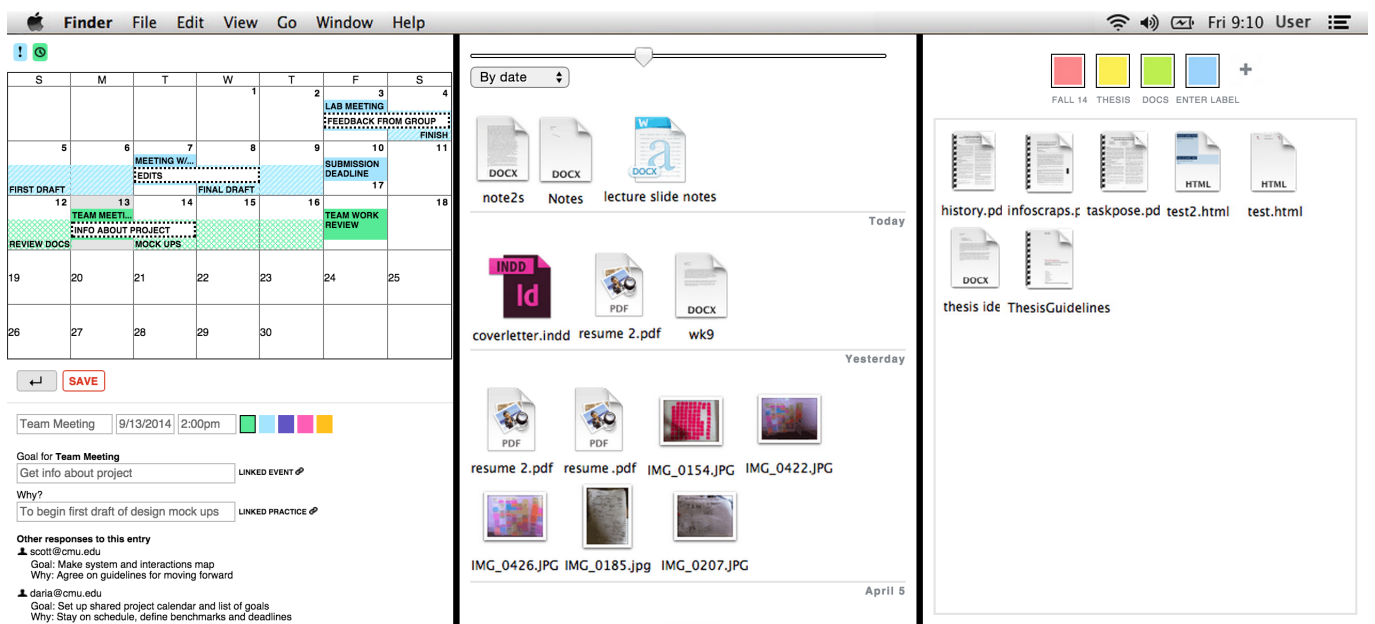


Fig 1. Goal Scoper

Goal Scoper

The first prototype divides the desktop into 3 display interfaces, two that distinguish the patterns of activity and subjective values of files and the third that displays temporal knowledge about those activities. This prototype provides different opportunities to view, organize, and contextualize files and events as an approach for revealing the nature of these practices.

The right column keeps and shows temporary files normally saved on the desktop for references and later thrown out instead of archived. This column allows for spatial color-coding according to relevance, so there is a degree of organization in order to bring the most basic degree of finding and searching to this interface. The center column is for accessing files kept in typical file folder hierarchies. This interface lets you view the most recent files opened in all folders by date or by degree of recent changes made. The left column contextualizes on-going interactions with project assets relative to schedules and tasks. It integrates user-knowledge about continuous goals into system-supported archives of discrete events in order to reinforce the value of capturing information in-action.

