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THE OPEN ACADEMIC ENVIRONMENT
A NEW VISUAL IDENTITY

UNIVERSIDADE Ð
COIMBRA

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THE OPEN ACADEMIC ENVIRONMENT: A NEW VISUAL IDENTITY

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ABSTRACT

Designers and developers have a difficult path to tread when it comes to creating interfaces. Considering that an interface is a necessary tool that allows the user to interact with a system, meeting users' needs and anticipating expectations is crucial for a positive result. In today's world, where online communities flourish, open source projects are favored and the demand for innovation within the technology field has never been higher, the user has become critical of the resulting design artifact.

As such, this report aims to analyze and provide solutions for the redesign of the Open Academic Environment (OAE), a platform maintained by the Apereo Foundation, with the aim of supporting educational institutions worldwide – through sharing and collaboration between users.

Given the somewhat aged image of the OAE, a careful study of the present problems was carried out, both on the website and on the platform. The proposal will include a careful approach to improving the interface. The main objectives will be to redefine redundant or obsolete features and attract the project's target audience, in order to gather volunteers who want to contribute to the open source project. A questionnaire was prepared to understand structural and visual issues of the platform, keeping in line with European data protection legislation.

The project is based on the flexible use of Google's Material Design guidelines, in order to create a more modern and accessible design, with visual aesthetics pleasing to the user.

Keywords: *open source, branding, community, redesign, user interface.*

RESUMO

Designers e developers têm um caminho difícil de percorrer no que refere à criação de interfaces. Considerando que uma interface é uma ferramenta necessária que permite ao utilizador interagir com um sistema, atender às necessidades dos utilizadores e antecipar expectativas é crucial para um resultado positivo. No mundo de hoje, onde as comunidades online florescem, projetos de código aberto são favorecidos e a demanda por inovação dentro da área tecnológica nunca foi tão alta, e o utilizador tornou-se crítico em relação ao artefato de design resultante.

Como tal, esta investigação tem como objectivo analisar e fornecer soluções para o redesign do Open Academic Environment (OAE), uma plataforma mantida pela Fundação Apereo, com o objectivo de apoiar instituições de ensino em todo o mundo através de partilha e colaboração entre utilizadores.

Dada a imagem algo envelhecida do OAE, foi efectuado um estudo cuidadoso das problemáticas presentes, tanto no site como na plataforma. A proposta incluirá uma abordagem cuidadosa para melhorar a interface. Os principais objectivos serão redefinir features redundantes ou obsoletas e atrair o público-alvo do projeto, de forma a reunir voluntários que queiram contribuir para o projeto de código aberto. Foi elaborado um questionário com o fim de entender problemas estruturais e visuais da plataforma, que cumpre com a lei Europeia de protecção de dados.

O projecto tem como base a utilização flexível das guidelines de Material Design da Google, com o intuito de criar um design mais moderno e acessível dentro de uma estética visual agradável para o utilizador.

Palavras-chave: *código aberto, identidade, communidade, redesign, interface de utilizador.*

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ATTACHMENTS

A   Entire Q&A to assess project constraints.

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GLOSSARY

Blueprint – The act of blueprinting or a service blueprint, is a type of diagram used in Service Design activities to visualize relationships between service components (Gibbons, 2017). These are often instrumental in management as a two part approach to customer journey maps, corresponding to a specific user goal or touchpoint (Lawrence et al, 2018).

Content Management System – Software that handles basic infrastructure to help users create and manage content on a document, website or platform (What Is A Content Management System (CMS)?, 2019). Abbreviated to CMS.

Design Thinking – "Outside of the box" thinking. When Designers attempt to develop a solution by using new ways of thinking that do not abide to more common problem-solving methods (Interactive Design Foundation, January 14, 2019).

Document Object Model – Object-oriented representation of the programming interface for HTML and XML. Scripting languages, such as Javascript, can be used to modify and manipulate web pages (MDN Web Docs, January 26 2020).

Flat Design – A minimalistic aesthetic approach to design, created by Apple, with strong roots in the International Style of Design, otherwise known as Swiss Design. The guiding principles sought by this system were based on order through clarity, establishing a universally understood visual language that removed futile ornamentation and emphasized function (Moran, 2015). Flat Design is also known to heavily use grids to generate a hierarchy of information. It rejects elements such as gradients, textures and drop shadows – 3D components of skeuomorphism – and replaces them with simpler alternatives (Tubik Studio, 2017).

Framework – Software that has been developed and intends to serve as support or a guide that provides a specific functionality. The intention of a framework is to help the programmer avoid having to reinvent the wheel (Christensson, 2013).

Frontend - The graphical interface that a user can see and interact with. This part of an application communicates with the functions that run in the background, making use of languages such as Javascript or Popular-General-Purpose (abbreviated to PHP) to manipulate certains components in the interface (Lindley, 2019).

Human-Computer Interaction - Multidisciplinary field of study of applied cognitive science and engineering design that focuses on the interaction between humans (users) and computers in order to produce functional systems with good usability (Carroll, n.d.and University of Birmingham, 2011).

Interaction Design – The design of behaviour for a service or device through refinement and responsiveness, within the appropriate context for interaction. In this field, the designer scrutinizes the user's needs to shape and improve the experience. The term interaction design can be used interchangeably with user experience design (Interaction Design Foundation, n.d. a). Abbreviated to IxD.

Interface – An interface is the access point upon which a system defines interaction with the user and outside world. There are three interface formats: Graphical user interfaces (GUI's), Voice-controlled interfaces (VUI's) and Gesture-based interfaces (Oracle, n.d.).

Journey Map – Commonly represented as a timeline visualization of an individual's relationship with a product/brand, the journey map contains a series of strategic channels that detail interactions and experiences. This approach acts as a helper for the designer to understand the product from a user's point of view (Gibbons, 2018).

Layout – Interface elements that bring together a concept into a successful visual system to communicate a message or context. The visual language and identity are organized in such a way that defines the structure of the user interface (Android Developers, 2020).

Learning Management System – Software application used by educational institutions and corporations alike to aid and track online training initiatives. It differs from the aforementioned CMS in that its purpose is to operate mainly on administration level (Pappas, 2020). Abbreviated to LMS.

Material Design – Visual language created by Google in 2014 that incorporates the principles of good design, reflecting the innovation of technology and science to create a harmonious design system across platforms and devices. While Material Design acts as a metaphor for the physical world, it was designed to enable brand expression by allowing a flexible foundation guided by print design methods – such as grids, typography, colour and space (Google, n.d.). Abbreviated to MD.

Mockup or Prototype – Scale model of a device, graphic artefact or system used for demonstrating a prototype. The usage of a mockup enables testing at least part of the functionality of a design. The term mockup and prototype are interchangeable ((Nielsen Norman Group, n.d.).

Persona – A fictional character created during the user-centered design research process to represent different user types. An approach aided by personas will allow for a better understanding of the needs, experiences and goals of the target user group, as the personas are created with real data (Dam &

Responsive Design – An approach related to web design and programming that renders web pages to scale accordingly on a variety of different sized devices (MDN Web Docs, July 3 2020).

Service Design – Process or activity of planning sustainable solutions when organizing a business' resources in order to achieve optimal experiences for customers and service providers. Service blueprints are often used to map Service Design (Interaction Design Foundation, 2020a).

Touchpoints - In design thinking, a touchpoint is part of the customer's journey and can be both physical or digital. As such, a touchpoint can be determined as the defining steps of interaction with a product which change the customer's feelings towards it (Interaction Design Foundation, 2020b).

User Interface Design - The development of an interface for desktop applications, websites or computerized devices. A designer will focus on visual appearance and functionality, while assembling the interface according to a set of style and human-computer interaction guidelines that are accessible and appealing for the end-user. Toolkits are often used to aid prototyping. Abbreviated to UI.

User Experience Design - The field of user experience covers a wide range of topics that help meet the needs of the customer - such as, research, accessibility and wireframing. Although the term is used in relation to the design process of web and software applications, it can involve an array of services and products (Interactive Design Foundation, 2019). Abbreviated to UX.

Wireframe - Also known as page schematic or screen blueprint, a wireframe is an essential approach to user interface design, used early in development to lay out content and functionality by representing the skeletal framework of a website. After establishing the basic structure of a page, the designers add visual elements and content to the interface prototype (Rees, n.d.).

[01]
Introduction

[1] INTRODUCTION

Since the breakthrough of computer technology in the mid–1960's, the digital world has suffered such deep mutations that, from the 80's onwards, a single decade in the history of humanity has brought outstanding achievements in a wide range of areas – science, arts, literature, etc – all of which share the same base influencer. Associated to this revolutionary growth is the creation of interfaces, in the context of design (Moggridge, 2007). As technology settles comfortably as part of our daily routine, the impact on the end–user's perspective over what constitutes a usable computing artefact is a primary concern for developers and designers alike. Now, where function and function coexist, the expectations are higher than ever.

In today's world, the user may also be the creator or the developer, relying on a community effort to maintain software meant for open–source collaboration. Knowledge and experience have become key factors in the average user's education, as the World Wide Web allows for an extensive search of any topic, at any time, anywhere.

It is this newfound perception for users of how things should work that designers and developers must take into account. While most systems will be used by a wide variety of users, who employ different levels of skill and experience, it is crucial to abide by good design practices that reflect a balance between utility and visual consistency (Cox, Walker, 1993: 9-12). Users are, on average, better informed and familiar with interfaces now than 30 years ago. Thus, in order to achieve a positive result that a) helps companies understand their target audience, and b) provide a sensible and user-focused interface that meets the needs of those meant to use it, it is necessary for teams to focus on defining goals by exploring the problem.

1.1 Motivation

As a firm supporter of open source and its many benefits in a wide range of sectors, my choice of internship was precisely to be able to collaborate in a community-driven project that is both challenging and a valuable asset in the educational field. In fact, as a member of a large community that engages with its members frequently, I am used to these initiatives and often contribute to projects that range from documentation to graphic design. Community engagement is also a fundamental trait which I enjoy, as it allows for breaking barriers and knowing interesting people who would otherwise be unreachable.

According to Jenny Preece (Preece, 2000: 8-14), communities gather around a mutual purpose. For a community to thrive, it must be able to draw people in and engage them to participate so they keep coming back. Without people, a community has no meaning. Despite being obvious, it's a curious concept: how can a community thrive if it has trouble gathering volunteers?

Being remote, the internship also gives me the opportunity to choose my own work method, which I will talk about in greater depth in Chapter 3. When it comes to the OAE, I was very much drawn to the premise of open source, and being able to promote a useful platform so to gain more visibility seems a worthy goal to pursue. As a student, there is also a sense of familiarity and empathy towards my peers. It made most sense to choose this internship given my background in Design and Web Development. It also gives me the chance to explore several branches of design related to frontend development, such as service design, user interface, interaction and experience design. In fact, it's impossible to complete the internship without having a strong grasp of the above mentioned, as this project is meant to cover a lot of ground. Additionally, any promotional material regarding the OAE requires a redesign of the platform and its image in order to be successful.

1.2 Frame of Reference

The core foundation for this research cannot be simply defined in terms of belonging to a single framework. For the internship to be successful, it is necessary to go through several branches of design until the end process of implementation and testing. These include methods of Service Design, User Interface Design, Interaction/Experience Design for the Web and Frontend Development. While it is vital to establish the more suitable approach for the project, this will be an iterative process, which renders all paths interchangeable.

An overview of Service Design states that its purpose is to help solve problems organizations face regarding user experiences, making services more useful and efficient for clients. Combined with the guidelines for good interface design and an application of design for interaction, this eases the process of development and implementation for the web. This is a helpful method that helps to make sure a) the needs of the OAE users are met and b) that Apereo benefits from the redesign of one of its most valuable services. In short, a multi-disciplinary approach is effective and works due to its user-centric mindset, allowing for a pragmatic view that strikes the balance between community and business.

1.3 Context and Goals

A new era of fast technological growth dictates that designers must learn to keep up with the changes in society, so as to be able to understand how perception of computational artefacts has changed, and what those changes mean in a wide context. Coincidentally, Ellen Lupton cites Jacques Derrida's theory of deconstruction as an example of critical thinking across a range of practices (Lupton, Miller, 1999: 3), while Bill Moggridge further confirms this by establishing a continuous line of learning in user interaction, from the earliest days of computers to the plethora of devices and systems we now use (Moggridge, 2007: 9-14).

By establishing this parallel between the deconstruction of an artefact and the symbology behind a timeline, we can determine how a beginning affects the end. It within this context that the research expands, so that there is a bridge of understanding between user expectations and the purpose of the OAE as a platform in the educational field, focusing on a worldwide scale collaboration. The internship itself has a number of goals with different levels of priority:

Redesign the OAE: The first goal is to attempt at a redesign for the image of OAE, followed by the platform and website. Its image has aged and no longer holds appeal to the mass of users who, nowadays, are much more demanding of function and aesthetic than 10 years ago.

The redesign is the result of a detailed study of the target audience and the context of the platform. It is the first phase and will dictate the outcome of the remaining goals. It should be noted that the redesign includes a re-evaluation of features, in order to compete/stand out from other similar platforms.

Marketing Strategy: Right now, the OAE's marketing tactics are weak, an issue that hinders its promotion. Thus, it becomes difficult to appeal to the project's target audience, gather more momentum and volunteers that might want to contribute for the open source code.

The project's stakeholders from Apereo Foundation are heavily included in the redesign, being responsible for providing feedback on the decisions taken.

Main Goals
> 1. Identity Redesign
> 2. Image
> 3. Platform
> 4. Website
> 5. Implementation

> **Secondary Goals (extras)**
> Documentation
> Style Guide Manual

The task priority for the second semester is scheduled in order to accomodate the needs of the internship and a likely presentation of the renewed OAE in a conference during June 2019. The conference will display an assortment of materials created for the OAE redesign.

Further details regarding the Open Apereo Conference are reviewed in section **5.6 Conference Intervention**.

The secondary goals are extras that complement the internship but are not officially part of the evaluation in case they are not completed.

It is imperative to focus on a functional prototype of the platform (firstly) and website (secondly), but neither can be achieved without a clear notion of what the redesign will be.

Task Priority
1. Image
2. Platform
3. Website

1.4 Document Structure

The present dissertation has been split into 10 chapters, each pertaining to a different research or implementation phase.

The first chapter – **Introduction** – concerns the theme of the document, preceded by a personal statement about the internship and the reasons that led to its choice. Then follows a description regarding the context of the dissertation, and the topics that will be approached in the following sections. The introduction touches upon the several areas of insight necessary to complete the internship, concluding with a short reference on the OAE and the goals agreed upon.

The second chapter – **State of the Art** – is, in broad terms, a descriptive section that addresses the background of multidisciplinary design, how internet communities influenced open source, dynamic web languages and an analysis of important case studies. In greater detail, the first subsection is a brief explanation about Design as a subject with a myriad of branches, focusing on design for interfaces and how Service Design differentiates from other design processes. The second subsection is an investigation about digital communities and their intervention in open source projects, with a nod to the significance of the end-user as the one who one will use the software. The third subsection is a case by case study of several platforms that, as direct competition or a good example in terms of features, are important to use as comparison with the OAE. Finally, the fourth subsection concludes the State of the Art and provides a short reflection on the topics addressed.

The third chapter – **Intervention Scope** – introduces the internship proposal in detail by explaining the context of the OAE in depth, its mission and values within the educational field. The following subsections further clarify the goals of the internship by focusing on scope, which is defined by the restrictions and methodology applied.

The fourth chapter – **Intervention Proposal** – is a deeply design-oriented section that addresses the analysis of both the website and platform of the OAE, focusing on finding solutions for problems (painpoints) related to layout and features. It also examines the survey results, aided by Use Cases featuring personas and journey maps.

The fifth chapter – **Redesign Proposal** – focuses on the development of the proposal found in the previous chapter, giving special emphasis to a pre-implementation phase. In accordance to Service Design principles, prototyping is also covered in this section. Then, within the proposal subsection, a deconstruction of the design artefacts found and suggestions for their improvement. This chapter also makes an in depth analysis of the new design for the website and platform. It focuses on good practices for web patterns and how to properly structure guidelines for a wiki manual.

The sixth chapter – **Implementation** – addresses an in-depth analysis of the development process for the new OAE – website and platform. Here, the main focus is on the testing of modular frameworks and possible conflicts that may arise.

The seventh chapter – **Conclusion** – is a reflection of the internship. displays a summary of the results achieved and if the internship goals were fulfilled. Any changes in the research will also be referenced in this section. This section also creates a bridge between what went wrong and the hardest moments, alluding to possible mistakes and oversights in both the research and the implementation.

The eighth chapter – **Bibliographical References** – is a compilation of every reference used for the dissertation. The citation method adopted was based after the APA v6 – American Psychology Association.

The nineth and last chapter – **Attachments** – includes all the references that complement this dissertation but could not be included in the original document.

[02]
State of the Art

[02] STATE OF THE ART

2.1 User Interfaces

The 21st century has seen a rising increase in communication ranging from all platforms, where users come in various shapes and sizes. The dimension of this human diversity includes cognitive and perceptual differences, as well as age, gender, capability, culture, experiences and personality (Schneiderman, 1998). When closely interrelated with software or Web pages, some of these characteristics may influence reactions to user interfaces. This is where qualities from usability to sociability come into play: to put it simply, as users, we expect systems to be useful and adapted to our needs. However, according to Bill Moggridge, many systems suffer from not helping people do what they want or even need in a way that fits the way they work.

Mitch Kapor, creator of the spreadsheet Lotus 1-2-3 and one of the pioneers at utilitarian design, introduced this problematic with his "Software Design Manifesto" in 1990, by reminding developers to first think about designing things so they're right for people (Moggridge, 2007, p. 13) by ensuring their needs are covered. In his "proposal", Kapor alludes to how vital it is for developers to take these issues into consideration rather than jump head first to build prototypes, as computer technology has become part of everyday life. In the words of Kevin Cox and David Walker, an interface is nothing other than a tool, and people will always want to use a tool in different ways, which makes it all the more important to make "tools" flexible. The evolution of technology since the early 90's was a key factor in deep social changes that affected the best of three generations. Nowadays, users interact with interfaces and experience them as artefacts of routine, which in turn makes them far more critical of a "tool" than 30 years ago.

"Engineers start with technology and look for a use for it; business people start with a business proposition and then look for the technology and the people. Designers start with people, coming towards a solution from the point of view of people."

Ellen Lupton, Beautiful Users

What is an interface?

An interface is nothing more than a tool and a means to an end. As a tool that is supposed to be "flexible", it constitutes people's perception of it. A good tool does what it is expected to do, on the basis of what the user knows about it (Cox & Walker, 1993, pp. 3-7). If not, then it is not suitable and its core features or design should be rethought.

There are different types of systems adapted to their function. There is also a variety of users who can be broadly defined as novices, casual users or regular users, the latter being more knowledgeable about systems.Thus, they feel more comfortable with an interface and will have less trouble finding their way around it. A user's motivation to learn differs, for every individual has a unique interaction style that affects their experience (Tidwell, 2011, p. 6).

2.1.1 Principles of Interface Design

According to Bill Scott and Theresa Neil (2009, pp. 3-30), a designer should follow a set of principles that will help them build an interface. These are:

Make it direct - there should be context for a task. A user will become frustrated and lose interest if they have to skip pages in order to perform a meaningful task. As Alan Cooper says: "if there is output, there should be input".

Keep it Lightweight: Reduce the effort to interact.

Stay On Page: By using patterns, dynamic content and overlays, make the user stay on page in order to interact.

Provide Invitations: Help visitors discover site features by giving small clues or tours of the content.

Use Transitions: Make the experience more engaging.

React Immediately: Lively responses will engage the user. Users want the application to react immediately to their every action.

Section **2.3 Case Studies** will analyse a few websites and platforms that use these same concepts to engage their audience. These approaches are considered good practices in creating an interface by making it predictable and familiar, as users will find it more intuitive. In turn, this helps with task completion, efficiency and satisfaction. Furthermore, a combination of a simple interface, consistent UI elements, a purposeful layout, using typography, colour and texture to create a strategic hierarchy and planning ahead, are also appropriate guidelines for an interface (James Garrett, 2011, pp. 30-79).

A good visual for an interface requires notions of graphic design and image editing. The first thing a user notices is the visual of the website, and in the context of instant gratification makes a quick judgement of the aesthetic - whether pleasant or not. Beyond that, constructing a hierarchical structure that takes into account the characteristics of the page and its various elements, guides the user into reading through context. A page layout should help users identify content that interests them, as users engage in selective reading. As such, if the information available is not relevant or if it's difficult to find, then users might abandon the website (Gonçalves, Campos & Fonseca, 2017, pp. 311-313).

When it comes to designing for desktop and mobile devices, it is important to observe the fundamental differences among screen sizes. The most common browser resolution is still desktop based, while mobile devices require another approach. However, we do know that more users access the internet with their phones and tablets. This data strengthens the notion that preparing a responsive layout will influence the flux of users, thus contributing for the success of a redesign.

According to Gonçalves et al (2017 pp. 311–315), there should be a balance between aesthetic, function and usability. A minimalistic design is a good principle for a medium such as a Web page, due to its dynamic condition - unlike a magazine, the user has to interact with the page successfully. Given the plethora of devices and configurations available for the users, it's not possible to know the resulting layout. Furthermore, a good design should adapt to functionality, instead of forcing users to browse an environment that is neither familiar or consistent with other visited websites. This is the reason that makes it important to follow Web standards, design, usability and accessibility conventions.

On the other hand, an engineer might be concerned with implementing the various functionalities the website should display, while dismissing aesthetics. This approach is not conducive to the success of a website. While designing a layout for the Web, there should be a compromise between the various intervenients during the design and development process. A coherent layout along several pages, with repeated graphic elements that are easy to identify, will provide advantages for the user to recognize their location (Gonçalves et al, 2017, p. 315).

How to structure a web page?

A coherent layout along several pages, with repeated graphic elements that are easy to identify, will provide advantages for the user to recognize their location (Gonçalves et al, 2017, p. 315).

There should be a concern with the utility of the elements displayed in a page. While unnecessary elements should be omitted, it is important to keep in mind that every additional button, image, sentence and line increase complexity. The concept of signal vs noise in signal processing is a ratio that describes how essential it is to remove as many superfluous elements as possible. Failing to do so, will result in the user to overlook useful features due to the noise.

Prominent elements on a page will help the users find what they are looking for by getting their immediate attention. As such, relevant features will be a starting point in visual search. An example of this would be the usage of headlines and headers. All visually different elements that make use of colour, spacing, lines and images are immediately notorious. However, it is imperative that accentuated elements are, without a doubt, relevant for the user. Otherwise, the user will be induced in error (Gonçalves et al, 2017, pp. 316-317).

While it is important to accentuate some elements, it should be noted that not all elements should stand out equally. There should be a clear visual hierarchy that immediately identifies which elements are positioned in relation to which, and those that are subordinate. Tidwell (2011, pp. 131-143) argues that visual hierarchies are present in all forms of design. The relative position of page elements and the relationships among them should be arranged on the page by being made to look important. Using font size, contrasting colours, characteristics that emphasize text to differentiate between quotations and body text gives meaning to the layout.

The visual flow of a page is intimately related to the established visual hierarchy, as the reader's eyes follow visual cues in a sequence of importance. These are called focal points, defined as spots that the eye follows, from the strongest to the weakest visual cue. A layout that flows well connects the page using a visual narrative for the user to follow.

It is convenient to approach this with implied lines that seem hardwired into our visual systems, such as applying the *Four Gestalt Principles*:

Proximity

Place elements close together, so that the viewers will associate them with one another. The basis for grouping content and controlling the UI takes shape from this principle.

Similarity

Elements that have the same shape, size or orientation will be associated together. These become peer items.

Continuity

Aligning small items in precision with each other creates a visual line (ex: bulleted lists, navigational menus, text fields in a form, row striped tables).

Closure

Using whitespace to set off small, grouped items makes them often appear closed. Simple forms, such as rectangles and blobs of whitespace are visually appealing to the viewer.

While important individually, when combined, these four principles create an effective design. Applying redundancy is helpful to assume relationships (Tidwell, 2011, pp. 132-138). Gonçalves et al (2017, pp. 169-170) say that the principle of repetition is as valuable as coherence. If a chosen element is repeated consistently throughout the interface, doing so avoids a scattered and neglected visual.

Figure 1 - The Four Gestalt Principles.

According to Gonçalves et al (2017, pp. 318–319), the modern definition of the expression "above the fold" applied to the Web is connected to these principles, in the sense that hierarchy takes a large part in the reading of a page. The user skims the page looking for information that interests them, so it is necessary to consider placing important content at the top of the page.

Colour

Colour will, above all, influence the user emotionally. Its primary role is to contribute to the aesthetic of the interface. An example of the benefits of using colour as an aid to the design of the interface is how it can be used to identify a brand: most associate blue to the IBM brand, recognize red as the primary colour of Coca Cola and the golden arcs from McDonald's (Gonçalves et al, 2017, pp. 177–178).

Conveying information through colour is a common approach for maps, or representing terrain elevation. As such, it can be inferred that colour is used to highlight information in order to draw attention. Another possible scenario is the use of selective colour to contextually demonstrate the priority of an element in comparison to others around it. When defining a colour scheme, one must ensure consistency throughout the interface (Gonçalves et al, 2017, pp. 177–179). A limited palette of four colours is reasonable to avoid compromising the user's comprehension of the interface.

Furthermore, colour can also be an indicative of state. A phone can turn red when it's charging and then turn green when the process is finished. When using contrast to choose a consistent colour scheme, the designer should ensure that there is enough contrast to make the interface elements recognizable and keep it legible - as low contrast colours make this challenging (Gonçalves et al, 2017, pp. 177–180).

This also applies to the choice of colour for text, as numerous studies show there must be enough contrast with the background for the text to be legible. The option that maximizes legibility through contrast is having black text over a white background. However, while the opposite also has the same level of contrast - white text over a black background - it is less legible and so the first option is preferable. When it comes to accessibility, a dark theme with a variant of the second option is less straining for the eyes - particularly after a certain age or when the eye becomes too sensitive to bright colours (Gonçalves et al, 2017, pp. 180-183).

When creating a colour scheme for the interface, the designer should plan for a variety of appropriate palettes that avoid combinations which can cause problems to users with colour blindness. As such, the designer must prepare accessible schemes that help deal with congenital eye diseases where the perception is affected (Gonçalves et al, 2017, pp. 181-182).
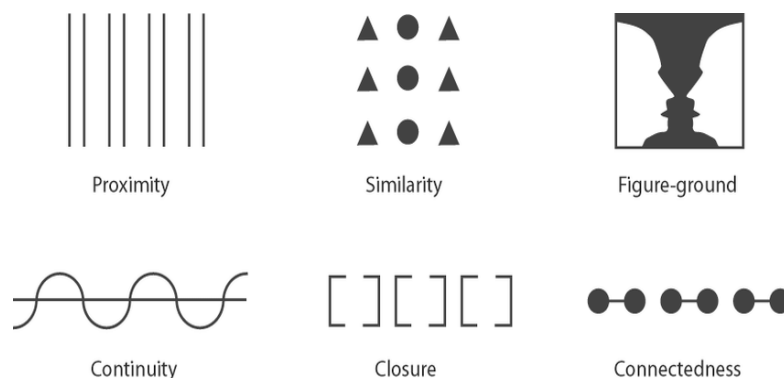

Figure 2 - The Wheel of Colours.

According to Gonçalves et al (2017, pp. 318-319), the modern definition of the expression "above the fold" applied to the Web is connected to these principles, in the sense that hierarchy takes a large part in the reading of a page. The user skims the page looking for information that interests them, so it is necessary to consider placing important content at the top of the page.

Typography

Gonçalves et al (2017 pp. 182-185) say that one of the most important rules in design for web interfaces is that types with serif should be avoided - and remain on print. Legibility issues that come from the technical limitations of present day screens make serif types too thin due to a 72 dpi resolution. For text on screen to be legible it should be around 12p. However, the choice of the type itself is also an important factor to keep in mind.
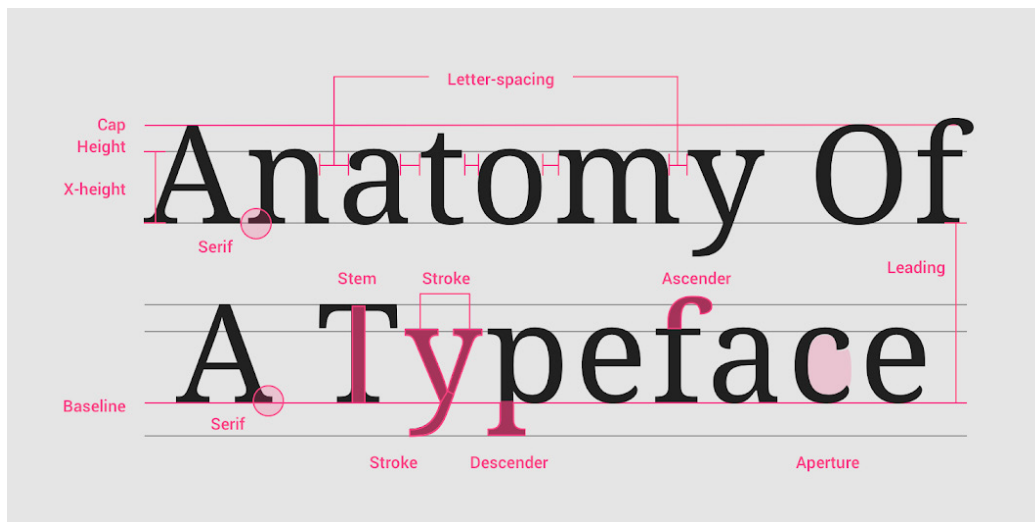
Figure 3 - Anatomy of a Typeface

When dealing with a body of text, Gonçalves et al further argue that the spacing between sentences should be at least 30% of the height of the chosen type. Otherwise sentences will be too

close together and start mixing, causing further issues with characters like <j/q/p> due to extending below the line. Spacing text above 50% is far too much, while anything above 100% makes the viewer lose the sense that they're looking at a block of text. Spacing between characters should also be adjusted, if necessary.

For western countries, text should be read horizontally, from left to right.

2.1.2 *User and Data Analysis*

Studying users is a beneficial approach that allows a more insightful understanding of the public that will use a certain system. The developer will not be the main user of the system, and as such there are some concepts or functionalities which might seem obvious but can be baffling to the common user. As a rule of thumb, developers should not assume that users are on equal grounds with them when it comes to understanding the system (Gonçalves et al, 2017, pp. 75-77).

A first step into analysing users is deciding who they might be. The range of potential users will be indicative of how the system should work and its limitations. There are several types of prototypes that define scenarios of interaction with users. As a concrete, albeit limited, representation of the system under development, prototypes can help schedule tasks to better understand users and their unique characteristics.

It should be noted that users start as beginners when first introduced to a system and, overtime, become advanced beginners. These are defined as focusing on completing their work quickly, using a system fortuitously. However, not all users become experts. In fact, most users remain advanced beginners, who are focused exclusively on finishing their task as quickly as possible – preferably with little to no complications (Gonçalves et al, 2017, pp. 78-87).

Interviews for Data Analysis

When taking advantage of techniques to gather data during the cycle of development of an interactive system, these are paramount during the evaluation and requirement analysis phases. It is important to define objectives prior to a session or interview with users, in order to identify a list of stable requirements.

The four types of interviews with users are: non structured, structured, semi structured and in group. The first three are characterized between themselves by the control that the interviewer imposes during the conversation, followed by a set of predefined questions. The fourth involves a small group of users coordinated by a facilitator (Gonçalves et al, 2017, pp. 223-227).

Similarly to interviews, surveys are also a technique often used to gather data and opinions from users. Both models can include open and close ended questions. The questions from a survey are similar to those of a structured interview.

Surveys are most useful for large and scattered groups of people. It is enough to print the surveys and distribute them, or place them online. Given the advantage of being quicker than interviews, surveys allow to reach a higher number of potential users, which makes the data gathered more reliable to analyse statistically. Since the questions from a survey or interview can easily be conceived to influence the replies of users, it is necessary to define a structure that avoids these traps. The first section should be about demographic information, such as gender, age and other data important for the study. Following these, the questions should be generic and then specific. If the number of questions is long, then they should be grouped (Gonçalves et al, 2017, 228-232).

There are several types of questions: multiple choice, rating scale, ranking, open ended, Likert scale, among others. A set of questions should be consistent and avoid ambiguity. Likert Scale

questions involve a numeric scale (usually from 1 to 5) or a narrative scale such as Yes/No/I don't know to assess the level of favorability towards the context of the question itself. The usage of a value range of over 5 is advised when the interviewer requires the questions to be answered with more precision.

2.2 Communities in the Digital Medium

This section will provide clarification on the reasons that make it so important to look at online communities, how they came to be and their role in approaching software development. For the past two decades, the Internet has changed the way society communicates and interacts. Perhaps it is the exchange of ideas, collaboration or social synergy that makes these communities so appealing to the modern user, but to understand the complexity of what they involve requires study into social and technical issues.

2.2.1 Open Source Software

"The rampant creativity that leads to innovation in both science and software comes at a cost. Maintaining control of an active Open Source project can be difficult."

Open Sources: Voices from the Open Source Revolution (2000).

The term "open source" is used to designate a specific approach towards the development of software. While the concept for a methodology that is community-oriented originated within this context, nowadays projects or initiatives that fall under the category of the "open source way" encompass a broader set of values, "celebrating principles of open exchange, collaborative participation, rapid prototyping, transparency and meritocracy" (Walli, S., et al, n.d.: January 5, 2019).

As such, given the rapid growth of open source software in the last decade, thousands of projects that exist in a wide range of sectors have grown considerably, as even within the public sector there are advocates for its use. Similarly, open source has had a huge impact with privately owned businesses, driving the increase in public consumption around the world and relying on software diversity as well as community collaboration in order to create innovative software at a large scale.

However, around two decades ago, Open Source was considered a radical idea, something that would never escape from its academic clutches. This can be easily explained if we consider that computers were used as tools for research when they reached universities, and whatever software existed was passed around freely.

Only when businesses took an interest in computers did programmers begin charging fees for each software copy (Behlendorf, 2000, pp. 76-87). During this time, since 1984, Richard Stallman [1] popularized the idea of Free Software, subsequently creating the Free Software Foundation in later years, along with his GNU project, which inspired many to contribute free software under the GNU General Public License. According to Stallman, "people should have more freedom and should appreciate their freedom", a statement that hides how uneasy followers of this philosophy feel about Open Source, as most don't consider it equivalent to "free software" due to ethical issues. Despite the contradiction, the affirmation of free software was a first, crucial step in the direction of Open Source.

Bruce Perens (Behlendorf, 2000, pp. 76-87), suggests that victory belongs to Open Source, rather than to Free Software. The Linux Operating System and Apache Web Server Application are examples of the massive success that is the result of cooperation in the development medium, and thus prove how anyone using the Internet today benefits from this scheme. It is understandable why companies such as IBM make significant investments in open source (The Value of a Common Foundation 2.0, An Apereo Values Document, 2014). More and more users have gained a new appreciation for the rights they have with open source.

