Group4 GmbH

gutenshare network

Project sketch

Alicia Rüegg
Kaspar Wolfisberg
Louis Leon Müller
Aleksandar Spasojevic
Arik Sidney Guggenheim

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Current situation

Creating and gathering learning resources can be a tedious and time-consuming task that students must deal with. To distribute this work load, students exchange notes, summaries and other learning resources. Acquiring these resources requires to get in touch with the right people and to have access to the right channels. The exchanging process usually happens through file sharing solutions that get the job done but are not specifically catered towards the problem and miss out on a lot of potential use cases.

Idea

To address the aforementioned inconveniences, we plan to create a web platform independent from lecturers and educational institutions, for students by students to share study related resources. Students upload documents they are willing to share and categorize them by allocating them to a general subject or a course within the curriculum of their study program. Besides the obvious search functionality, users will be able to easily locate documents through a sophisticated browser. While checking them out, they will be provided with suggestions of related media and related courses of different institutions.
As means of quality control on a per upload basis, a resource can be rated and discussed in the comment section by all users as well as reported as inappropriate or illegal. All document uploads are available through a user's profile as well as uploading and rating statistics to help others assessing the quality of their work. Additionally, a market place section will allow for reselling of study books and other physical media.

Customer value

The primary target group consists of students looking for learning resources. By using the platform, they get an easy way to share their documents and have access to a vast collection of learning resources across the boundaries of educational institutions. Where your own school may be lacking material, students of other schools may help you out! Users will be able to efficiently locate these materials through an advanced searching and browsing capabilities. The document rating system allows you to jump right into material that was perceived as valuable by others. The main benefit is receiving a specialized tool serving one purpose only while providing the best possible experience doing so.

State of the art / competitor analysis

There are already lots of different Learning Management Systems (LMS), some of them are open source and free to use for universities while others are published under a commercial license. One of the biggest and most used LMS in Switzerland is OLAT [1] and openOLAT [2] which are maintained by the University of Zurich respectively by a spin off called Frentix [3]. Other popular solutions are Ilias, Moodle and many more.
However, universities rely on their own implementation of the mentioned platforms and these are
not designed to allow document sharing between different schools. The content is also maintained and controlled by teachers and professors. If students want to share their own documents they often need to use third party cloud systems like Dropbox or OneDrive.
There is already a platform in Switzerland which is maintained by students. This web service called Uniboard [4] is not primary designed for document sharing but acts as a forum.

[1] University of Zurich. (2018). *Online Learning and Training (OLAT)* [Online]. URL: https://help.olat.uzh.ch/ [2018-02-03]
[2] OpenOLAT. (2018). *Infinite learning* [Online]. URL: https://www.openolat.com/features/?lang=en [2018-03-04]
[3] Frentix GmbH. (2018). *Open OLAT* [Online]. URL: https://www.frentix.com/produkte/openolat-hosting/ [2018-03-04]
[4] Uniboard AG. (2018). Gemeinsam studieren ist besser! [Online]. URL: https://www.uniboard.ch/startseite/ [2018-03-04]

Main use cases

Main use case 1: Uploading a new document

- After signing in the student gets to the home page.
- In the navigation bar the student clicks on the link that leads him directly to the page where he can upload a new file.
- The student chooses the document which he wants to upload and types in an appropriate title.
- The student has now two options:
    - On the one hand, the student has the possibility to choose a path from a collection of existing paths.
    - On the other hand, he can specify the path to his document on the platform. The student is requested to comply with the following guidelines: School/Department/Study Course.
- The student submits his upload and is now redirected to the page where he can see his uploaded document.

Main use case 2: Search, download, rate and comment a document

- After signing in the student gets to the home page.
- In the navigation bar, the student clicks on the link that leads him directly to the page where he can see the already uploaded files.
- As the uploaded files all have a prescribed guideline (School/Department/Study Course), the student browses now until he finds his desired file.
- The student has now three options:
    - If he wants to download an existing document, he clicks on the corresponding document and the file will be downloaded directly.
    - If he wants to rate the document, he clicks on the stars below the document. The application now recalculates the number of stars based on its and existing ratings.
    - If he wants to comment on the document, he types in his message. The student now hits the submit button and the captured comment appears directly below the file.

Additional requirements

All web traffic must be encrypted to ensure adequate security standards. The web service, file storage and databases must be highly available and scalable.
Uploaded documents must be backed up in case of a system failure.
In regard of copyright claims a control system will be implemented. A legal advisor must be consulted to clarify possible further requirements.

Resources

The team consists of five students. All of which have experience in object oriented programming. The following roles are needed for this project.

- Project manager
- Software architect
- Frontend engineer (HTML, CSS, JavaScript)
- Backend engineer (Java)
- Database engineer
- DevOps

Furthermore, we need external help for legal counsel to clarify copyright issues for stored documents and user data.
To provide resources for the infrastructure, a platform as a service (PaaS) will be used.

Risks

If the platform is not being used by a critical number of students the archive of provided documents will be too small for new users to see benefits in registering. Therefore, the number of contributing users must surpass a certain threshold within a reasonable amount of time. Early and targeted marketing is vital to the success of the platform.