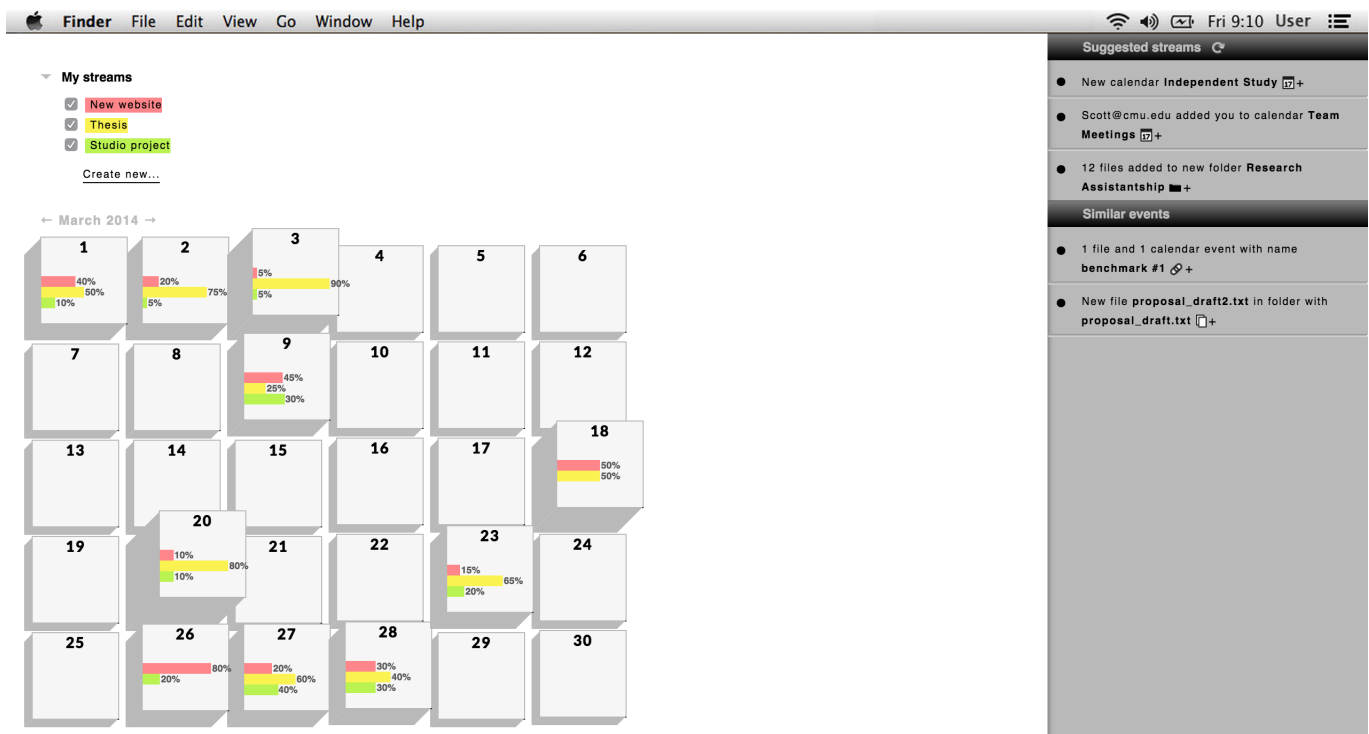


Fig 2. Pattern Predict

Pattern Predict

The second design provides abstracted evidence of progress across multiple simultaneous projects. As opposed to the previous design, it displays levels of activity as a record of behavior. The graphic visualization allows at-a-glance summaries about what was worked

on and how much work was done per day over a month. This provides an opportunity for users to use system-supported documentation for reflexive habit change.

The interface uses the analogy “streams” to represent high-level workflow, where a “stream” is an assigned topic that has been associated with a directory of files and a series of calendar events. The notification system suggests possible streams to the user based on the creation of new calendars or increased activity within a new folder. The desktop will also detect similar names between files to prompt versioning or a file and a calendar entry to create linked events. User-assisted creation of system knowledge makes documenting time- and file-based progress easier for users who are not likely to otherwise engage in these practices.

