openlaws

Deliverable 3.3.d1

User Experience Design

openlaws

JUST/2013/ACTION GRANTS

Grant Agreement Number 4562

Project Start date: 01.04.2014
Project End date: 31.03.2016

Report No. D3.3.d1 – USER EXPERIENCE DESIGN

Version – 2.1

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Scope: Internal

Deliverable due date: 31.03.2015
Deliverable actual date: 10.09.2015

Document History

Date	Revision	Comments
16.03.2015	0.5	Initial version
13.04.2015	0.8	Added Code Camp feedback
11.05.2015	1.2	Update of UI to match development
15.06.2015	1.7	Update of UI to match development
15.07.2015	2.0	Add OSS workshop feedback
10.09.2015	2.1	Final version

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Executive Summary

User experience design, SUAS (ALP, UVA, BYW):

This document describes the overall approach towards user experience for the openlaws platform. It focuses on both main user groups, namely end-users as well as developers from the legal informatics community. After a review of existing legal platforms as well as some analytics and research platforms, the mock-ups for the openlaws portal are presented, together with its first prototypical realization. In addition, the authors report briefly about the two major community events for user experience input, the Openlaws Code Camp and the Openlaws Open Source Software Workshop.

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1 Introduction

User experience, in conjunction with user interfaces and user interaction, is more than sole delivery of functionality. Target user groups have to be "touched" on an emotional level to raise the use of the platform to a thrilling experience (Schmitt, 1999). The ISO describes user experience as a concept related to both, the expected perception and reaction as well as their actual manifestations regarding the use of the platform (ISO 9241-210:2010). While commonly, the term "users" is related towards end-users, within the openlaws.eu project, we have two kinds of users that have interest within the platform, which are the end-users and the developers. Therefore, throughout this document, we focus on both user groups. During the development of the openlaws.eu platform, three main factors have to be considered as described by the PACMAD usability model (Harrison, Flood, & Duce, 2013). Although this model is designed primarily for mobile applications, we argue that it is suitable for our platform as well due to the fact that we offer a responsive Web-based service. In addition, generalized aspects can be derived for both our user groups.

The first factor to consider is the actual **user** of the system. On the one side, classical input methods have to be covered; on the other side new input variations arise from upcoming mobile input device. It is one of the main challenges to fulfil demands from both worlds. In addition, physical limitation can also impact the usability of a system. Standards for universal access should therefore be consulted from the very beginning of the development. In addition, the previous experience a user possesses has a significant impact on how he or she interacts with the system or perceives interaction processes intuitive or not.

The second factor relates to the actual **task** a user wants to achieve. This task should also be the main focus of the platform. During the course of development, additional functionalities can be added to enrich the capabilities of the platform. This can attract more users and also new user groups, which where not attracted by the platform before. However, these additional functionalities come by the cost of increasing complexity of the platform, which, in the worst case, negatively impacts the usability of the platform.

The third factor comes in form of the **context of use**. This factor is separated form the both factors mentioned before. It includes special aspects of the physical environment (e.g., mobile device, desktop application) as well as job-related aspects (e.g., law student, lay person, employee in an organisation). Different views within the platform could help to provide a suitable support for each particular context or group of contexts.

In the upcoming parts of this deliverable, we shed light not only on the front-end part dedicated towards end-user, but also on the back-end, development part and our strategy to get close to the community.

2 User Interaction – A Two Side Perspective

To ensure sustainability towards the openlaws.eu platform, it is necessary to go beyond boundaries of conventional development (West & Lakhani, 2008). It is not enough to join forces within our institutions; we have to reach to new "frontiers". This is necessary as knowledge from outside the consortium should not be neglected but rather embraced to establish a hybrid approach towards the project aim. The combination of external and internal innovative ideas can push the development to new levels (Lakhani & Panetta, 2007). This is called *open innovation*.

To achieve this innovative process, it is of great importance to incorporate external community developers from the very beginning of the project. Regarding this aim, several critical aspects have to be considered (Roberts et al., 2006). Firstly, it is mandatory to interact as directly as possible with the community. This interaction can be achieved in various forms such as code camps, workshops, or open code repositories. Furthermore, dynamic and fluent feedback cycles help to understand and realize the input coming from the community. Last but not least, making "them" part of the team encourages closer and sustainable cooperation. Yet, it is a challenging task to achieve all these points for several reasons. We see the most dominant reason with the heterogeneous motivations behind the contributions of community members (Lerner & Tirole, 2002), which reach from getting famous, over pure altruism, up to pushing development further for their own use or increasing professional reputation. Therefore, it is necessary to getting to know the openlaws community throughout several interaction events.

3 Overview of existing (Legal) Open Data Platforms

This section of the deliverable is intended to present an overview of existing legal information platforms, especially the platforms essential for the scope of the current openlaws.eu project. The authors picked out particular interesting aspects of existing platforms and derive design and implementation suggestions for the openlaws platform. In addition, an exemplary platform for scientific research exchange is presented and useful features are highlighted, which have the potential to foster the social layer of the openlaws platform in the future development of the platform.

3.1   Governmental Legal Open Data Platforms

The first platform to be portrayed is the **EUR-Lex** platform.[1] This platform serves as distribution point for the Official Journal of the European Union, EU law, preparatory acts, EU case-law, international agreements, EFTA and other related documents. The provided functionalities range from a detailed expert search, over personalized RSS feeds, a collection of documents and related searchers, as well as personalized print and export functionalities. Figure 1 shows the landing page of EUR-Lex.
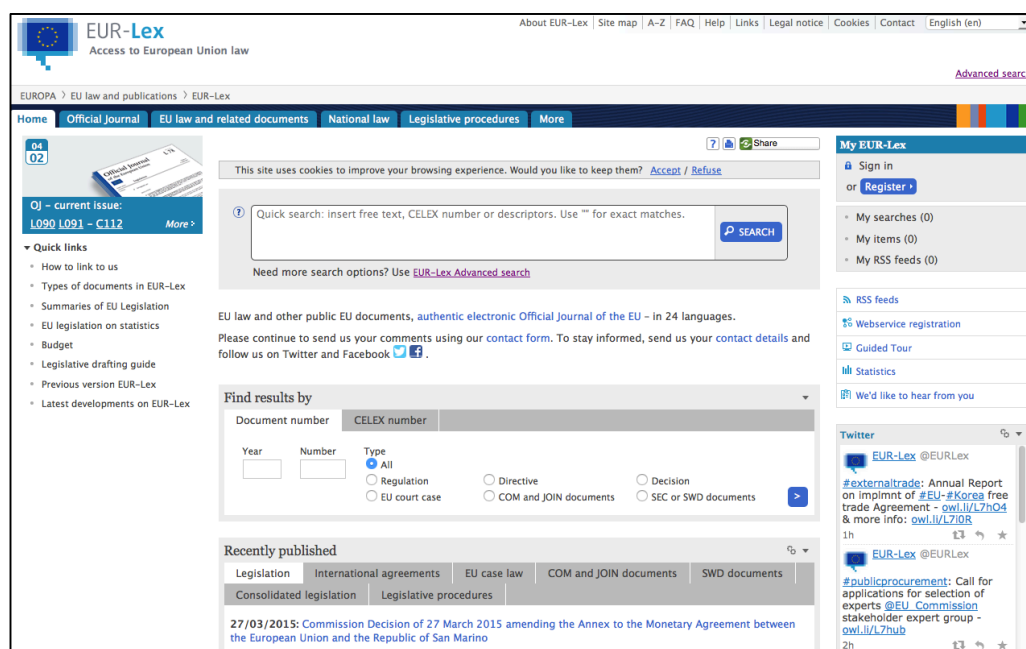

Figure 1 - EUR-Lex landing page

The first circumstance to be noted is that the platform is not designed for lay people, but rather for professionals from the field. Nearly all functionalities described before are directly embedded on the landing page. For a person not accustomed to the subject of the legal profession, it is hard to see through all of the offered starting points. If the user is not absolutely aware of what exactly he or she is looking for, chances are small to find the right item. Figure 2 extends this observation, as the single result offers multiple options again for the user to choose. Not only are all available languages and formats displayed at once, extended filter functionalities and additional related contents are presented right away.

