Research Document

Contents

Introduction

This document is a summary of the research made during the Graduation Internship at Drieam. There is one main question/goal **"How might we provide more tools to students to manage their evidence more easily?"** that gives rise to the other three research questions (with their sub questions) guiding the internship. Each of the research questions gets a chapter and their sub questions are subchapters on this document. It is not a report but serves as part of the Graduation assignment deliverables. There are more parts of the internship that naturally required a little research, however, they did not have big impact on the final outcome thus were excluded from this report.

Characteristics of a working portfolio software

In order to better understand the assignment, it is important to know what the portfolio software is and what features make it a useful tool for students and teachers alike. To better define the characteristics of a working portfolio software I performed several LIBRARY and FIELD research methods.

WHAT FUNCTIONALITIES HAVE OTHER E-PORTFOLIO PRODUCTS BUILT?

To answer this question a *Competitor Analysis* was performed. Some of the main competitors were already listed on the company's internal pages. I made use of that to start the analysis but also needed to add or update some of the data. This led to updating the internal pages with the findings, thus benefiting me and the company. The ***Competitor Analysis*** lists main competitors and the core features of their solutions, it is a separate document. By comparing the competitor products with Portflow I could identify some *Best Good and Bad Practices*.

Good	Bad
• Filter evidence (files) • Mobile friendly • Templating • Rubric Scales integration • Alumni access • Version history • Badges & recommendations • Visibility per evidence • Multilingual	• Steep learning curve • High complexity • Overwhelming amount of features • No archive or bin • Lack of control for student • Course and assignment dependent • Unfit for various study fields • Re-occuring costs due to form updates (customization costs) • Inaccessible after graduation

The figure above summarizes core features of the competitors as being well or not well received by users. Most of the products were inaccessible for me due to being paid and/or part of the LMS, thus next to the *Available product analysis,* online reviews and internal company *Document Analysis* came in handy. I received access to some of the requirement and feedback from Drieam's existing clients, which helped to better identify the approach of Dream. It became clear that the company does not rush to deliver what clients ask but tries to understand what is needed and why, to be able to serve best the institutions and their students' needs. Knowing why a feature is needed can help identify the best way to offer it.

Regarding the *Good and Bad Practices*, some of the good practices are already implemented one way or the other in Portflow. The Filtering and Rubric Scales are an ongoing process, to which I will have an input.

HOW IS THE AGGREGATED DATA MANAGED BY SIMILAR PORTFOLIO SOLUTIONS?

Data aggregation is the process of collecting large amounts of information and organizing it into a more consumable and comprehensive medium. In the context of the assignment, it is the Evidence page of the portfolio where students can manage all their study evidence. It is used to summarize information and should offer tools to manage it.

To gather inspiration on how best to design the Evidence dashboard I reviewed existing Portfolio products as well as any similar file management tools and applications. In other words, an *Available product analysis* was carried out to get a better understanding of core aggregated data management features such as filtering, sorting, easy overview and clear interface. These are the features that are lacking in the current Evidence page, and I will design and implement some of them. For this reason, a ***Design Document*** has been created where I gathered insights and comparisons of other similar products. In addition, the I talked to colleagues - experts about the potential solution. *The experts interview* insights proved to be very useful.

The *Available Product Analysis* and *Expert Interv*iews gave the following insights:

- File map can be used to show where the file is within the structure,
- Option to view by list, icons or info to add customization,
- Option to sort the contents by (size, name, date) within any view,
- Filtering by date, name, collection, type - needs to be available via search field or buttons,
- Very convenient to have a preview section for a faster file management,
- Hovering over the file should display its information or details could be shown in a designated area within the Evidence page,
- A simple table can be improved to offer more functionality and overview,
- A dashboard can offer useful insights and offer more features,
- Highlighting search and filter options is familiar and inviting to use the page,
- Clear filter button is a good reminder to the user that there are applied filters.

These are just some of the core insights that were also discussed with the UX designers and Product Owner (PO) within Drieam. It is important not too stray too far from PO's vision as well as use the expertise and knowledge of UX designer to learn and improve as the project progresses.

The key needs of the target audience in the context of Portfolio Evidence page

The target audience of Portflow is students and educators, however the Evidence page is only for the use of the student owning the portfolio. To better answer this question, I gathered information via the FIELD, WORKSHOP and SHOWROOM research methods.

WHAT ARE THE EXISTING CLIENT REQUIREMENTS FOR PORTFLOW EVIDENCE MANAGEMENT?

The company keeps track of the requirement received from clients at the different stages of collaboration, for example, initial expectations as well as later insights and feedback. Therefore, I received access to these files and did a *Document analysis* of such notes to see how Portflow has grown from a basic assignment submission section to an eportfolio with feedback requests, goals, templates and notifications.

Next to that I had an opportunity to talk to peers and colleagues at Fontys university to receive insights directly from students and teachers that have just started using Portflow in their semester. These insights were later shared and discussed with the development team and the product owner.

Lastly, the company already keeps track of user requirements for Portflow product, and I explored them.

All this has led to creating a separate document within the internship documentation called ***Requirements and Design process*** where I list out the core requirements of the evidence page. Green part represents features that are already implemented, the red is for those that still need to be developed. This document also holds all the potential addition features to be implemented as well as the design/sketching instructions to create various versions of the solution.

HOW COULD THE USER EXPERIENCE OF PORTFLOW EVIDENCE PAGE BE IMPROVED?