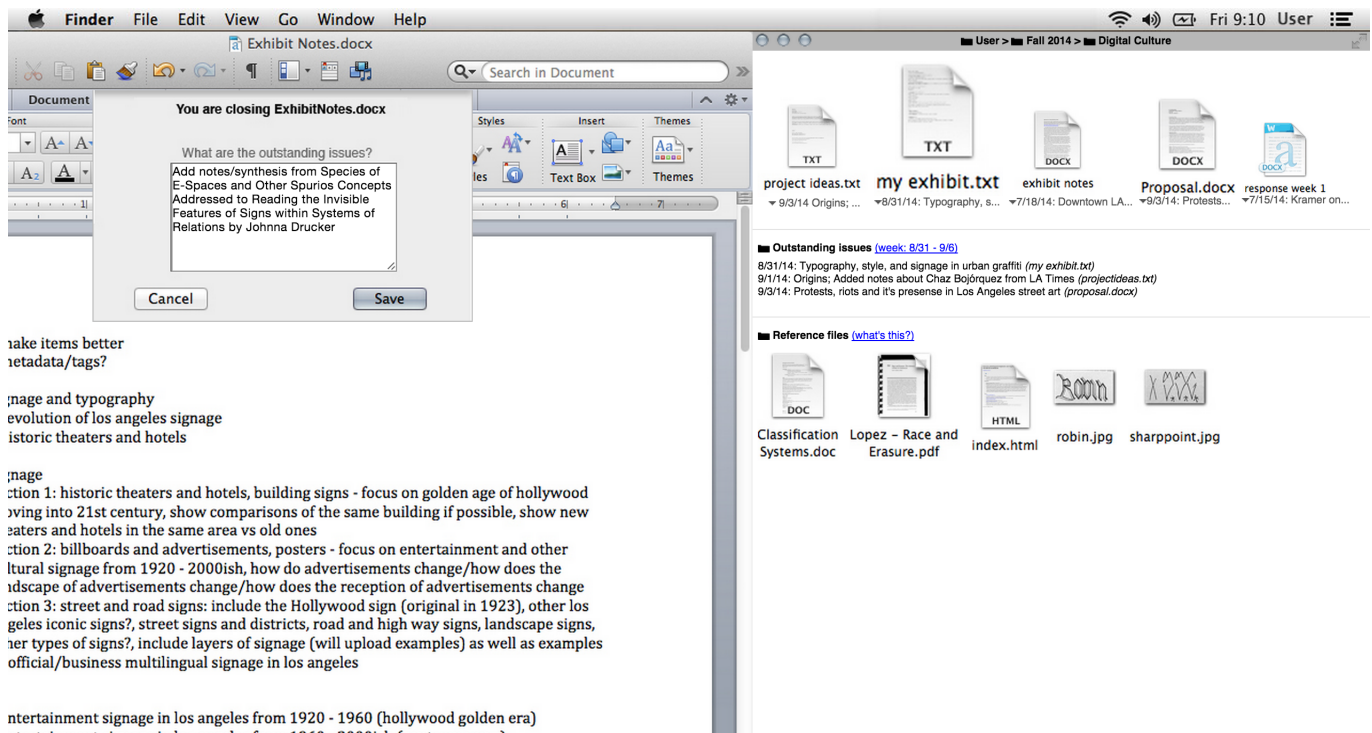


Fig 3. Dia.Log

Dia.Log

The last prototype directly solicits documentation input during project work. It prompts the user to write a short note describing outstanding issues when a file is closed, which is subsequently displayed the next time the file is opened. Users can view the archives generated by regular note taking for one or many files, and can opt to organize them as complete collections, or search for documentation created before, during, or after a span of time.

This prototype also augments project folders by making documentation for reuse more apparent. This view displays a list of assets that are

stored elsewhere in the file system, but frequently accessed while the user is working on files within the current folder.

The design, implementation, and assessment of these prototypes adopt the methodological approach of technology probes [4] and user enactments [5]. They were developed as a catalyst for discussion about novel system design for supporting documentation practice as opposed to the viability of the design.

Eight participants (3 female and 5 male) with backgrounds in computer science, engineering, humanities, and design were recruited through personal contacts. The study took place in person and lasted approximately 30 minutes. Participants were asked to explore each environment while listening to a short description, and then move through interaction possibilities guided by scenarios. I conducted conversational interviews, which allowed me to answer questions informed by their verbal feedback and steer them towards thinking outside of existing technological conventions and constraints when possible. This provided varied feedback about the design in the context of the participant's own workflow and their speculations about possible user stories.

The nature of probative design as a methodology includes the risk of failure. This study revealed a disconnect between the goals of my design explorations and the scope the participants used to evaluate them. Much of the feedback was informed by conventional knowledge about digital problem solving and constrained by the evaluation of success based on commercial viability in the current market. There was an overwhelming preoccupation with suggestions for optimizing productivity, efficiency, and usability.

“Checking boxes is much easier for me than typing something in... [maybe if] I could use one word to describe it.”

“The thing with proposing any new habit [is] you have to instill the user with a sense of reward. And the reward here is not instantaneous; it's what you get the next day. It would not be easy to engrain.”