Furthermore, the entire services, including the offered web service, are very slow if more complex or larger queries are issued to the system. This can be particularly frustrating for lay users, as they normally tend to search in an exploratory way, rather than in a very focused and – from the beginning – directed way. In addition, even while the system offers some functionalities for personalization, it is not learning from the behavior of its users nor is it adapting for specific user when logged on to the platform.

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[1] http://eur-lex.europa.eu/homepage.html?locale=en

The openlaws platform therefore shall include a simple, but focussed landing page with the central functionality – the search. All additional functionalities should be hidden until the user accesses them deliberately or the next step within the search and use process requires the user to interact with them. Also, in the long run, the system should adopt to the users search behaviour and suggest related items in regard to the current item set displayed as well as in relation to the users overall favourite search subjects.

Figure 2 - EUR-Lex detailed search result

Legislation.gov.uk[2] presents Great Britain's solution towards publishing open legal information. If compared to EUR-Lex, the landing page of legislation.gov.uk is much cleaner and better organized (see Fig. 3). An interesting search variant presented, besides the classic search, is the search via a geographic filter. Users can select the area of geographic interest on the map provided, which serves a filter for legislation items. Furthermore, it is also possible to browse entries by accessing them on a timeline. This can be particularly interesting, if a user wants to investigate the creation of legalization or its adaption over a certain period of time (see Fig. 4).

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[2] http://legislation.gov.uk

Figure 3 - Landing page of Legislation.gov.uk
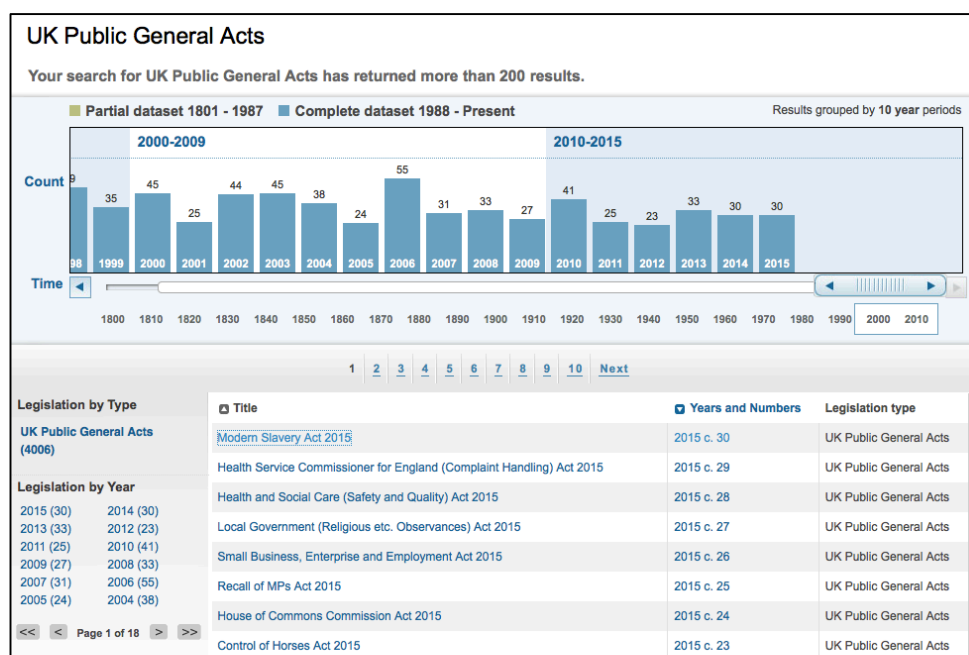
Figure 4 - Search results Legislation.gov.uk, including timeline

Overheid.nl[3] is the third legal information source visited in this report. It presents the legislation access portal of the Netherlands. Similar to the Eur-Lex platform, the initial search presentation already features some level of complexity. Still, from a clean, accessible interface point of view, it does a much better job in its representation (Fig. 5).

Figure 5 - Landing page of Overheid.nl

The search results are represented in a clean way, with the option of printing specific sections, or the entire document. The representation of the interaction icons is subtle and blends into the interface (see Fig. 6). It is also possible to expand or collapse pieces of information to keep a better overview.

Figure 6 – Search result page from Overheid.nl

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[3] http://wetten.overheid.nl/zoeken/

The final legal platform to be inspected is the Austrian RIS (legal information system). The search mask is, as with all the other portals, fairly complex and can be potential confusing for lay people to actually start their search (Fig. 7). The results are displayed in a kind of overview, which the authors personally do not find as much easy to look at as the Netherlands' version for example (Fig. 8). As to the best of the authors' knowledge, the Austrian RIS is the only platform of the four introduced legal platforms that also provides a mobile app version. However, this version is not maintained by the Austrian government, but by a private company.[4]

Figure 7 – RIS landing page for search for federal law

Figure 8 – RIS search result detail page

3.2   Ravel Law – Legal Research and Analytics

Ravel Law[5] offers a search engine for legal information items, paired with analytics and visualization options. It specifically focuses on lawyers to provide them deeper insights in cases and associated materials. Figure 9 shows a detail search results item.
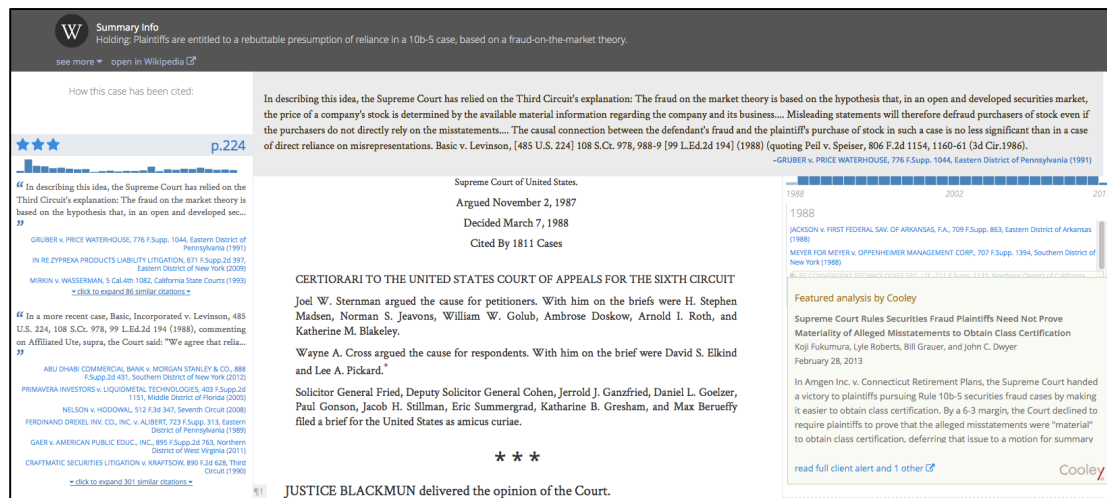
Figure 9 – Details of a search item in Ravel Law