[1] Richard Matthew Stallman is an American programmer and activist for the free software movement. He created the GNU project, a free software for mass collaboration that aims to give computer users the freedom and control of their devices by creating software which can be distributed and run freely.

There are many reasons that lead companies to choose and invest in open source over proprietary software, one of them being the cost of licensing. However, it is important to acknowledge that licensing on its own is neither a guarantee of quality nor sustainability (The Value of a Common Foundation 2.0, An Apereo Values Document, 2014: October 17, 2018).

The clear success in terms of performance and the undeniable proof of sustainability that generates a solid lineage, places open source on par with its commercial-proprietary counterparts, allowing organizations to support projects by resorting to their internal resources, external contractors or a strong community – sometimes converging all three options. This offers distinct advantages, as contributors have the freedom to choose what to improve while also learning from the innovations of others.

According to Perens (Behlendorf et la, 2000, pp. 76-87), adopting the Open Source model allows groups of companies to collaborate in solving problems. Many large corporations have adopted this strategy as it gives them legal leverage over their software, and removes the looming threat of lawsuits. The promise of free public contribution is also enticing. From a competitor's perspective, Open Source also helps dismiss the threat of another company like Microsoft dominating the software industry.

2.2.2 *Online Communities*

The term online community means different things to different people (Preece, 2000, p.8). We cannot accept one single definition because it is a concept which requires a multidisciplinary overview, but even there it is crucial to at least examine how others have characterized the term. In order to do so, we will turn our gaze at Howard Rheingold, a 1994 cyberspace guru who wrote that "… virtual communities are a cultural aggregation that emerge when people bump into each other" (Rheingold, 1994, pp. 57-58).

Why exactly do "people bump into each other" and start a community? What is the criteria? To answer this question, Preece's working definition of what an online community consists says:

1. Social interaction with the purpose of satisfying people's needs or performing special roles, such as leading or moderating.

2. A shared purpose, that provides a reason for the community to exist. It may take the shape of an interest, need, information or service exchange.

3. Shared context of social conventions in the form of policies that guide people's interactions.

4. Computer systems, facilitating a sense of togetherness due to members engaging in repeated, active participation and activities.

Having identified four high-level criteria, these will provide a framework to guide whenever necessary to make operational decisions. However, we are most interested in 2, a shared purpose. Preece tells us that, from a purely technological perspective, online communities are frequently defined by the software that supports them.

Preece also suggests that an e-commerce perspective has a very broad view of community. Here we introduce a concept known as stickiness, related to marketing strategies that aim to draw people in to a Website, so that they will buy goods or services. When the result is successful, business blooms, as people will tell others about their purchases and bring in more clients. Owners believe that online communities in the context of business, serve the same function as an appealing advertisement or a tasty looking meal. They invoke a sense of comfort and trust which is essential in order to sell. Even if this perspective devalues the concept of community, Steve Jones points out that the Internet is a market-driven social place (Jones, 1999: 1-3).

2.3 Case Studies

In this section follows the analysis of educational and community sharing/social media platforms, all of which contribute to the feature and design evaluation of the Open Academic Environment.

2.3.1 Educational Platforms

Moodle

A free and open source Learning Management System (LMS), Moodle was designed to allow for educators, administrators and learners to create personalized learning environments. The interface is mostly straightforward and allows for some flexibility, boasting of being accessible from any device and highly customizable.
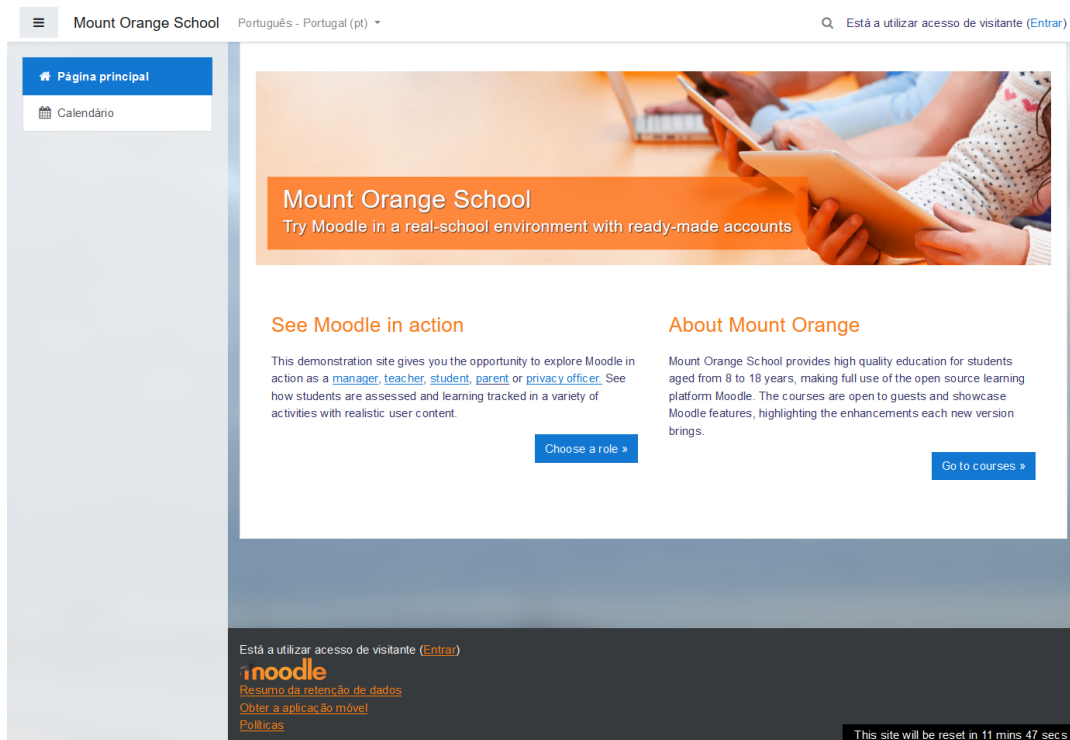
Figure 4 - Moodle Demo – Mount Orange School layout.

The purpose of Moodle within the education medium is to support the student community and give access to course materials. However, most users report disliking how the interface looks and that the platform is frustrating to use. Some defined Moodle as "slow and clunky". However, it is a starting point towards the redesign of the OAE, as it gives us a perspective of what to avoid.

Sakai

The Sakai project is a highly popular LMS developed by a community of institutions that eventually merged into what would later become the Apereo Foundation. As a free, community platform under the Education Community License, it is a good example of a successful open source project following basic design guidelines. Sakai redesigned its user interface in order to become responsive and adaptable to mobile screens, which in turn enhances the usage of some of its core features, such as: lesson tools, gradebooks, feedback, assessment, etc. From this we can determine how important it is to have a responsive and adaptable layout.

Feature-wise, there is little to criticize about Sakai. It is a widely used tool throughout the world.
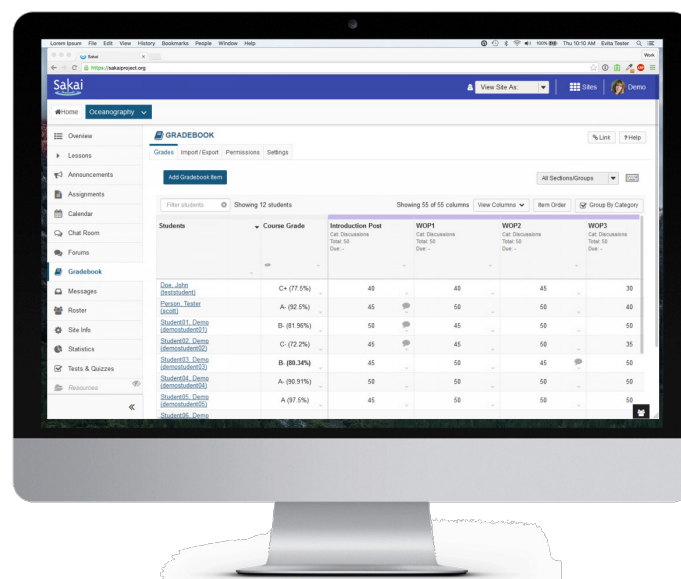
Figure 5 - Sakai Demo – Gradebook responsive layout

2.3.2 Community Sharing Platforms

Reddit

Websites such as Reddit are great to have an idea how group discussion, conversation flow and multiple posts in a single thread should function. It features social news aggregation, subreddits with a topic and discussion, member areas, threads and posting history.

On Reddit, registered members submit content to the site such as links, text posts, and images, which are then voted up or down by other members. This allows users to filter through posts at their choosing, a simple action that a) saves time and b) helps the user to find the information they want.

1. Thread system;
2. Ranking system for comment section;
3. Upvoting system for most relevant threads.
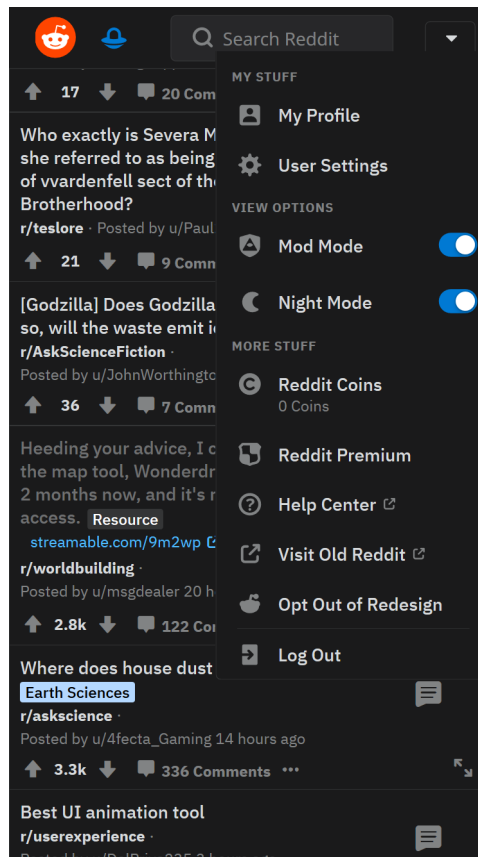
Figure 6 - Thread example and Night Mode option – Reddit.

Stack Overflow

Stack Overflow was created in 2008 by Jeff Atwood and Joel Spolsky. The platform was designed to act as an alternative to Q&A websites, like Expert-Exchange, well known for being more niche and technical. Compared to Reddit, it is somewhat different on its approach, choosing to focus on groups of answers to a specific problem. It features questions and answers on a wide range of topics, but is widely used in computer programming matters.

1. Thread/comment section layout;
2. Community;
3. Discussion system.
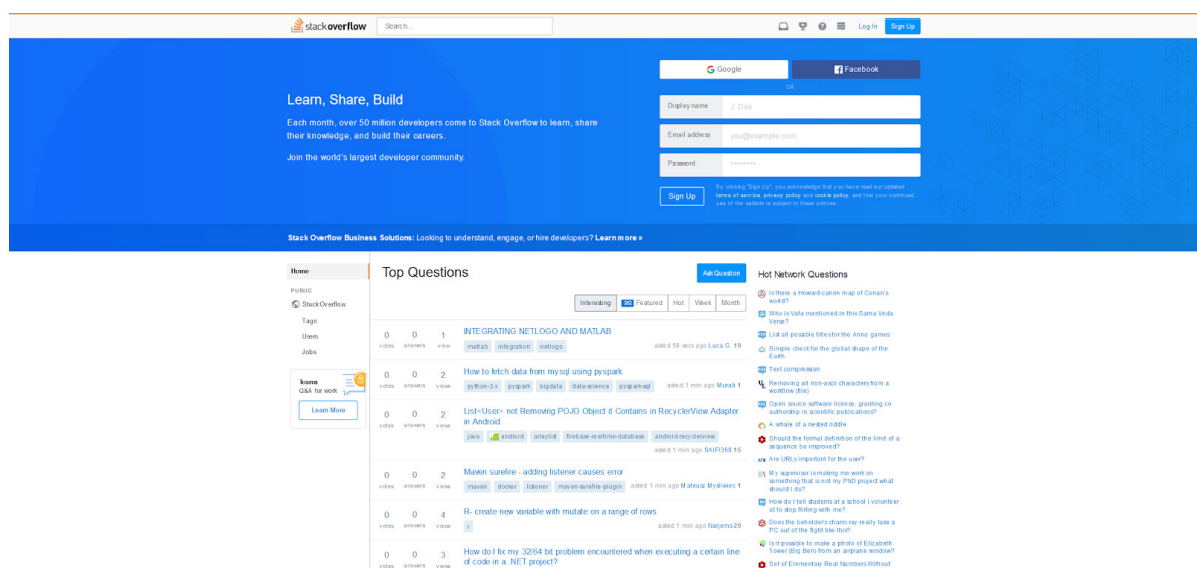
Figure 7 – Homepage thread list and ranking system – Stack Overflow.

2.3.2 Community Sharing Platforms

Discord

While Discord started as a gaming platform for groups to join and chat in dedicated servers, it became clear some of the features would be useful to adopt, such as creating social groups, using direct messaging and search functions (keywords). A similar platform that revolves around team collaboration is Slack.

Despite being proprietary, Discord is free to use and to browse, something that makes it more reliable than other team collaboration tools, like Slack. In fact, Discord is being used as the preferential platform to communicate for this internship, as real-time chat (or voice, if required) is crucial to a good performance when coworkers are working remote.

1. Light/Dark mode for the UI;
2. Server based system that allows for chat and voice rooms;
3. Multiple servers;
4. Search engine that filters a server by tag, channel, user, date and relevance;
5. Direct Messaging.
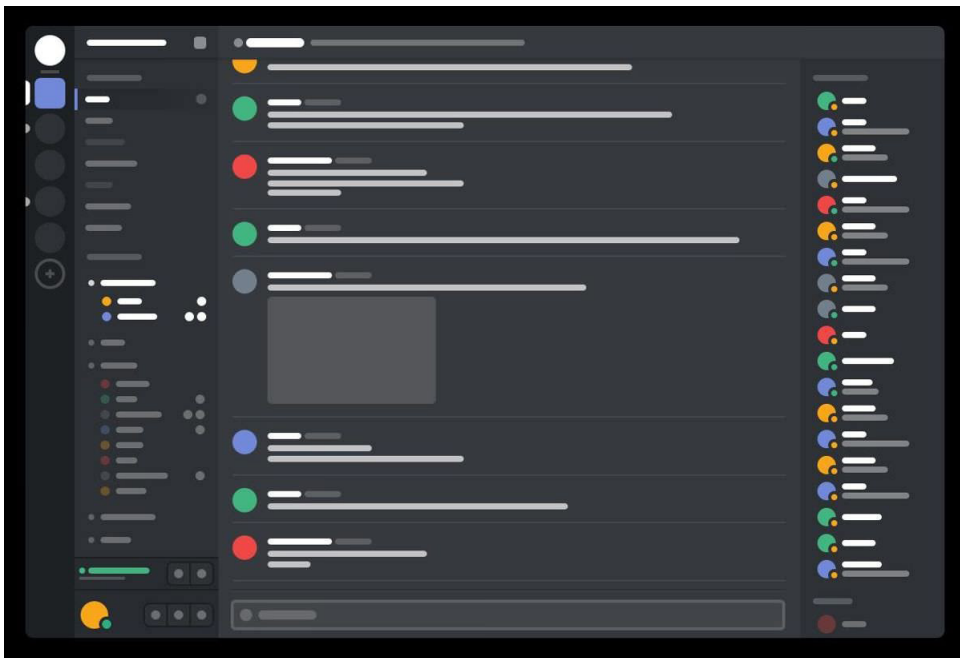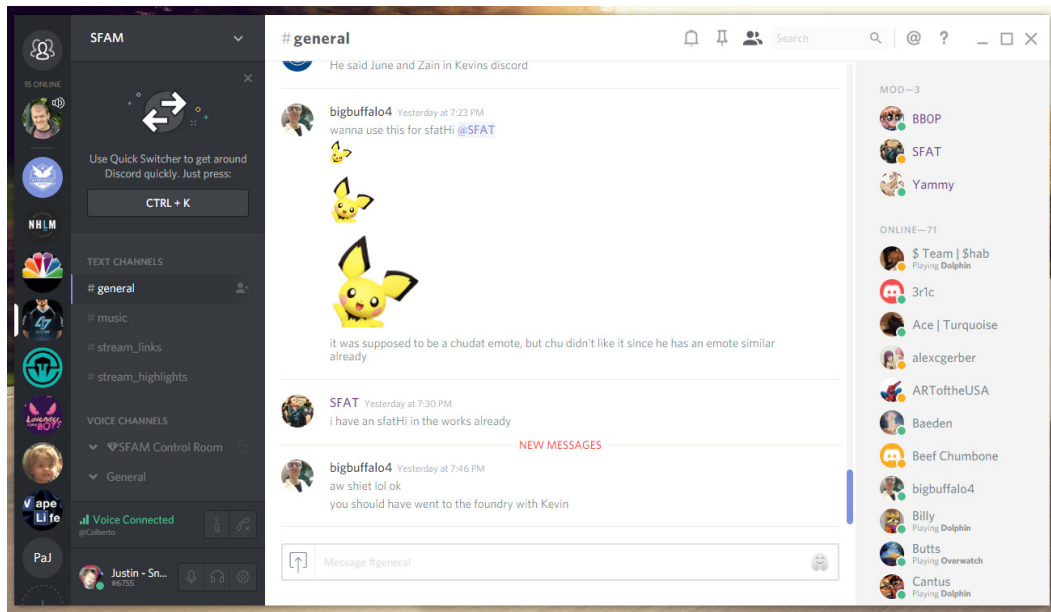
Figure 8 & 9 - Layout visual hierarchy, dark theme (top) and light theme – Discord.

Slack

Slack is a proprietary, cloud-based set that is hugely popular among startups for its team collaboration tools and service. It began as an internal tool used by Stewart Butterfield at his company, Tiny Speck, in the development of an online game. The name Slack is an acronym for "Searchable Log of All Conversation and Knowledge".

One of the reasons why Slack is considered as a case study for this dissertation, is due to its layout and team collaboration features. The latter allows for teams to join in chat rooms within a server and talk about work, university coursework or even hobbies. One of the biggest downsides of Slack is that the user has to pay for full access to browse the whole contents of the history log, which can become an issue if sensitive data is at stake.

1. Clean interface;
2. One dedicated server per user with multiple channels;
3. Real-time chat;
4. Direct Messaging.
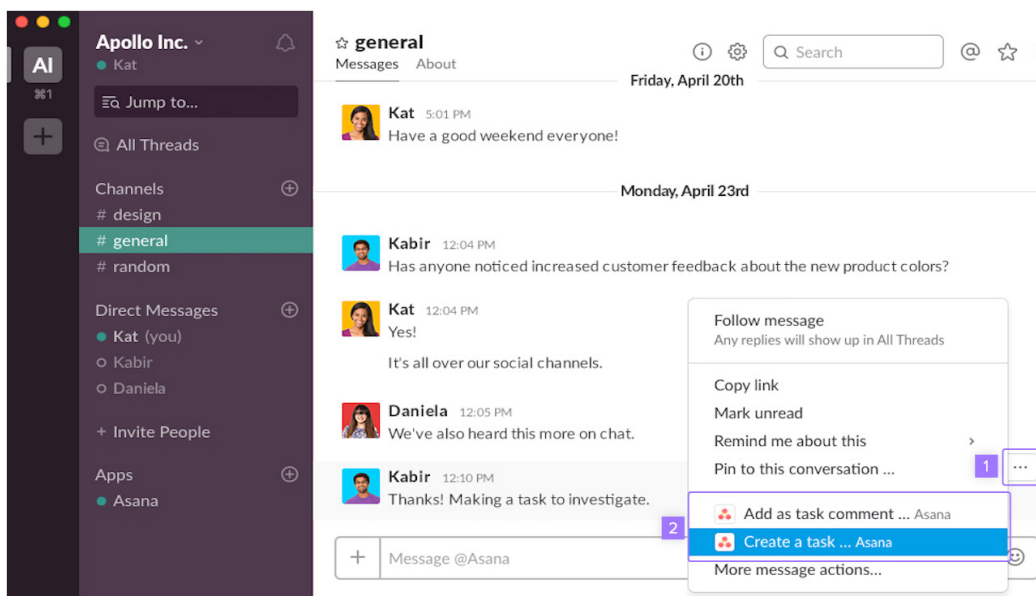
Figure 10 – Layout showcase – Slack.

Facebook

Launched in 2004, Facebook is an American social media and networking service company with over 2.2 billion users. For the purpose of this internship, Facebook boasts a few interesting features, and could probably be considered a lengthy case study on its own. It is an interesting social phenomenon how entire communities, of different ages, rely on Facebook to keep in contact with their family and friends. In fact, given the platform's popularity, it is very difficult to beat its level of influence. Users flock to Facebook for menial things, and it is very difficult to find someone who doesn't have an account.

Nowadays, it is not uncommon for universities to create Facebook groups and share interesting notifications with students. The Computer Science Department at the University of Coimbra does this. The main argument is that students are always connected to Facebook, so it makes sense to share information through the platform. The same principle applies for coursework, as students primarily communicate and create groups for this purpose. While this is a sensible approach, are there not other ways that respect users' privacy and thus guarantee that student / staff information remains confidential inside a server? Should students need to resort to social media to form groups?

The same happens with students from the 75 universities that comprise ESUP. They are actively using facebook for work and collaboration, and this is a very clear starting point for addressing their needs with the OAE.

From the Facebook social media network, we can assess that a wide community is important to facilitate interaction between members. According to Preece (Preece, 2000: 10), online communities get together for a number of reasons, but a shared purpose is essential to guarantee its success.

1. Creation of groups and chats with several members;
2. Attracting a wide community to facilitate interaction.
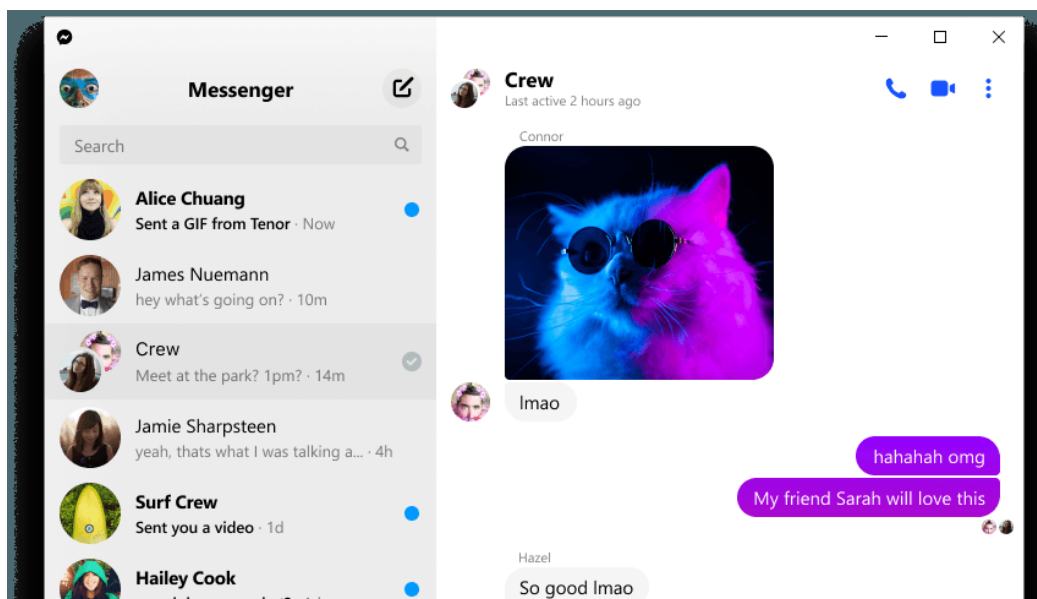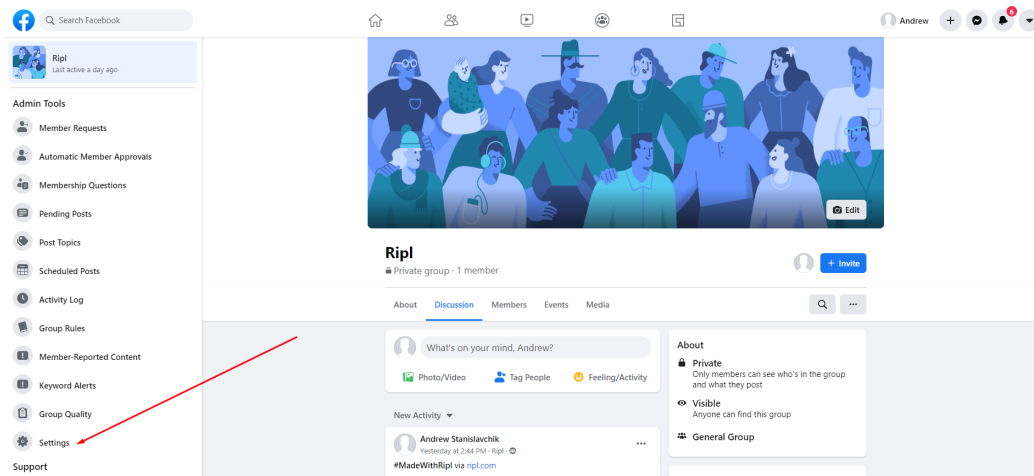
Figure 11 & 12 - Layout showcase for Facebook groups and messenger.

2.4 A Final Analysis

There are some common misconceptions about usability, user-centered design and the role of online communities. In order to build a successful application, there must be a thoughtful planning process that helps implement user feedback effectively. (Lowdermilk, 2013: 8-47). In a user-centered strategy, it is important to collect requirements so that form follows function.

The process of user-centered design tells us that you can remove ambiguity by placing users at the center of the development. This helps get to the heart of what users need, and that is an important step towards a great user experience. However, this is not the whole picture, as focusing on the user means more than just aesthetic. By performing usability studies, one can identify flaws in the application's interface (UI), but it shouldn't be the only focal point. Thus, we can conclude that user feedback is a crucial point in the design of any application, but there is more to it than that. The result should not be at all subjective. Listening to users is not always straightforward, as we're dealing with several layers of understanding and different backgrounds. The bottom line is: users don't always know what is possible or impossible and need to be guided in order to collect valuable feedback. (Lowdermilk, 2013: 30-37).

The role of online communities in education is still in the development stage. A community that is built on cooperation and trust will be more active, which engages users. This also encourages reciprocity, a central concern for communities (Preece, 2000: 188). It is important to consider the benefits of Web resources to support student learning. Distance education is less of an issue nowadays than it was a decade ago, as we now have the tools to mitigate flaws in feedback, guidance and enjoyment. Features that boost meaningful exchanges help facilitate learning (Preece, 2000: 120-121).

In conclusion, given the examples analysed in previous sections, the in-depth study of interfaces and online communities, we can now assess the kind of approach necessary to redesign an educational platform, focused on user needs.

[03]
Intervention Scope

[03] INTERVENTION SCOPE

3.1 Apereo Foundation

The Apereo Foundation is a non-profit corporation based in New Jersey, dedicated to the development and nurture of global partnership programs for higher educational institutions. As such, Apereo plays a major role in fostering innovation by developing and sustaining open source software ("The Apereo Foundation, An open source foundation serving education", 2015: January 3, 2019). As a network with members on six continents, it supports software both promoted and self-maintained, in the context of sustainability and innovation. Furthermore, Apereo's incubation process helps communities develop products while seeking to actively develop partnerships to further its mission of creating software for learning, teaching and research.

However, Apereo as an official Foundation is relatively recent. As of 2010, two organizations that evolved from early open source initiatives in education, explored the possibility of a potential merger that would allow them to collaborate more closely by forming an alliance. The two organizations were the Sakai Foundation and Jasig: the former, led by Chair Josh Baron, supports the Sakai Collaboration and Learning Environment, while the latter, led by Chair Aaron Godert, was the parent organization for uPortal, CAS, Bedework and other open source projects for higher education (Marshall, 2010: September 27, 2018). With an initial positive evaluation by the Jasig-Sakai Joint Working Group (JWG) about the benefits achieved by bringing the organizations together, a series of documents were developed to describe the expectations of the merger. After producing a joint statement of common values and achieving continuous positive feedback, the Apereo Foundation was eventually created in 2012.

"Early this year, Jasig, the parent organization for uPortal, CAS, Bedework and other open source software serving higher education, and the Sakai Foundation, which supports the Sakai Collaboration and Learning Environment, formed Board-level groups to examine ways the two organizations could collaborate more closely. These Strategic Alliance Committees, led by Jasig Chair Aaron Godert, and Sakai Foundation Chair Josh Baron, met in New York in September to consolidate the outcomes of their discussions and bring proposals to their respective Boards."

Marshall, 2010

It is within the context of open source and global networking that the Apereo Foundation finds its ground. The list of partners and software maintained by the Apereo Communities grows ever longer as open source within academia offers advantageous benefits in comparison to proprietary software – and not just the obvious freedom from licensing costs. As mentioned in the second chapter of this dissertation, within the Open Source Software section, open source as a methodology is community-oriented, a concept that has appealed to developers throughout the last decade and vastly contributed to the rapid growth of projects which advocate for this kind of collaboration.

According to a 2010 report, "Higher education is under pressure to meet greater expectations, whether for student numbers, educational preparation, workforce needs, or economic development. Meanwhile, the resources available are likely to decline" ("The Value of a Common Foundation 2.0, An Apereo Values Document", 2014: 5). This creates an increased challenge for universities as the financial costs associated with proprietary software causes a constraint in funding, which in turn will affect the student body. Thus, having a measure of freedom to choose software which is not vulnerable to monopolization is a refreshing perspective that should be nurtured.

Apereo takes advantage of this appropriate set of circumstances to open a path that leads universities to consider open source software more thoroughly. After all, aside from budget constraints, another appealing prospect of open source is the possibility of sustainable innovation in education. Even if this is a recent phenomenon, a support ecosystem that creates strong and inclusive communities is welcome, despite sometimes being portrayed as anti-commercial.

As such, Apereo develops and maintains partnerships with several institutions on par with its philosophy in order to deliver its mission. One of the most important partnerships is with the ESUP Consortium, a group of seventy-plus French higher education institutions ("The Value of a Common Foundation 2.0, An Apereo Values Document, 2014": 9). ESUP encourages universities to adopt Apereo software and back projects like uPortal and uMobile, as well as the exploration of Sakai. As a crucial side-note for this dissertation, it should be mentioned that ESUP has taken an interest in the Apereo Open Academic Environment, issuing material resource contributions to the project to help sustain the OAE's development.

The Apereo Commercial Affiliates are a group of entities demonstrating support for the Foundation by becoming members and advocating for its constituent software communities. ("The Value of a Common Foundation 2.0, An Apereo Values Document, 2014": 6-10). The Affiliates encourage the promotion of software by offering services around Apereo, and membership grants them right of fair use from Foundation trademarks. Some, like the Beijining Open Mindedness Technology, provide services associated with Sakai, while others like Blindside Networks provide online classes to remote students. The common element is the educational medium in which all of the Affiliates have a broad interest in, and thus connect to Apereo's open source projects, while most favour Sakai.

Projects and Communities

The Apereo Communities help develop maintain a growing list of software used by high education institutions world-wide. By taking advantage of the Foundation's incubation process, the projects are supported as communities develop around products as OpenEQUELLA, Edexchange and OnTask. Two of the most well known projects within the Apereo family are:

Sakai

The Sakai project is a solid Learning Management System (LMS) dedicated to collaborative teaching, learning and research with over 4 million users. It will serve as the main comparison for the OAE. A more insightful analysis is available at 2.3.1 Educational Platforms.

uPortal

A free open source software managed by Apereo, uPortal has been adopted by hundreds of higher education institutions and boasts being one of the most widely deployed enterprise portal frameworks within the open source medium. It contains a layout management system and is customizable for specific user needs.

However, for this dissertation we will focus on a previously mentioned project within the Apereo community, the Open Academic Environment.

3.2 Project Goals

The Open Academic Environment is a platform connected to a network of seventy higher educational institutions and partners that relies on community sharing for collaboration. The fact that OAE is open source is a huge benefit to everyone involved, as developers that come into the project have a passion for what they're doing and are allowed to enjoy a certain amount of flexibility by creating a structure that suits their needs, while also making a difference for the community.

Right now, the OAE consists of a website and a platform that is accessible to students, professors and staff alike. The premise for this internship was to primarily redesign the OAE's image, as it has aged rather ungracefully when compared to other projects maintained by Apereo, such as Sakai, which boast of a responsive layout and a modern design which appeals to a broader range of users. In fact, in order to compete with similar platforms, not only does the OAE's image require a redesign, but an overhaul of some of the features present in both the website and platform.

A lack of consistency in the design also affects the project's promotion and marketing strategy. Being open source, it is vital that the OAE draws in volunteers dedicated to the further development of the source code as a way of making sure the project survives, as well as attract the attention of its target audience. Without satisfying the parameters mentioned above, it is difficult to get a positive result.

As such, while the internship goals will be further discussed in 3.4 Proposal and Methodologies, the purpose of the dissertation will be to further analyse and justify the choices made for the technical process, by employing Service Design principles of design thinking. This will corroborate the development of the proposal step by step, while detailing the different approaches included in an iterative process which ranges from different areas of design and development.

3.3 Constraints

In order to understand the fundamental rules of the redesign, it was necessary to perform some research that allowed for a clear set of conditioning factors to abide by. For this purpose, the first step was to question those directly involved in the project. The result was a short Q&A that grants insight on boundaries and expectations. The Q&A can be viewed in *Attachment A.*

From the Q&A alone we can confirm that the OAE brand not only shares the same core values as Apereo, but that the website and platform rebranding must be in tune with the existing identity. This means that instead of recreating the brand from scratch, the logo and colour scheme will remain a starting point to develop the rest.

As previously mentioned, the main partners of the OAE and the target audience are members of universities throughout the world. The visual devices for the identity design must retain a sense of familiarity so that the change feels gradual rather than radical. In order to achieve this goal, the guidelines used will ensure that the identity of the OAE will be kept coherent, which allows the brand to stay recognizable.

As such, the constraints specified are the following:

1. There is no need to recreate the brand from scratch. The design process must take into account the present logo and colour scheme, which will serve as a starting point.

2. The image of the OAE must retain a sense of familiarity in order to stay recognizable.

3.4 Proposal and Methodologies

The following section concerns the proposal and methodologies that will be applied during the development of the internship. It should be reiterated that this process includes concepts of Service Design that will allow it to iterate through the unfolding of the project in a way that covers the needs required by each phase.