The results of this study also revealed that design that suggests the possibility of documentation but does not require direct engagement fails to facilitate meaningful insights about documentation activities in-action. Finally, this study suggested that designing for a complex system like the desktop was not an ideal approach for the scope of my project because it contained too many other issues that easily obscured my actual intentions.

5.

**Ideation
and concept
development**

5.1 Why are we obsessed with productivity?

In the 20th century, the principles of Fordism revolutionized mechanized assembly lines for mass production. Mediated by the standardization of technology, the division of labor in the manufacturing process broke down complex processes into single-function units executed one worker.

In the 1970s and 80s, the affordability of technology like personal computers changed business practices and replaced cognitive functions that previously required human agents. Companies were restructured as flexible systems of labor and technology to afford a new material culture and diversity of goods.

However, in the 21st century people are paid to think, not to make. Particularly in creative fields, productivity is less quantifiable because the output of time spent generating ideas, receiving feedback, and even failing is valuable, but often not tangible.

These days ubiquitous modern technology like smart phones have increased the time and space we have to get things done. The massive proliferation of commercial software and the “there’s an app for that” mentality has ushered in a category of tools for productivity, including information management, organization, and planning.

However, for many people productivity has moved beyond “cranking widgets” (reference) to maximize time and output to include personal development and quality of life. While things like family, friends, or interests may not be measurable, they are necessary for human happiness and self-awareness. But this change in dialogue about productivity has not carried through to the products we use and own; our productivity tools are not being designed to afford personal growth.

5.2 Why not reflection?

In the initial interview study, participants were asked how documentation informed reflection during their process. Despite this, only 2/8 mentioned reflection as an explicit part of their practice. Most not only treated reflection as implicit to process, but also discussed it implicitly.

In the following prototype study, the participants were not asked a specific question about reflection. Many saw utility in reflective design features but did not mention the benefit of reflection for those utilities.

These results made reflection hard to define within the scope of my research. Like the participants, I also ended up treating reflection implicitly: I designed for explicitly defined types of documentation actions in a way that suggested some kind of reflection could occur. The inclusion of reflection in my design was informed not by the intention of designing to help with reflective documentation, but instead by thinking that reflective documentation could work towards the goal of making documentation more visible and meaningful.

I felt that this was the missing link. Instead of focusing on productivity and utility, I wanted to go in the opposite direction and design explicitly for reflection. I decided to work through design approaches for treating reflection as inherently valuable in itself.

5.3 Lightweight design solutions

The concept of a lightweight design solution is informed by my previous research designing for the desktop environment. Designing for more complex system-level features proved to be too big in scale - it encompassed many other design issues tangential to the ones I was interested in investigating. Additionally, in the prototype pilot study the most successful features were the ones that had a direct interaction for a specific function at a discrete moment in time. I synthesized what worked and what didn't from my previous designs and created general guidelines for moving forward.

Lightweight design solutions should

- ① Be flexible and scalable in order to afford a range of users, requirements, and environments
- ② Provide instances of interaction where users can not only capture and access information, but contextualize and reframe it
- ③ Focus on qualitative value and open-ended use-case possibilities

5.4 Reflective interventions

Reflective interventions are simultaneously a reaction against productivity and a move toward explicit moments of reflection during practice. Most design approaches for reflection suggest behavior by providing information; reflective interventions work to explore more meaningful ways of engaging with reflection for reflection's sake.

Reflective interventions should

- ① Solicit active user engagement for input
- ② Represent the quality of information as opposed to the information itself
- ③ Focus on just-for-you subjective value, as opposed to being usable for a wide possibility of applications

6.

Final Design

6.1 Lightweight Interventions for Reflective Documentation

I chose two common productivity tools to design lightweight reflective interventions: task management and word processing. I broke down common capabilities and dimensions of these tools to use as a context for my design. My process was not focused on designing products but an approach for critiquing productivity and working through ways of incorporating reflection into digital tools.