As it can be seen in Fig. 9, the result representation clearly focuses on experts, as a lot of additional information is displayed at the same time together with the main legal item. What makes Ravel Law particularly interesting is its extended timeline functionality (see Fig. 10). It does not only represent laws over time, it can also show very influential cases at the same period and how the single cases are referenced to each other.
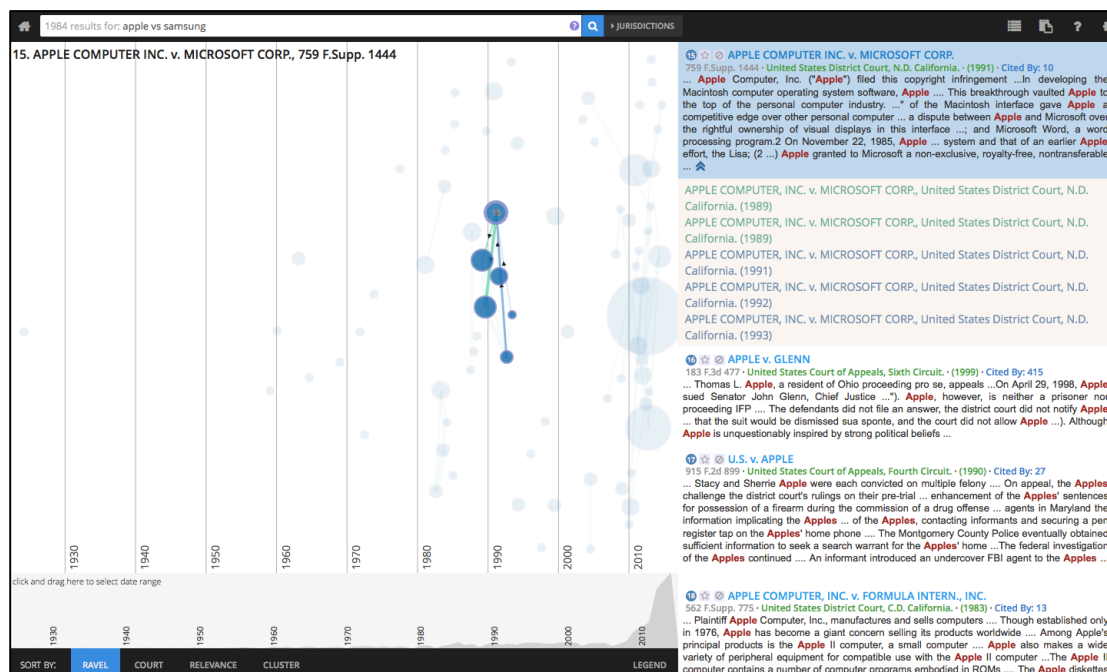
Figure 10 – Extended timeline functionality with impact level of cases

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[5] https://www.ravellaw.com

3.3   ResearchGate

The social platform ResearchGate[6] offers researchers worldwide the possibility to exchange ideas via their publications and knowledge within the included Q&A forum. The profile page can be seen on Fig. 11. It offers a clearly structured overview of detail information regarding the person of interest. Besides a short description of the person, a viewer can see basic statistics related to documents uploaded by the person, as well as featured publications the user wants to highlight for visitors of the profile.
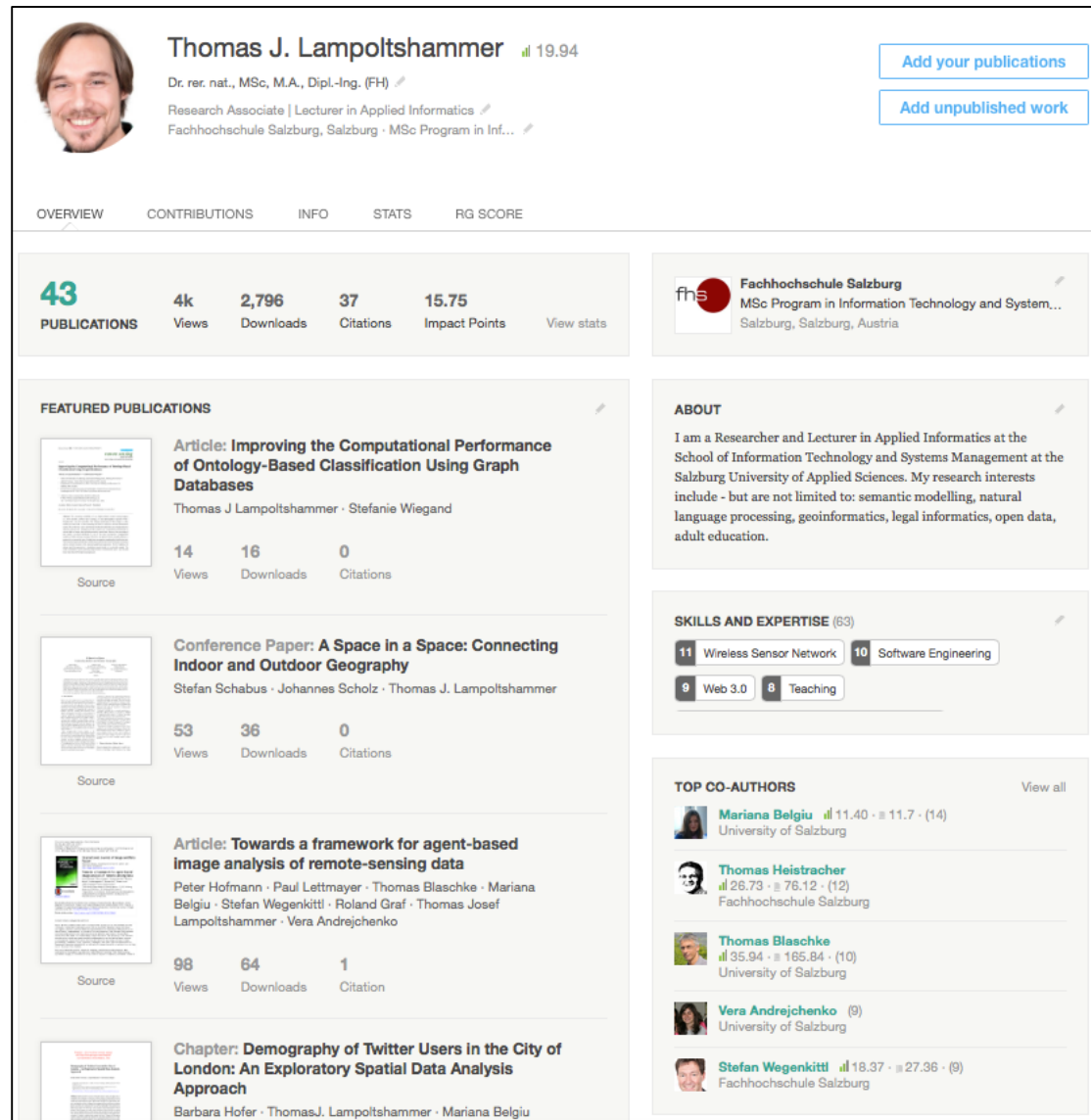
Figure 11 – Overview of personal information in ResearchGate