As a new player in an already established market another risk is big players like OLAT, Moodle and such starting their own adaptation of the “for students by students” cross university document sharing concept.

Copyright infringements and consequential lawsuits can cause severe financial and reputational damage. Any abuse of the platform must therefore be prevented technically and legally.

Draft planning

From planning to the first market release the project is estimated to take eight months of work. To evaluate the product a prototype will be built within the next 12 weeks.

To assure the best possible project outcome the incremental and iterative software development process framework “Unified Process” will be adapted. Given the five team members and the estimated required effort, a total of 550 hours of work will be put into the development of the prototype.

The following section presents the first draft of prototype development project plan. With the finalization of this document the inception phase and first iteration will be completed. Adjustments to the project plan can be made during future iterations. Any modifications will be communicated to all parties involved.

The prototype will consist of the following key features:

- Register/login as a user
- Create courses within your studying program
- Upload and categorize documents
- Comment and rate documents
- Search, browse and download documents
- See basic statistics on user profile

The project plan for the prototype consist of four phases, each of which has its own milestone.

Inception Phase [1st Milestone: Requirements and project sketch]:

1. Iteration: Finalizing of the project sketch (50 hours)

Elaboration Phase [2nd Milestone: Architecture verified]:

1. Iteration: Choose technologies and architecture, domain modelling draft, feature set for prototype determined (50 hours)
2. Iteration: GUI prototype, technical proof of concept (technology stack), finalized domain model, define document and user model (80 hours)

Construction Phase [3rd Milestone: Running Prototype]:

1. Iteration: implement document & user model (core) (90h)
2. Iteration: interfaces (interface layer), storage, DB (infrastructure layer) & refine core capabilities (core layer) (130h)
3. Iteration: GUI, Rest API (infrastructure layer) (110h)

Transition Phase [4th Milestone: Documents finalized and project closed]:

1. Iteration: Last GUI changes, search testing and fine tuning, finalisation of project documentation and alpha testing (50h)

Economic viability

Since the project is estimated to take 8 months of work and requires a team of 5 engineers with an average pay rate of 100 $\frac{\text{CHF}}{\text{year}}$, a realisation of the product will cost

5 software engineers (full time)	$5 \cdot 100\frac{\text{CHF}}{\text{h}} \cdot 8\frac{\text{hours}}{\text{day}} \cdot 20\frac{\text{days}}{\text{month}} \cdot 8\text{months}$	640'000 CHF
Legal advice		50'000 CHF
Marketing		100'000 CHF
Infrastructure	PaaS provider, Rent	150'000 CHF
Development (first year)		**940'000 CHF**
Infrastructure	PaaS provider, Rent	150'000 CHF
Fix costs (FC) $\frac{\text{CHF}}{\text{year}}$		**150'000 CHF**
Marketing	5% of revenue	
R&D	extending service and developing new services, 20% of revenue	
Support	20% of revenue	
Partial Redemption	30% of revenue	
Variable costs (VC) $\frac{\text{CHF}}{\text{year}}$	25% of revenue for uncertainty and investors/shareholders	**75% of rev.**
Operational expenses $\frac{\text{CHF}}{\text{year}}$	Fix costs + variable costs	**FC + VC**

One can see that operational costs depend on revenue. In order to quantify the former, a Break-even analysis is conducted.

Break-even analysis

Let's assume an investment horizon of 5 years. For the product to repay all its costs within these 5 years, a revenue of **~783'250** $\frac{\mathbf{CHF}}{\mathbf{year}}$ would be required.

Year	**Revenue**	**FC+VC (75% of rev + FC)**	**Investment + Redemption**	**25% (uncertainty)**
0	CHF 0.00	CHF 940'000.00	CHF -940'000.00	CHF 0.00
1	CHF 0.00	CHF 0.00	CHF 0.00	CHF 0.00
2	CHF 783'250.00	CHF 737'437.50	CHF 234'975.00	CHF 45'812.50
3	CHF 783'250.00	CHF 737'437.50	CHF 234'975.00	CHF 45'812.50
4	CHF 783'250.00	CHF 737'437.50	CHF 234'975.00	CHF 45'812.50
5	CHF 783'250.00	CHF 737'437.50	CHF 234'975.00	CHF 45'812.50
Sum	CHF 3'133'000.00	CHF 3'889'750.00	CHF ~0	

Compared to the number of students in Switzerland, which is about 246'000, a revenue of this kind is realistic [1]. Keep in mind, at this level a 25% would lead to 45'812 $\frac{\mathrm{CHF}}{\mathrm{year}}$ which is put on side for forecast and investors & shareholders; therefore, generate some yield. A minimum revenue of 600'000 $\frac{\mathrm{CHF}}{\mathrm{year}}$ is needed, if the project has to cover its costs. At this rate the project is for an investor not interesting anymore, since the yield would be negative and therefore the redemption not possible within 5 years.

[1] Federal Statistical Office. (2017). *Szenarien 2016-2025 für die Hochschulen - Studierende und Abschlüsse* [Online]. URL: https://www.bfs.admin.ch/bfs/de/home/statistiken/bildung-wissenschaft/szenarien-bildungssystem/hochschule-studierende.html