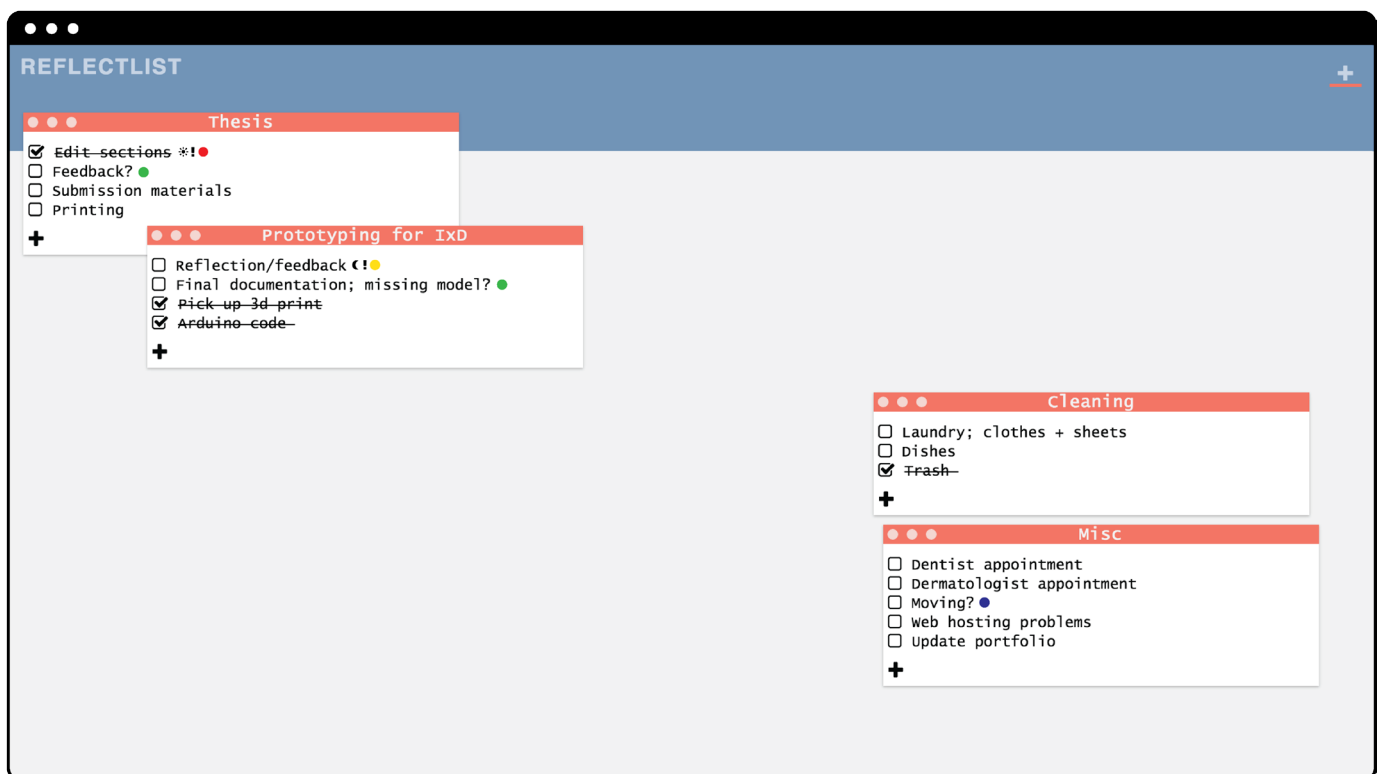


Fig 4. Reflectlist

Reflectlist

This prototype uses reflective interventions to disrupt the inherently reductive nature of lists, in order to create a feedback loop for thinking about tasks as human experiences. Task management systems and to do lists reduce our daily lives into procedural activities; these reflective interventions investigate ways to break that convention. Reflectlist captures user-subjective knowledge about how we feel about tasks, how we contextualize them, and how we plan for them.



Fig 5. A single task item

The reflective intervention is initiated at the smallest unit of a single list item. The interface for priority and time settings, common features in digital to-do lists, introduces a new codification for emotion.