In addition to the public available statistics, platform users can also get detailed private information about their impact within the social community. ResearchGate therefore offers a unique impact score consisting of publications, questions addressed to the community, questions answered by the community, and the number of profile followers (see Fig. 12)

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[6] http://researchgate.net
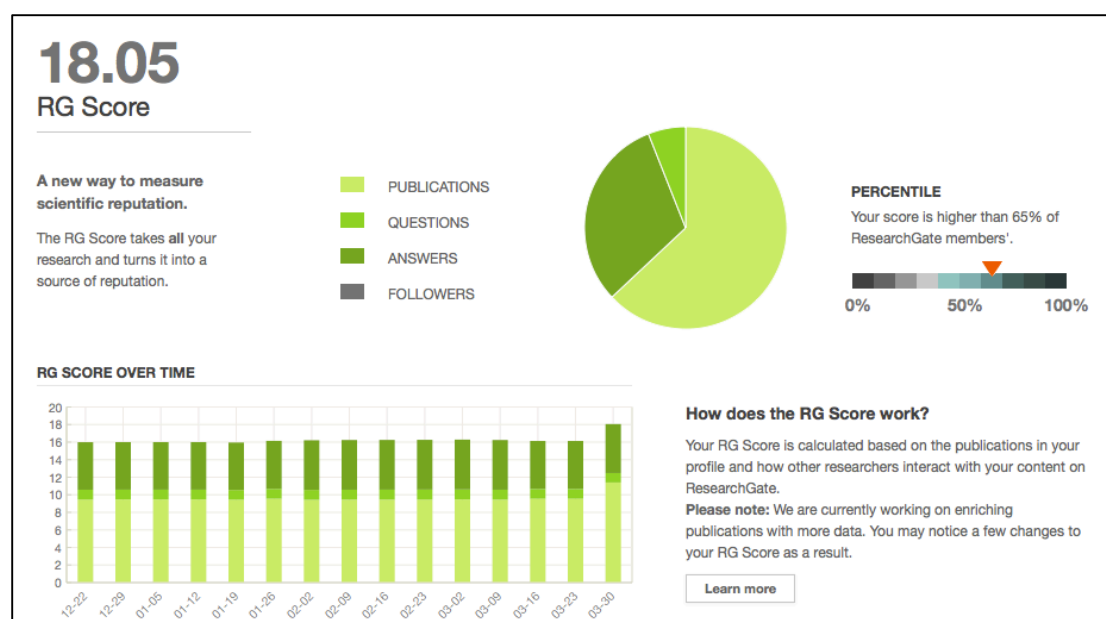
Figure 12 – Personal statistics via ResearchGate-specific metric system

As publications are one of the most important assets for scientists to measure their impact within the community, the platform has a detailed view for the associated downloads, views, citations, and profile views per day and per week (see Fig. 13).
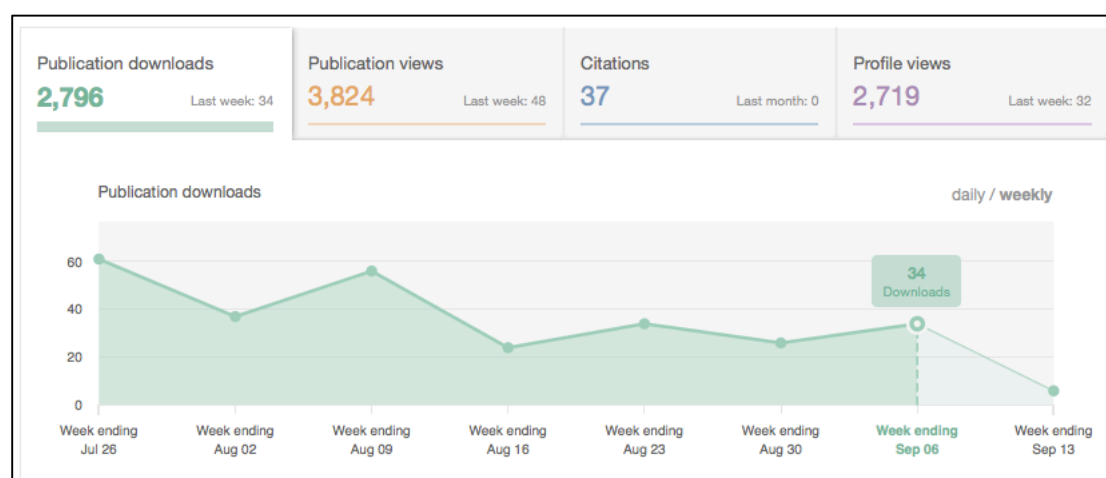
Figure 13 – Publication and profile statistics in ResearchGate

Summing up the visited legal portals, as well as the analytics portal Ravel Law and the research community platform ResearchGate, the authors make the following conclusions to the main design of the openlaws platform. The main central point has to be a slick, clean interface. Additional information such profiles, analytical results, and statistics are absolutely beneficial, however, confronting the user from the very beginning with all these different kinds of information can results in an uncomfortably user experience. Not all users that are going to work with the openlaws.eu platform are legal experts. The authors therefore are going to design the initial prototypical front-end as a "minimalistic search view" with extended functionalities in the back-end, ready to be delivered at the right point in time within the search and working process of the user.

4 Interface Design

This section of the deliverable shows the first set of user interface mock-ups for the openlaws project. As already discussed before, the user should start the search from a clean and slick starting point. The authors therefore decided to present the main search input as the center piece, similar to the approach that Google chose for their search page. Figure 14 displays the landing page for search within openlaws.
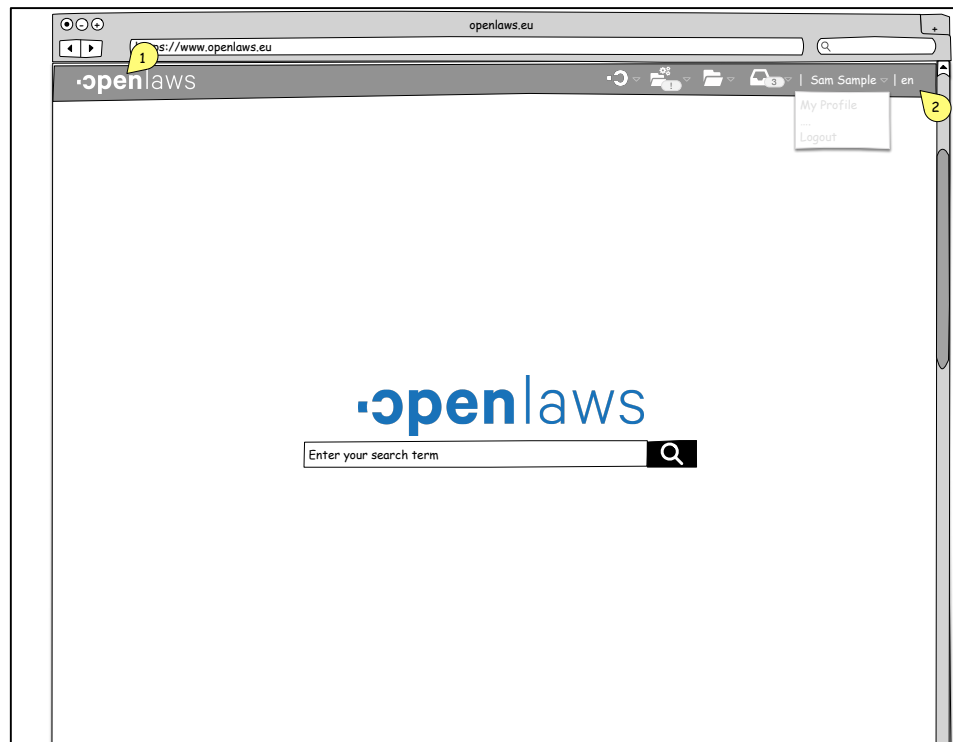
Figure 14 – Mock-up landing page for search in openlaws