1. Analysing the present image of the OAE in order to understand its purpose, target audience and ecosystem;

2. Research companies, both in and out of the Apereo family, involved in the education field with similar projects;

3. Make a thorough analysis of case studies that involve successful/unsuccessful design options within the education field. Repeat the process for relevant sharing and collaboration platforms that display features the OAE should consider adopting;

4. Identify the painpoints present in the interface for the OAE website and platform, then discuss possible solutions;

5. Make a case for the redesign by means of a proposal that contemplates pertinent changes to the interface, while taking into account the restrictions imposed;

6. Define a list of features for the new website and platform;

7. Under Design and Prototyping methodologies, choose suitable frameworks to work with for the redesign and implementation;

8. Develop and implement the new OAE website and platform based on previous pre-approved prototypes;

9. Structure and elaborate the dissertation.

3.5 Work Plan

The planning of the dissertation contemplates a 9 month long period of work, scheduled to start in September 2018 until June 2019. Some items were due to changes throughout the 2nd semester and beyond 2020.

1. The Open Academic Environment (OAE)
September 2018 – November 2018
Research and acquainting with the purpose of the OAE project, present state, target audience, goals and constraints for the design overhaul.

2. State of the Art
September 2018 – January 2019
During this stage, there was a careful investigation of the more relevant themes to include in the dissertation, such as the role of Open Source and Online Communities, the User Interface with its good design practices, methodologies and an overview of Service Design.

3. Bibliography Research
October 2018 – October 2020
The dissertation is corroborated by a series of bibliographical cross-references that comprehend publications, websites and video conferences (talks from Apple, Google, TEDx, etc) which were considered pertinent.

4. Competition
October 2018 – January 2019
Research companies directly or indirectly related to the education field and open source. Additionally, further research was made regarding collaboration and sharing platforms.

5. Design Manifesto
October 2018 – January 2019
Research and creation of a design manifesto for the redesign of the OAE.

6. Case Studies
November 2018 – January 2019
Analysis of case studies related to competition and use cases.

7. Internship with the Apereo Foundation
February 2019 – June 2019
Full schedule (40h per week) internship with the Apereo Foundation.

8. Proposal
January 2019 – February 2019
Develop a series of finalized prototypes for the website and platform, including iconography and illustration. Creation of desirability surveys to assess further user needs.

9. Prototyping
February 2019 – June 2020
Finalized proposal for the implementation and feedback.

10. Implementation
March 2019 – October 2020
Development and implementation of the proposal for the website and platform, based on the image redesign. Step by step documentation and style guide.

11. Dissertation
September 2018 – October 2020
The writing of the dissertation was initiated during the first semester and will continue until the conclusion of the internship.
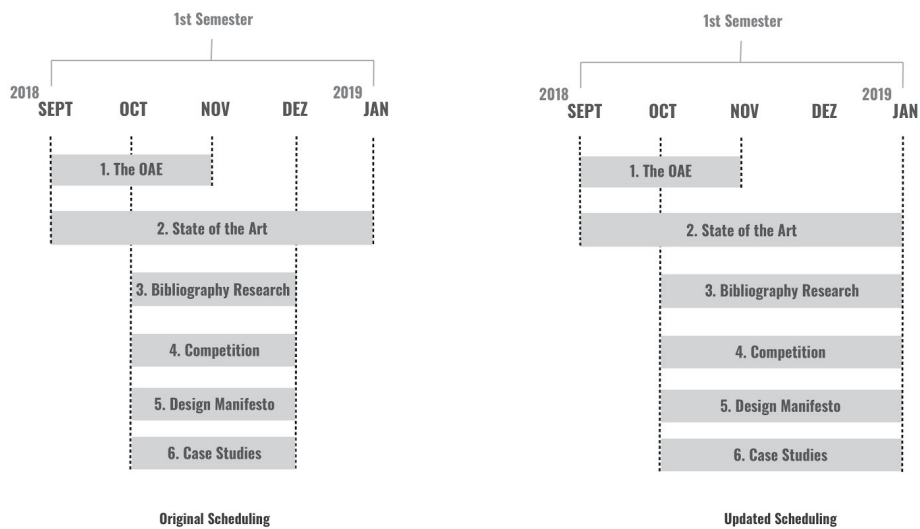
Scheduling for the 1st Semester

Figure 13 – Original scheduling for the 1st semester and updated
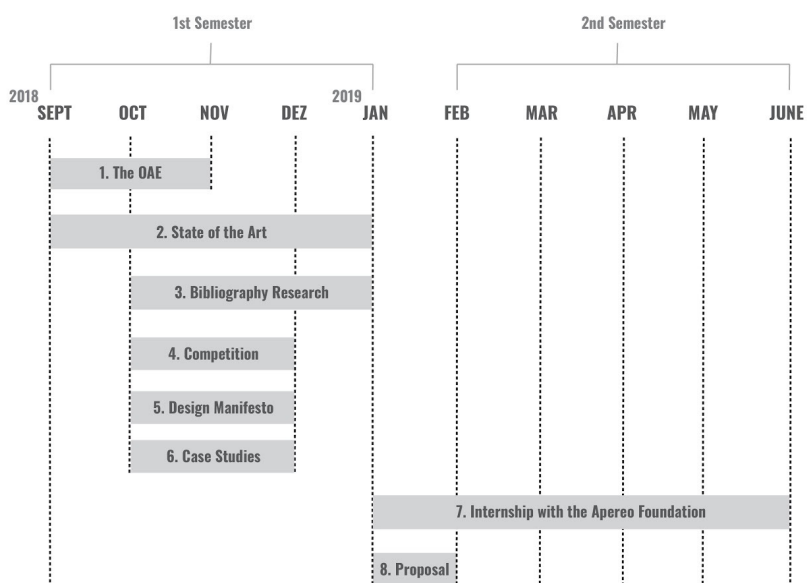
Scheduling for the 2nd Semester

Figure 14 – Original scheduling for the 2nd semester.

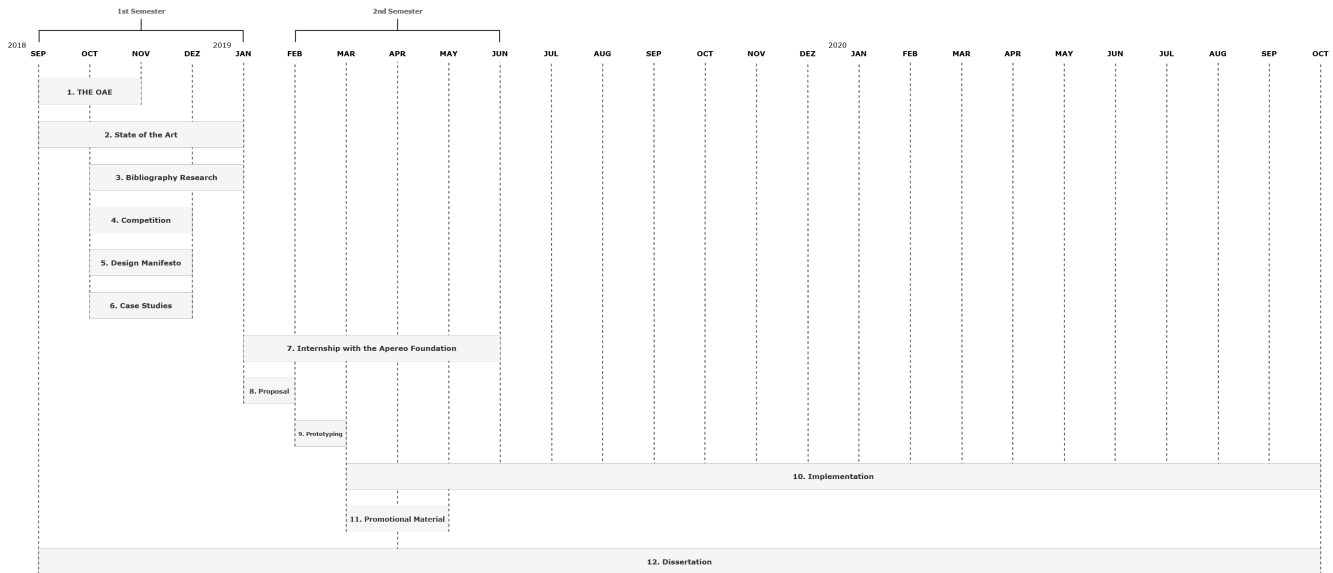## Final scheduling Sept 2018 – Ocotber 2020

Figure 15 - Original scheduling for the 2nd semester and updated version.

[04]
Intervention Proposal

[04] INTERVENTION PROPOSAL

The importance of keeping a consistent design is paramount to a successful renewal. When restructuring a project, one changes the rules of the game to a certain degree, which can cause a problem where a faithful audience is concerned, as people dislike change.

Why is a redesign necessary?

If we consider the disastrous case of Snapchat's redesign, we can conclude that changing features or perverting rules of thumb may cause a negative feeling among the users, and it will most likely spike negative reviews (Rawat, 2018: January 10, 2019). With Snapchat, causing a division between the chat and story sections was enough to alter the navigation structure and tapping area. This lead to a daily user drop of 2%, a quick exodus of about 5 million users (193 to 188). According to Rawat, Windows 8 is another case study of a terrible redesign. On the other hand, Facebook's treatment of Android and iOS as two separate products, when simplifying navigation for mobile, turned out to be very popular.

However, breaking standards can lead to uncomfortable situations for users as they will have to re-adapt to a whole new paradigm. This shift can either be positive or negative, depending on a number of factors, such as the target audience, context and how intuitive the interface turned out. In fact, Rawat stresses that "redesigns are meant to solve problems with specific business constraints and requirements".

Considering the above, this section will focus on the analysis of the interface, its core features, and the feedback from real life users who inspired a series of use cases. A follow up to this section will be **05. Redesign Proposal**.

4.1 Interface Analysis

The OAE website is the first contact a user has with the platform. Much like the phase of Discovery in our design methodology, it will be the gateway for exploring, so that the user gathers information on the OAE.

Website

Tidwell (2011: 131-140) states that critical content should stand out in a page. It follows that the least important content should have a place of less prominence in the layout - in other words, a visual hierarchy helps users deduce what they should focus on. To do so, the designer must define what are the most important elements in a page and arrange them accordingly. As seen in Figure [x], the OAE attempts at this by emphasizing text and contrasting the headline "A global network for academic collaboration" against a blue background. However, the header section is lacking in height, the font's visual weight is too subtle and the position/size of the composition is quiet.

The previous description of design dynamics within a single section, combined with the absence of key features are hurting the website. It is also necessary to include a visual flow, so that users know where to look. By creating a consistent design which makes use of a strong visual hierarchy, readability will improve. Right now, the design is not quite there yet because it is flawed, making the website look incomplete.

As of now, the homepage is split into 3 sections:

Header and Navigation

Includes main navigation, a "sticker" on the top right corner of the page linking to the Github repositories for the OAE and a set of screens (sliced in half) of the platform. The latter is meant to serve as a brief overview of the layout.

Infographic Diagram
The aim of the infography is to explain in a concise manner just how the communities and groups within the OAE connect with the institutions around the world.

Footer
Section that links to the main Apereo website, navigation, social media and the Github repository.

The downside is that every section of the homepage not only lacks clear information on what exactly the OAE is, but it also does not contain any instructional text that would help a new user understand exactly why they want to use the platform. The website feels empty and is not very useful at this stage. There is also no clear way to access the platform, which could easily be fixed by adding a button. Let's continue inspecting other areas of interest within the header.
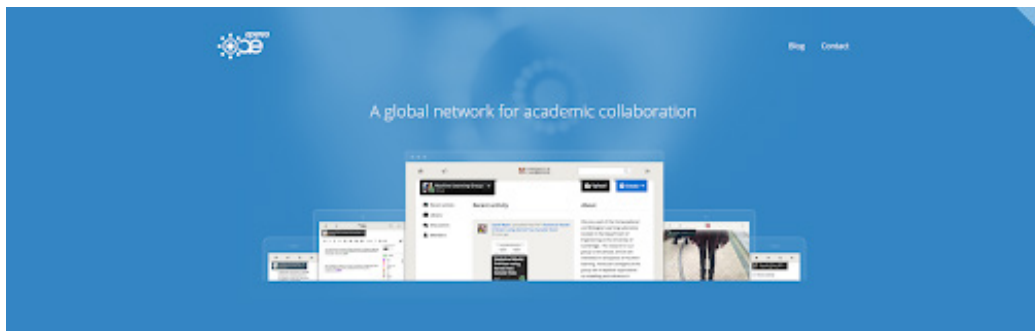
Figure 16 – Header section of the OAE website.

The **Navigation** bar does not contain much. Unlike the Sakai website, there is no About Us section, a page listing the latest features or even a clear link to the open source community contributing to the project. Since the OAE is an open source project, perhaps this should be prioritized.

Blog
Leads to an infinite scroll page with blog articles about the OAE and updates to the open source code;

Contact
Leads to a single page with a contact form with Name, Email and Message fields.

Overall, we can list a few problems with the website, the core of it being that it lacks information about the OAE, the very project it should advertise for. The screens displayed above are the only in the entire website pertaining to the platform and show very little of what the OAE does. Aside from that, the description in the Header is vague and not insightful enough for new users to understand what the platform is about. This turns away users and possible contributors.

Solution: The OAE is "selling" a very distinctive software. In order to be successful, the website should have a similar behaviour to that of a company, so that it receives more visitors.

This means:

1. Extending the content to include more information on features, rather than just concepts and ideals;

2. Include a tour of the platform, so that users may have an overview of functionalities;

3. Explain what makes the OAE a better option than other similar platforms. Why is it innovative? What makes the OAE stand out?

4. Add other sections that make sense to show how reliable the OAE is, such as sponsors and testimonies.

A key principle of designing interfaces is that users browse a website, so it follows that the content should be adjusted to facilitate the understanding of the information therein. In fact, people accessing websites will want immediate results to satisfy their need of instant gratification (Tidwell, 2011: 10). Thus, adding complexity to the content is not a good idea.
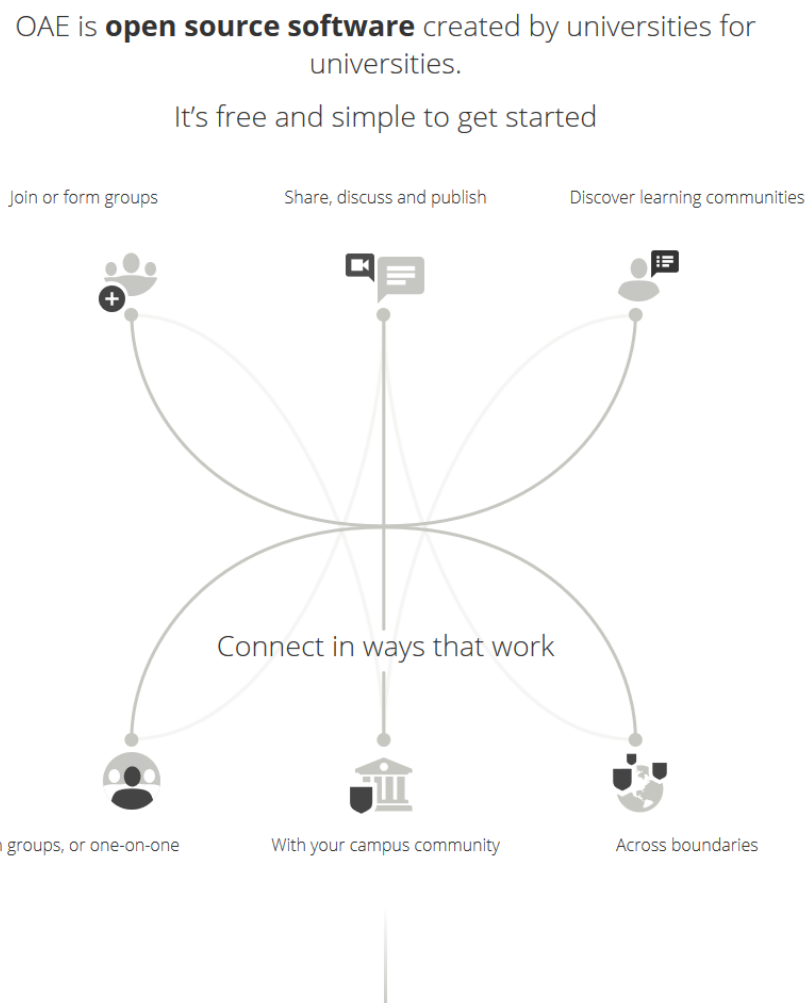
Figure 17 - Middle section of the OAE website (Homepage).

The second section contains a diagram, which makes up for about half the content of the current website. Right now, it is confusing and unhelpful because it lacks context. A regular user will skip the diagram as it adds little to the comprehension of what the OAE does. It is also overly convoluted in its current state.

Solution: simplify the diagram or remove it entirely.

As of now, the Footer has little issues other than requiring some further organizing. With the redesign, it might be necessary do add more sections.

Figure 18 – Footer section of the OAE website (Homepage).

From the remaining sections of the website, it is the Blog that deserves more focus. This page functions as a compendium of news and statements 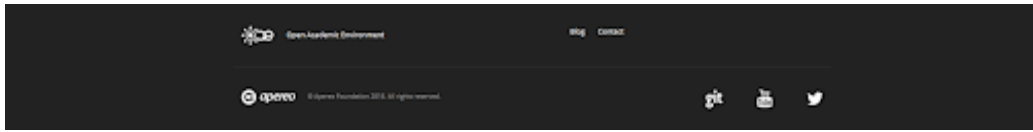from the community developers, and it is a shame that it does not have a prominent role within the Homepage other than being a link on the navigation bar. The Contact Form poses another similar issue, and so does any social media attached to the OAE. In fact, by misunderstanding how to engage the audience and providing a hierarchy of information, the project as a whole suffers. The following list show some notes and suggestions:

Blog
While it makes sense for the blog to be linked in the navigation or even kept in a different area of the website, it would not be amiss to include a section in the homepage that directs the user to it. This section could show the last blog entry and a button that leads to a compendium of the articles page.

Contact Form
In order to minimize the number of pages, the contact form could be included in the homepage, before the footer. Without an extensive addition of content that justifies an extra, dedicated page, it is not necessary to spend resources on creating one.

Github, Social Media and Documentation
These areas should be given more importance, as they are critical elements in a community driven project. The Github repository and all documentation involved are at the core of what the OAE represents, thus requiring a section of their own as they cannot be just a footnote in the website.

Final Thoughts

The general conclusion for the website analysis is that it lacks a goal. It exists, but does not serve the function it was supposed to. As a final note, it should be reiterated that a number of open source software websites suffer due to not being able to capture a wide audience for their product. However, their capacity to attract more users is directly related to their marketing strategy, which is why designers should look at successful cases within the industry – and, in the case of the OAE, not limited to the educational field.

A great example of how to fulfill a niche and, at the same time, implement a design that is not only functional but also appeals to users, is the case of the JetBrains family. The Intellij website is a reference of good design practices due to its simple, clear and pleasant layout. Additionally, the JetBrains family is a successful company that sells software to a wide community of users, so they must keep their marketing strategy up to date and according to their target audience. Sakai seems to have adopted a similar approach and it has served the project well.

Thus, to summarize suggestions that aim to improve the OAE's website interface:

1. Define set of requirements for the website – what to do and what not to do;

2. Create a visual hierarchy;

3. Redesign should have the platform's functionalities in mind;

4. Functional requirements help prioritize content; Greater focus on sharing and community related sections (Github, documentation);

5. Fully mobile friendly layout;

Platform

At this point, we know what the users of the OAE want with the platform. A quick search with Google tells us that the most straightforward path is from the website, as there are no links available that will take the user directly. This alone places even more importance on the overall redesign. What happens to the platform if you can't easily access it? The answer is that it might be set aside, or barred from most of its target audience.

Recently, a member of the OAE collaboration team tried to redesign the platform. One of the interesting specifics of the redesign is that little else changed aside from a slight inversion of colours and the removal of the Upload and Create buttons, as seen in Figure [x], from the top right of the section. In fact, there is some inconsistency as a few discussion pages show the same style of buttons, but in different colours from the original.

The redesign tried to keep a similar colour scheme to that of the original. Both versions keep a consistent, if rather basic, compliance with accessibility guidelines: the contrast between a white background under black text is suitable, as it helps readability. However, what little modifications occurred regarding the skeleton of the search were inconsequential.

The biggest changes were projected for group areas, adopting a two column grid and a different system for threads, similar to the Facebook layout. This is normalized standard behavior, something which more and more websites are adopting with contemporary interface trends.

Ultimately, the previous redesign was not a success because it lacked a basic understanding of design and the principles of building a user centered interface, with focus on needs. According to Tidwell, a user's awareness is dependent on a strong visual framework – if the pattern is repeated on each page, then the content stands out more. These patterns include a consistency in color, font, layout, titles and navigational aids, combined with a flexible layout that is up to date with design guidelines

It could be said that the present design is outdated and does not capture the attention of its target audience. As stated in previous sections, users are more critical of good design now that technology has been ingrained in our day-to-day. This makes the job of both designers and developers more demanding, as it is necessary to find reasonable alternatives to solutions which have been surpassed.
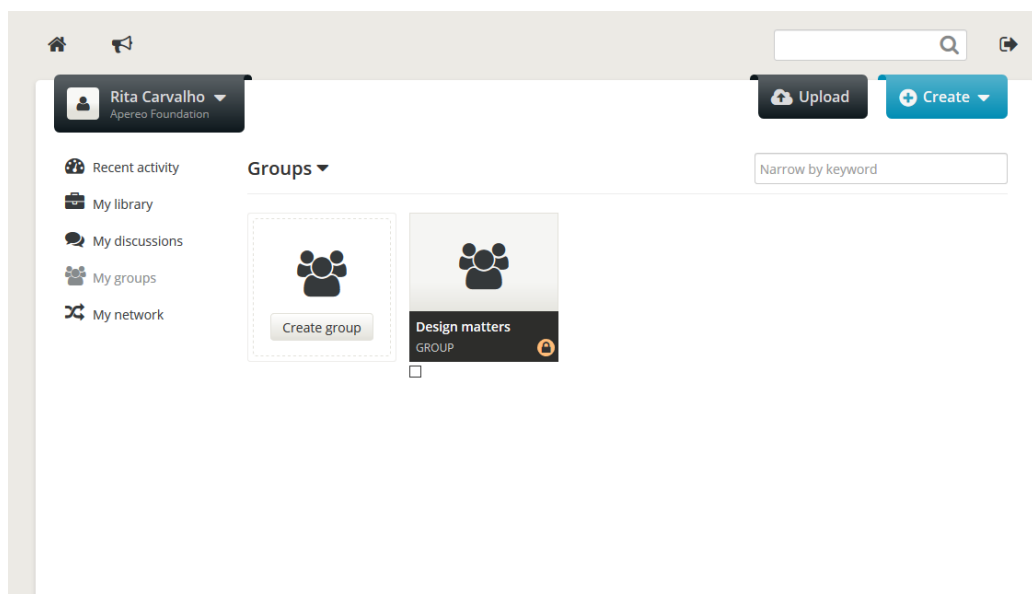

Figure 19 –Current private user area, OAE platform after login (groups).
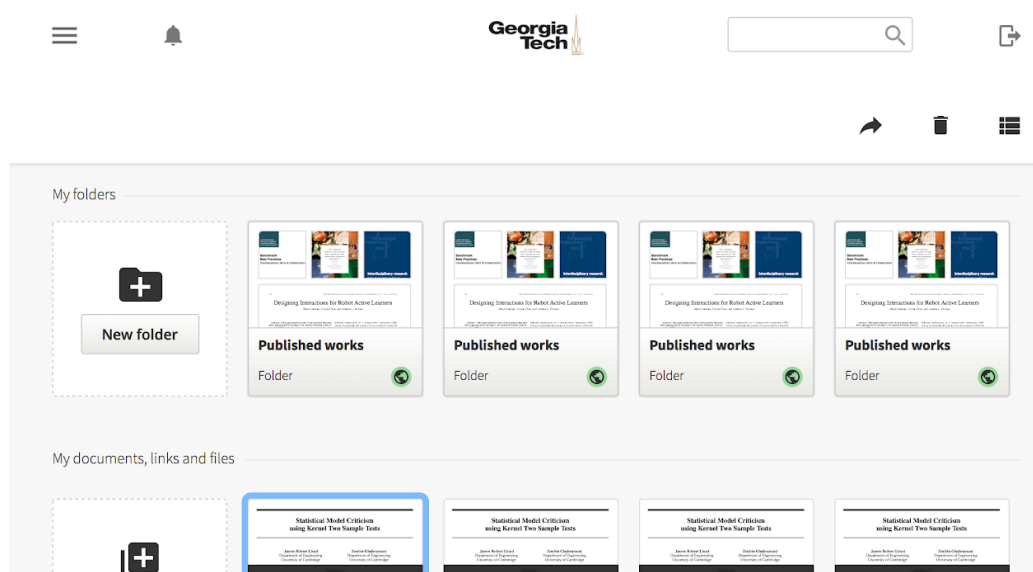

Figure 20 – Redesign attempt. Private user area, OAE platform after login (groups).

For the redesign to have a successful outcome, first it is necessary to define the painpoints of the interface. Although there are various, the same issues keep appearing on every screen, so it's relatively simple to compile and split them into sections.

For the Homepage, the user starts with a layout that doesn't indicate where they are or what they are supposed to do. This is a rather critical error that appears in every single screen. Without helpers to serve as a guide, the user has trouble adapting to an interface, which hinders readability. A non-intuitive experience is a sure way to burden the user with unnecessary exploring when the tasks should be clear.

1. Create a consistent and purposeful layout – Simple search bar. Serves as a hint, but what is the user supposed to look for and what is their purpose?

2. Communicate what's happening – Needs more information about the platform – what is this, what's happening here?

3. Draw attention to items by creating a visual hierarchy – Sign in button is too small and too far away from the main content, which is in the centre of the page.

4. Avoid redundancy – Video of the OAE should be on the main website, not the platform.

5. Remove negative space as it is not functional or useful – There is a lot of unused space that is useless on non-small devices.
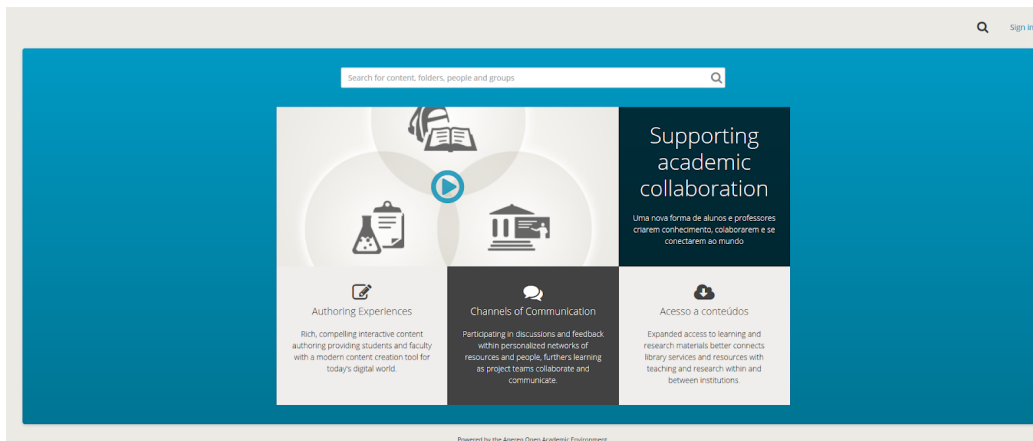
Figure 21 – Homepage of the OAE platform.

A survey to the stakeholders shows that there are complaints about the filtering system implemented for the search engine. It is too powerful, to the point that it becomes frustrating to search for anything at all, for every single result with the searched tag with be returned. This is a problem which can be solved by adding a number of filters to the search, so that users can customize results based on:

1. Date;
2. Other keywords;
3. Relevance;
4. Number of views.

Customization is an asset for the UI.This principle is important for thread discussions, where the comments are shown by date, rather than relevance. A user doesn't want to browse through a thread with 100 posts just to find one that interests them; this is where filtrage comes into play, so that the UI allows the user the flexibility to choose what they want to see. According to the stakeholders, comments are a very popular means to communicate, given that the social network and chat of the OAE isn't working as supposed.

Navigation has the positive trait of respecting both accessibility guidelines and the natural eye movement when browsing websites. In the redesign, the developer idealized a vertical menu on the left that filled the screen 100%. Both solutions work and are worth considering for the next stage of the project.
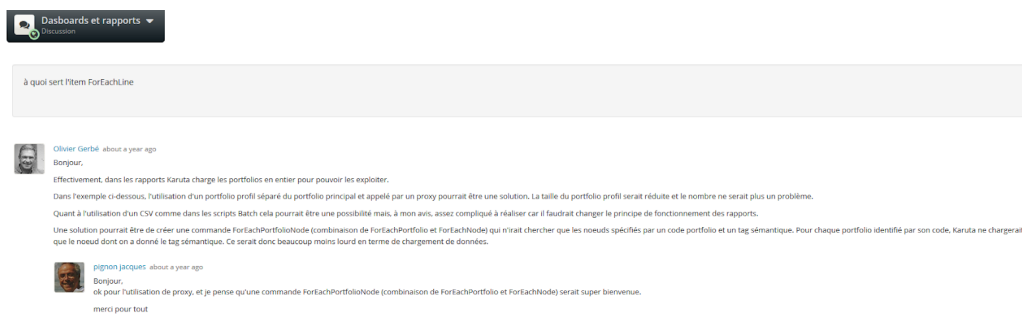
Figure 22 - Current discussion thread layout.
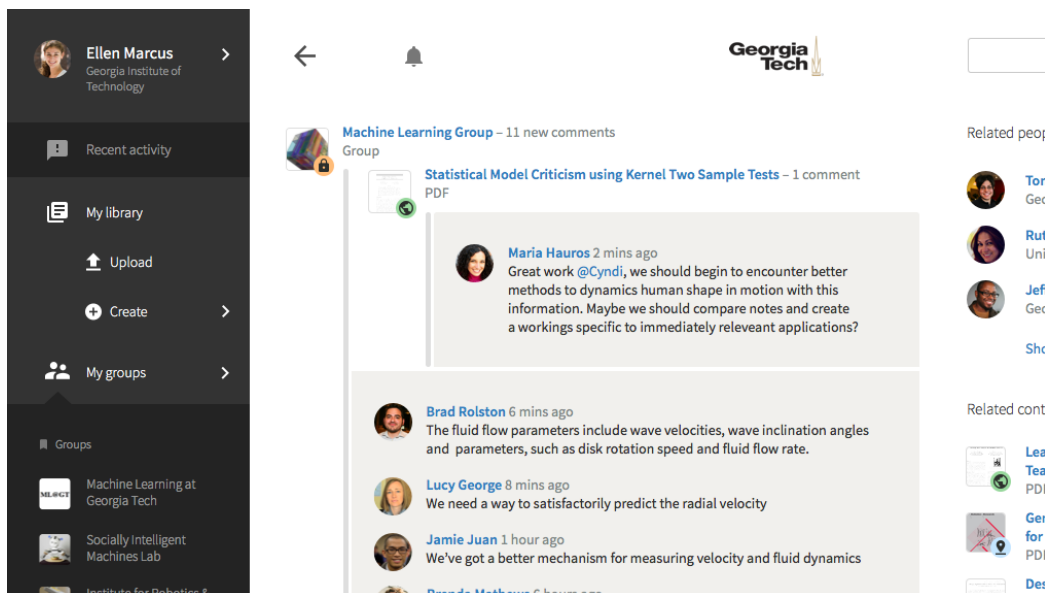
Figure 23 - Discussion page and side menu (previous redesign from OAE colaborator).

Final Thoughts

Overall, there are quite a few problems to solve with the platform. By employing the strategies defined in the upcoming chapter, it will be possible to understand and redefine the features to implement in the new OAE, which is a first step towards a positive redesign. It should be considered that the UI in the making is complex and highly interactive, which will require a form of wayfinding (Tidwell, 2011: 25-71) that uses clear, unambiguous signage to help guide the user through the interface. A simplistic approach no longer exists now that the Web has matured (Scott & Neil, 2009: 105-174), but it is possible to simplify the UI by creating patterns of visualization.

4.2 User Interviews

Between the months of September and October 2019, the OAE team made available a survey on Typeform [2] for the students and staff of the French universities of La Rochelle and Littoral Côte d'Opale. Our goal was to receive feedback on OAE's current design and the first new solid iteration of the redesign, so that we could qualitatively compare the two based on data.The survey was based on Nielsen's guidelines for usability testing and research methods in human-computer interaction.

During earlier research, we interviewed the stakeholders with an informal questionnaire that was designed to understand the core problems of the OAE, according to the user base. The replies indicated that most of the problems reported were focused on functionality rather than extensive dislike of the design, but there was a shared opinion on the necessity of modernizing the OAE in order to make the platform more attractive. As of the current version, the OAE is mainly used by university staff, something that was confirmed by the stakeholders and further supported by the survey results.

See **Attachment A** for the stakeholder interview results and **Attachment B** for the aforementioned survey.

For the full survey results, see **Attachment C**.

Constraints

Before gathering the survey data, we had to consider a number of realistic constraints that could become potentially troublesome when defining objectives.

At the start of the project, we scheduled monthly remote meetings with the stakeholders where the design phase would be reviewed, and these meetings were also intended as a way to update the clients on our progress.

[2] Company that specializes in online surveys.

In the end, we were limited in the type of testing we could run to achieve reliable results as our access to the current user base was remote and unmoderated. The timings of the survey were also another factor to consider, as the priority soon shifted to presenting updates to the Open Apereo Conference community a few weeks later (?). This ended up pushing the survey to the beginning of the school year of 2019/2020, between September and October. The survey was distributed online by the stakeholders via email.

What follows is a comprehensive list of the aforementioned constraints:

1. Limited contact with the student body. Feedback was gathered from survey data to be analysed quantitatively;

2. Limited access to interviews with the stakeholders due to scheduling issues. As such, the more adequate approach was to conduct semi structured interviews during meetings in an exploratory, conversational fashion;

3. Could not perform testing in person with users, as originally planned;

4. Creation and release of the survey had to be postponed to a later date (September–October 2019) as the Open Apereo Conference of 2019 became a priority.

4.2.1 Desirability Survey

The data gathered from the survey distributed online at the Université La Rochelle and the Université du Littoral Côte d'Opale, from September – October 2019, covered a universe of 17000 users - from which we received a total of 305 replies. In order to analyse the target population, we will consider the average student age range to go from 18 to 30 years old, according to official statistics from the 6th EUROSTUDENT [3] survey that took place in 2016–2018.

[3] EUROSTUDENT is a collaborative project that collects and analyses data on European higher education, relying on the coordinated network effort from each participating country. All collected data is available at the EUROSTUDENT database.

The data shows that the majority of students in European countries are under the age of 25 and the mean ages range for less than 23 in France, with an average transition period of one year between the previous study programme and Masters (EUROSTUDENT VI, 2018, pp. 4-8).

The demographic factors that define a realistic user are broad enough to warrant feedback from a target population that:

1. Has used the OAE;
2. Knows about the OAE but has never used it.

This definition encompasses both students and university staff. The goal of this survey is to gather feedback on the OAE so that we can better understand its issues from a wider perspective and plan for accessibility.