Using the list of requirements and potential features I created *Sketches* that later were turned into *Wireframes*. There were 7 versions made in iterations. First versions explored different approaches to the solution while others refined the previous versions. Each iteration experts were involved to give feedback and guide me. The inspiration was gathered by *Reviewing Existing Designs.* The wireframes were improved with each *Peer Review*, where I pitched the idea and the experts provided feedback (separate folder in Manage Section). Thus, with each iteration the design was refined until the stakeholders and I were satisfied.

The process could be explained with a double diamond model. I did two iterations over it. The image below illustrates it. More details can be found in the "**_Sketches_**" folder of the portfolio, the **_Design Document_** and the **_Project Report._**
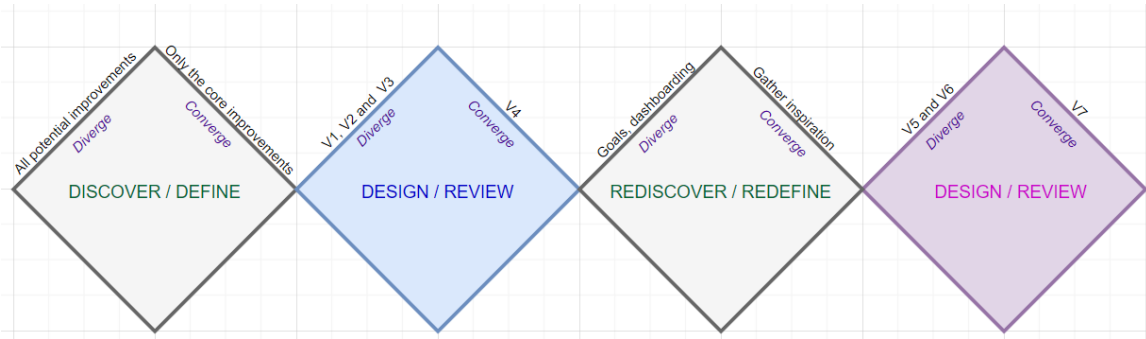

Figure 1. Double Diamond model of Design thinking representing iterations of improving the Evidence Page

The last pitch before moving into development was made in a form of a *Playback* (from IBM's Enterprise Design Thinking Toolkit), where the stakeholders were reminded about the process made and the iterative design development that has led to the solution at hand. This format made the story more compelling by providing context and presenting the latest solution. The Playback Pitch presentation (**_Evidence Section Improvements.pdf_**) is located in the Design folder of the portfolio.

Once the satisfactory version was created and agreed upon, I *Prioritized the Requirements* and began creating an epic with issues to systemically work on implementation. The Refinement process was completed with the help of the mentors. This way, the course of action was reviewed and agreed by both parties.

The best practices to technically implement the design

The company is using Ruby as a backend language, it is applied via the Ruby on Rails framework. Frontend is implemented via TypeScript using React. These choices have been made long before I joined the company and while it is useful to understand them better it is not in the scope of the assignment to challenge that. On the other hand, the application is designed, built and tested with the help of various modules, packages and libraries. In addition, there are various tools and applications used in the development process. Both of these are less difficult to change than the core languages. Thus, I looked into better tools and libraries using the LIBRARY, FIELD and WORKSHOP research methods.

WHAT OTHER LIBRARIES COULD SERVE THE SOLUTION?

During the course of the project the design library became the centre of attention. The company was aiming to improve accessibility of their applications and thus discussions whether upgrading the Ant Design component library would help with that or is it more work than benefit, came about. Thus, the team began to question whether we should stick with Ant Design or not as it will keep upgrading causing a lot of work and breaking old code each time. I decided to look into the alternatives for Ant Design library. The *Community Research* and *Literature Study* were used to gather the requirements on accessibility and set the right criteria to later apply the *Multi-Criteria Decision Making*. The full comparison can be found in the <u>Accessibility in web UI libraries document</u>.

Furthermore, every component added during the course of the assignment had to have at least one unit test written, for this the Jest framework was used. Regarding end-to-end testing, Cypress was integrated into pipelines for automated E2E testing and ran every time the code is pushed to main branch. I only had input on the unit tests but wanted to learn and understand the choices of these frameworks. The *Community Research* and *Literature Study* were helpful in reviewing the potential frameworks. Their advantages and disadvantages can be found in the <u>Frontend Testing Libraries</u> review document.

Lastly, the project was managed with the use of Zenhub integration to Github, however due to frequent downtime, the team began to question if this is still the right fit for us. Thus, I looked into Jira as the next potential project management and issue tracking tool and made a comparison between the two. The full comparison can be found in the <u>Project Management Tools</u> document. *Online Information, User Feedback and Community Reviews* were very useful in gathering the information and comparing the two tools.

In conclusion, changing the design library while the product is being used by thousands of users is more challenging than updating the version every year or so. As the research shows, AntD is a very good choice and migrating to a new one does not add enough value for the cost. The biggest cost being the developers' time. Similar conclusion applied to the Testing library choice. As the results proved the choices made were well researched and strategic, thus changing them at this stage is not beneficial. Perhaps as the product grows in size and

complexity there will be need for more testing coverage, but it is not the case at the moment. Lastly, the project management tool of choice – Zenhub, is sufficient for the needs at the moment, but I advise the company to migrate to Jira within the next few years. Rapid growth and development would benefit from more detailed reporting, wider integration possibilities and more stable issue tracking software. However, the migration needs to be planned as Jira has a higher entry threshold.

HOW TO QUICKLY FETCH THE AGGREGATED DATA?

This question was planned as a part of dashboard implementation, however, the priorities have shifted during the course of the internship. I, together with the mentor and tutor, agreed to focus more on the table implementation and leave the dashboard as a recommendation for future development. User testing for the entire design solution, including the dashboard part, were arranged to validate the decisions and improve the recommendations. They can be found in the main Internship Project Report document.

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