The openlaws logo element (1) serves as a "return to home" functionality as it can be commonly found on various websites. The interaction bar (2) at the upper right corner holds access points to varies functionalities that can be offered to the user. The openlaws-styled "o" can hold additional functions that may be added later on during the development. The inbox and smart-folder icon (with gears) show the status of new items in (smart-)folders and/or notifications from the system side. There is also an access point towards the profile of a user, as well as a convenient way to foresee the switching capability between different languages.

Users can also register at the platform to reach additional functionalities such as persistent collections of legal items, notification of new items within openlaws, etc. The registration dialog is shown in Fig. 15. The sign-up page provides all necessary input fields for the sign-up processes (1). In addition, the user is informed about the terms and conditions of the platform, as well as he/she can state if they are an expert or not (2). This can be used in a later phase of the platform and can be seen as placeholder feature at the moment. In addition to the login functionality by openlaws, users can also login by employing verification service of other established platforms, such as LinkedIn, Xing, or Facebook (3).

Figure 15 – Mock-up sign-up page for openlaws

After the sign-up process is finished, users are presented with some of the core features of the platform to trigger exploration (see Fig. 16).

Figure 16 – Mock-up sign-up confirmation on openlaws

The listing of search results is shown in Fig. 17. Again, the representation is similar to the representation by other search engines to easy the usage of the platform for the users. The headline in blue (1) represents the main title of the legal item found and by clicking on it, users can directly jump to the detail page regarding this legal item. The text block beneath the direct link provides a short teaser to give users a first impression what this particular legal item is about (2). Right underneath this teaser is a link to the original source from where openlaws acquired this legal item (3). Last but not least, search results can be sorted by date or other features such as potential ranking scores from the back-end (4).
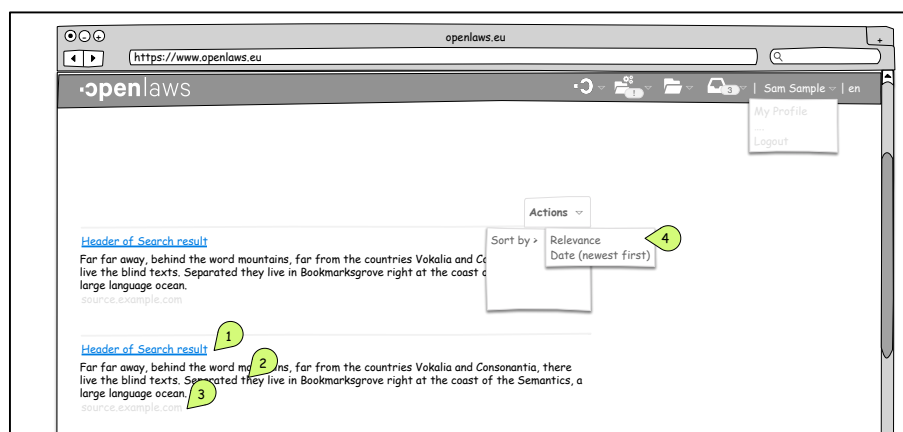
Figure 17 – Mock-up search results in openlaws

In the detail page (see Fig. 18), a particular legal item chosen by the user is displayed. At the very beginning of the detail page, the official and – if available – unofficial title is presented (1). Furthermore, multiple "views" on the document can be chosen (2). These include, e.g., the document as such, related documents, summaries provided by other users, etc. Users are provided with necessary detail information to place the legal item into its context (3). Then the actual text of the view chosen is displayed (4). In addition, relevant keywords (5), together with the original source (6), as well as important dates such as creation and effect date are shown (7).
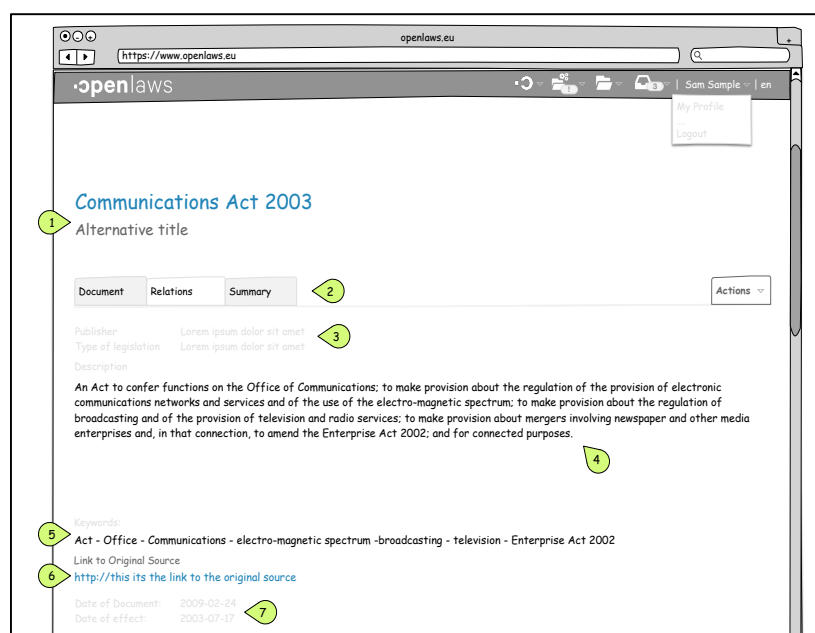
Figure 18 – Mock-up detailed search item in openlaws

5 Implemented Interfaces Within First Prototype

This section of the deliverable shows the initial prototypical implementation of the developed mock-ups.[7] This can only be a snapshot, as the front-end development is a continuous endeavor and has to reflect also lessons learned during development as well as to reflect changes and addition in the back-end functionalities. Figure 19 shows the landing page regarding search for the prototype. It puts the input for the search query right into the focus of the site, while other elements such as login and sign-up are available, but remain unobtrusive. At the very bottom of the page, the authors placed a short description about openlaws and what it is all about.

Figure 19 – Prototype landing page for search

Figure 20 is dedicated to the login and sign-up process. The authors chose to combine both input masks within one dedicated spot. The input fields offer a smart placeholder system as well as "speaking" icons to guide users during registration or login. In Fig. 21, the search result page is shown. Again, the authors present this view as minimalistic and straightforward as possible, alongside of known search engines. The results include links towards the detail result page as well as a short teaser text about the legal item. Furthermore, there is a bookmark functionality foreseen on the right of each search result item. Figure 22 shows the access towards user-generated folders. These folders can hold legal items from search results and can serve as a collection of items towards a specific topic. While private by default, these folders could be shared with others or even made public. When a search result is clicked, the specific details of this legal item are displayed (Fig. 22). An extensive tab system provides different view and additional information regarding the selected legal item (Fig. 22 & Fig. 23).