Although there was a brief discussion about the possible benefits of sharing the survey with the students of the University of Coimbra, in the end it was decided that this feedback would not be valid, given that students from Portuguese universities did not have any previous knowledge of the OAE.

Data analysis

A primary analysis of the results based on descriptive statistics demonstrated that the OAE is not widely used by the student population, as the percentage of users reveals a gap in ages. In a universe of 305 replies, at least 226 (74.4%) are above the age of 31, making them either staff, researchers or mature students – which leaves 24.3% of users between the ages of 18 and 30. Only 1.3% chose not to reply.
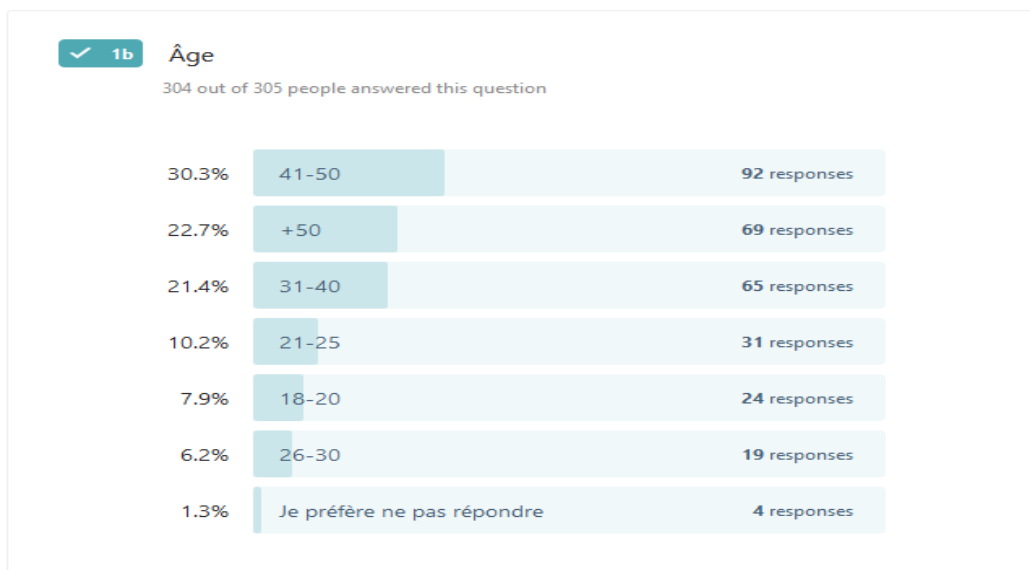
Figure 24 – Question 1b: age of the survey participants.

At least 37.5% of users rarely use the OAE, although 30.9% sometimes use it and 20.4% do so frequently. A minority of 11.2% has never used the OAE, but from context we can deduce that they heard of the platform and perhaps have second hand experience.
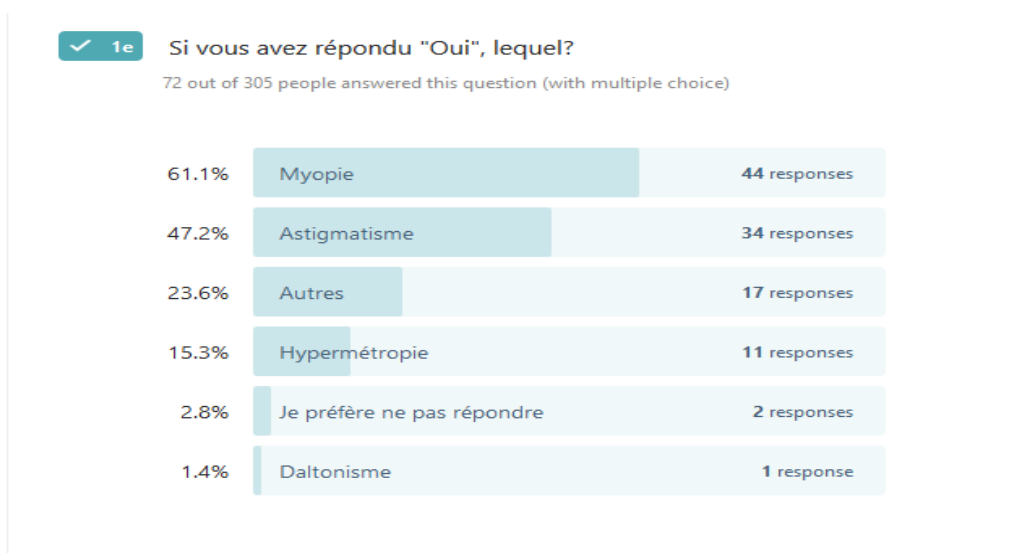

Figure 25 – Question 1e: types of eyesight conditions.

A substantial minority of users claimed to suffer from eyesight conditions such as myopia, astigmatism and hypermetropia, among others. The numbers point to 23,7% against 75%, with 1.3% choosing not to reply. We can deduce from the data that extra preparation for accessibility features will be necessary beyond dark mode, such as increasing font size and preparing higher contrast colour schemes with neutral colours for users with tired vision and colour blindness.

As the most used devices to access the OAE currently are the laptop (79.9%) and desktop (49.7%), there are numerous approaches with enough flexibility for development with a focus on accessibility. Smaller devices are also contemplated, but the most popular devices are the priority.

Current OAE vs OAE Redesign

While analysing the average results of the survey, we took advantage of closed ended, ordered questions ranging from 1 to 10, where 1 = I do not agree at all and 10 = I agree completely to obtain reliable feedback on the desirability of the current version of the OAE versus the new version.

In order to examine the data, the approach was based on descriptive statistics for the Likert Scale.

There is a general apathy with the current OAE, a trend shown in the mean of each question that concerns the current OAE. Data shows us that the resulting mean of questions 2a to 2j was 5.8. Sampling shows a more or less even distribution of the results to each question, with little focus on positive extremes.

As such, we can deduce that the target population is indifferent to the current OAE but there is a slight positive response regarding functionalities and their usefulness. On the other hand, the feedback gathered from questions 4b to 4l, concerning the redesign, was much more positive.

An exception was made for 4c since it breaks the consistency of the sampling given the phrasing, and so it won't be contemplated for the final average.

Sampling data shows the user base approves of:

1. Features such as a modern design, a file system based on Dropbox and Google Drive, filters and message tags;

2. Having the possibility to use the OAE with small devices;

3. Switching between a dark theme and light theme;

4. A better and more informative website

Overall, the above mentioned demonstrates that the user base considers the changes desirable and is willing to give the redesign a chance. So far, there is a preference for the light theme over the dark theme.
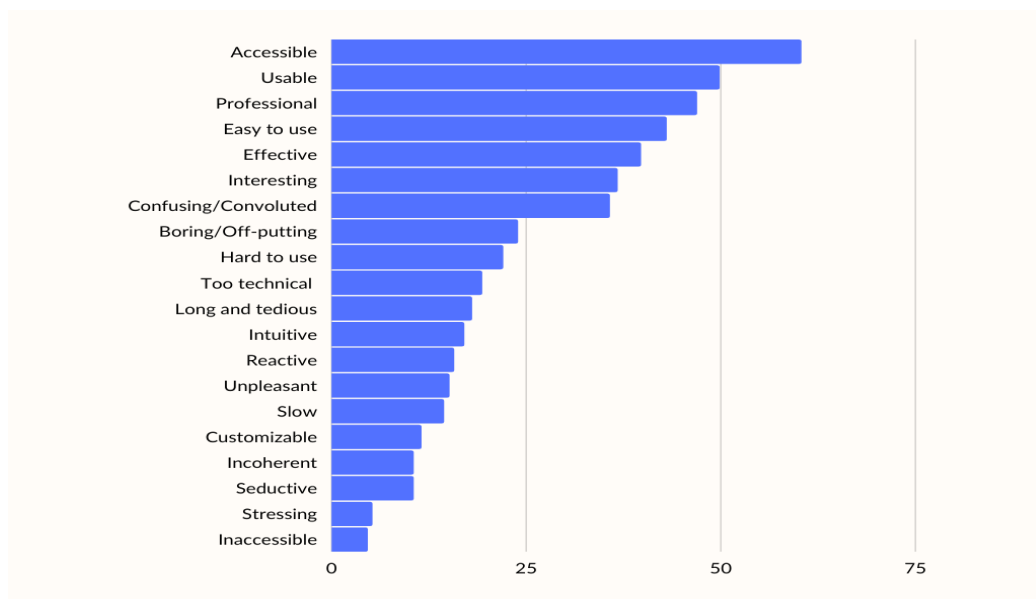
Keywords

Figure 26 – Question 3: adjectives associated with the OAE.

With the aid of usability principles closely tied to emotional design and how it defines user experience, the survey contains a section where the participant has to choose up to 5 relevant adjectives that reflect their thoughts on the OAE. As such, this section was relevant to conduct a study on primary characteristics and to allow us to figure out how to accommodate user expectations - but also to repair problems.

The 3 most positive adjectives are accessible, usable and professional.

The 3 most negative adjectives are confusing/convoluted, boring/off putting and hard to use. Special emphasis on too technical.

These replies are favorable to drawing conclusions on the need to have a familiar interface so that it doesn't become too different and difficult to access. The redesign is not necessarily expected to look corporate, but it is important to assure the visual inspires confidence. As of now, the OAE is considered boring and in need of modernization.

Some features are scattered across the interface. Better organization would mitigate this issue.

Conclusion

After the survey results, we confirmed that the majority of replies belonged to individuals who are likely university staff or mature students. This further supports what we already knew from interviewing the stakeholders at the beginning of the internship, regarding the necessity to redesign the OAE within the guidelines of accessible, responsive and visually pleasing design standards to make the platform more useful. Right now, the sample data shows that the target population of the OAE is lacking the average student, as they are among a minority of probable users.

The disinterest in the current OAE can be explained by examining questions 2, 3 and 4 as the replies are a manifestation of the current problems and desires for a better platform. After this phase more prototyping will follow to achieve an ideal design that has better focus on the end user.

As there was positive feedback for the redesign combined with planning for new features, it is possible to deduce that the survey was successful and allowed the team to draw conclusions on the state of the project.

4.3 Use Cases

After conducting the desirability survey, the next step in research was to give shape to realistic users with the aid of personas based on the data previously collected. This phase is as much a study of the users as it is of the OAE. Context defines how multiple tasks with different goals would proceed in various scenarios.

Notwithstanding the 3.3% of unidentified users, data shows a similar distribution ratio of users based on gender with a variation of approximately 7.3%. However, since the majority is male (52%), the personas will reflect the disparity.

Personas

Michael Brown

Age: 23 years old

Occupation: Physics Student

Location: La Rochelle, France
(previously Edinburgh, Scotland)

Michael is an exchange student at the Université La Rochelle. He decided to try one year abroad in France to live new experiences and meet different people through a variety of adventures on foreign soil. While Michael is comfortable with the latest technology, he is not very tech savvy. He still has a solid presence in social media and enjoys creating content for his Youtube channel.

As someone who would like to follow an academic career, Michael is focused on his university courses and would like to use a platform that would allow him to easily share coursework with the rest of his classmates. Most of his class uses third party services like Google Drive, Facebook and Dropbox, but Michael is frustrated that he has to create two or three different accounts just to be able to keep up with everyone. If his professors all had access to a dedicated set of groups to answer questions, getting feedback would be much easier.

Michael's Questions

"I would like to share coursework with my classmates. Is it really necessary to rely on social media or several different platforms for this?"

"How can I efficiently ask for feedback and communicate with my professors other than just email?"

"Where can I upload and work on my course related assignments?"

Michael's Goals

"I enjoy brainstorming with my classmates for group projects, or just be able to keep all my university related coursework organized in one place so I can share with others. I am looking for an easy way to achieve this."

"Sometimes reaching a professor can be complicated, so I would like to simplify this process."

Michael

Scenario: Michael needs to upload and share his contributions to a group assignment. He wants a collaborative platform that is easy to use.

Expectations

- Collaboration tools
- Ability to upload and share files or documents
- Free or with a flexible subscription rate

Define	Compare	Negociate	Select
1. Review current tools 2. Define necessary features	3. Research different platforms that offer the wanted set of features 4. Try out the best options on a trial basis 5. Filter unwanted options	6. Talk to group about platforms to collaborate 7. Check if they have better ideas	8. Together with the group, decide the most suitable option

Opportunities

- Collaborate with group on assignments
- Accessible interface that isn't complex to navigate
- Compare alternative opportunities
- Features such as uploading files to share for future university related coursework

Figure 27 & 28 – Michael (persona), Michael's Journeymap.

Mélanie Arquette

Age: 34 years old

Occupation: Researcher for Computer Science, part-time university assistant

Location: La Rochelle, France

Mélanie is a researcher at the Université La Rochelle, as well as an assistant for one of the Computer Science lecturers of her department. Every once in a week, she has to help students during classes and, sometimes, even replace the head lecturer when he calls in sick or the topic is leaning towards her field of expertise. Since Mélanie is doing her PhD, she has regular meetings with her supervisor to discuss the state of her research. When she has some free time, Mélanie enjoys going to the theatre and meeting with her cinephile group of friends.

While working on her PhD, Mélanie noticed just how important it is to have a centralized platform to upload and share documents with her supervisor and students, as well as an easy and direct medium to answer questions - so as to not overload her email inbox. It can be difficult to help the students quickly when she has dozens of emails to reply, but if there were topic based threads where everyone with the same problem could participate, then it would be more helpful to discuss results and the transparency could benefit the more distracted ones.

Mélanie's Questions

"I have a lot of notes to share with my supervisor, aside from documents I would like him to proofread. What kind of environment would be the most suitable?"

"How can the students get better and quicker feedback from myself and the head lecturer?"

Mélanie's Goals

"An ideal scenario to avoid an overflow of emails would include a better way to approach QA's from the students, while being able to maintain an organized thread."

"I would like to facilitate my supervisor's task of reviewing my work by keeping all PhD related material in one place, accessible to him alone."

Mélanie

Scenario: Mélanie would like to engage with her students in order to better help them with coursework questions. She wants a thread like system for discussion.

Expectations

- Discussion threads
- Being able to reply to questions based on topic
- Better engagement with students

Explore	Review	Reply	Starr
1. Experiment with different discussion features 2. Define template for Q&A	3. Analyse student posts before replying to threads/starting own thread, if necessary 4. Check if there are repeated questions 5. Make notes of question patterns	6. Answer questions from students 7. Post helpful files along with answers (diagrams, pdfs, images, etc)	8. Choose most important threads to pin

Opportunities

- Help more distracted students
- Online engagement on different schedules with little restrictions
- Better thought out replies

Figure 29 & 30 – Mélanie (persona), Mélanie's Journeymap.

Gabriel Couillard

Age: 54 years old

Occupation: University Lecturer, writer

Location: Remote

Professor Couillard is a lecturer at the Université La Rochelle who is currently teaching classes remotely from home. He is working on a book related to his field of search before starting a sabbatical the following year, so his time in-person at the university has been reduced to two meetings per month. However, he keeps engaging with students often - only he has switched to online lectures which he prepares for with a few weeks in advance. The contents displayed during classes are uploaded in video format and are available on Youtube, but also up for download. Other coursework gets similarly uploaded to a library for easy access.

While fairly proficient with technology, the professor has trouble navigating unfamiliar interfaces with no option for dark themes. At night, when his eyes are tired, this becomes an issue.

Gabriel's Questions

"What kind of system should I create in order to organize my lectures? I need to communicate better with my students."

"I am looking for a more accessible alternative. What do I need to make it so?"

Gabriel's Goals

"I need to organize my lectures and make them available more efficiently."

"A dark theme would help me work at night with less strain to my eyes."

Gabriel

Scenario: Professor Gabriel Couillard wants to make available a set of helpful coursework files and lecture videos. He needs to create a dedicated library.

Expectations
- Sharing files to aid remote learning
- Organize lectures by topic

Sort	Upload	Share	Q&A
1. Filter files 2. Create folders by topic	3. Define which files to upload 4. Update library visibility	5. Notify students of new lecture material	6. Engage with students to assess success of coursework files

Opportunities
- Lecture aids are available at all times
- Students can rewatch a lecture for further study
- Q&A's are more insightful

Figure 31 & 32 – Gabriel (persona), Gabriel's Journeymap.

[05]
Redesign Proposal

[05] REDESIGN PROPOSAL

5.1 Methodology

The adopted methodology for the redesign of the OAE will be based on the creative process approach which has been mapped as 'the Double Diamond'. As shown by the figure illustrating the model below, this will be an iterative process that assures "ideas are developed, tested and refined" (Design Council UK, 2015a: October 9, 2018) as many times as necessary. By splitting the problem in phases, we will be reducing complexity and making sure that the main activity – problem solving – is not only justified, but relevant. A brief overview of each phase will be provided in the form of topics.

It should be noted that the extras, as previously mentioned in **3.2 Project Goals**, are only meant to be an addition that complements the project.
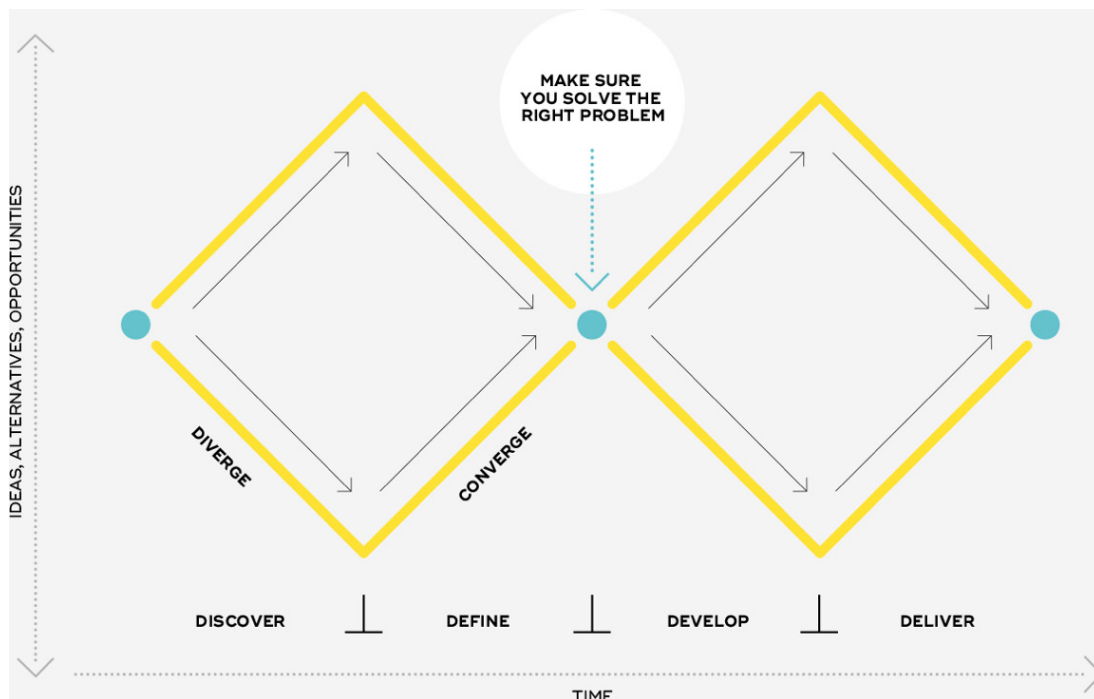
Figure 33 – The diagram above illustrates the Double Diamond model (Stickdorn, et al).

The first part of the process is meant for the designer to gather research about the context of the project. It will be a starting attempt at understanding the problem with an unbiased perspective, allowing for a wide range of ideas and influences.

Phase 1: Discover

During this phase, substantial research is used for the purpose of understanding the context of the Open Academic Environment within the Apereo Foundation, as well as its present state. The use of qualitative methods for data collection here will allow us to synthesize and improve the accuracy of the upcoming analysis. It should be noted that this is a necessary method that grants the unveiling of essential data regarding the target audience, so as to understand their background, motivations and needs – a user centred philosophy to structure the problem at hand.

Overview

1. Analyze the context of the project by extensive research on Apereo, the OAE, its present state, target audience, constraints and expectations for the design overhaul;

2. Make a case for the end user by knowing the target audience and evaluate its needs;
    a. What do users expect from the OAE?
    b. What is the user's motivation to use the website? What about the platform?

Phase 2: Define

Given the iterative nature of this method, during the second phase of the process there will be a further analysis of the collected data. Here the goal is to define the information found and make sense of all the possibilities, in order to create a brief that frames the upcoming design challenge (Design Council UK, 2015b: October 9, 2018). This helps identify the following course of action.

Overview

1. Clearly define the needs of users. This can be achieved by doing surveys, creating personas, direct observation, interviews and case studies (Tidwell, 2011: 1-22). Relevant feedback will be critical to determine expectations;

2. Deconstruct the current design and image of the OAE and define a new style guide;

3. Based on the previous point, make an in-depth analysis of the website and platform. Focus on tasks and the interface; Define the tools for the next phase.

Phase 3: Develop

The Develop phase concerns the design concepts and subsequent implementation of the most viable options. It is during this phase that a Service Blueprint gets created, in order to represent the service over time – in this case, the OAE and all the different parts of the website and platform that make it work. This is useful to ensure the user has a meaningful experience and that the design of the system itself is consistent (Design Council UK, 2015c: October 9, 2018).

Following this, after the features for the interface, tools and frameworks have been approved, starts the implementation cycle of the prototypes. Previous steps will be considered and revisited if necessary so that the team may test components, further inspecting what doesn't work.

Overview

1. Create Service Blueprint: user journey maps in order to map a user's progress through different stages;
2. Use previously defined style guide to implement the new redesign;
(extra)
3. Documentation for the open source code;
4. Formalize style guide for the OAE.

Phase 4: Deliver

By verifying any final constraints or issues before delivery, this phase serves as a way to assess that the items off the production line are fully functional. The solution implemented is scrutinized and tested, but there is some modicum of flexibility given the method's iterative basis.

Overview
1. Deliver website;
2. Deliver platform;
(extra)
3. Finalize and deliver documentation;
4. Deliver style guide.

5.2 Technology and Implementation

A functional approach in the design of web interfaces requires pre-planning suited for a variety of devices. When designing for modern browsers, it is necessary to consider cross platform layouts and the guidelines for best practices — but the paradigm shift to mobile first trends in UX cannot neglect the most common denominator, which is still desktop. This poses a complex issue to designers and developers who are required to create and then implement using strategies that ease this transition, now with the aid of Web Components (MDN Web Docs).

The following subsection is dedicated to defining the technologies and frameworks used during the implementation of the website and platform. What follows is a comprehensive list that includes responsive-ready strategies aligned with the needs made clear by our survey results and subsequent mobile layout conversion.

Programming Languages and Frameworks

HyperText Markup Language (HTML)

This internship takes advantage of the latest evolution of HTML, called HTML5, the semantic markup language used for building diverse web pages and applications.

According to the Mozilla Developers docs, HTML is defined as the "most basic building block of the Web" (MDN Web Docs), being the tool that defines and structures web content into logical sections. The term Hypertext refers to the fundamental aspect of connection between web pages by using links, while markup is what HTML uses to annotate text, images and content for display in a browser.

Cascading Style Sheets (CSS)

Cascading Style Sheets (CSS) is a stylesheet scripting language and one of the core standardized languages of the Open Web for browsers, following W3C specifications. CSS syntax and rules are used to style HTML content in web pages – for example, one of the most basic iterations of CSS styling includes altering the font, colour and size of the displayed content and the use of patterns or frameworks to manipulate the layout have become normalized.

Syntactically Awesome Style Sheet (SASS) and Sassy CSS (SCSS) SASS is the acronym for Syntactically Awesome Style Sheets, a superset of CSS and the oldest and most popular CSS Preprocessor in the world. Launched in 2006 by Hampton Catlin and later developed by Natalie Weizenbaum, SASS is established at the forefront of CSS Preprocessors due to its maturity and stability, ahead of others like LESS and Stylus. Sassy SCSS (SCSS) is an alternate approach to SASS and was coined thus due to its advanced features and advantages over conventional CSS.

As the complexity of stylesheets grows, CSS files have become harder to maintain due to their increasing file size. The use of preprocessors like SASS fix the inherent limitations of CSS which result in difficult code maintenance and scalability, a specific issue when working on large scale projects and with multiple CSS stylesheets. SASS uses yet inexistent features in CSS like variables, nesting, modules, inheritance and other elements as shortcuts to reduce the output size and optimize compiled CSS files by seamlessly automating menial tasks. However, it should be noted that since browsers only understand CSS, the preprocessor compiles SASS syntax into native CSS code to be interpreted correctly and avoid cross browser compatibility issues.

The main difference between SASS and SCSS is the structure and shortcuts within the code, which can be used to shorten previously defined functions. Both use the same .scss extension, but while the structure of SASS is visually cleaner and quicker than SCSS, it is sensitive to white space and doesn't support inline CSS yet.

Overall, this approach helps to store information and later reuse it, which eases the process of development as we can apply modularity to individual components in organized code.

JavaScript (JS)

JavaScript, abbreviated as JS, is a lightweight, compiled programming language for implementing complex and dynamic elements on web pages. As the most well-known scripting language for Web pages, JavaScript runs either on client or (Web) server side and supports prototype based object construction. As such, it works both as a procedural and object oriented language that creates objects programmatically by attaching methods and properties to an empty source.

With JavaScript events it is possible to trigger reactions by the user or the browser, such as changing the content of an HTML page while loaded in the browser (Duckett, 2014, pp. 4-6). In conclusion, a high level definition of JavaScript would classify it as the functionality and behaviour of the page, while HTML is the structure and CSS the appearance or presentation (reference, mozilla).

Functionalities

HTML
Used to define and structure content for the website and platform.

CSS, SCSS
To style layouts in a way that allows for reuse of code and facilitates code maintenance for modularity purposes in the future.

Javascript
Used to make pages interactive and create scripts that react to events.

Polymer
JavaScript framework created by Google that relies on patterns to build smaller and faster web applications.

Bulma
Lightweight CSS framework based on the Flexbox layout that is similar to Bootstrap, revolving around idiomatic templates.

Eleventy
Framework that automatizes the creation of websites and blogs.

Early on, during the preliminary assessment of the necessary tools for implementing the project, the best candidates for CSS and JavaScript frameworks were Tailwind and Vue.js. Eventually, it was decided that there were better options to explore. As a utility-first CSS framework that allows the developer to build custom user interfaces by composing classes together like Lego blocks, Tailwind was a reasonable choice given that it is not a UI kit, allowing the developer to implement a custom design. The nature of this framework would play along with web components and the incremental approach used by Vue.js, as a progressive Javascript framework for building user interfaces.

However, after further research, we found that despite Tailwind's obvious progress in catching up to stronger frameworks, its community has not yet been able to create the necessary functionalities to help improve accessibility or gather enough reliable documentation. For the former, at most there are packages that install individual focused only elements for screen readers, though they are not all supported by the official developers or updated.

Although Tailwind does bring distinct advantages over Bootstrap as it allows for greater flexibility and doesn't bind developers to a set of templates, we came to the conclusion that this framework was not stable enough to be used for the OAE. Given Apereo's role within high education and open source, the OAE redesign requires extra care with the implementation of accessibility basics. With the exception of Spectre.CSS, the other CSS frameworks listed above have a measure of ready-made accessibility elements for web interfaces. However, only two comply with the basic guidelines by fulfilling the WCAG 2.0 (A/AA/AAA), Section 508 – Bootstrap and Bulma. After experimenting, we opted to use Bulma with Polymer's LitElement framework.

In the meantime, all modern browsers have implemented the web components standard, making it universally supported. This opened up the possibility of using an agnostic native standard rather than a framework, something that is invaluable in avoiding technological vendor lock-in and obsolescence. Considering OAE is over 10 years old and that open source Edtech is a long-term game (universities will likely be around for a few more decades) the OAE team took interest in this approach and eventually picked it approach over vue.js.

At the same time, the Polymer team released LitElement and lit-html, two web components friendly abstractions that support most modern browsers , including Microsoft Edge, which made LitElement the most attractive option to develop WCs.

5.3 Interface Design

5.3.1 Deconstruction of the OAE Brand

Logo

The logo for Apereo and the OAE were created several years ago by Peter Varadi. The latter has remained unchanged ever since the launching of the project and, for the purpose of this internship, remained mostly untouched with minor modifications. As a symbol that represents the entire brand and identity, it gives us a good starting point.

Symbology

1. When one looks at the logo, two elements immediately pop out:
2. The symbol representing the O;
3. The typography for the a and the e;

The clear symbology inserted in the logo already conveys a very strong message regarding the values of the OAE. As previously mentioned, the OAE shares its core values with Apereo. The usage of an icon for the O, which means Open, can be extrapolated to link the concept of community, networking and sharing to Open Source. As such, the utility of a mark this simple helps set the OAE apart from other businesses by giving the platform its own identity.

Font

The typeface used for the logo is a reconstruction of a sans-serif font based on the original Apereo logo. Both logos use lowercase to best channel a more modern look which does not seem so traditional and serious, while keeping the sense of innovation, stability and objectiveness. Lowercase also transmits an approachable and casual vibe, which allows companies to relate to their target audience.

Colour Scheme

Colour helps us interpret a brand by perceiving the corporate image as whole. In fact, it plays a key role in logos as it conveys a message. While different hues transmit a specific emotion, the OAE chose to use blue, white and black as its main colour palette. From this decision we can extrapolate that the brand is supposed to convey:

Blue: trust, strength and dependability;
Black and White: credibility, cleanness, balance and simplicity;

Thus, the colour scheme chosen to identify the OAE is not only on par with the values of Apereo, but also gives us a clear notion of what to expect for the rebranding.

5.3.2 Redesign Proposal

The following subsection will be split in six parts: interface design, wireframe and paper prototype, colour scheme, typography, iconography and page mockups. Jesse James Garret (2011: 34-52) states that the goal of a website should focus on user needs. Now that these are defined, the design for the new OAE interface will take into account the good principles of UI/UX in order to provide a meaningful and valuable experience (Morville, 2004: January 2, 2019).

Interface Design

The interface redesign went through a process of discovery, starting with: a detailed research of the context of the OAE within the Apereo Foundation, gathering user related data (such as background, expectations and needs), defining tasks and important features, identifying painpoints, evaluating competition and organizing a comprehensive style guide that would serve as the main structure.

Nowadays, most users access a browser with their mobile phone instead of a desktop. When redesigning the OAE, our main concern is to adopt a system that allows for cohesiveness and accommodates new reader habits online - which have changed since 2010. Thus, Google is a good reference for modular design, usability and accessibility on the internet, while keeping an open source philosophy.

After careful analysis of competition, the conclusion is that popular projects such as Sakai, having undergone a rebranding, focused on a simple, clean design that is user centred. In fact, both the website and platform for Sakai boast of a responsive user interface that is optimized for desktop, tablet and mobile screens, completed with breadcrumb navigation bar and improved accessibility that is screen-reader compatible. These are all important features to take into account for the new OAE, as non-desktop users now make most of the traffic. Furthermore, accessibility is paramount in the educational field.

https://oae.apereo.org/

Navigation

Main Section/Button to OAE

Mobile Layout

Navigation

Main Section/Button to OAE

Features,
Video Tour,
Testemonies,
Community Links

Footer
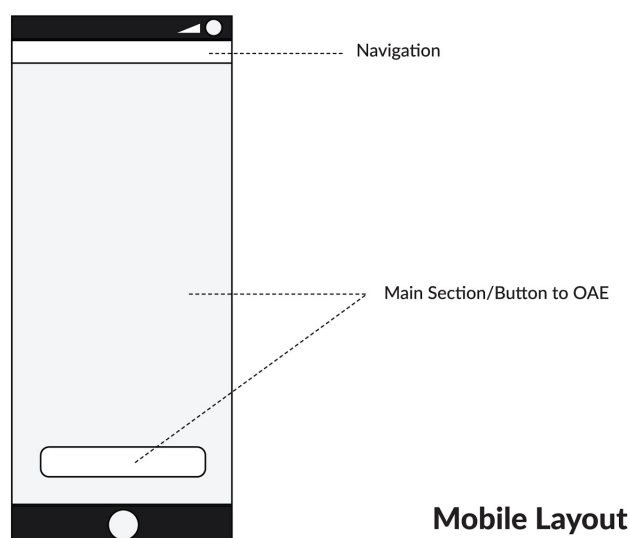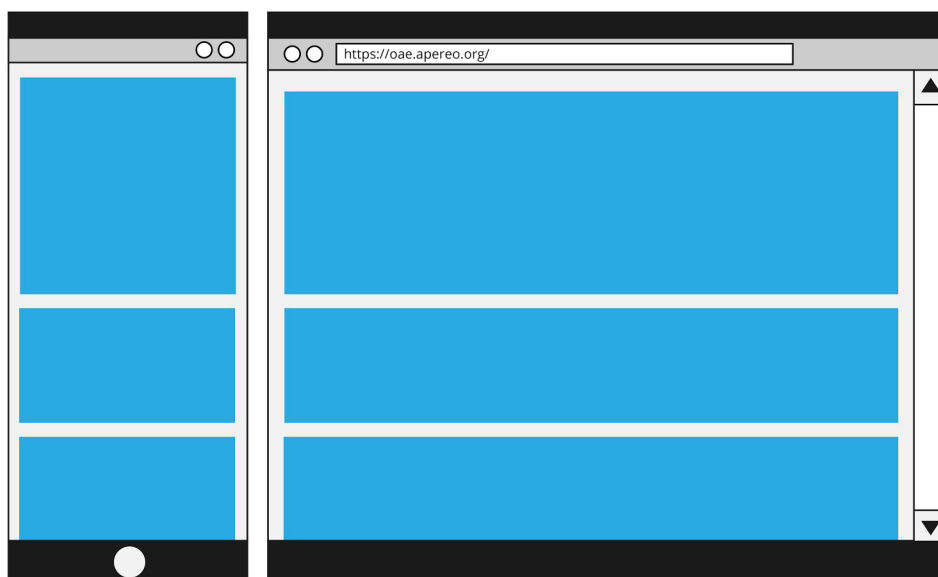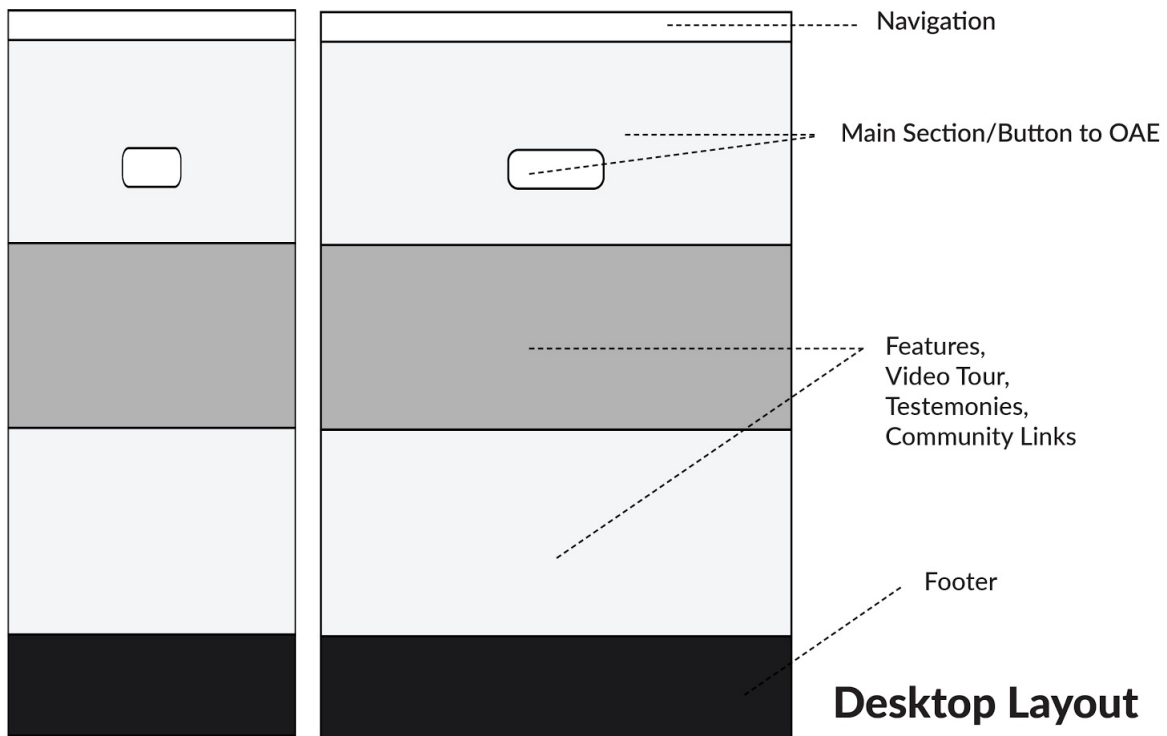
Desktop Layout

Figure 34, 35, 36 - Example of layout behavior under web components system. Responsive desktop and mobile mockups provided.