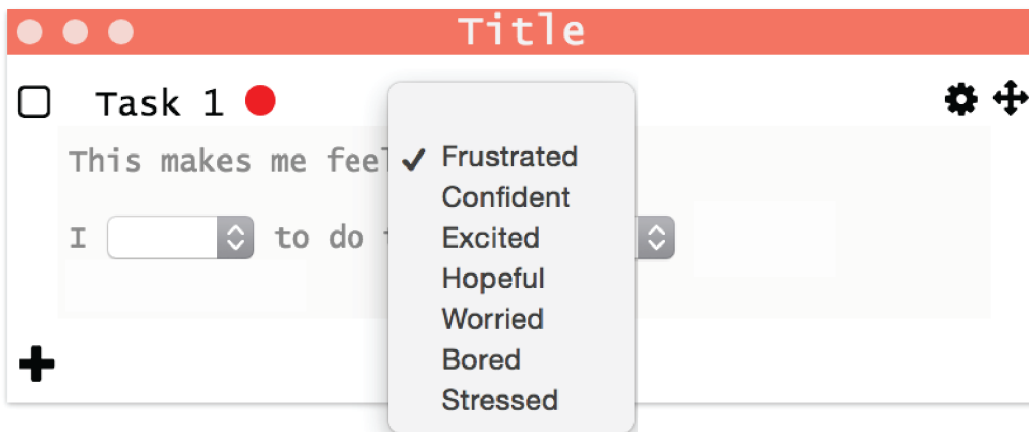


Fig 6. Affective annotation

Affective annotation is used to externalize and visualize the users feelings about individual task items. First, this breaks the pattern of list making by initiating a process of reflective thinking. Then, it represents the outcome of that reflection as a quality of the list item. Positioning this moment of reflection within the context of editing and displaying other settings guides thinking about well being within a productivity-oriented environment.



Fig 7. Need vs. Want

This prototype reimagines priority and time settings for moments of reflection as well. Priority is often represented as an abstraction like low, medium, and high. However, this precludes anything that is not explicitly captured within the task management system because it sets importance for tasks only relative to each other. Instead, Reflectlist has only two settings for priority: need or want. This breaks the closed environment of a digital tool and requires the user to evaluate their tasks as part an overall psychological and social cost of being (reference).

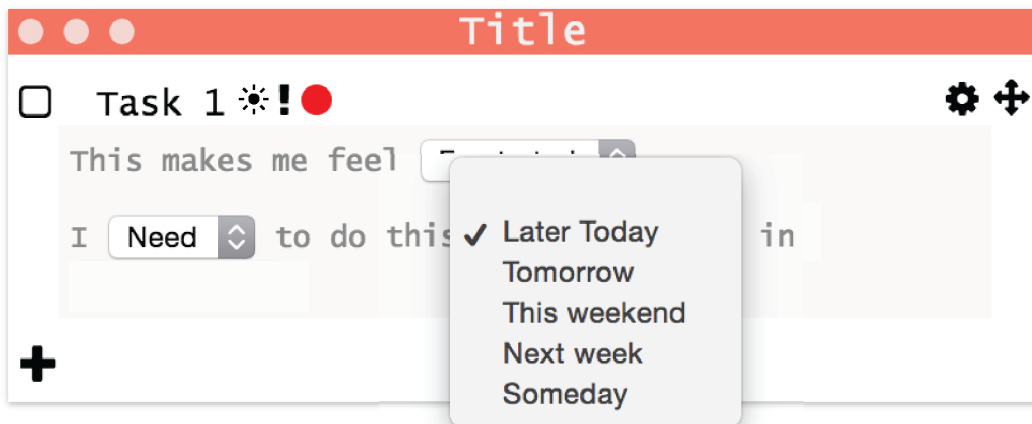


Fig 8. Open-ended time boundaries

Finally, it treats time as open-ended and imprecise. Instead of choosing a date for when something is due by, it allows the user to plan for when they might need or want to execute a task without setting restrictive boundaries that may not be compatible with knowledge not captured in the system.