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[7] The mock-ups are intended to depict the initial development idea and are meant as 1:1 blueprints for the front-end
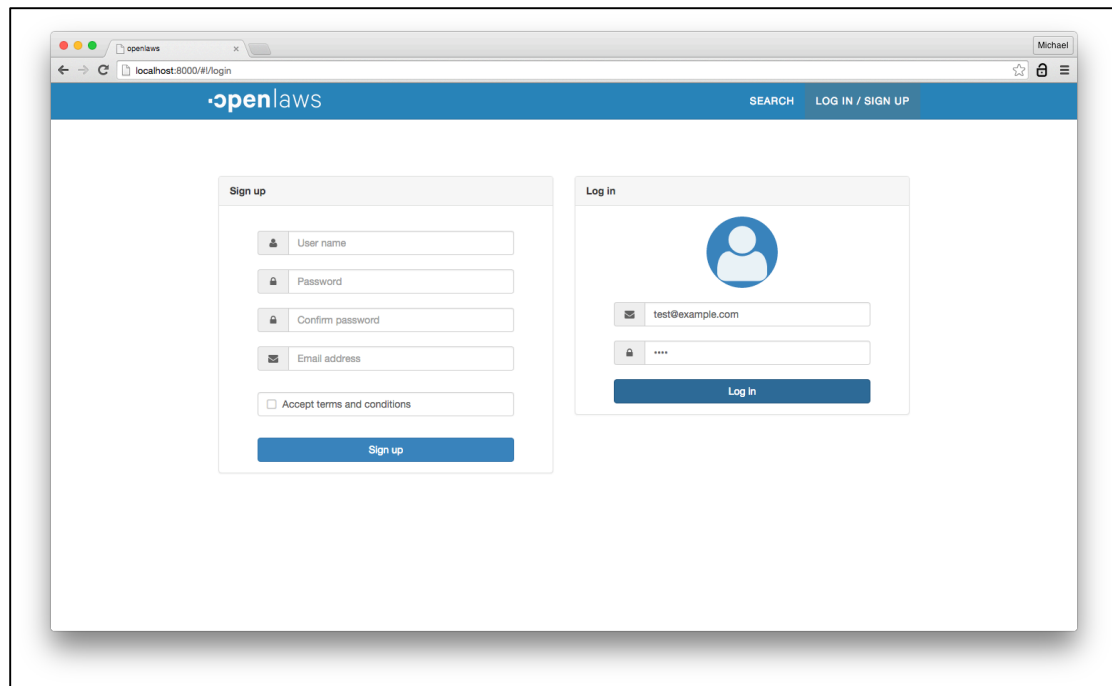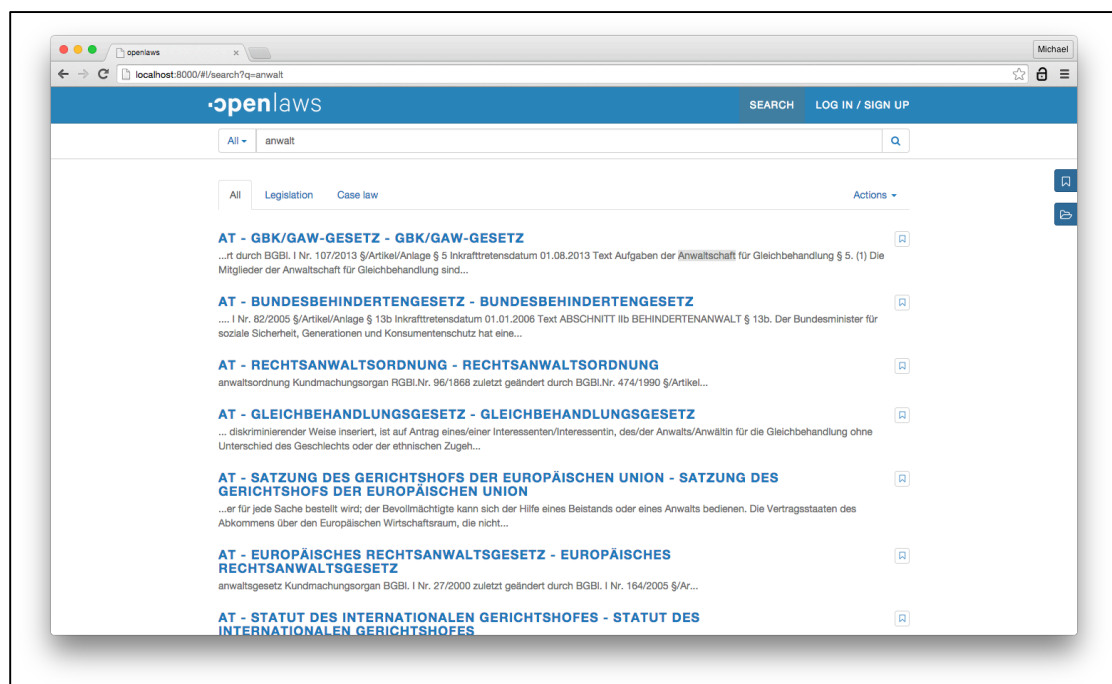
Figure 20 – Prototype sign-up page
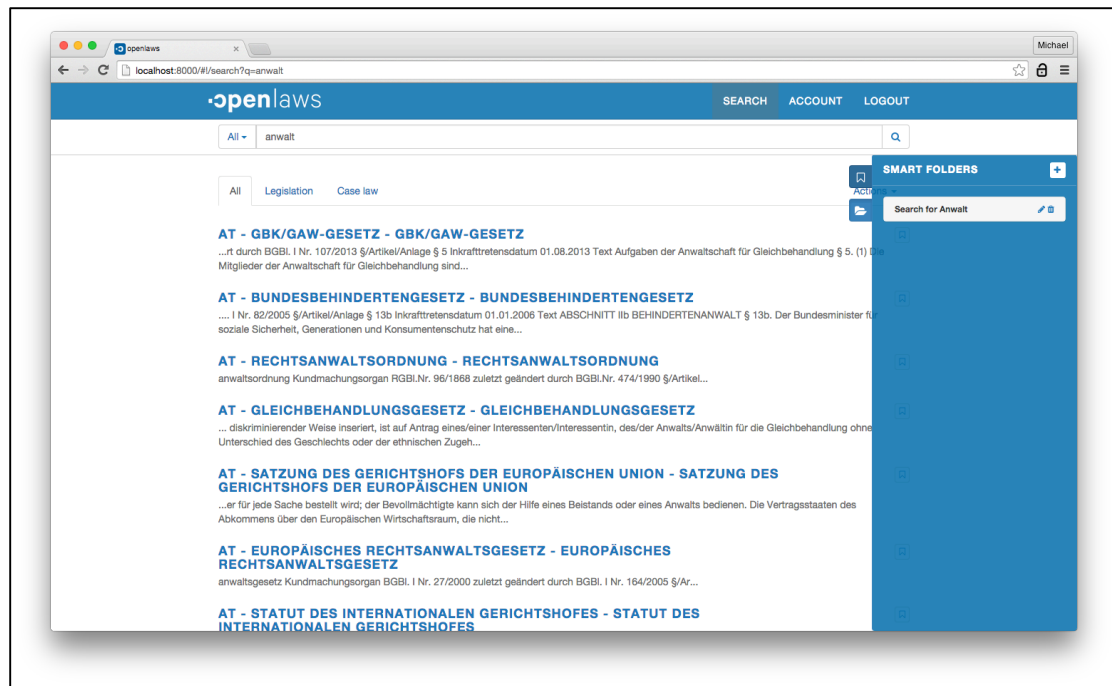