Thus, the strategy adopted will:

1. Follow the good principles of interface design;

2. Improve the current design by implementing a modular system that allows for responsiveness;

3. Comply with WCAG 2.0 (A/AA/AAA), Section 508 for accessibility (focus elements for screen–readers, contrast between colours and a clear hierarchy).

For this purpose, the rebranding will adopt an accessible responsive layout. Since we will be working with Bulma as the primary CSS framework, flexibility in layout creation will also be a necessity. The UI itself will have a hybrid style somewhere between the guidelines of Google's Material Design and Apple's Flat Design, so as to take advantage of the perks of both approaches and minimizing their aesthetic and functional flaws.

Colour Scheme

The colour scheme used will take into account the main colours from the OAE: blue, white and black. This decision was prompted by the constraints referred to in 3.3, as the new layouts must retain a certain level of familiarity with the previous design.
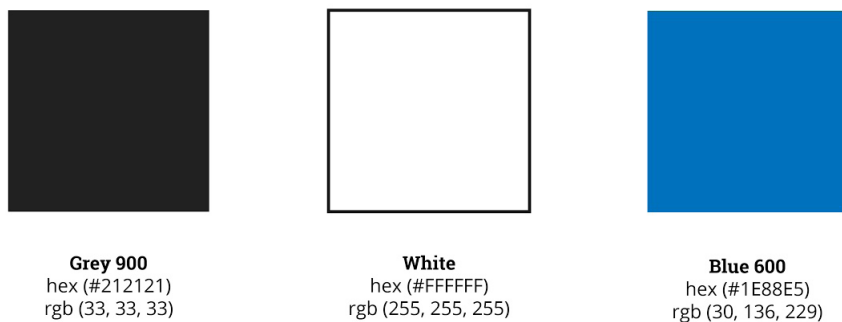
Grey 900
hex (#212121)
rgb (33, 33, 33)

White
hex (#FFFFFF)
rgb (255, 255, 255)

Blue 600
hex (#1E88E5)
rgb (30, 136, 229)

Figure 37 – Primary colours.

The OAE blue is a colour that should stand out from the others. This shade was chosen directly from the Material Design colour palette, as it is the closest in hue to the original present in the website and platform.

The secondary colours are an accessory and complement the design whenever necessary. Their function is to be an extra, and will be featured in navigation, links and backgrounds.

Blue Grey 50
hex (#ECEFF1)
rgb (236, 239, 241)

Blue Grey 100
hex (#CFD8DC)
rgb (207,)
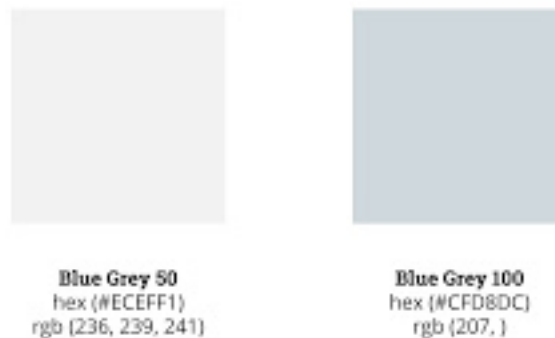
Figure 38 – Secondary colours.

Typography

As per Lupton (2014: 48-75), in order to keep with good design guidelines, the fonts used will be Roboto Slab and Open Sans, for titles and content, respectively. Both belong to Google's open source project, Google Fonts. This allows for a free use of any family developed under the project, be it personal, academical or commercial.

Roboto Slab will be used for titles as it is able to stand out from the content. The Roboto family was designed to bring balance between content density and reading comfort.

Roboto Slab Bold

0123456789
abcdefghijklmnopqrstuvwxyz
ABCDEFGHIJKLMNOPQRSTUVWXYZ

Open Sans Regular

0123456789
abcdefghijklmnopqrstuvwxyz
ABCDEFGHIJKLMNOPQRSTUVWXYZ

Figure 39 - Roboto Slab for titles.

Open Sans retains the quality of being legible, regardless of size and colour. It is also visually appealing, although the main advantages of this font are its consistency and readability, which allow for the user to read through content without disruption instead of just skimming through.

Open Sans retains the quality of being legible, regardless of size and colour. It is also visually appealing, although the main advantages of this font are its consistency and readability, which allow for the user to read through content without disruption instead of just skimming through.

Figure 40 – Comparison between Roboto Slab/Fira Mono and Open Sans/Roboto.
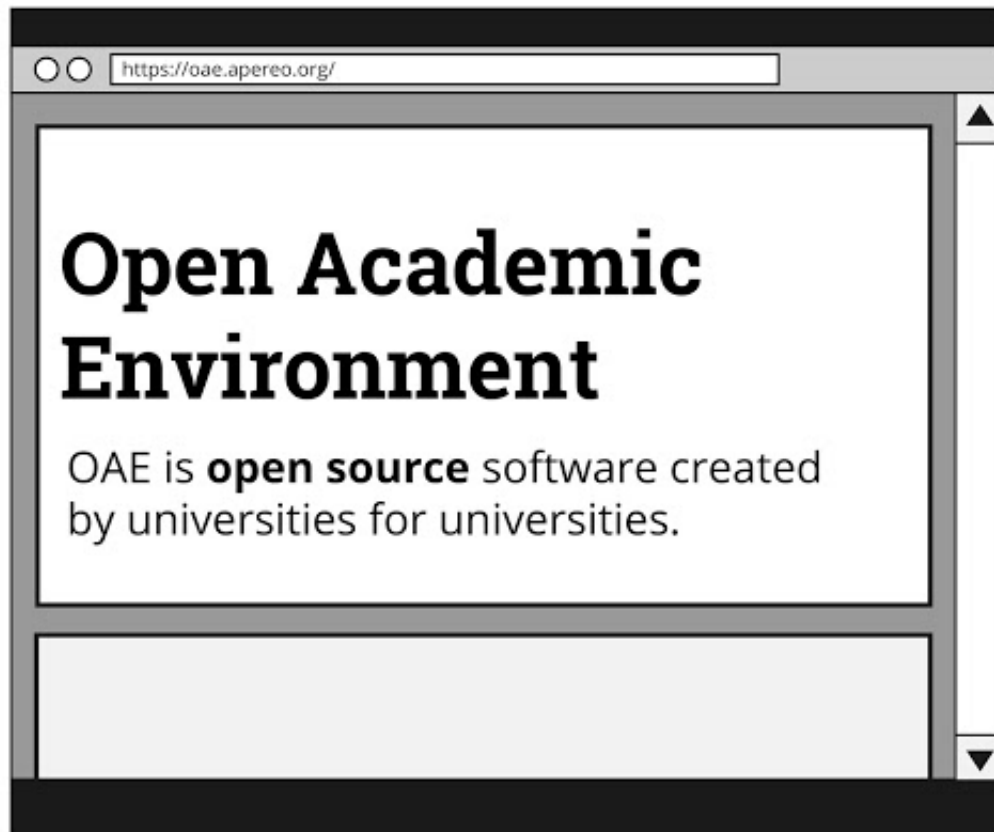
Figure 41 – Example of Roboto Slab and Open Sans.

It should be mentioned that a comparison between fonts is an important step to understanding how they will work on a screen. Fonts have different heights and widths, and thus their behavior will differ when combined with other fonts.

Iconography

During the first phase of prototyping, the iconography used will be from websites like Font Awesome, which design their own vectorized icon toolkit for designers and developers to use for free. Later on, during the second semester, customized icons will be created, based on a combination of Material and Flat Design principles.

5.4 Interface Guidelines

The style guidelines for the OAE serve the purpose of refining the mental models of users, which promotes a better perception of the way a system works. This manual makes use of visual clues and rapid reference aids, as this approach is preferable for high level knowledge - although structurally it is organized in a non-exhaustive, easy to learn-navigate-read basis that doesn't overwhelm the user unproductively (Gonçalves et al 2017, pp. 274-279. By making sure that there is a group of guidelines that uphold the consistency of style and terminology, future contributors to the OAE have a frame of reference for the development of the interface and a step by step guide for duplicating layouts).

Thus, the following manual is a complement to the annotations within the code of the OAE platform and website, respectively located in Github repositories Biscuit-ux and Jelly-ux (see: 3.2 Project Goals).

5.4.1 Style Guidelines

In order to keep a focus on the new design for the OAE, the manual structure was devised to introduce the purpose of the system, explain the changes in the brand and then follow with a detailed explanation of usage and visual norms for various elements. Examples such as IBM's open source Carbon Design, Apple's Flat Design and Google's Material Design were used as structural guidelines to build the manual and create a consistent visual. The colour scheme reflects the OAE palette.

The format chosen was an eight column layout based on the good principles of readability for technical documents, an approach that supports images and diagrams of reasonable dimension (Gonçalves et al, 2017, pp. 278-280). It is structured as follows:

1. The manual is split in five sections: Purpose, Logo, Typography, Grid and Interface;

2. The index at the top row (fixed header) contains hyperlinks to sections of the manual. These are highlighted in accordance to the currently viewed page;

3. Inside the body there is a large area for content and a smaller column on the left for quick points.

Each section is introduced with a brief paragraph that is easy to skim through, as it contains simple, quick information adapted for the target audience: designers and developers. Indeed, a non verbose structural guide focuses on a unique set of needs within a context of familiarity to expert users (Gonçalves et al, 2017, pp. 274-276) . An additional inclusion of useful assets to aid development are available as links for material design icons, logo variants in .svg and .png format and the Github project for further instructions.

The icons used in the manual are the same from the OAE website and platform, taken from Google's open source Material Design icon system. Like other interface elements, icons come with instructions for CSS programming functions and sizes.

A real life version of the manual is available at the OAE wiki, along with documentation for the project.

Purpose

This section lists the purpose of the manual and how it relates to the OAE project, making use of several important links that point to Github repositories, the wiki, website and platform. It contains a short introduction adapted from the Biscuit-ux wiki:

"Biscuit-ux and Jelly-ux are the experimental frontend for Apereo's Open Academic Environment. While the platform is based on the Polymer project PWA starter kit and uses Bulma, Jelly-ux uses Eleventy as a base framework. Visit the wiki for further documentation.

The OAE redesign follows Material Design guidelines from Google, which allows us to implement a functional and unified visual language system, consistent with the structure of Web Components. One of our priorities is to make sure the redesign complies with Accessibility Guidelines in order to enhance usability for all users."

Logo

The logo area was designed to serve as a wrap for guidelines regarding the construction, sizes, colours and best practices of the logo, referencing the assets available for download on the wiki in .svg extension.

"The Open Academic Environment brand is driven by its collaborative, community oriented goals and exists to serve the academic mission.

Although the briefing didn't ask for a redesign of the original OAE logo, we concluded it would be beneficial to transform it by addressing two main design challenges:

1. Keeping the familiarity of the logo;

2. Refining the dynamic of the brand according to the changing needs of the interface and OAE users.

With a simplified version, it became easier to adapt the brand into a modern layout."
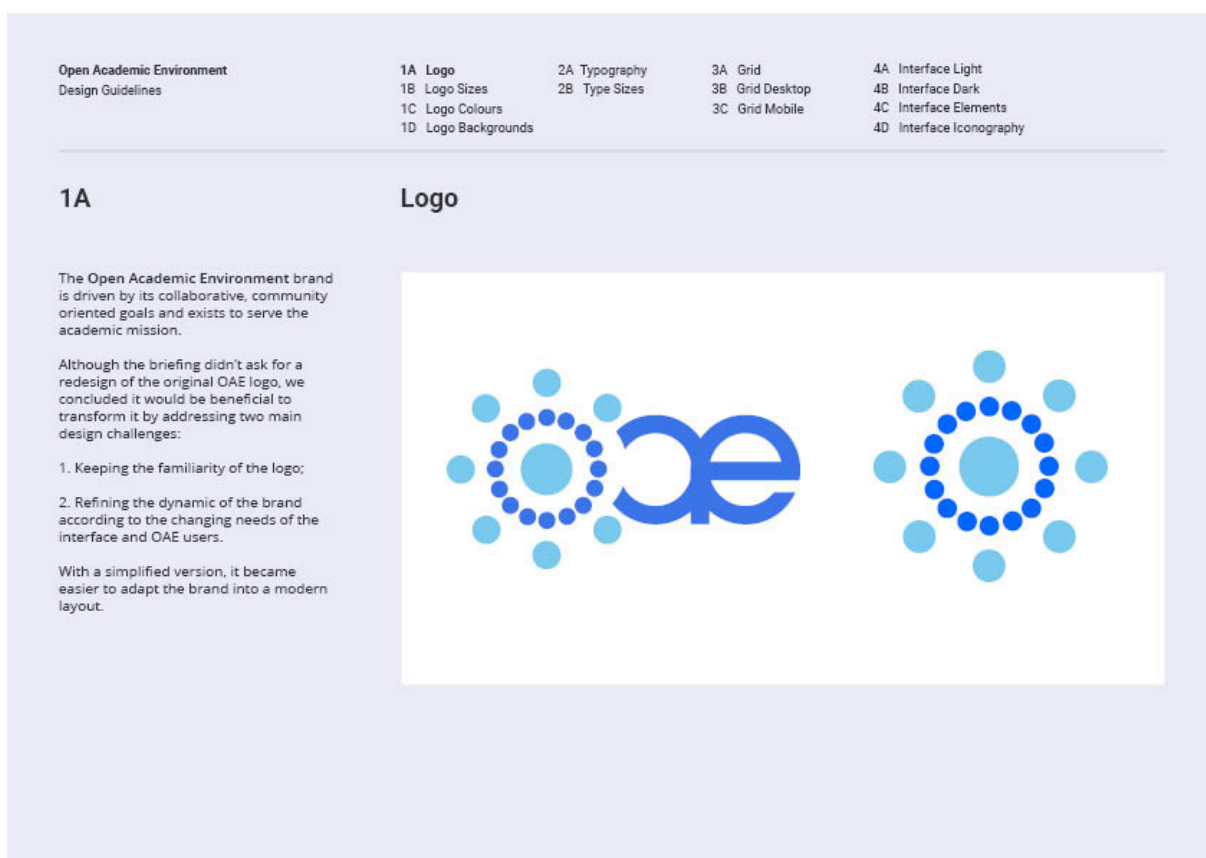
Figure 42 – Developer manual, section: Logo.

Typography

The typography section makes a detailed comparison between the two type families used for the project: Open Sans (Bold, Regular) for regular text and Roboto Slab (Bold, Regular) for headlines. As such, this comparison allows for an analysis of behaviour of the types in different contexts and elements, such as links, tags, general text in the body and menus.
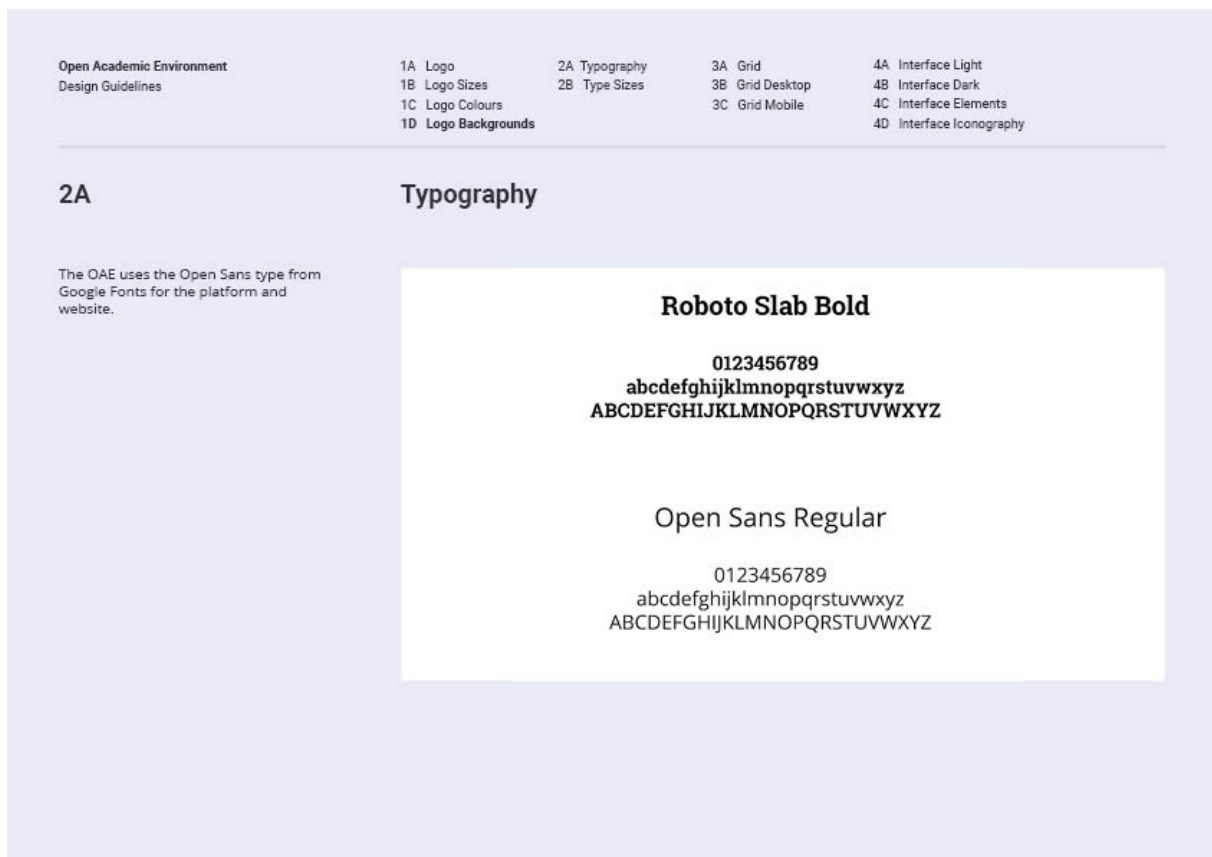

Figure 43 – Developer manual, section: Typography.

5.5 New Design Overview

State of the Art: 2.1 User Interfaces references how there can be advantages to an approach that guarantees a minimalistic design, indicating that this is a good principle as it facilitates the identification of relevant parts of the interface. Furthermore, use of graphic design guidelines produce visually appealing results when applied correctly.

The complexity of the OAE demanded a profound analysis of the functionalities for the platform and website, in order to obtain real data regarding the priority focus of the interface. During a primary research phase, identifying requirements was necessary as a starting point to understand the constraints of the project before a redesign proposal and prototyping, which was then followed by a survey to aid the creation of use cases and personas to outline user profiles. The skeleton of the proposal stands on a lightweight structure from the Polymer Project's LitElement. According to Daniel G. et. al, a minimalist design helps keep a balance between aesthetic, function and usability. To achieve this, Material Design guidelines were followed for templating and to customize layouts with Bulma's pre-created interface elements.

This setup allowed to set the foundation for reusable web components that can be customized or extended, as the building blocks for modern web applications. Google's LitElement and Material Design are prepared to accommodate these behaviors and usage specifications in their adaptable set of guidelines. In short, it is ideal to create a component when there is dynamic interaction between the user and the interface under the context of actions, input or communication. A base layout for the OAE platform includes the following:

1. Navigation (drawer, left);
2. Header (search);
3. Content

Figure 44 – OAE platform structure.

Each section is split into several components styled under the Material Design guidelines, ranging from cards, lists, navigation drawers, tabs, floating action buttons, text fields, breadcrumbs, dialogs and banners. Tidwell (2011: pp. 45–46) argues the importance of keeping crucial information without requiring the user to scroll to reach it and Daniel G. et al (2017: pp. 171–172) say that the most common place to find graphical elements is the center of the interface. As such, it was necessary to predict through logical determination the type of content that should be prioritized for users to focus on. The data gathered from the survey and interviews with the stakeholders helped establish a visual hierarchy for the layouts and adopt a patterned structure, so that the pages have a recognizable style.

There was a conscious effort to position objects within the page in such a way that it establishes relationships between elements and upholds the principles of space distribution. Non–perfect alignments would cause the interface to look sloppy, while blank spaces are a complement of proximity and should be used sensibly to provide a sensation of a clean and orderly layout. Repetition was used for the benefit of familiarity on elements such as buttons which are identical, with the same typography, colour and shape – depending on the interaction state (see: 5.3.2 Redesign Proposal).

What follows is a comprehensive explanation for the different pages of the OAE and the interaction patterns present on desktop and mobile devices, according to the best practices suggested by Tidwell.

Navigation

Navigating a website or application is a "problem" similar to commuting, which is to say that the best kind should be none at all (Tidwell, 2011, p. 77). The more convenient approach is to keep tools within reach on an interface and avoid clutter, so that the user has to travel short distances.

As referenced in 4.3 Use Cases, most internet users fall in the category of advanced beginners. We can expect the OAE target demographic to share a similar level of contextual knowledge. If the most common type of user is defined as looking to complete tasks instead of learning concepts, then an optimization of the interface will ease task realization. Indeed, many of these users will ignore the rest of the interface in favour of the sections they need to complete a set of tasks.

When developing the navigational models for the OAE, we analyzed patterns that indicate good usability practices to help users navigate by telling them where they are and where they can go to find the way towards their goal – also known as Wayfinding. Based on Tidwell's guidelines (2011, pp. 77–78), we used the following common sense features to help users figure out their surroundings (Signposts):

Good Signage
Label features which are clear and unambiguous. Displayed on the interface as menu labels, breadcrumbs and dropdown context menus.

Environmental Clues
These can be expressed by iconography, such as an "X" close button at the top right of a window, or a logo in the upper left corner of a webpage. Often culturally determined and might not be known to users new to the culture (Tidwell, 2011, p. 78).

Maps
Navigational aids defined as a larger frame of reference. Consistent layouts with good signage help users establish mental pictures of the space.

Additionally, we established a multi-level navigational model for the OAE platform where the main pages (Dashboard, Library, Discussions, Groups, Settings) are connected with each other, but subpages are connected only among themselves. However, the latter are also connected to the main pages via global navigation. As an example, it takes two jumps to access the library:

Dashboard –> Library

To access specific features like the Etherpad, it takes two to three jumps:

Dashboard –> Create File –> Open Etherpad File (New Window)

or

Library –> Open Etherpad File (New Window)

On the other hand, the one page website is defined by its fully connected model instead, with simple global navigation featuring a top menu that links every page.

Aside from the cost of latency of page loading times that can discourage a user from exploring the site, we tried to structure the OAE in order to maximize efficiency gain, with few context switches. As such, we made the interface task oriented and descriptive. Data from the survey shows that the OAE has many infrequent users, so these would be best served by a more self explanatory navigation with defined categories up front. This is an approach based on the Clear Entry-Points pattern, where the visiting user is gently guided into the application by unambiguous starting points, until the user gains more contextual experience.

These can be defined as an analogy to the concept of front doors and translate to interface tutorials or very clear menu navigation labels. (Tidwell, 2011, pp. 87-89).
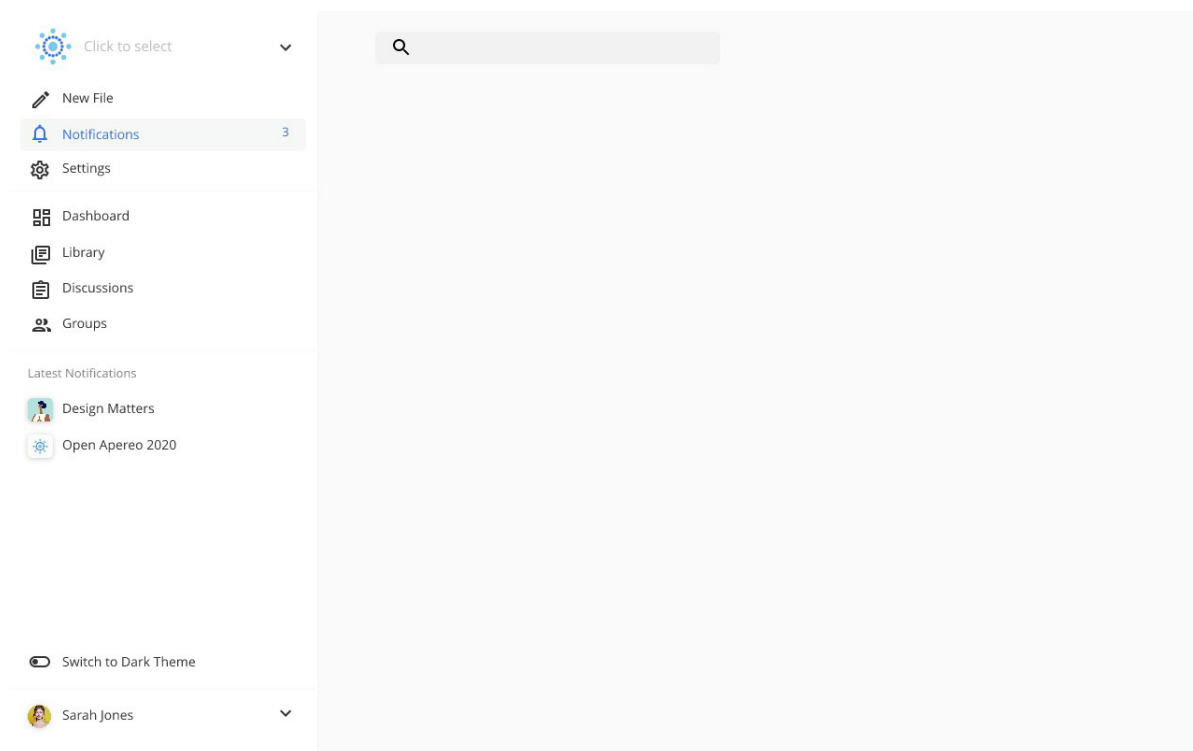
Figure 45 - Main navigation menu for desktop platform and website with the Clear Entry-Points pattern.

In case of misclicks or upon accessing the wrong page, we took advantage of elements such as breadcrumbs to adapt the Escape Hatch pattern to clearly take the user out of unwanted screens and back to familiar ground (Tidwell, 2011, pp. 104-106). We employed this method for the whole OAE platform, although it works best for the library file system since the hierarchy levels can be too deep. Sometimes, global navigation isn't enough to show the user a "You are here" signpost and extra help is needed. (Tidwell, 2011, pp. 121-123).
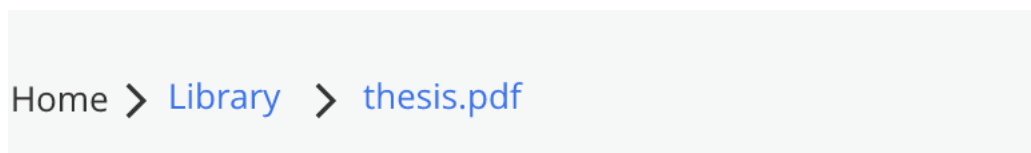
Figure 46 - Library breadcrumbs for the Escape Hatch pattern.

Figure 40 demonstrates an example for the breadcrumb approach with clickable links. These are a navigational device on their own found only in the OAE platform, as it was unnecessary to implement a similar system for the website.

As shown in Figure 39, the desktop version for the platform uses a standard static drawer menu that is permanently visible. The menu has been enhanced with dividers to create hierarchy and is split into four main areas: context, settings and files, app pages and notifications. At the very bottom of the menu, there's a toggle button to switch theme colours into dark or light mode and, under the toggle, is the avatar which opens a dialogue box with the option to log out of the OAE.
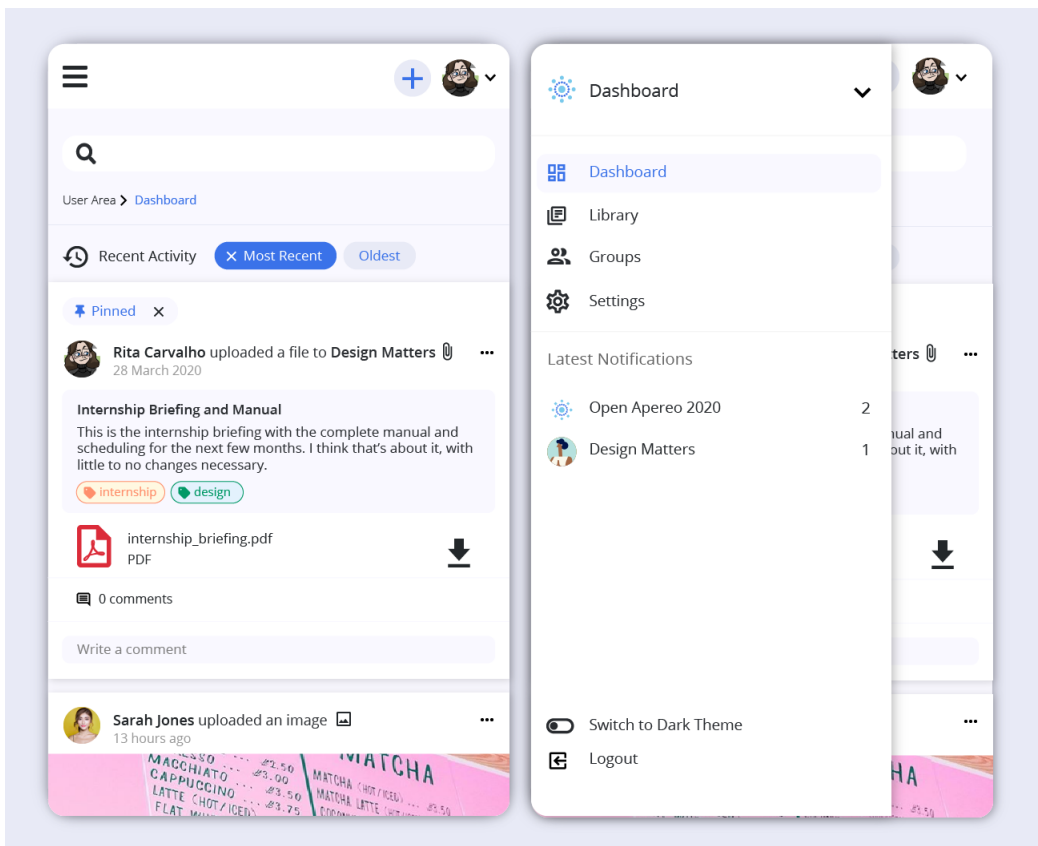
Figure 47 – Main navigation menu for mobile.

The main navigation menu for mobile is a modal drawer, easily identifiable on the top of the screen by tapping on the hamburger button. Clicking the button opens a drawer menu that slides from the left side of the screen, as the menu is only visible after interacting with the triggering icon. We concluded this would be the most suitable approach for small devices, as it keeps the various features and functions available in the desktop version organized in an intuitive way that allows the user to quickly navigate between unrelated destinations.

For the first drafting phase, we considered reducing the number of icons to contain only the most useful for the user, given the limited horizontal space and issues that may arise with notched devices – as opposed to the desktop version, where the navigation expands in full.

The result is a clean layout for both devices types that obeys the three principles of drawer navigation: identification, organization and context. As such, through a process of context and familiarity, the user can easily understand how the menu works, from left to right, by:

1. Quickly changing context to recently viewed groups;
2. Easy access to the main areas of the interface;
3. Clicking the hamburger icon to expand the drawer (mobile);
4. Interacting with the avatar, which alerts for new notifications (mobile).

The context change dropdown has the same function in both devices. It should be used when the goal is to switch between groups or access the user area.

The platform drawer menu has three levels of navigation hierarchy: the first is used to switch context between groups and useful shortcuts, the second includes the main pages and the third is a notification list for user and group feed that have been updated with new content. The end of the highlighted section displays the number of notifications missed.

Upload File/Create New

A dialogue, or modal window, pops up on the interface upon pressing the menu buttons for Upload File or Create New. The purpose of a dialogue is to be interruptive, and, as such, is an element that should be used sparingly, only to appear when it is necessary for the user to decide on critical information. These are useful to make sure content is addressed and not ignored, as the only way to make the dialogue disappear is by confirming or dismissing the action in focus.

The system is similar to that of the original OAE, although there are some key differences regarding aggregation and file location. In short, the former means that, with the redesign, we organized the navigation so that important browsing elements can be found in one place instead of being scattered across the interface, while the latter is in regards to the option of placing files within folders or adding tags upon creation.

Notifications

The Notifications page is a novel addition to the OAE redesign that lists all notifications – past and present. We based this layout on the Github and Twitter notification pages, which, from the previously examined case studies, better adapted this system into a clear and functional structure that is both visually appealing and organized.

As a prototype, it might not be implemented at the end.

This page follows a pattern called Lists, explained in further detail below (see: 5.5.3 Library).