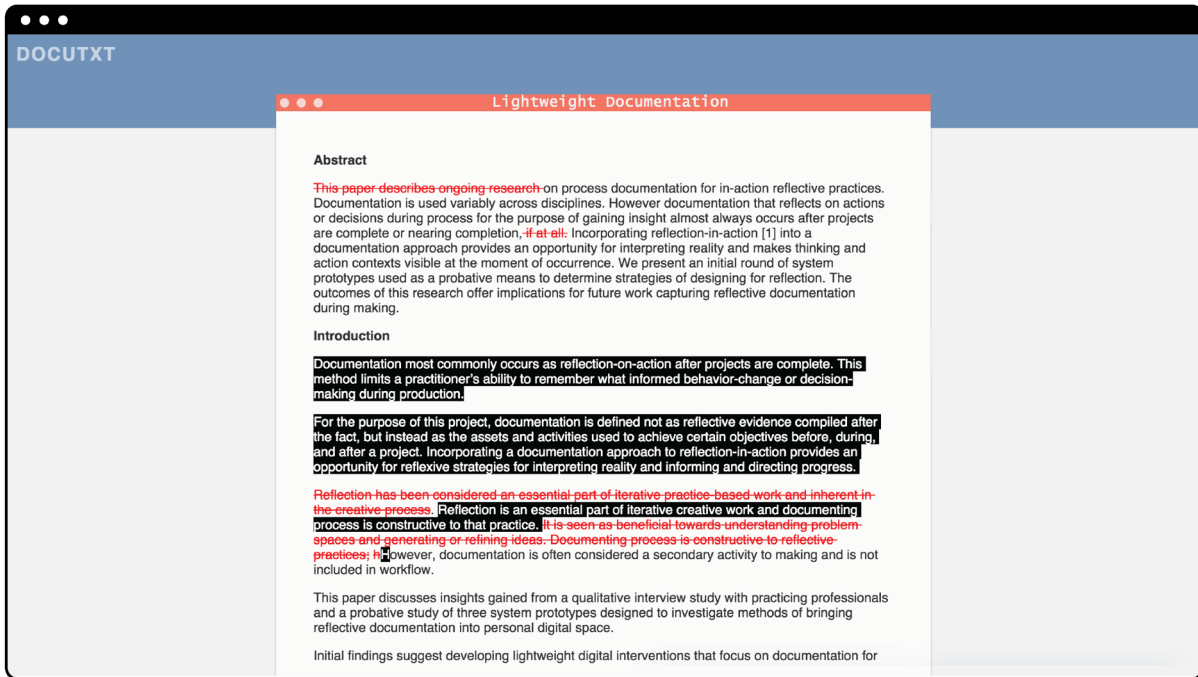


Fig 9. Temporal versioning

Docutxt

This prototype uses reflection as an approach to versioning and history, in order to capture how a user feels about a piece of writing as it changes over time. These interventions focus on the messiness that is inherent to the free form and unstructured nature of text-editors. This prototype creates a layer of affective information by representing the temporal nature and user-perception of “done-ness” in fine-grain text editing.

The first layer uses time-based visualizations of word-by-word deletions and insertions to reveal the nature of word processing in-action. Users can view the history of their process not only as changes over time, but as animations that capture the nature of a quick easy edit versus long painful revisions. This captures not only the messiness that occurs during in-line editing, but the emotional character of those edits.