Figure 21 – Prototype search result list

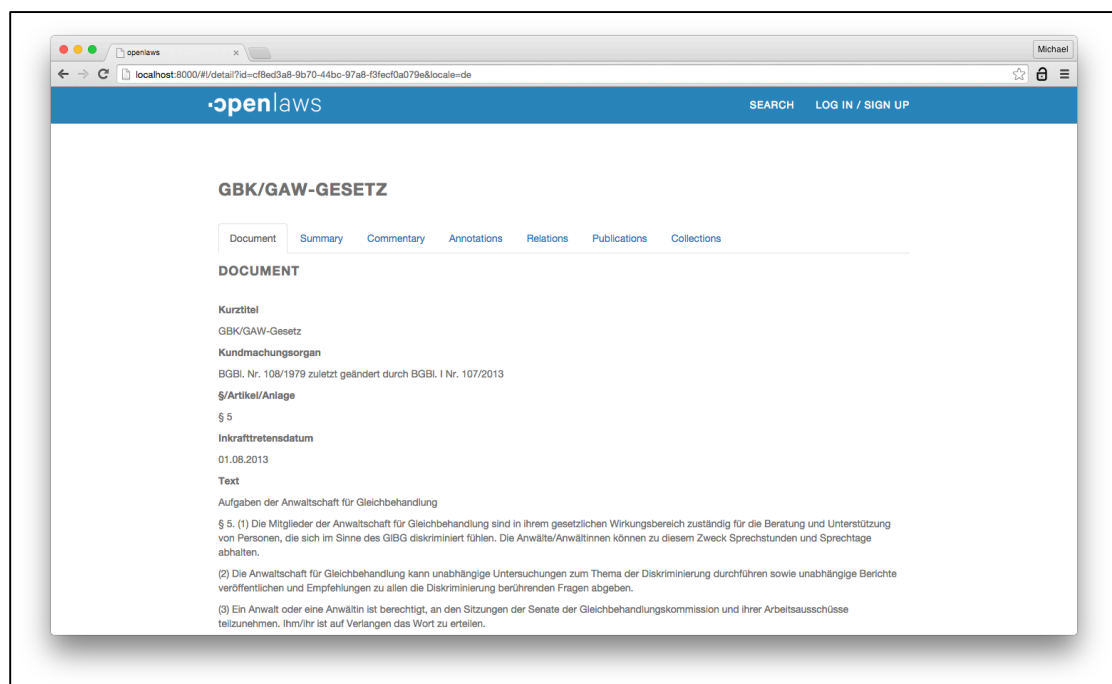*Figure 22 – Prototype advanced functionalities*

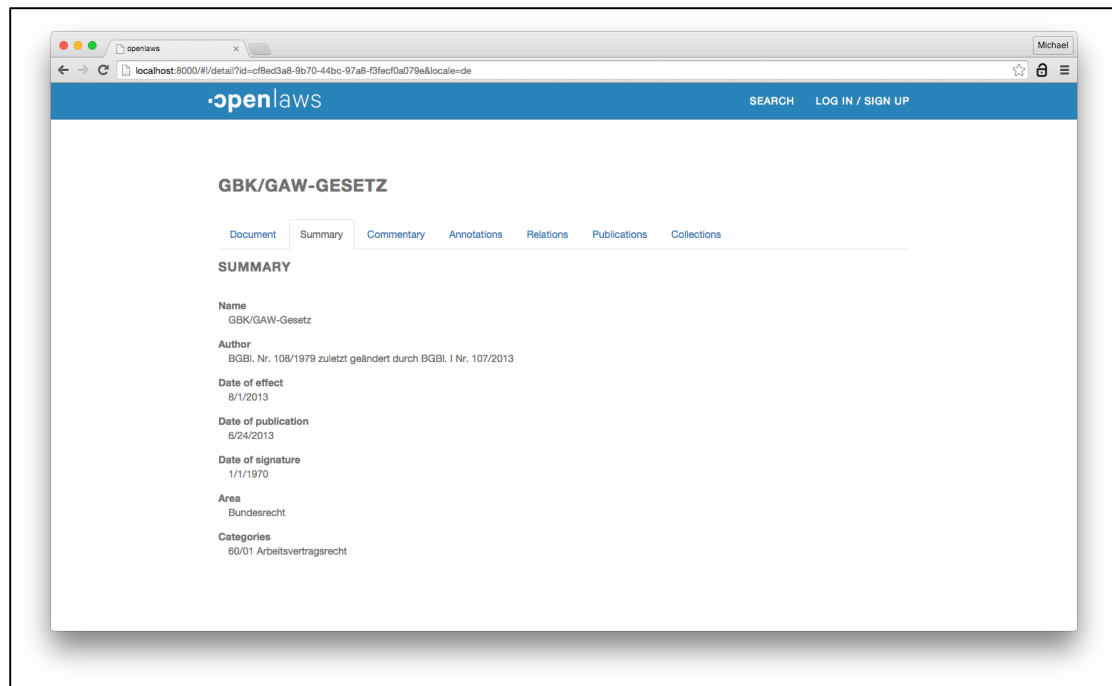*Figure 23 – Prototype detailed search item I*

Figure 24 – Prototype detailed search item II

6 Feedback Cycle Regarding User Interaction

In the following section, possibilities to assess user feedback and feedback from the developer community are presented.

6.1   Assessing the Usability Perspective of End-users

While the project is still in a too early phase for in-depth end-user usability testing, we are going to discuss potential feedback mechanisms and details, which will provide valuable feedback once the platform can be released to the wider public.

In the following, we describe seven attributes according to (Harrison et al., 2013), which have an overall impact on the usability of the openlaws.eu platform.

The first attribute is **effectiveness**. This attribute refers to the user being able to successfully complete a task in a defined context. The measurement of this attribute can be done via assessing if or if not a user has complete a certain task or set of tasks.

The attribute **efficiency** addresses the time and the overall accuracy a user achieves while completing a task. Over all sets of tasks a user wants to complete by using the platform, this attribute describes the productivity of a user regarding openlaws.eu. The efficiency can be measured either by taking the time needed to fulfil the tasks, by counting the number of keystrokes or mouse clicks, or by the number of necessary steps within the application.

The **satisfaction** refers to the individual and subjective perception of fulfilment of the users' desire when working with the platform. Questionnaires offer one possible way for assessing this peculiarity.

Learnability reflects the difficulty for users to gain knowledge required to use the platform appropriately. As users will only spend a certain amount of time for learning towards the platform (at least for casual users) this attribute will heavily impact the sustainability of the platform regarding the return rate of users.

The **memorability** affects the way of how users remember all necessary steps to actually use the platform. As potential users of the platform can be distinguished between regular and power-users, there exists a difference between the frequency of use and therefore different levels of inactivity regarding the use of the platform.