The user has a dedicated page where they can filter messages by status (Read/Unread) and date. The interface allows the user to pin and delete notifications.
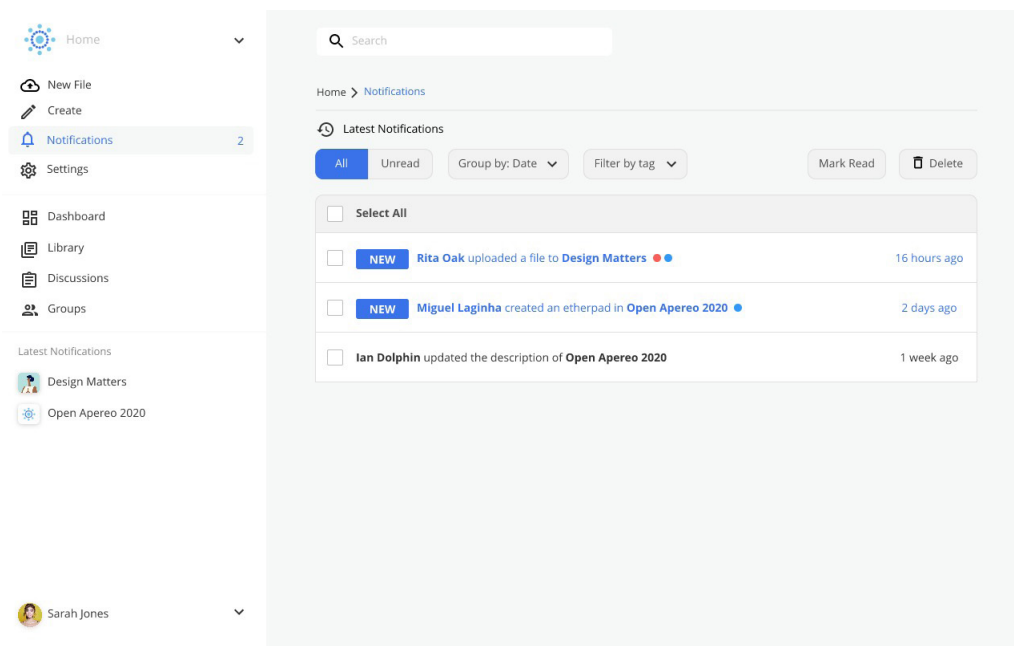
Figure 48 – Notifications page prototype for desktop.

Settings

Given how scattered the settings are in the original design, we decided to aggregate this section by adapting the Gestalt principles of proximity and closure. This creates relationships among page elements, instead of isolating them – which, in turn, adds a sense of distinction instead of group.

As such, the user settings are contained in one single page. By adding focal points in the shape of a visual hierarchy with implied lines to contain elements, we set a structured flow that draws attention to the right sequence.
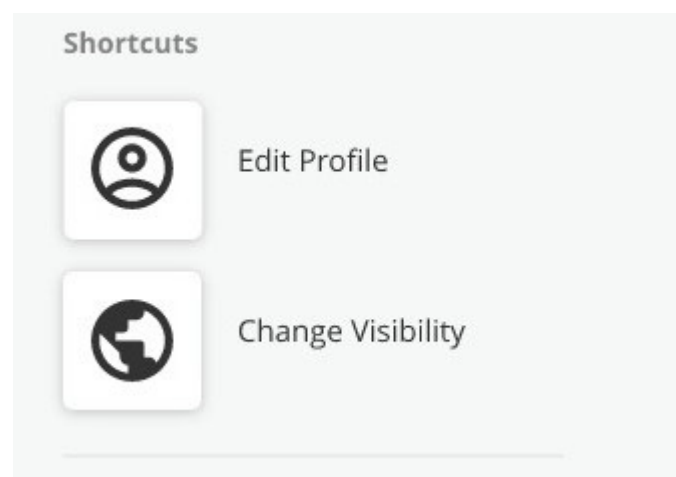
Figure 49 – Settings elements prototype for desktop and mobile.

On mobile, the user can see updates by opening the drawer menu, browse through Latest Notifications and choose one (opening a modal window with the corresponding messages), access the label Notifications or click the avatar for a quick jump to a comprehensive list. The last two methods go directly to the Notifications page.

The avatar has a simplified function on the mobile version of the OAE. While it contains a list of items on desktop (logout, enable dark/light mode, settings), these were instead integrated in the drawer menu, instead allowing for a more focused use by alerting the user of new notifications.

Search

As the search is a prominent feature in past and newer versions of the OAE, we looked to the mobile version of other websites which are highly search based - such as Wikipedia and Google - to better understand how to integrate it in an intuitive way.
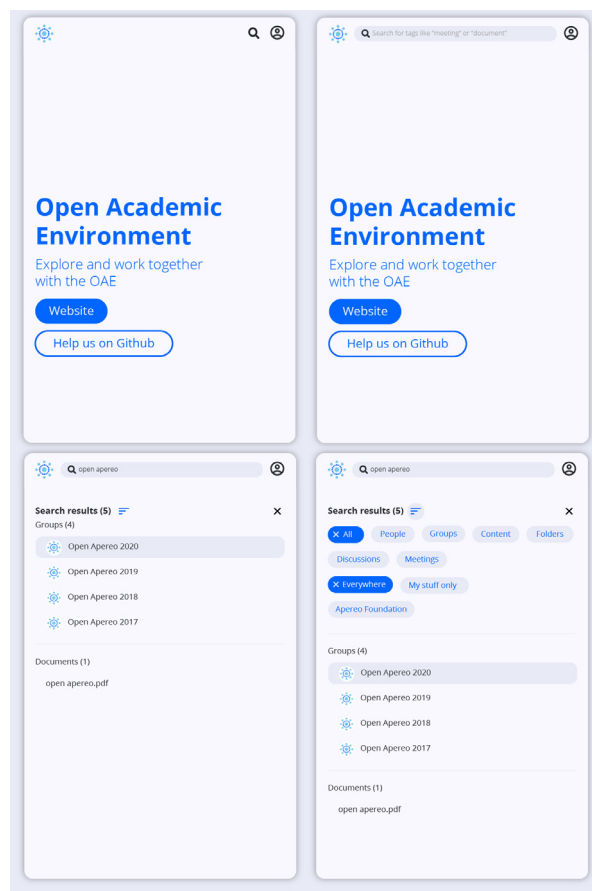
Figure 50 -   Search query results.
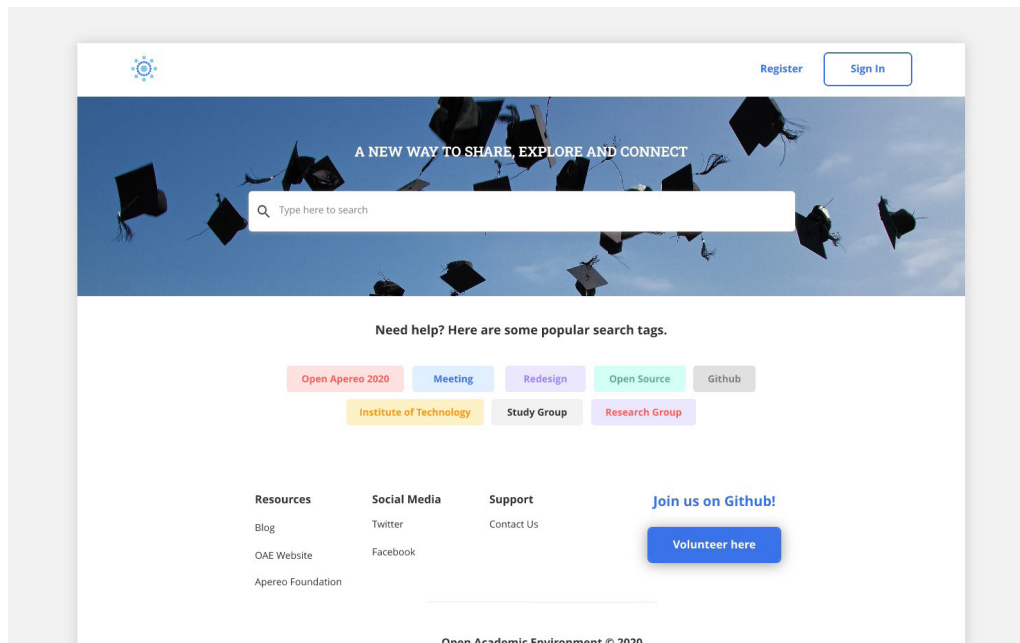
Figure 51 –   Desktop search, platform homepage.

The search feature is meant to allow users to find content. The OAE uses a basic search which requires users to input a query into a search text field to view results, although in the future we would like to extend it to include at least historical suggestions. For the redesign, we adapted the search system into a simpler, more accessible feature so that when the user inputs a query, it loads another page with the search results split into the following five categories:

1. Groups
2. Content
3. Folders
4. Discussions
5. Meetings

These categories can be further filtered to show files from the logged user or everywhere in the OAE platform, as long as the files are public.

Tidwell says that a search box should be placed in a prominent location and demarcated from the rest of the site - whitespace or a different surrounding background help add necessary contrast to the element, making it easier to find. The ideal scenario would be to make sure users don't confuse other fields with the search box, so a preferable location for it would be in an upper corner of the interface or in a banner across the middle top of the site (Tidwell, 2011, pp. 30-33).

It should be noted that other than the sign-in element, more text fields can cause unnecessary confusion around the search box.

On mobile, the interaction is different. At first, the search bar is under the nav, where it's displayed in full. When scrolling down, the bar is hidden and the icon appears next to the avatar on the nav, where it expands after being clicked. We adapted this approach from the Wikipedia mobile version and Google Material Design standards.
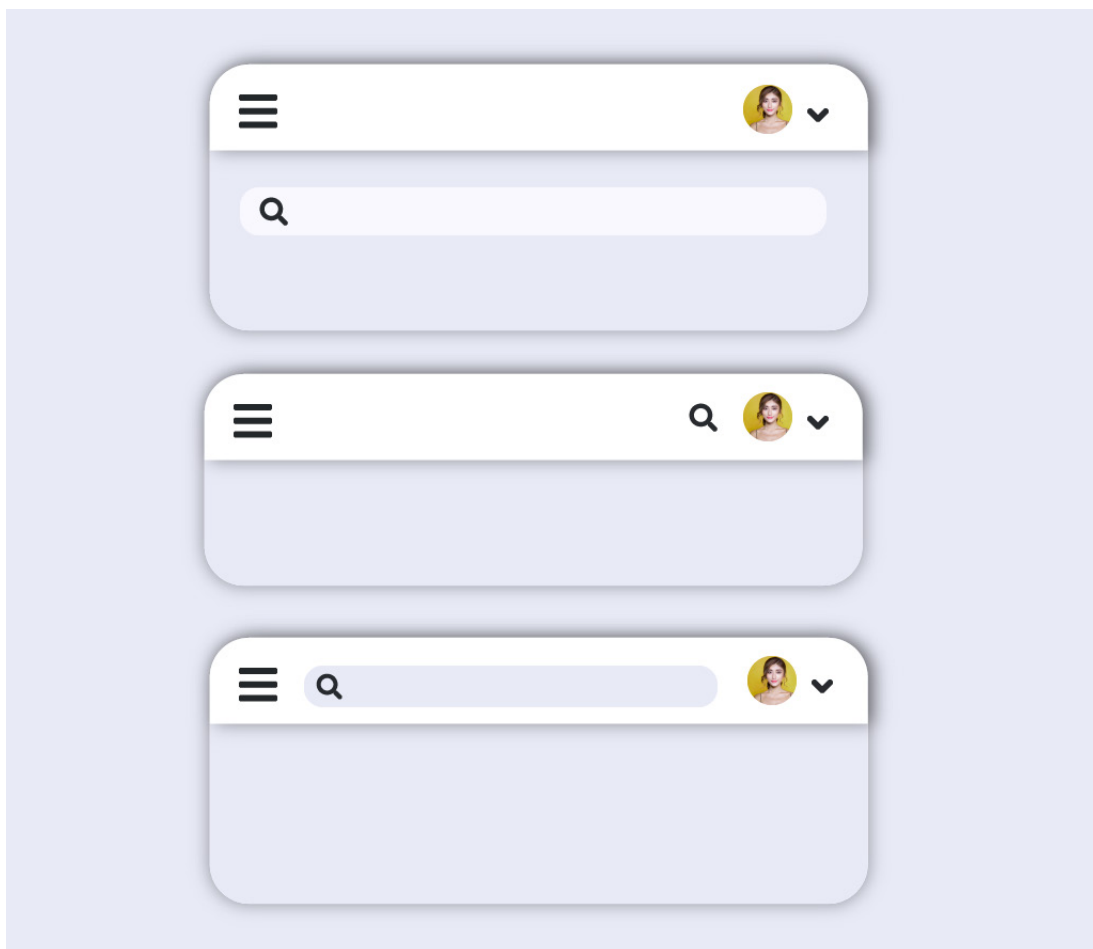

Figure 52 – Sequence demonstrating the behaviour of the search bar works after scrolling (the field is hidden on the app and appears on the top nav, where it can be expanded).

Sign In

The pattern for Sign-in Tools is useful for any website or service that deals with registration or users signing-in. It is pure convention in the sense that users expect the sign-in form to be located at the upper right corner of the interface - so unless the goal is to challenge the user, having tools where they are expected to be will contribute to a successful and gratifying experience (Tidwell, 2011, pp. 115-117).
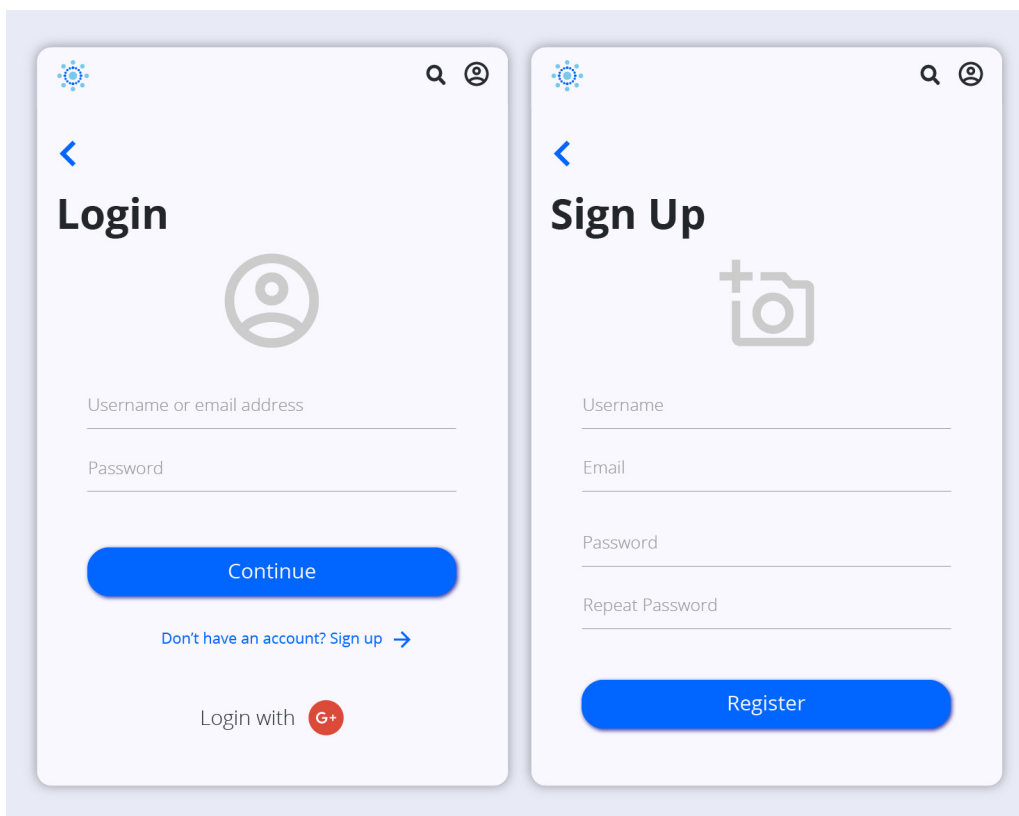

Figure 53 -   OAE sign-in form at the homepage.

As mentioned previously in the Navigation section within this chapter, the avatar serves more than one function on desktop and mobile devices, being a cluster of functions and useful notifications for the user. After signing in, the avatar is located in different spaces, depending on the device:

Desktop
Located at the bottom of the static drawer menu. The main desktop navigation is always visible.

Mobile
At the upper right corner of the top bar.

Dashboard/Recent Activity

The primary function of the dashboard is to show users relevant information that is customizable and updated regularly. Given their long history, there is an expectation of familiarity about how dashboards work and the kind of data in display, notwithstanding the various interlocking patterns and components that make them predictable to users (Tidwell, 2011, pp. 46-49).

Upon designing the dashboard, we had to deal with three constraints that would be a deal breaker to the page:

1. The user dashboard is essentially a news feed;
2. The group dashboard is a news feed as well, but requires a more focused navigation;
3. How to deal with white space when, for this phase, we are somewhat bound to the original features in the interface.

The first and second items imply a strategy that would not be dissimilar to a social media news feed, for all intents and purposes. We determined that the information users need or want to see in the OAE wouldn't necessarily mean infographics, but we learned from stakeholder interviews the broad idea was to engage users with the social side of the platform by creating a Twitter or Facebook-esque type of layout feed. The patterns used for the dashboard are thus not traditional, but adapted from the News Stream methods that show dynamic, time sensitive items in a reverse chronological order with an infinite scroll (Tidwell, 2011, pp. 34-39).

In short, the OAE user dashboard is meant to deliver news. The groups dashboard employs the same principle, but shows information pertaining to the activity of the group, rather than the users outside of context. This is an approach that also allows for comments and discussions in thread, as users can "like" items or provide an immediate response. We used Material Design cards to aggregate content into a single topic, adding text, images and icons in such a way that clearly indicate hierarchy.

The tag system was a feature requested by the stakeholders to resemble the Gmail filter system, where tags are an indicative of a topic, thus being easier to search the feed or library for specific labels.
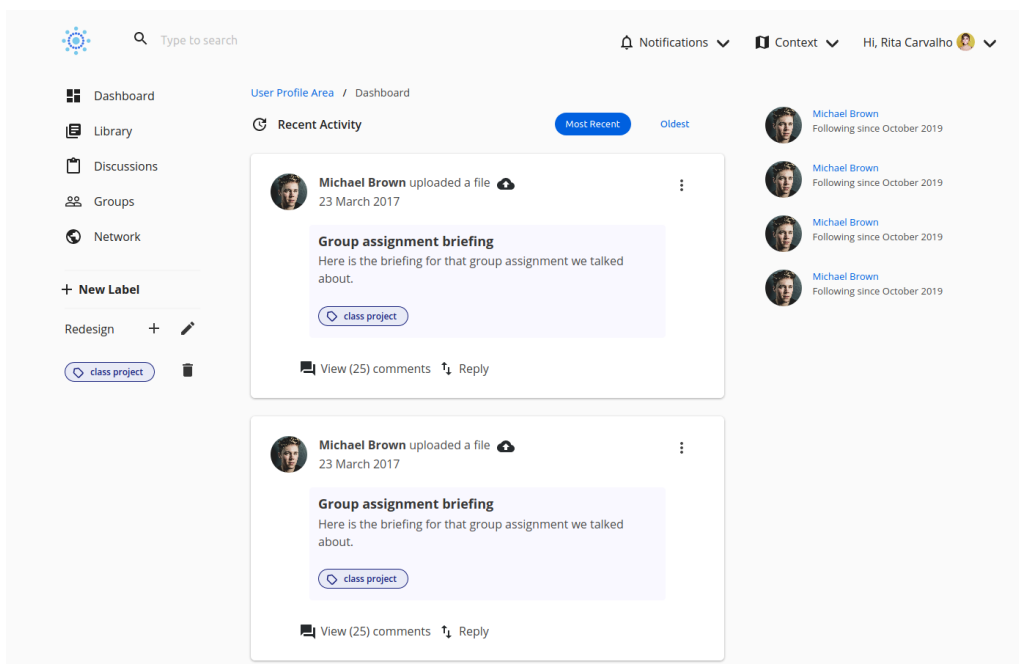
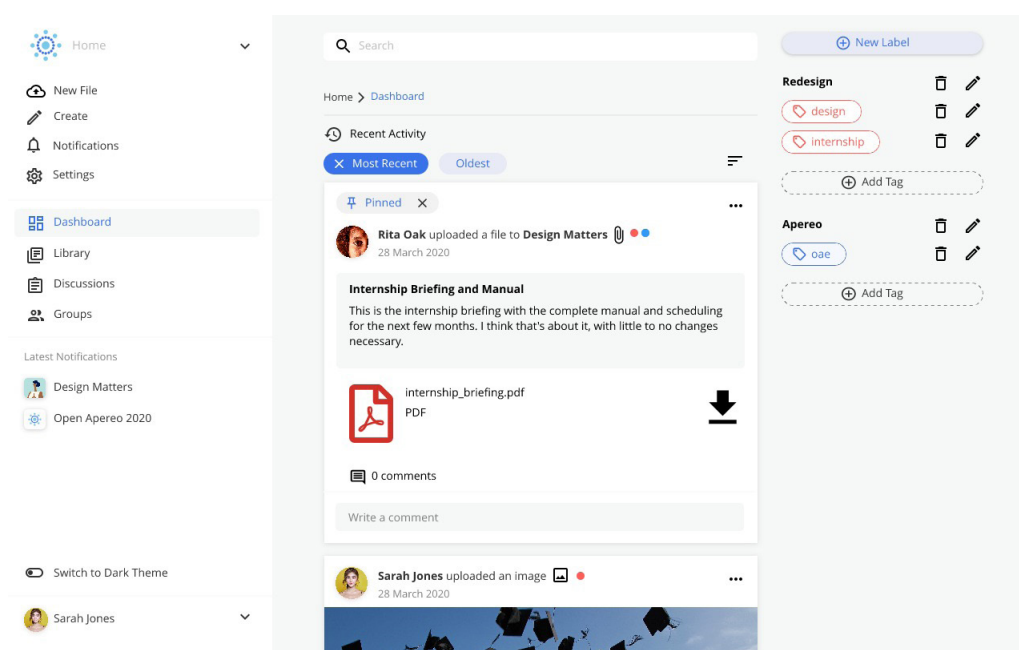**Figure 54** – Implemented dashboard version.

Figure 55 – Dashboard prototype for desktop, final version.

As a first draft, we ended up creating a very simple example for the Dashboard. While Figure 48 shows a more recent version of the redesign, the currently implemented one differs in the navigational structure for the main menu and position of the tag system.

The mobile dashboard is a more compact version of the desktop. Like on the desktop version, there's a special focus on the activity feed as it is how the users can check their activity. The filtering system shouldn't be too complex, as we are trying to filter by going through the oldest and most recent posts. This might change in the future if we add more options.
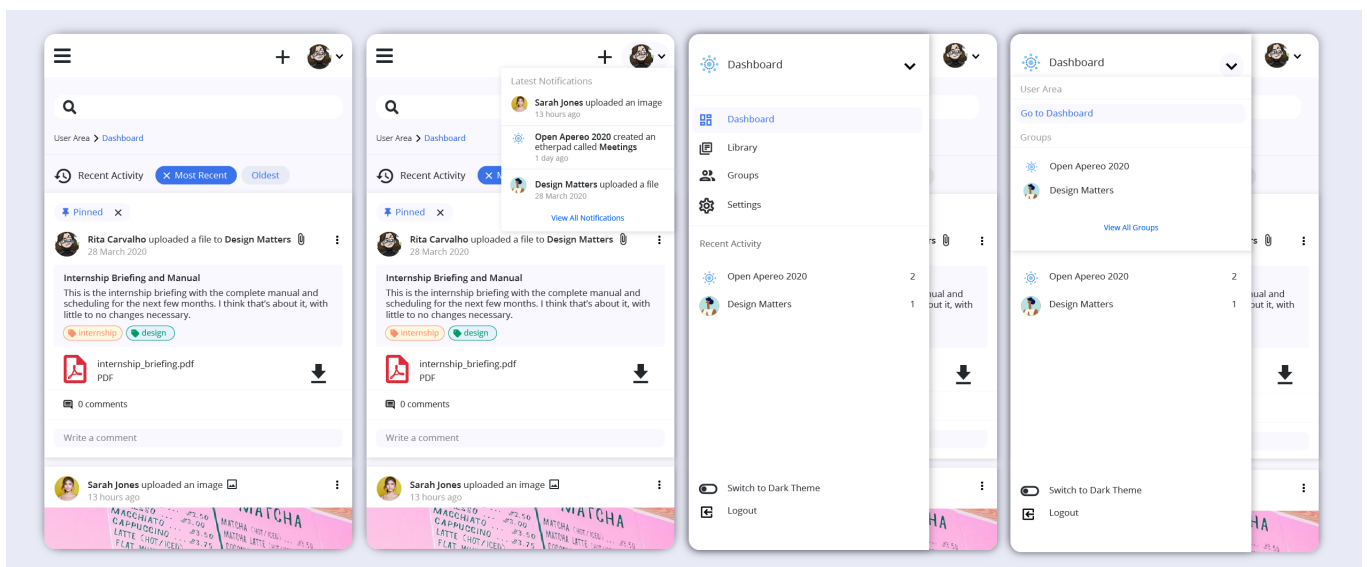
Figure 56 – Dashboard mobile prototype with a drawer menu that slides in from the left as an overlay. To open the menu, the user must click the menu icon button (hamburger).

Library

The OAE library is the section of the interface that displays all uploaded files and other content shared with the user by others. With our recent redesign, we adopted a strategy that takes advantage of the browsing patterns on desktop and mobile operating systems to create a UI that feels familiar when switching platforms. By fostering this type of focus, the user doesn't need to learn how to manage a new interface and the visual consistency further promotes common ground for teams and single users.

The library can be accessed through two distinct levels of context, with different levels of permission:

User Area

The User Area includes all the files uploaded by the user. Only a signed in user has permission to access their personal library. The user library is accessible through the main menu, by toggling the drawer menu or simply clicking Library on desktop.

Groups

The OAE groups library lists files uploaded by members. Depending on the visibility settings for the group, the library might not be public.
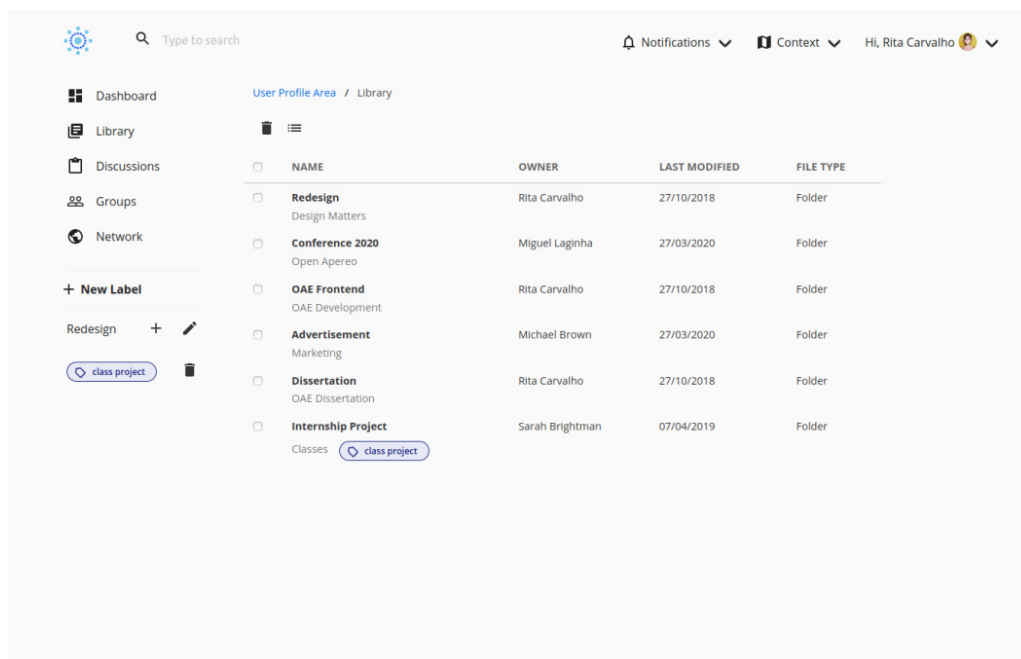

Figure 57 – Implemented library version.

To avoid confusion with the main navigation, we devised a tabs system where the user needs to press the library tab to access it within a group. This approach removes complexity from the interface and eases the user by providing more focus into this section, making the navigation simple and quicker.

The library uses tables to list files from users and groups, under the format of the Data Table element from Material Design. The logical structure makes the displayed content easier to understand, as it is conveyed in a meaningful way.
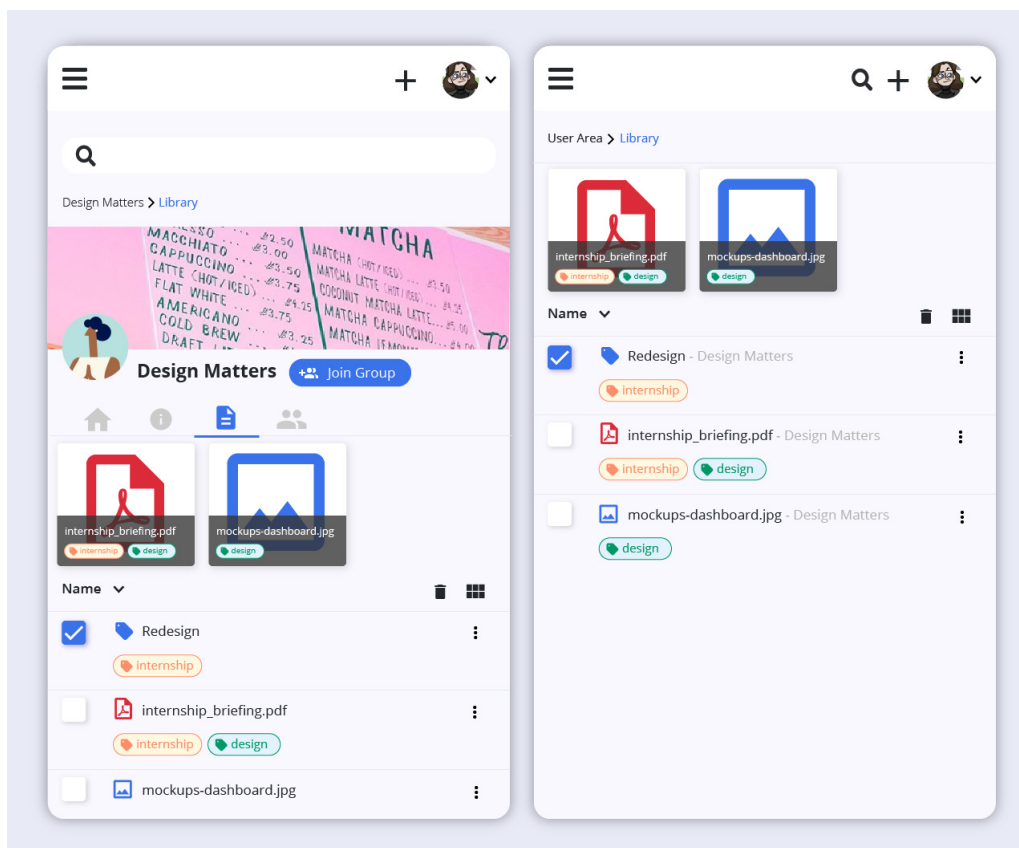
Figure 58 – Library prototype for mobile for group version (left) and user side (right).

Lists are used when a user needs to peruse, sort items or go through them, either randomly or in order. These are a common type of design of information that conveys the impression of careful visual representation. Interacting with a list means that a user can select, click or browse the list items with a specific goal in mind, depending on its dynamic behaviour - or lack thereof (Tidwell, 2011, pp. 191-193).

Given the large multi-column tables, we decided to use two shades alternately to have a visual separation for the rows. This is a colour block technique known by designers and cartographers, being part of a set of list related patterns that aid in the display of visual representations for item sets, known as Row Stripping - or simply called zebra stripping (Tidwell, 2011, pp. 220-224). One of the possible downsides is that this type of pattern does introduce some visual noise to the interface. Depending on context, users might find it to make tables harder to read, or that it slows them down. However, a single coloured table would benefit from this approach if it is fairly large, with many rows and several columns with wide spaces. Small tables, on the other hand, showed no benefit with or without. According to Tidwell, researchers have concluded that users prefer this method.

The preferred way to articulate this type of design starts by picking two saturated colours. These should be similar in value but not identical, as one should be slightly darker than the other. For this purpose, we used the OAE platform background as the primary colour and a lighter grey version for the strip.

This approach transforms rows into coherent visual objects, benefitting from the principles of Gestalt of continuity and closure. It also eliminates the need for horizontal lines between the rows.
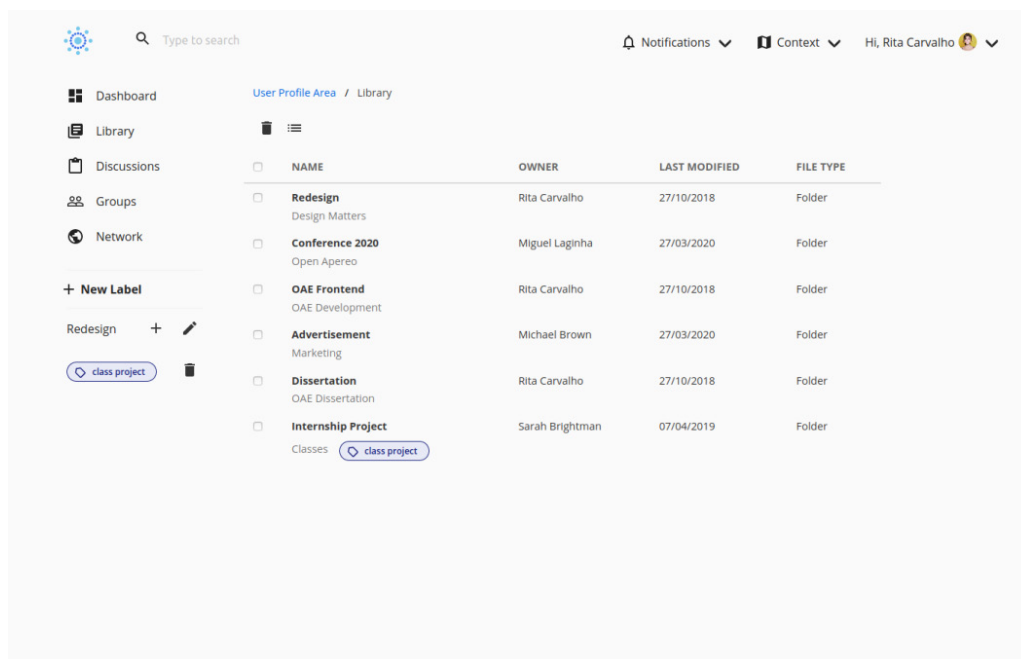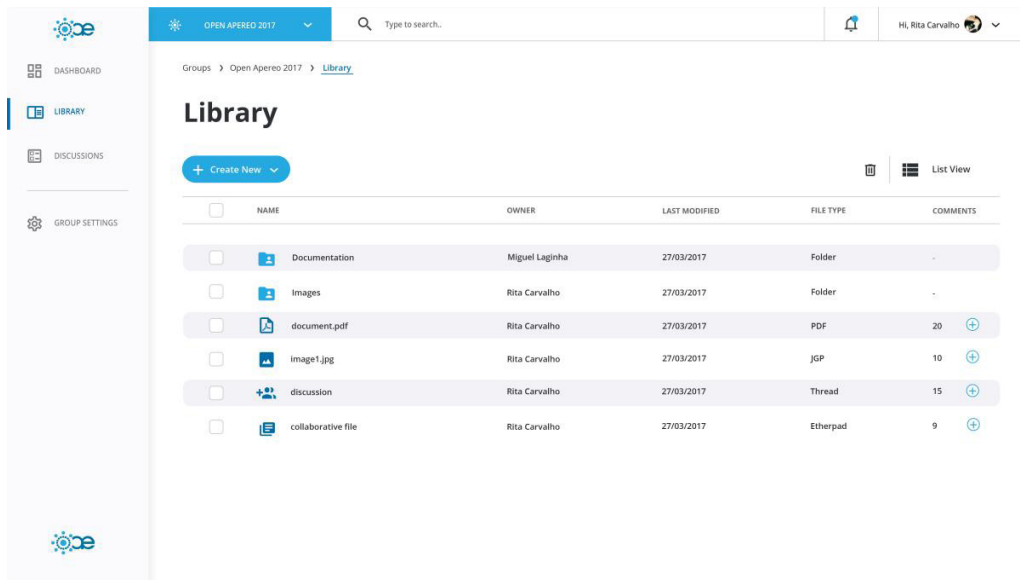

Figure 59 - Implemented library version.