Text
 Insertion
 Deletion

Fig 10. Insertions and deletions

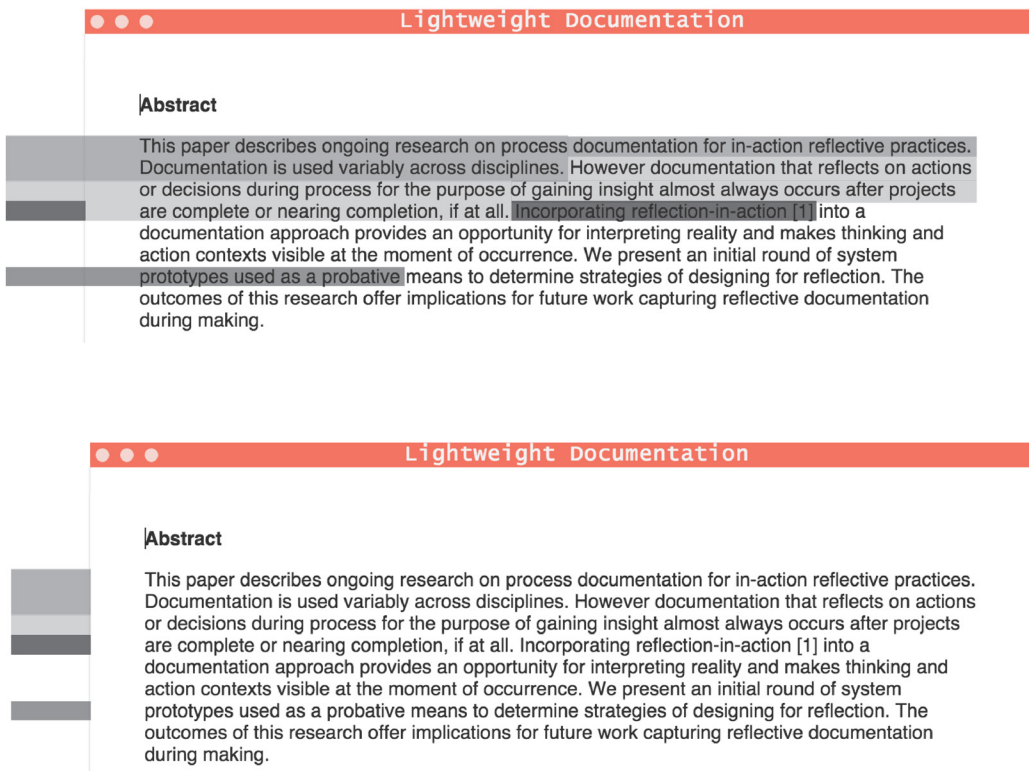


Fig 10. Done-ness

The second layer uses a method of non-verbal commenting to allow the user to embed their intuitive perception of done-ness as they move through an iterative editing process. It allows users to mark up their tacit knowledge about satisfaction of language. A selection of text is highlighted using a sliding scale of opacity from 0 (done) to 1 (not done) to represent different subjective opinions about doneness, which allows the user to capture feelings like “this paragraph is complete but not perfect”. This treats a body of text as a living document where being good enough to use or publish does not necessarily mark the end-life of future use.

7.

Reflection and Evaluation

I think my design process was successful. I worked on the exploratory and generative research phases as directed research with Aisling Kelliher. I concluded the generative research prototype pilot study and analysis at the beginning of my thesis year when I decided to continue investigating this space for my project. These first two stages are evident of my learning “just-in-time” research methods during my first year at Carnegie Mellon. They were very valuable to my process and learning experience, but I think this nontraditional timeline is perhaps why my project phases seem slightly non-linear.

I think my research-through-design activity with desktop environment prototypes was successful because it failed. Even though my study was based existing methodologies for testing future technologies, all of my participants had a difficult time responding to them within this framework which is evidence of something that went wrong. All of the data I gathered and analyzed was very low-level and concerned with design for improving usability and efficiency; something I did not find very interesting. Instead, a lot of my project is informed by looking between the lines of the data I gathered to see what wasn't said and why. These conclusions would benefit from additional testing, however I wanted to focus on moving forward on my final design.

Learning how to reframe and restructure the value proposition of my design was something I benefitted from as well. Shifting my focus from thinking about single products and almost-working prototypes to investigations for design guidelines was something I found challenging and enjoyable.

Despite the exploratory nature of the outcomes that informed my design, I learned a lot about myself as a designer. Having previously come from a more studio-based design background, learning to balance creativity and rigorous research methods for evidence and evaluation was an invaluable experience.

8.

Conclusion

Reflection is an essential part of iterative creative work and documenting process is constructive to that practice. Many practitioners consider documentation in the context of formalized procedures standard to some industries and corporations. However, documentation is both a process and an outcome that occurs in-action at different points and throughout the creative process. Documentation for process is made up of the physical and digital artifacts generated during stages through activities informed by goals. While reflection is inherent to process, its value is often seen as implicit.

Lightweight Interventions for Reflective Documentation is an approach for thinking about how to design for reflection within the current paradigm of digital tools for productivity.

9.

References

1. Claudia Giudici, Mara Krechevsky, and Carla Rinaldi. 2001. Making Learning Visible: Children as Individual and Group Learners. Reggio Children Editore, Italy.
2. Briet, Suzanne. What is Documentation? English Translation of the Classic French Text. 2006. Trans Ronald Day & Laurent Martinet. Lanham, MD: Scarecrow Pr.
3. John Zimmerman, Jodi Forlizzi, and Shelley Evenson. 2007. Research through design as a method for interaction design research in HCI. In Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '07). ACM, New York, NY, USA, 493-502.
4. Hilary Hutchinson, Wendy Mackay, Bo Westerlund, Benjamin B. Bederson, Allison Druin, Catherine Plaisant, Michel Beaudouin-Lafon, Stéphane Conversy, Helen Evans, Heiko Hansen, Nicolas Roussel, and Björn Eiderbäck. 2003. Technology probes: inspiring design for and with families. In Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '03). ACM, New York, NY, USA, 17-24.
5. William Odom, John Zimmerman, Scott Davidoff, Jodi Forlizzi, Anind K. Dey, and Min Kyung Lee. 2012. A fieldwork of the future with user enactments. In Proceedings of the Designing Interactive Systems Conference (DIS '12). ACM, New York, NY, USA, 338-347.
6. Allen, David. 2001. Getting Things Done: The Art of Stress-Free Productivity. Penguin Books.