Errors describe possible pitfalls for users to complete a desired task at hand. The result reports and maybe occurring workarounds can help to further improve the platform and to introduce maybe

convenient support functionalities for certain areas of the platform.

Last but not least, there is the attribute of **cognitive load**. This aspect is particularly important when it comes to the responsive design of the platform, which is used on mobile devices. The use of such devices is usually coupled with other activities such as walking or moving in general. This circumstance demands a somewhat light-way and easy use of the platform in comparison to standard desktop usage.

6.2   Impressions From a Developer's Perspective I – The Openlaws.eu Code Camp

The openlaws.eu development team works closely with the open source community to bring the best user experience to our target group. One step towards this ambitious goal was the conduction of our code camp on March 20th – March 21st, 2015. We invited developers of different countries and with different backgrounds and experience levels to work hands on the first prototype of the openlaws.eu platform (Fig. 25).

Figure 25 – Openlaws Code Camp participants

The participants where provided with a virtual machine, containing a first preliminary prototype of the openlaws platform, together with a snapshot of already imported legal documents. This enabled our participants to not only test our first front-end visualisation, but also to have an intense look at our data model. It was interesting to see, how the shared passion for coding brought individuals from various backgrounds together. Soon after the event started, people already paired up on ideas, how to enrich the platform and what could already be done with the existing data at hand. These ideas reached from new legal data source connectors (e.g., for German legislation), utilities to visually explore linked data within openlaws, recommendation algorithms for the social layer within the platform, up to enrichment features for existing legal documents.

However, not all aspects of the code camp worked right away, which – for us – were important lessons learned for future events and also for cooperation with the online community. The biggest hurdle to be taken by the participants was our graph database and the associated data model. While some of the developers already had experiences with No-SQL databases, nearly no one had worked with graph databases – in our case Neo4j – before. It is not only the way how to create and evolve the data model,

also the query language cipher is different to other languages such as SQL. Therefore, we spent some time to "educate" seniors, which in return then helped out other, less experienced developers (see Fig. 26).
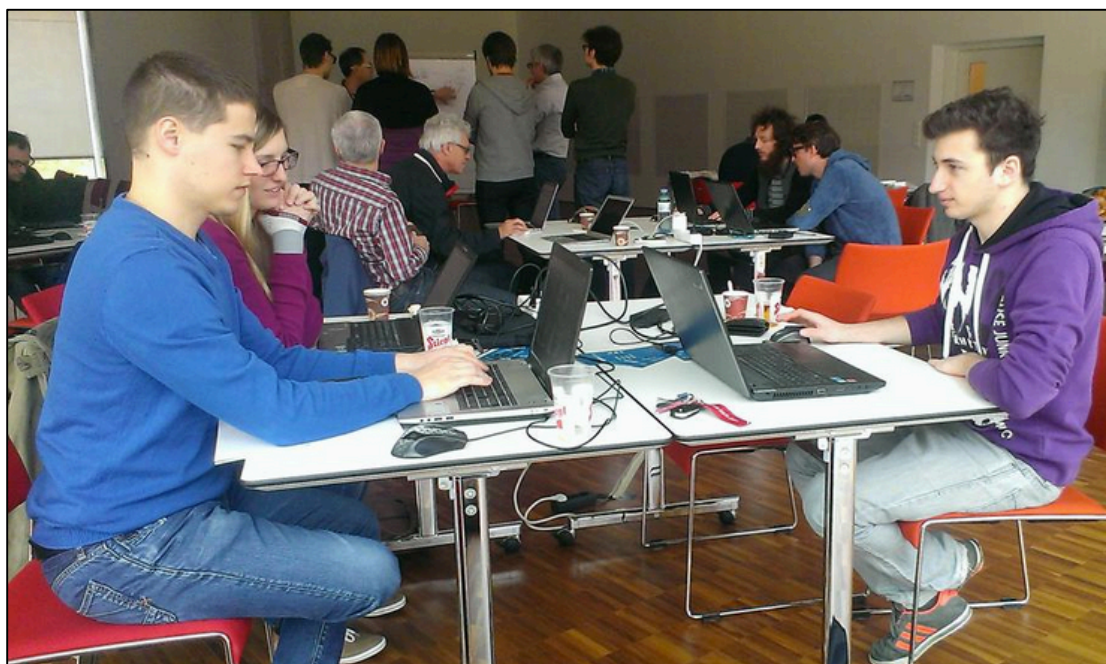

Figure 26 – Data model discussions and developer groups

This multiplication method worked well and people could already provide valuable input through their independent outside view. For the follow up code camp event in early 2016, the openlaws team plans to provide already some training and information package several weeks before the actual event to guarantee that the developers can then fully concentrate on the prototypical realization of their ideas.

6.3   Impressions From a Developer's Perspective II –
The Openlaws.eu Open Source Software Workshop

As early on recognised during the initial planning for the openlaws platform, Open Source Software (OSS) plays a key role in research-driven projects. To guarantee sustainable results, the process of innovation has to reach beyond organizational boundaries. The combination of internal and external knowledge and motivation unleashes new potentials and opens paths to new ways of success. It is Open Source Software that establishes this link. Thus, OSS is a building block, which cannot be neglected by academia, industry or the public sector. OSS gains also importance from a European perspective, which becomes obvious by the emphasis of the European Commission on their Open Source Strategy for 2017[8].
We therefore decided to initiate the *openlaws.eu - Open Source Software Workshop*, aiming at bringing international professionals from academia, industry, and the public sector together to exchange experience, findings, and ideas in the realm of Open Source Software (see Fig. 27). The workshop took place on the 26th of June, 2015 at the Federal Chancery in Vienna, Austria.[9]

Seven speakers from Austria, Germany, and the United Kingdom presented their topics to the workshop audience. The topics ranged from legal services building on open data, over open source software licensing issues, up to legal text processing and linked open data in conjunction with open source software. A detailed overview of the presentations is given in Tab. 1.

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[8] http://ec.europa.eu/dgs/informatics/oss_tech/strategy/strategy_en.htm
[9] The openlaws consortium would like to thank the team of the Federal Chancery in Vienna for providing the venue for our workshop.

Figure 27 – Experts discussing challenges towards open source software

Title	Speaker	Institution/Company
Openlaws - A Legal Service by the Community for the Community	Thomas J. Lampoltshammer	Salzburg University of Applied Sciences
The use of open source software in Switzerland	Marcus M. Dapp	Digital Sustainable Commons
An example of open legal data text processing and analysis using open source software	Florian Kuhn	Institut für Deutsche Sprache (IDS)
Open Source – A legal view on the Dos, Don'ts and Maybes	Árpád Geréd	Maybach Görg Lenneis Geréd Rechtsanwälte GmbH
Interaction between creative commons and open source licences	Andres Guadamuz	University of Sussex
The Apache Way and How it can help Research Projects	Jakob Frank	Salzburg Research Forschungsgesellschaft
Spatial, Linked (Open) Data - Theory, Practice & Problems	Johannes Scholz	Graz University of Technology

Table 1: Topics of the openlaws.eu open source software workshop

A particularly interesting issues between the participants of this workshop was towards licensing issues. As the business model behind the openlaws platform is crucial for its sustainability, choosing software components with incompatible or viral licenses: could severely harm the service. In addition, the lessons learned from the Apache foundation and its management of code contributions showed us important aspects towards the open innovation aspect of openlaws regarding do's and don'ts.

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