Figure 60 - Previous mockup, row stripping example.

Groups

The purpose of an OAE group is similar to that of an online community, in which the goals of individual users are shared, providing a primary reason for belonging (Preece, 2000, pp. 5-13). Platform users can engage in active participation with other members and share support or resources through a feed that follows the same functional News Stream pattern of the Dashboard.

The group navigation had to be structured in such a way that didn't interfere with the main navigation and risk confusing the user with an overly complex layout. Within the groups, we are dealing with the same level of hierarchy and related content, even if it is distinct when on a set, due to which we used Tabs to organize content into categories.

To move between tabs, users can navigate by tapping a tab. Using a gesture swipe (left or right) within the content area is also an option for mobile, while scrolling through the tabs would be an alternative for desktop. The latter two are an ideal implementation for a later phase of the project.
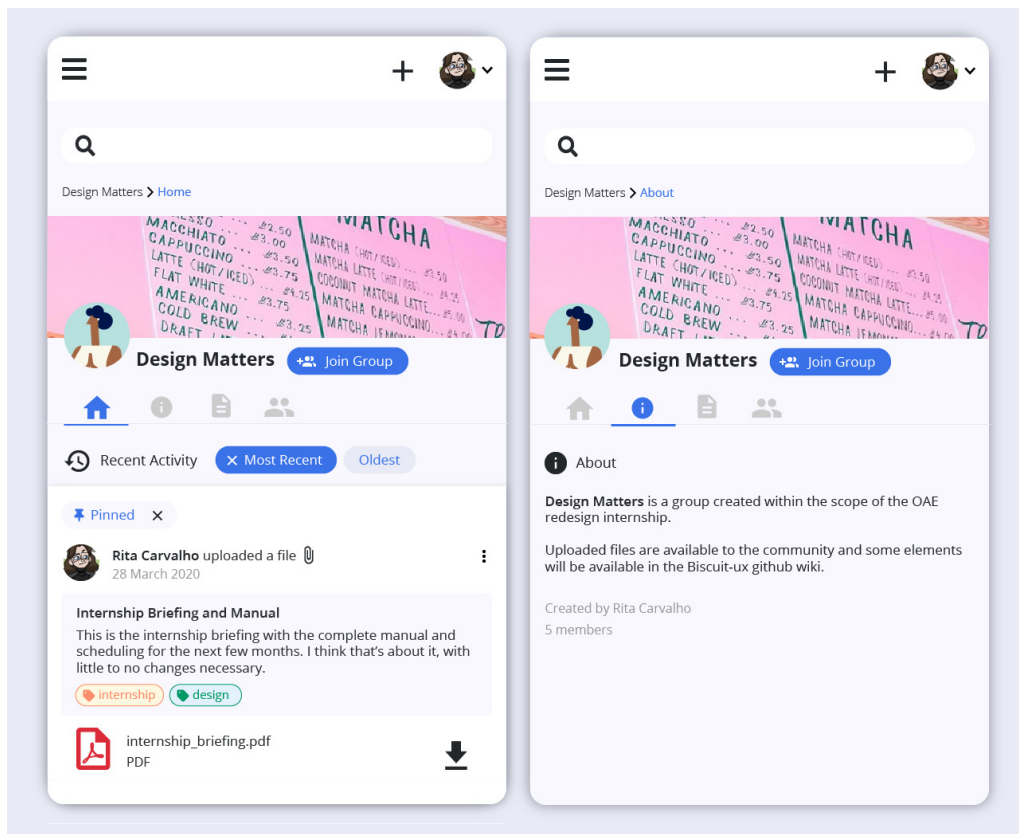
Figure 61 – Group prototype for tab navigation.

Unlike the original version of the OAE, all groups have an avatar to become better identifiable. During the redesign, we added the possibility of uploading a banner in a similar fashion as that of Facebook groups.

Elements such as the banner and the avatar, group settings, descriptions or visibility (whether public or private) are moderated by the group admin – which refers to the user who created the group. At a later date, we have plans to implement the following features:

Add more than one group admin (managed within the settings of the group);

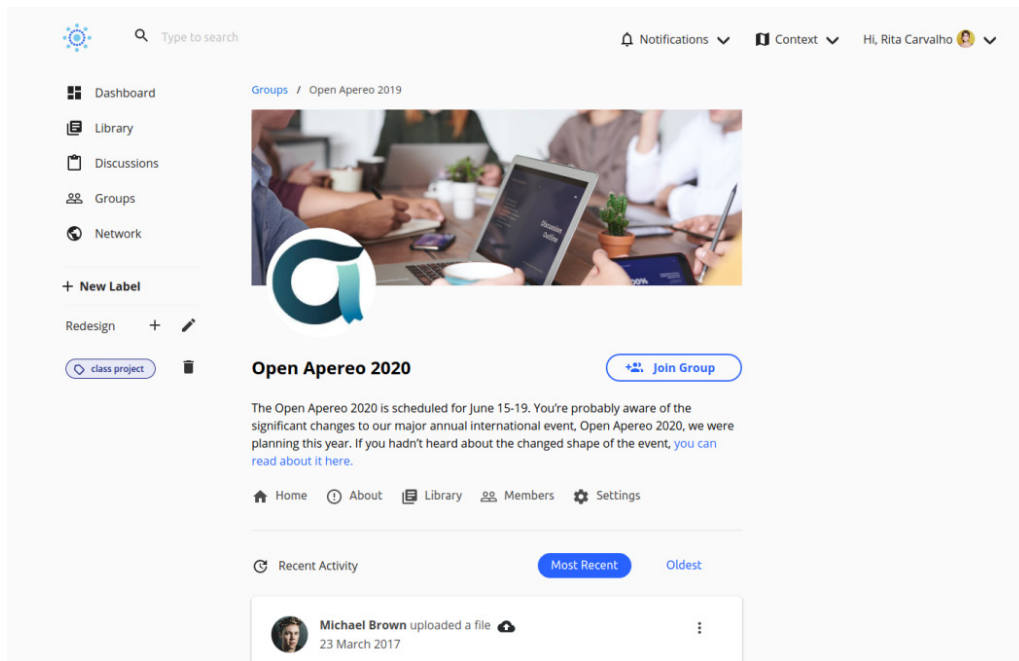Add an icon to see which users are online.
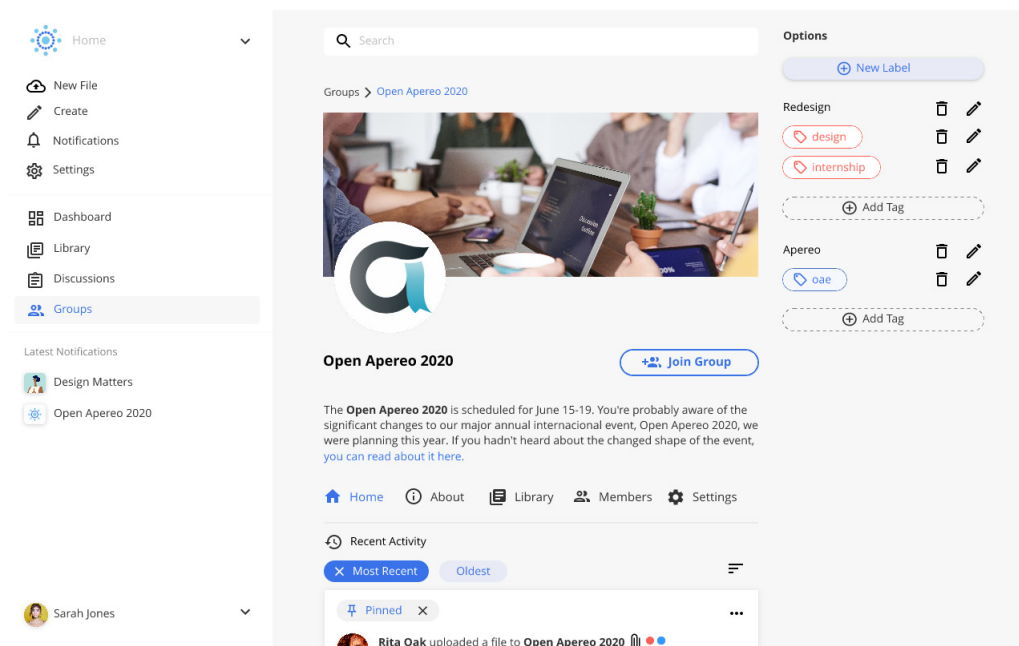
Figure 62 – Implemented version of groups page.

Figure 63 – Final mockup for groups.

5.6 Conference Intervention

The assets produced throughout this internship – in particular during the second semestre of 2018/2019 – were both a basis for the new interface and as support for the upcoming Open Apereo Conference.

During the main phase of interface design, a further crucial goal was to showcase the new redesign of the OAE. As such, the designs created during the second semestre were picked from the most recent group of screens (*Figures 54, 57 and 59*) for the first conference – in June 2019, with Eng. Miguel Laginha presenting the new and improved OAE in Los Angeles, California (USA) to a live audience of Apereo Foundation partners and associated universities. The presentation focused on the new features of the platform and website, in order to showcase the more modern and organised interface utilities.

The second conference (2020) happened remotely due to the pandemic and was realised under a similar format that of the first, with the most recently developed interface screens. This solidified the role of the design behind the new OAE.

Some assets that included a dynamic logo animation and interface animations were set aside before the first presentation due to being too heavy to load. It should be noted that the assets produced for both conferenced were used to display the project on an international scale.

Following the 2019 and 2020 conferences, the redesign of the OAE brought new attention to the project from education institutes and consortia, such as:

1. Georgia Tech (Atlanta, Georgia (USA));

2. Karolinska Institutet (Solna, Sweden);

3. Boğaziçi University (Istanbul, Turkey);

4. Neurotech (European Consortium).

Given the success of the redesign, the OAE project was on its track to a new, dynamic development as the presentations increased consumer trust.

[06]
Implementation

[06] IMPLEMENTATION

6.1 Implementation Tests

An important step in the process of automating the implementation of both the website and platform was dynamic browsing, as it facilitates viewing changes. The tool used was Visual Studio Code (VSCode), since it allows the enabling of extensions for the aforementioned purpose, upon saving files. However, this is just the frontend, as it would be necessary to follow the instructions from the Github project page to create the OAE backend.

Implementation tests also required maintaining a set of standards for the code itself. In order to be consistent with an organized code structure, the prettier and xo lints were added locally to the VSCode editor as helpers to enforce readable code. What these linters do is determine a set of rules based on code configuration practices for readability and force format it upon parsing, then re-print and wrap code when necessary. Lint options can be customized, but the OAE project uses the default standards.

Beyond code standards, it was also necessary to stick to specifications for commit messages. This allows for a set of rules that describe the changes made to the project, in a way that communicates intent using semantic elements. Developers interested in the open source OAE community can quickly spot the type of commit that range from a feat or fix to style and chore, thus moving forward in an organized fashion.

In the interest of ensuring that the OAE comes up correctly in different devices and browsers, it was necessary to plan how the users would interact with the interface. This brought about a series of tests to guarantee the responsiveness of the layout. The process started by toggling the Responsive Design mode on the Firefox Web Developer submenu and setting the screen size for mobile devices, then editing the width x height to test media queries - the default is 320x480px.

When it comes to automation, it should also be noted that package managers such as yarn and npm were installed to use locally in order to automate complex configuration processes that update and handle library versioning. Frameworks - such as Bulma - come with pre-coded functions that can be called to render an already defined element by its attribute class, within the HTML code. Pre-defined interface elements can have several styles, colours and states for interaction with the user. For example, an unstyled button that isn't linked to Bulma could be programmed like this:

<button>This is a button</button>

While a class customized Bulma button would be:

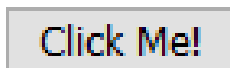*<button class="button is-success">This is a button</button>*

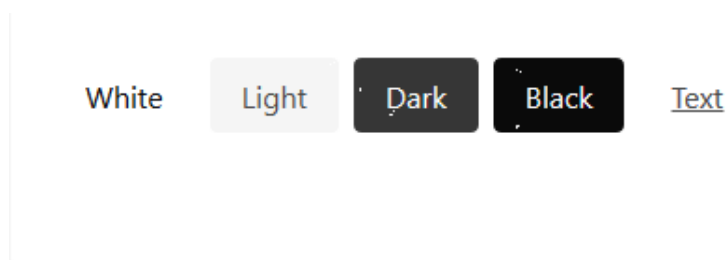**Figure 64** - Unstyled, simple HTML button.

Figure 65 - Styled set of Bulma buttons.

Unlike the platform, the website did not require a previous full implementation with the correct JS framework before prototyping. The first round of tests, after high fidelity mockups, was to create static prototypes with simple HTML and CSS, using the Bulma framework. Then, came the final development phase.

6.2 Conflicts

During the implementation phase, we came across some concerns that required careful consideration to ensure the stability of the project. Without a strong foundation, both the platform and website could develop issues in the nearby future. This could mean that we would need to revise the structure entirely, if the chosen technologies or frameworks became obsolete sooner than predicted.

The first concern that arose was the validity of Vue.js as the base of the project. As explained in 5.2 Technology and Implementation, when web components became universally supported by all browsers, we were no longer limited by our choice of JS framework. This led to the decision of adapting the newly released LitElement by the Polymer team into the OAE platform. Additionally, it was brought to our attention that Jekyll might no longer be the best framework to support the website due to its complexity and being non-friendly to beginners – which hinders involvement for the open source project. As such, we started exploring new options like Eleventy, which also helps automate the process of development, while Jekyll is more confusing.

The second problem to tackle was experimenting and choosing, at last, a CSS framework. Since we were aiming for consistency, the framework would be used on both OAE mediums and keep a similar design. Eng. Miguel Laginha and I made some tests to find out which would perform better when integrated with Polymer's LitElement, as there were some features that could be a deal breaker, namely: community support, accessibility and flexibility in customizing elements for the interface. Eventually we settled on Bulma, as this was the one framework that fulfilled the necessary criteria.

It's worth mentioning that a framework without community support and regular version updates would be dangerous to implement in the OAE, as those are signs that it either hasn't active developers to perform maintenance or isn't good enough to warrant attention - yet. On a large scale project with a high level of responsibility, these are valid concerns to cross a framework off a list of possible candidates. If we had gone through with Tailwind, then we would have had a lot of trouble solving bugs that hadn't been ticked on developer platforms such as Github and Stackoverflow, or lost points in accessibility, as this framework isn't fully developed yet. We would have also spent more time developing web components, since Tailwind doesn't have all the interface elements we require to customize into the project. Yarn also proved to be more stable than npm in the long run, which prompted a change from one package manager to the other mid development - although the console command to run the project output in a dynamic server is still npm run start:webpack.

A continuous probable conflict that can arise is a version update of Bulma or LitElement that destabilizes the project completely. Worst case scenario would have us revert to a previous version of Biscuit-ux. Right now, we are having an unresolvable conflict with the Bulma tabs for the groups page, that not even a version update can solve. We will likely have to create the tabs from scratch as opposed to using pre-made elements to ease the development process.

A deeper study of patterns on the interface showed that, in its current form, the dashboard page might not necessarily be a dashboard at all. According to Tidwell's patterns for interaction design, a dashboard follows a certain set of familiar elements with a recognizable style. Users have expectations that a dashboard uses components in a predictable way (Tidwell, 2011, pp. 45-49), something we are lacking at the moment, as the user dashboard currently behaves as a news feed. As the implementation progressed, we realized that it made more sense to dismiss shortcuts and quick options and contain those within the Settings page instead. The evolution of the interface made us deviate from the original plan for the dashboard.

This can be addressed in the future if we develop features that include information graphics, datatips, movable panels and other elements, but at the moment we are working under the assumption that the redesign keeps the current OAE's main functionalities – with a few changes here and there, where it matters or if the stakeholders request new features. While we're not necessarily limited here, we don't have enough data to make that jump just yet, which is why the dashboard will likely be renamed as Recent Activity.

[07]
Conclusion

[07] CONCLUSION

When I started this internship in September 2018, I was ecstatic to work on such a high level scale project and to be included in a real team for the first time. My academic career has been split since 2013, with mini freelance jobs here and there, but the lack of a mentor or a colleague can be taxing when there is no debate or brainstorming of ideas. In this sense, working with Eng. Miguel Laginha was a breath of fresh air from the very start, as he was always thoughtful, kind and very practical in a way that I appreciate. This approach allowed for educational debates and promoted a healthy environment for learning beyond the scope of the internship – with the added benefit of allowing me to become comfortable with teamwork under company context, in my own time. Any disagreements were taken under consideration in order to find the best path to achieve our goal: a better OAE.

In February 2019, there was a first of three reschedulings of the internship proposal and scope. Previously, at the beginning of the academic year, there was brief discussion of attending a conference in Paris, during which I would conduct a few user interviews in person to assess the virtues/issues of the OAE. Unfortunately the trip I was to take part in did not happen due to lack of funding, and a similar problem happened with the Open Apereo 2019 conference in Los Angeles, USA. Furthermore, it was decided that it wouldn't be necessary to create promotional materials for the conference and instead I developed short animations of the interface for Eng. Miguel Laginha to use during the OAE's Open Apereo presentation in June, 2019.

I knew from the very beginning that we would have, at the very least, monthly meetings via Google Hangouts with the stakeholders of the OAE. These were productive in an enlightening and constructive fashion, as the four stakeholders were nothing but courteous towards me, always making sure that I would feel welcome in the project. We often discussed the current state of the OAE, its issues and their shared vision of what the OAE could become after a redesign. Even though I had some experience working with clients and discussing projects, these frequent remote meetings helped demystify another side of the "client" and thus better understand the target audience. I hope that my performance as the lead designer was positive in their eyes, as I very much enjoyed working alongside Alain, Mathilde, Fred and Ian.

7.1 Future Prospects

As of September 2020, I will have been working as a designer and frontend developer on the OAE for 2 years - one in academic internship and another year in professional context. While the future is still uncertain, my preference would be to continue as part of the OAE team until the project is fully implemented and ready to deploy. Eventually, I would like to enroll in a second Masters degree to deepen my knowledge of UI/UX, but the search for a suitable course has taken a step back due to the pandemic.

In recent talks with Eng. Miguel Laginha, we concluded that the next few months should be focused on jumping from the static platform layout and start the implementation with Javascript so that we can connect functionalities and make the interface dynamic. What we have scheduled until December 2020 are four months of intense work that will also include:

1. More tests to determine if there are dimensional issues with the layouts (Responsive Design);

2. Clean up the code and make sure it is commented in a way that is both beginner friendly for open source project enthusiasts and for the developers to come back to it;

3. Possibly plan for the admin area;

4. Guarantee that the desktop layout is mobile friendly in structure.

Aside from immediate professional prospects, working on the OAE has opened my eyes to the necessity of preserving Open Source and the negative impact that industry can have on innovation. As such, I plan to continue my research on sustainable methods for usability and interface design applied to systems, alongside my pet project of good practices for teams that work closely with designers and developers.

Given the magnitude and responsibility of the project, we suffered somewhat from lacking a senior UI/UX designer to provide feedback. I was most affected from this, as the only designer in the team. As I soon discovered, a UI/UX designer is somewhere between a graphic designer and an engineer (or frontend developer). This poses a problem, as formal knowledge of the two areas ceases to be enough very quickly.

Not being able to conduct user interviews in person was another constraint (see: 4.2. User Interviews) that prevented in depth assessment of usability.

To overcome these issues, I had to do a lot of careful research before experimenting with the OAE interface. While this plunge provided a consistent and in depth learning of the principles of UI/UX, Human-Computer Interaction research and Service Design methods, it was also a setback since the design process took longer, with more vital back and forths to iterate over possible flaws in visual and functionality. Professor Ana Boavida was exceptional in helping me spot and fix inconsistencies, but there is an entire philosophy to the functionality of interfaces that goes several steps beyond the essential knowledge of graphic design. Even with some professional experience and the guidance of my supervisors, I struggled with this and had to undergo a deep training of my abilities as a designer in order to find strategies to bring balance to a project that relies a lot on visual modernization, coupled with a heavy technical structure.

My main concern was whether I would be able to fulfill the expectations Eng. Miguel Laginha and the stakeholders nurtured for the OAE. This burden made me work hard and smart until there was a point where I could be proud of what I had created. As per the above figures, it is noticeable how my design abilities improved drastically with the constant iterations. What started as a skeleton to understand structure, morphed into an aesthetically pleasing interface overtime.

The results from the survey issued in September–October 2019 give strength to the argument that the current OAE was accessible but confusing, usable but boring and professional but hard to use (see: 4.2.1. Desirability Survey). Functionalities were either too condensed or too scattered across the interface, which prompted a need for further reflection on how to improve the redesign presented at the Open Apereo 2019 conference. The learning process continued, and since we had qualitative data to support a more careful approach, new iterations of the redesign benefited from this.

Given that the implementation of the website and platform started from June/July 2019 onwards, I spoke to my supervisors and eventually made the decision to extend the delivery of the final dissertation for January/February 2020. This would allow us to send the survey to the students of the French universities of La Rochelle and Littoral Côte d'Opale.

I find that the internship proposal took longer to complete than the January–June/September 2019 deadline because the scope was larger than expected, even with the cuts we issued along the way. Due to some scheduling issues and the fact that I still wanted to revise the dissertation, the date was extended to April–May 2020. Unfortunate circumstances got in the way, and the world wide pandemic caused the university to close until further notice, to which I asked once again to extend the deadline until September–October 2020. Thus, I would be able to wrap everything and rest from a tendinitis that is taking over two months to heal and often prevents me from using my left arm.
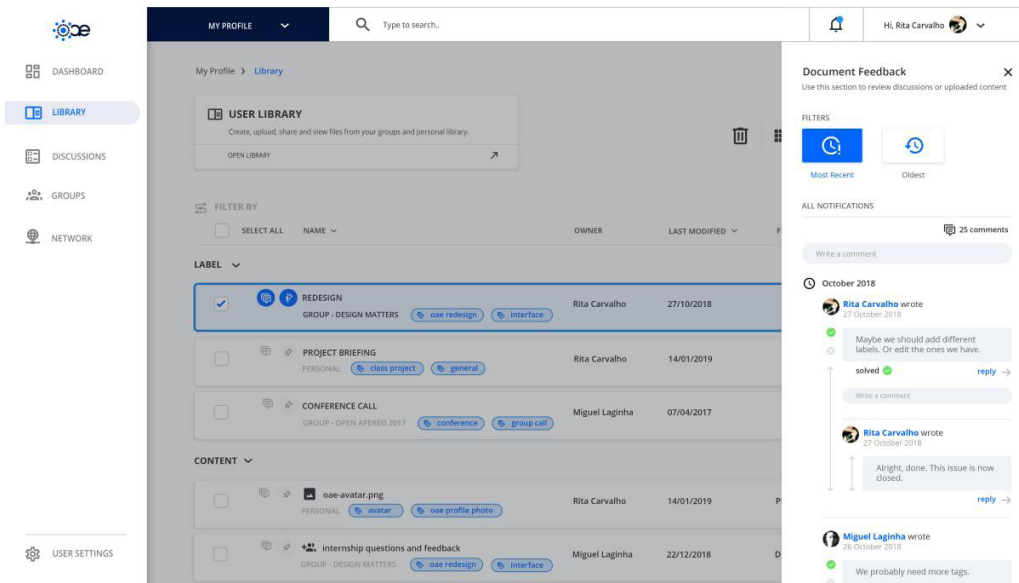
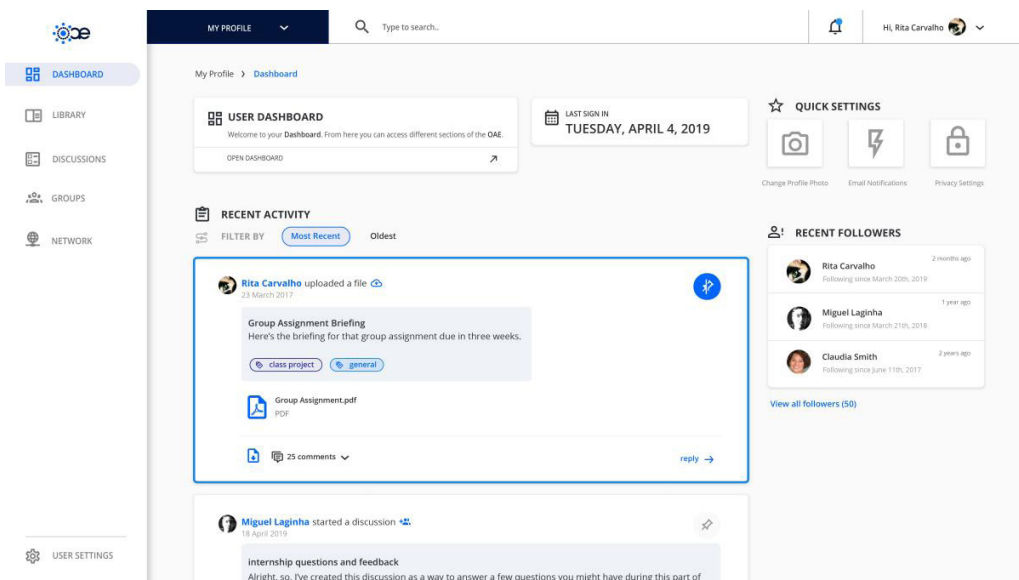**Figure 66** – Progression of the OAE redesign, version 1.

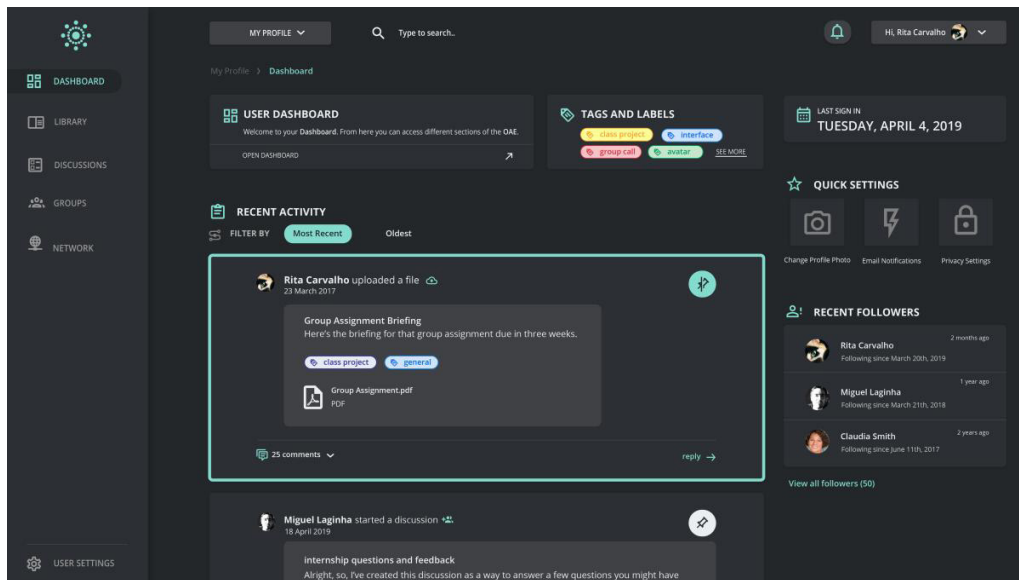**Figure 67** –   Progression of the OAE redesign, version 2.

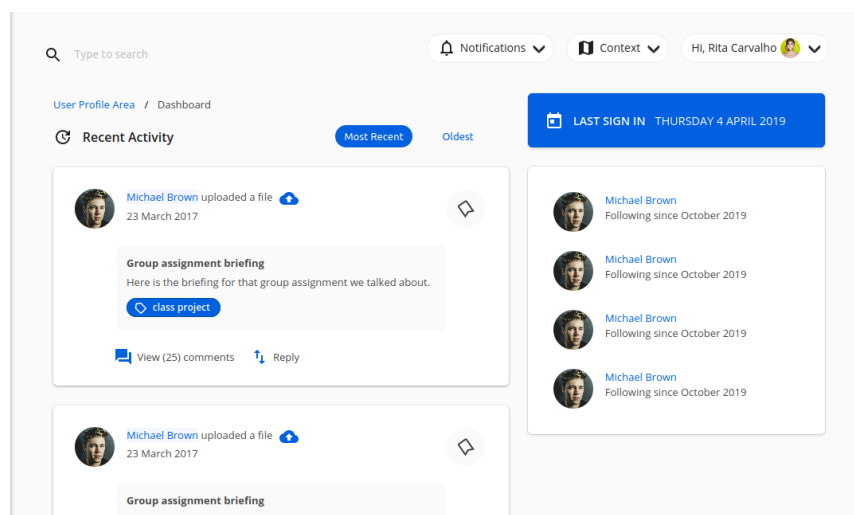**Figure 68** – Progression of the OAE redesign, version 3 – dark theme.
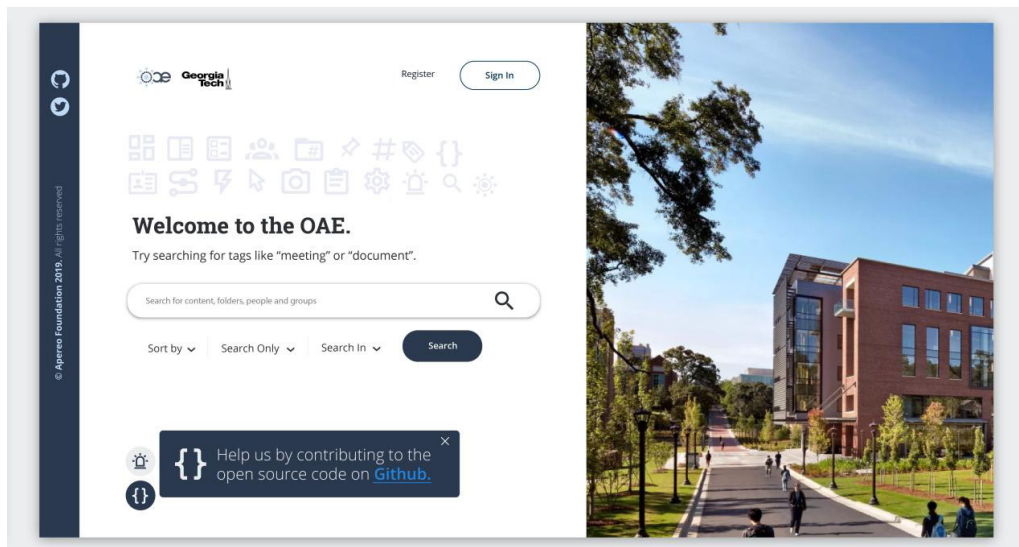

Figure 69 – Progression of the OAE redesign, version 4.

Figure 70 – Progression of the OAE redesign, version5 – homepage.

Figure 71 –   Progression of the OAE redesign, version 7 – website
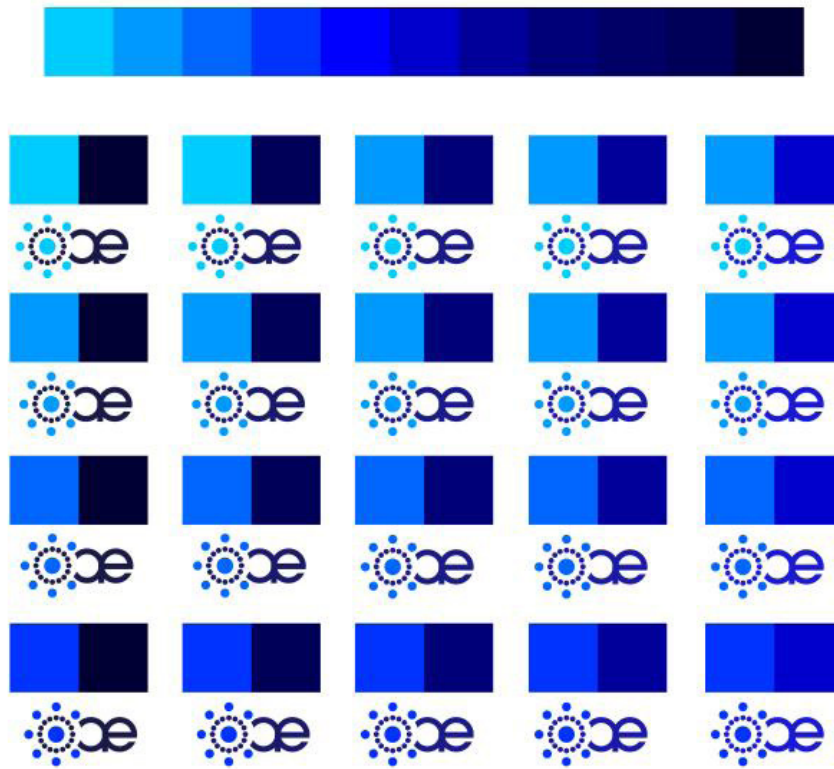
Figure 72 –   Colour Palette tests.

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Attachments

Attachment A

This attachment concerns the Q&A introduced in 3.3 Constraints and mentioned again in 4.2 and will serve as a guide for understanding the limitations of the design artefact, the expectations of the Apereo stakeholders and the subsequent steps the designer will need to be careful about.

Q: Does it make sense to recreate the brand from scratch?

A: No, the goal is to recreate the brand using the same logo and go from there. Furthermore, this helps to make a link between the old and new branding, while maintaining a sense of familiarity. The OAE has many partners, so it needs to be recognizable. As such, details like the usage of the same colour palette are also advised.

Correction: eventually we were allowed to slightly modify the logo and make it more dynamic.

Q: Does it make sense to maintain some of the pre-existent brand features?

A: Yes, maintaining features such as the same colour palette and the symbology linked to Apereo values (community, sharing, open source) are essential in order to recreate the brand in a consistent fashion.

A reminder that the logo is the starting point, which places a very definite restriction in the design process.

Q: What values are associated with the brand?

A: The values associated with the OAE are the same as the Apereo values (link:), which encompass the concept of community, sharing and open source, along with credibility for the Foundation. Moreover, given the academia links that Apereo has, perhaps a cleaner design laced with a certain degree of formality would work best.

Q: What are the restrictions associated with the OAE re-branding?

A: The main restrictions would be to a. use the logo as a starting point, b. use a similar colour palette and c. maintain the Apereo values throughout the rebranding (which includes the new website and platform).

Attachment B

Bienvenu(e)

Cette enquête menée par APEREO OAE et ESUP-Portail est facultative et ne collecte aucune donnée à caractère personnel.

Les destinataires des données collectées de chaque questionnaire d'enquête sont les membres du groupe de travail OAE en charge du traitement.

Les données collectées seront détruites après agrégation et restitution statistique.
La diffusion des résultats agrégés est réservée uniquement au groupe de travail OAE-Esup et Apereo OAE.

Pour toute précision, n'hésitez pas à vous adresser à support-oae@esup-portail.org

Commencer   appuyez sur **Enter** ↵

Attachments

Attachments

Attachments

a. Sexe *

A	Masculin
B	Féminin
C	Je préfère ne pas répondre

0 % complété

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Attachments

b. Âge *

A	18-20
B	21-25
C	26-30
D	31-40
E	41-50
F	+50
G	Je préfère ne pas répondre

0 % complété

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Attachments

c. À quelle fréquence utilisez-vous OAE? *

A Jamais

B Rarement

C Parfois

D Fréquemment

0 % complété

Powered by **Typeform**

Attachments

d. Avez-vous des problèmes de vue? *

A Oui

B Non

C Je préfère ne pas répondre

0 % complété

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Attachments

e. Si vous avez répondu "Oui", lequel?

Choisissez-en autant que vous voulez

A Myopie

B Astigmatisme

C Hypermétropie

D Daltonisme

E Autres

F Je préfère ne pas répondre

0 % complété

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Attachments

f. Utilisez-vous votre téléphone ou votre ordinateur la nuit ? *

| o | Oui |

| N | Non |

0 % complété

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Attachments

g. Si vous avez répondu "Oui", vos yeux sont-ils fatigués?

- **O** Oui
- **N** Non

0 % complété

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Attachments

Attachments

2→ Les déclarations suivantes porteront sur la version actuelle de OAE. Veuillez les évaluer de 1 à 10, où:

1 = En total désaccord
10 = En total accord

Continuer appuyez sur **Enter** ↵

Attachments

* | 2a | J'aime utiliser la version actuelle de OAE

Trial

* | 2b | Je pense que OAE est facile à utiliser

Trial

* | 2c | Je trouve les fonctionnalités inclues dans OAE utiles

Trial

* | 2d | Je pense que OAE a des caractéristiques trés cohérentes

Trial

* | 2e | Je me sens à l'aise avec OAE

Trial

* | 2f | Je crois que n'importe qui est capable d'apprendre rapidement comment utiliser OAE

Attachments

* **2g** Je n'ai pas (eu) besoin d'apprendre beaucoup de choses avant d'utiliser OAE

Trial

* **2h** Je pense que OAE est une plate-forme utilec

Trial

* **2i** Je pense que l'interface actuelle a un design agréable

Trial

* **2j** Cela ne me dérange pas que OAE ne soit pas adaptatif/responsive (c'est-à-dire que la plate-forme ne soit pas adaptée pour les petits écrans, comme les téléphones)

Trial

Attachments

✓ 3 Choisissez 5 adjectifs qui, selon vous, conviendraient à l'interface actuelle de OAE:

- Accessible
- Désagréable
- Séduisante
- Ennuyeuse / Rébarbative
- Confuse / Alambiquée
- Personnalisable
- Facile à utiliser
- Efficace
- Difficile à utiliser
- Incohérente
- Intuitive
- Professionnelle
- Réactive
- Stressante
- Longue et fastidieuse
- Trop technique
- Inabordable
- Intéressante
- Utilisable
- Lente

Trial

Attachments

4 → Les questions suivantes porteront sur la nouvelle conception de OAE

Continuer   appuyez sur **Enter** ↵

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Attachments

Attachments

Attachments

Attachments

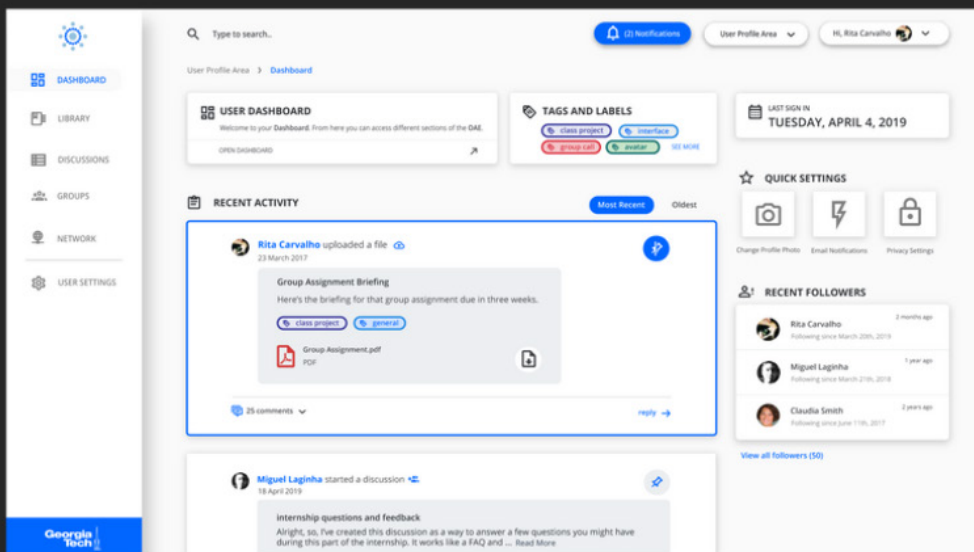a. Préféreriez-vous utiliser un 'thème' clair ou foncé? *
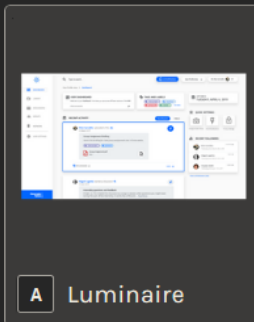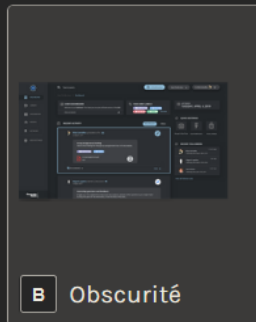
A Luminaire   B Obscurité

0 % complété   Powered by **Typeform**

Attachments

* **|| 4b** Je crois que la refonte de OAE améliorera mon expérience utilisateur

  Trial

* **|| 4c** Je trouve que l'interface actuelle est mieux que la nouvelle proposition (telle que présentée dans ce questionnaire)

  Trial

* **|| 4d** Je pense qu'il est temps pour OAE d'adopter un design plus moderne

  Trial

* **|| 4e** J'aimerais que OAE inclut un système de stockage de fichiers similaire à Dropbox et Google Drive

  Trial

* **|| 4f** Je trouverais utile de pouvoir filtrer les commentaires dans un fil de discussion

  Trial

Attachments

* 📊 4h Je trouverais utile d'avoir un système d'étiquetage pour filtrer les dossiers (bibliothèque) et les sujets (discussions)

  Trial

* 📊 4i Je pense qu'être capable d'utiliser OAE sur de petits appareils est une bonne chose

  Trial

* 📊 4j J'aimerais pouvoir passer d'un 'thème' clair à un foncé (et inversement)

  Trial

* 📊 4k Je pense qu'il est important d'avoir une interface accessible

  Trial

* 📊 4l Je pense que le site Web d'OAE (http://oaeproject.org) devrait être plus informatif

  Trial

Attachments

Attachments
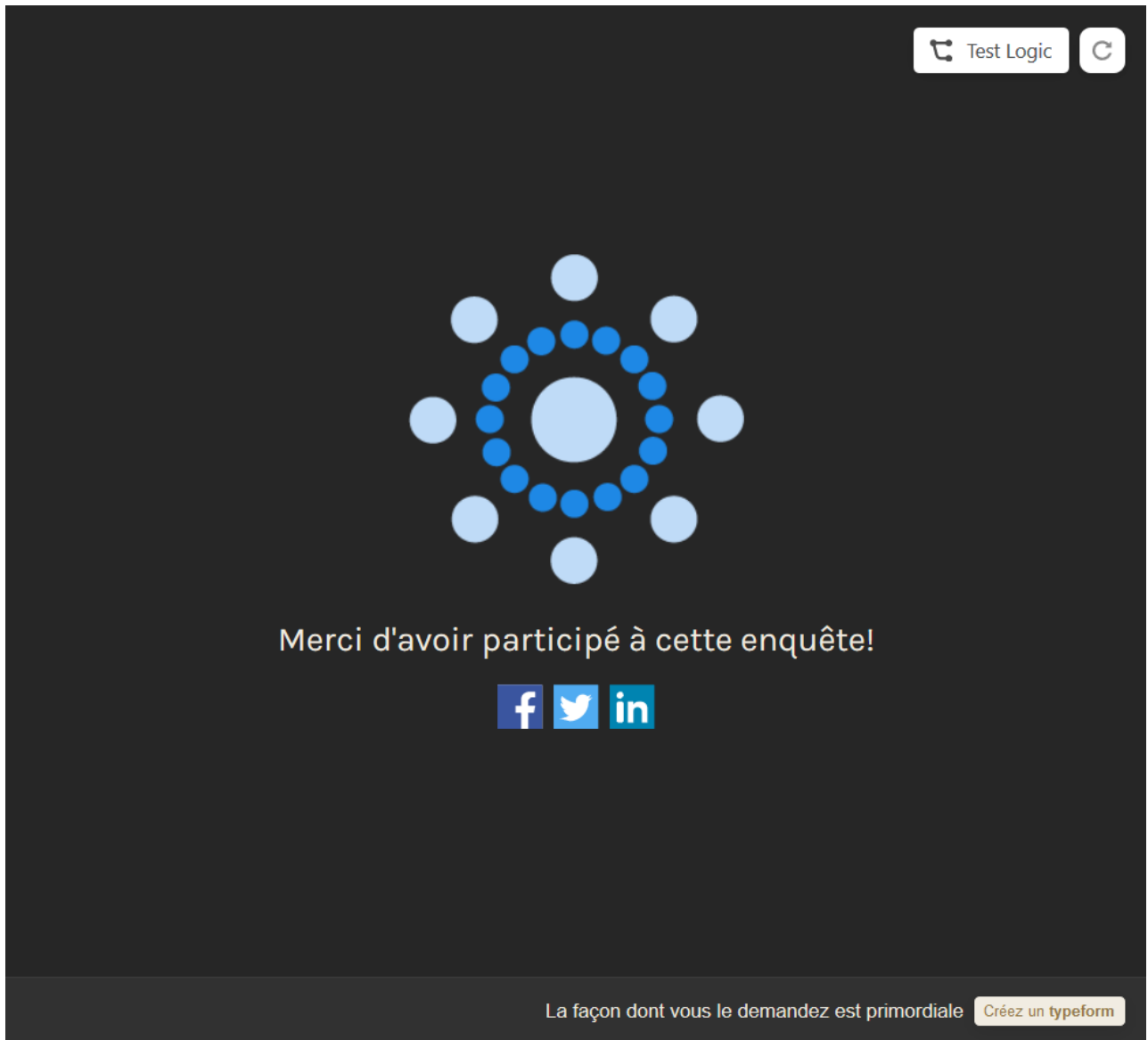
Test Logic

Merci d'avoir participé à cette enquête!

La façon dont vous le demandez est primordiale   Créez un typeform

Attachments

📋 **1**   Aidez-nous à améliorer OAE en répondant à cette enquête. Cela ne prendra que 10 minutes. Commencez par répondre à quelques questions personnelles

✓ **1a**   Sexe

304 out of 305 people answered this question

52%	Masculin	**158** responses
44.7%	Féminin	**136** responses
3.3%	Je préfère ne pas répondre	**10** responses

Attachments

✓ **1b** Âge

304 out of 305 people answered this question

30.3%	41-50	92 responses
22.7%	+50	69 responses
21.4%	31-40	65 responses
10.2%	21-25	31 responses
7.9%	18-20	24 responses
6.2%	26-30	19 responses
1.3%	Je préfère ne pas répondre	4 responses
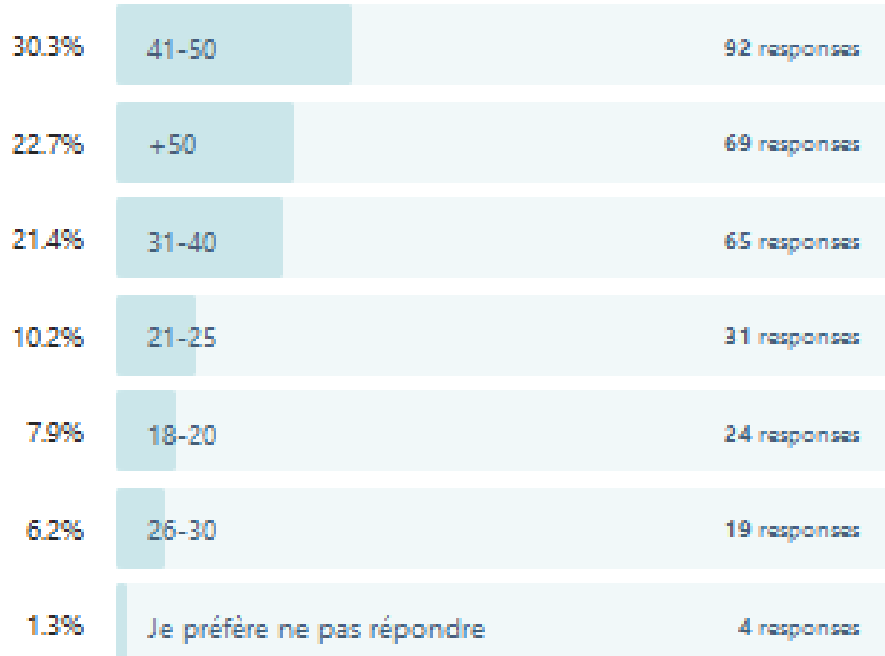
✓ **1c** À quelle fréquence utilisez-vous OAE?

304 out of 305 people answered this question

37.5%	Rarement	114 responses
30.9%	Parfois	94 responses
20.4%	Fréquemment	62 responses
11.2%	Jamais	34 responses

Attachments
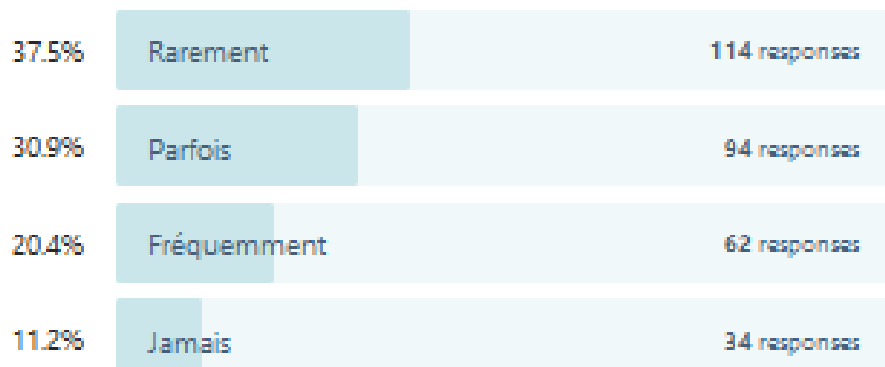
1d Avez-vous des problèmes de vue?

304 out of 305 people answered this question

75%	Non	228 responses
23.7%	Oui	72 responses
1.3%	Je préfère ne pas répondre	4 responses
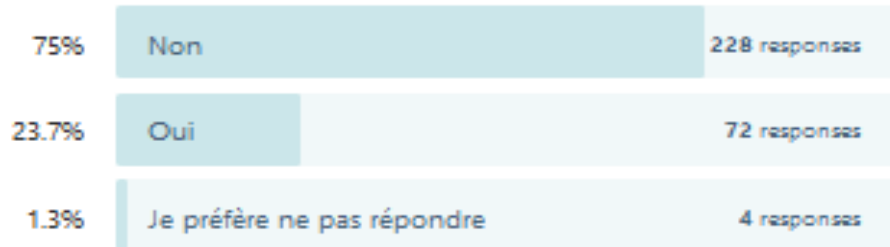
1e Si vous avez répondu "Oui", lequel?

72 out of 305 people answered this question (with multiple choice)

61.1%	Myopie	44 responses
47.2%	Astigmatisme	34 responses
23.6%	Autres	17 responses
15.3%	Hypermétropie	11 responses
2.8%	Je préfère ne pas répondre	2 responses
1.4%	Daltonisme	1 response
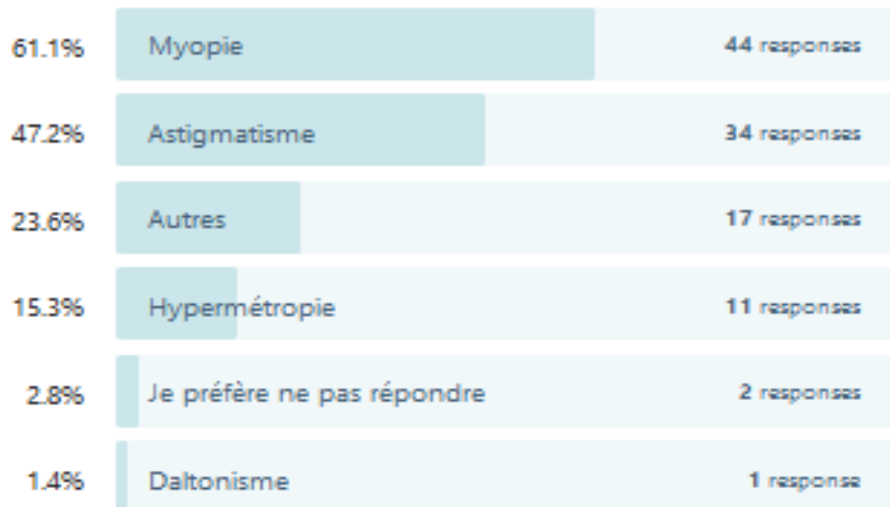
1f Utilisez-vous votre téléphone ou votre ordinateur la nuit ?

304 out of 305 people answered this question

57.2%	Yes	174 responses
42.8%	No	130 responses

Attachments

1g Si vous avez répondu "Oui", vos yeux sont-ils fatigués?

298 out of 305 people answered this question

36.9%	Yes	110 responses
63.1%	No	188 responses

1h Quel(s) appareil(s) utilisez-vous pour accéder à OAE?

304 out of 305 people answered this question

	79.9%	243 responses
	49.7%	151 responses
	26%	79 responses
	6.9%	21 responses

2 Les déclarations suivantes porteront sur la version actuelle de OAE. Veuillez les évaluer de 1 à 10, où: 1 = En total désaccord 10 = En total accord

2a J'aime utiliser la version actuelle de OAE   Avg. 5.5

305 out of 305 people answered this question

1	2	3	4	5	6	7	8	9	10
6.2%	6.2%	7.2%	10.8%	20%	14.4%	11.5%	15.4%	3.9%	4.3%

En total dés...   En total acc...

Attachments

2b — Je pense que OAE est facile à utiliser
Avg. 5.8

305 out of 305 people answered this question

1	2	3	4	5	6	7	8	9	10
4.6%	7.2%	7.9%	10.2%	14.4%	14.8%	14.4%	14.4%	6.2%	5.9%
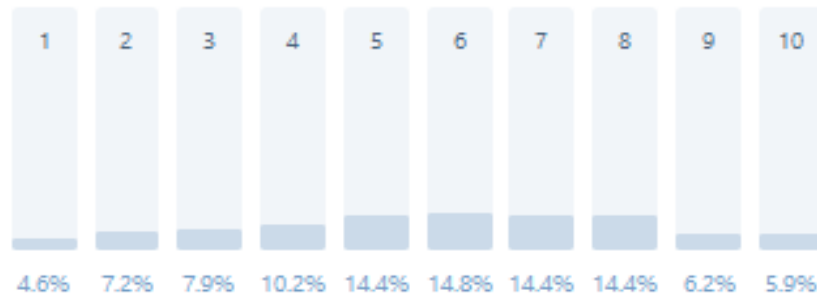
En total dés...   En total acc...

2c — Je trouve les fonctionnalités inclues dans OAE utiles
Avg. 6.1

305 out of 305 people answered this question

1	2	3	4	5	6	7	8	9	10
4.9%	4.6%	5.2%	6.6%	18%	12.5%	16.4%	20.3%	4.6%	6.9%
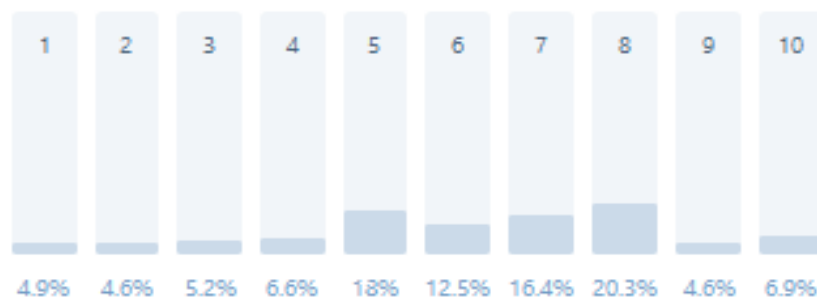
En total dés...   En total acc...

2d — Je pense que OAE a des caractéristiques trés cohérentes
Avg. 5.8

305 out of 305 people answered this question

1	2	3	4	5	6	7	8	9	10
4.9%	3.6%	5.2%	8.9%	22.3%	17.7%	12.1%	17.7%	3.6%	3.6%
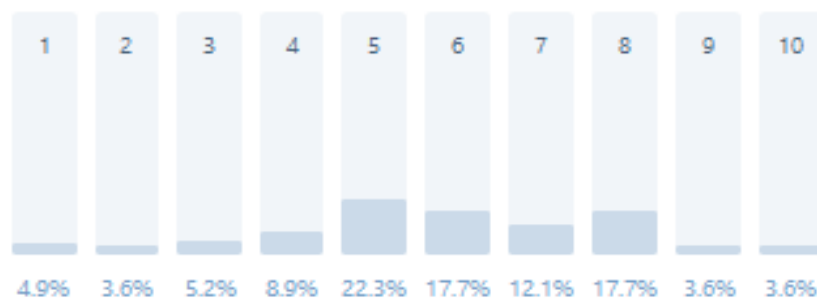
Attachments

2e Je me sens à l'aise avec OAE — Avg. 5.7

305 out of 305 people answered this question

1	2	3	4	5	6	7	8	9	10
6.6%	4.3%	8.5%	10.5%	17.4%	11.1%	16.1%	15.1%	5.2%	5.2%
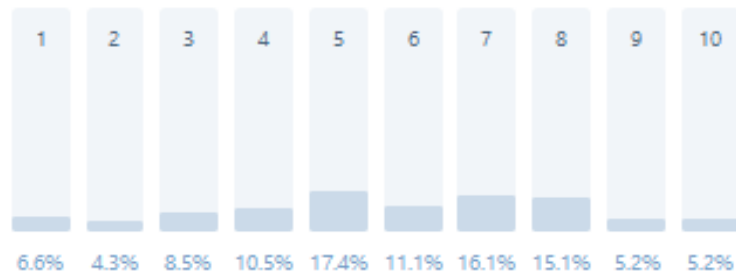
En total dés...   En total acc...

2f Je crois que n'importe qui est capable d'apprendre rapidement comment utiliser OAE — Avg. 5.9

305 out of 305 people answered this question

1	2	3	4	5	6	7	8	9	10
6.6%	5.2%	6.9%	8.9%	14.1%	13.4%	15.1%	17%	5.2%	7.5%

En total dés...   En total acc...

2g Je n'ai pas (eu) besoin d'apprendre beaucoup de choses avant d'utiliser OAE — Avg. 6.7

305 out of 305 people answered this question

1	2	3	4	5	6	7	8	9	10
4.3%	1.6%	3.9%	5.9%	16.7%	7.5%	16.1%	18.4%	9.5%	15.7%

En total dés...   En total acc...

Attachments

1	2	3	4	5	6	7	8	9	10
3.9%	1.3%	4.9%	3.9%	22.3%	13.1%	13.4%	17.7%	8.2%	11.1%

En total dés...   En total acc...

1	2	3	4	5	6	7	8	9	10
7.2%	5.9%	9.2%	9.2%	17%	10.5%	14.4%	16.1%	5.6%	4.9%

En total dés...   En total acc...

1	2	3	4	5	6	7	8	9	10
16.1%	10.5%	11.1%	7.5%	13.8%	5.9%	6.9%	10.5%	6.2%	11.5%

Attachments

✓ 3 Choisissez 5 adjectifs qui, selon vous, conviendraient à l'interface actuelle de OAE:

305 out of 305 people answered this question (with multiple choice)

%	Adjectif	Réponses
60.3%	Accessible	184 responses
49.8%	Utilisable	152 responses
46.9%	Professionnelle	143 responses
43%	Facile à utiliser	131 responses
39.7%	Efficace	121 responses
36.7%	Intéressante	112 responses
35.7%	Confuse / Alambiquée	109 responses
23.9%	Ennuyeuse / Rébarbative	73 responses
22%	Difficile à utiliser	67 responses
19.3%	Trop technique	59 responses
18%	Longue et fastidieuse	55 responses
17%	Intuitive	52 responses
15.7%	Réactive	48 responses
15.1%	Désagréable	46 responses
14.4%	Lente	44 responses
11.5%	Personnalisable	35 responses
10.5%	Incohérente	32 responses
10.5%	Séduisante	32 responses
5.2%	Stressante	16 responses
4.6%	Inabordable	14 responses

Attachments

Attachments

1	2	3	4	5	6	7	8	9	10
15.1%	9.2%	15.4%	10.2%	22.6%	8.2%	9.5%	5.9%	1%	3%

En total dés...   En total acc...

1	2	3	4	5	6	7	8	9	10
1.3%	1.3%	0.7%	2%	16.1%	12.5%	13.4%	19.7%	10.2%	23%

En total dés...   En total acc...

Attachments

4e J'aimerais que OAE inclut un système de stockage de fichiers similaire à Dropbox et Google Drive

Avg. 8

305 out of 305 people answered this question

1	2	3	4	5	6	7	8	9	10
3%	1.3%	1.6%	0.7%	10.5%	4.6%	8.5%	19%	12.1%	38.7%

En total dés...   En total acc...

4f Je trouverais utile de pouvoir filtrer les commentaires dans un fil de discussion

Avg. 7.1

305 out of 305 people answered this question

1	2	3	4	5	6	7	8	9	10
1.3%	1.3%	1.3%	3%	22%	9.2%	16.1%	19%	9.8%	17%

En total dés...   En total acc...

Attachments

4g Je trouverais utile d'épingler les messages que je considère importants dans mon flux d'activité — Avg. 7.7

305 out of 305 people answered this question

1	2	3	4	5	6	7	8	9	10
0.3%	0.3%	1.3%	1.6%	15.7%	6.9%	12.1%	23.6%	16.7%	21.3%

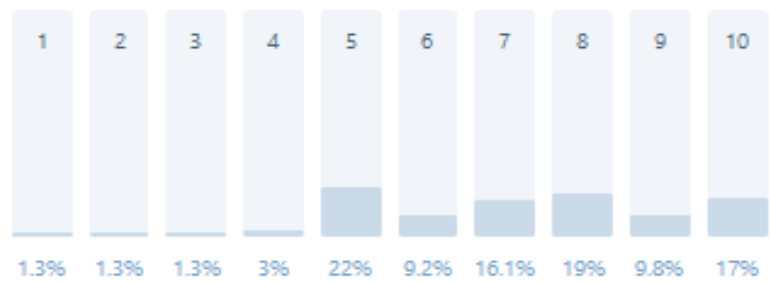En total dés...   En total acc...

4h Je trouverais utile d'avoir un système d'étiquetage pour filtrer les dossiers (bibliothèque) et les sujets (discussions) — Avg. 7.9

305 out of 305 people answered this question

1	2	3	4	5	6	7	8	9	10
1%	0.7%	0.3%	0.7%	13.4%	5.6%	12.8%	20.7%	16.7%	28.2%

En total dés...   En total acc...

Attachments

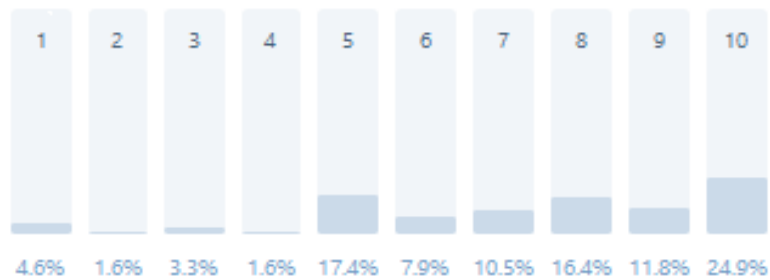**Je pense qu'être capable d'utiliser OAE sur de petits appareils est une bonne chose**   Avg. 7.2

305 out of 305 people answered this question

1	2	3	4	5	6	7	8	9	10
4.6%	1.6%	3.3%	1.6%	17.4%	7.9%	10.5%	16.4%	11.8%	24.9%

En total dés...   En total acc...
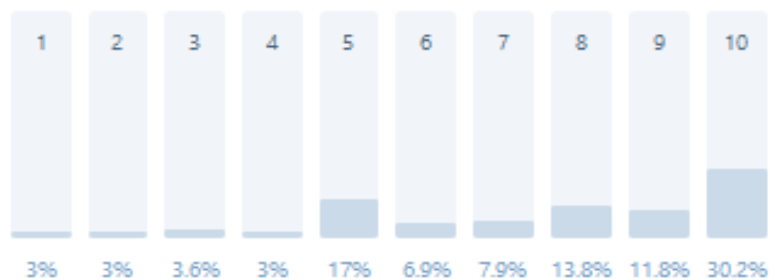

J'aimerais pouvoir passer d'un 'thème' clair à un foncé (et inversement)   Avg. 7.3

305 out of 305 people answered this question

1	2	3	4	5	6	7	8	9	10
3%	3%	3.6%	3%	17%	6.9%	7.9%	13.8%	11.8%	30.2%

En total dés...   En total acc...

Attachments

Je pense qu'il est important d'avoir une interface accessible   Avg. 8.7

305 out of 305 people answered this question

1	2	3	4	5	6	7	8	9	10
0.3%	0.3%	1%	0%	5.9%	2.6%	7.9%	18%	15.7%	48.2%

En total dés...   En total acc...

Je pense que le site Web d'OAE (http://oaeproject.org) devrait être plus informatif   Avg. 7.3

305 out of 305 people answered this question

1	2	3	4	5	6	7	8	9	10
0.7%	0.3%	1.6%	1.6%	24.3%	7.9%	14.1%	18.4%	10.2%	21%

En total dés...   En total acc...
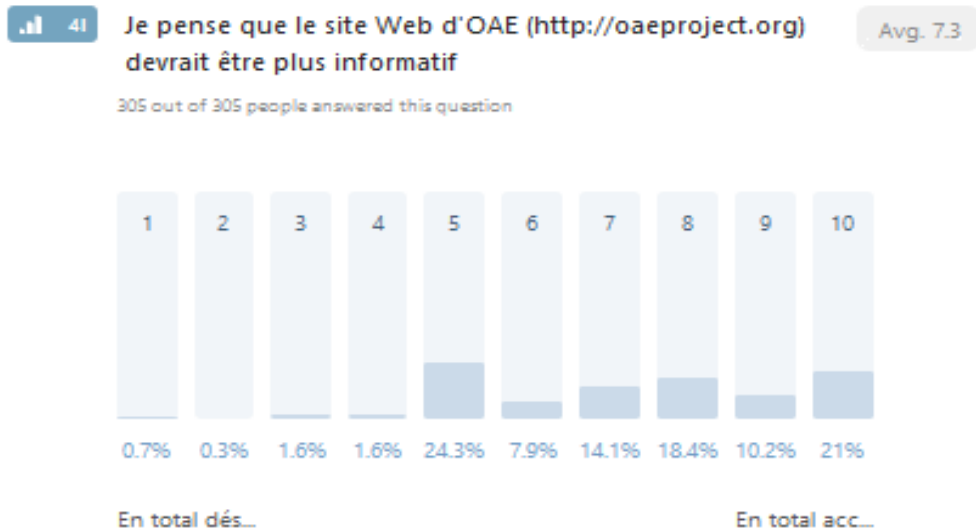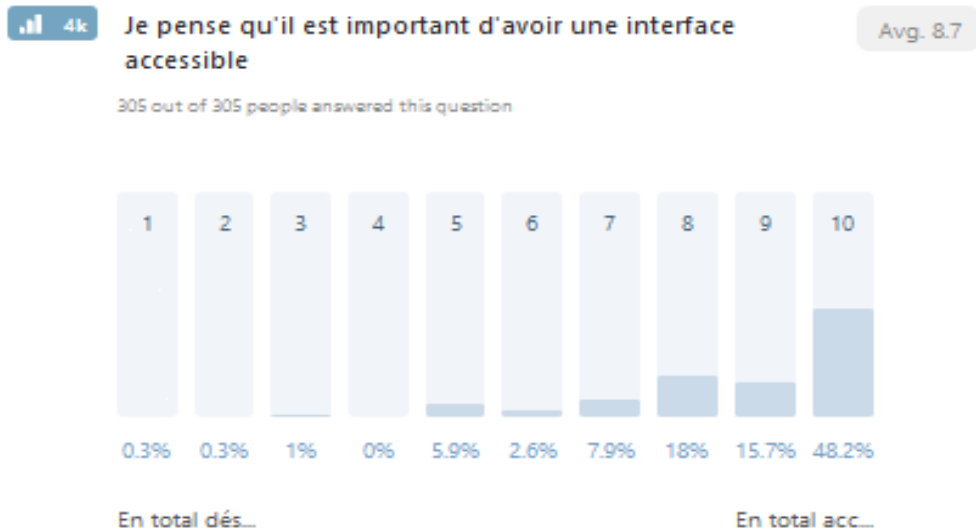
Attachments

⬤ 5 Je suis impatient de pouvoir utiliser cette nouvelle version d'OAE

304 out of 305 people answered this question

74.3%	Yes	226 responses
25.7%	No	78 responses