FINAL PROJECT REPORT
SWE574 CO-EDU

Git Repository:

- https://github.com/bounswe574-G3/swe574_2022_repo
  - Source Code
- https://github.com/bounswe574-G3/bounswe574-2022
  - Issues and wikipages are located in this branch

Deployment URL:

- http://ec2-54-205-199-25.compute-1.amazonaws.com/

Git Tag Version:

- v0.9
- https://github.com/bounswe574-G3/swe574_2022_repo/releases/tag/v0.9

Group 3 – Aydos İlgazi, Mustafa Yıldız, Erdem Bilgin, Mehmet Samet Taştı
SWE 574 - 02.01.2023 | BOĞAZİÇİ UNIVERSITY

HONOR CODE

Related to the submission of all the project deliverables for the Swe574 2022 Fall semester project reported in this report, We Group-3 declare that:

- We are student in the Software Engineering MS program at Bogazici University and registered for Swe574 course during the 2022 Fall semester.

- All the material that We are submitting related to our project (including but not limited to the project repository, the final project report, and supplementary documents) have been exclusively prepared by ourselves.

- We have prepared this material individually without the assistance of anyone else with the exception of permitted peer assistance which We have explicitly disclosed in this report.

Aydos İlgazi *Mustafa Yıldız* *Mehmet Samet Taştı* *Erdem Bilgin*

User ids and other information for testing deployed system

Username	Password
• MustafaYildiz	swe12345

LICENSE DECLARATION

Related to the submission of all the project deliverables for the Swe574 2022 Fall semester project reported in this report, We Group-3 declare that:

- We abide by the licenses for all of the third-party packages and contents that We used in this Project

Aydos İlgazi *Mustafa Yıldız* *Mehmet Samet Taştı* *Erdem Bilgin*

Table of Contents

In general, the following requirements are provided. Completion statuses are indicated in parentheses next to the titles.

and spaces he/she is a member of

Surfing (Completed)

- System shall let users to view/display to the About us, and Spaces.
- Users shall view previously created co-learning spaces with the search button.
- Users shall view the about us page with clicking aboutus button.
- Users shall register or sign-in by using buttons at the main page in the navbar.

Membership (Completed)

- User shall register with filling the mandatory fields as username, password, confirm password fields.
- User shall edit its profile by changing or adding name, surname or email field.
- User shall change its password by filling old password, new password and confirm password fields.
- System shall record the membership information, sign-in and sign-out times and unsuccessful sign-in attempts (**incompleted, logging information will be added**).
- Password shall satisfy the following conditions;
    - password can’t be too similar to other personal information.
    - password must contain at least 8 characters.
    - password can’t be a commonly used password.
    - password can’t be entirely numeric.

User Account (Completed - except for the details related to the rating issues, these issues were in the first milestone and removed in here.)

- When user signs in, system shall display edit profile and change password buttons to the registered user at side bar.
- When user creates a space or be a member of a space, system shall let users to reach their member spaces and created spaces by the buttons located at the side bar.

- When user signs in and click go to space button of any space, system directs him/her to the space content and user shall view the learning steps but not the discussion board if this space were not created by that user or the user is not be a member of that space.
- If a visitor is not registered the platform or a user logout, they shall not view the learning steps or discussion board of the spaces.
- When a space member or the creator send a message within a specific space, system shall only let the space members or creator of the space to view this message simultaneously.

Rights (Incomplete - these issues were in the first milestone and removed in here.)

Roles (Partial Completed, lack of invitation issues, these issues were in the first milestone and removed in here.)

- User that creates the space shall be the creator.
- User that is selected by the creator while creating the space is the member of the space.
- Space creator shall have the following right for the space that she/he creates.
    - Removing space member out of the space
    - Adding new space member(s) to the space
    - Update the space content and title
    - Delete the space
- Space members shall have the following right in his/her participated space.
    - Asking questions, **(incompleted, will be added)**
    - Answering the questions **(incompleted, will be added)**
    - Sending messages
    - Glossary **(incompleted, will be added)**

Spaces (Completed with some differences, lack of invitation module, space members are predetermined by the creator and creator creates the spaces with predefined users/members)

Creating the space:

- Number of space members shall be between 2-9. **(incompleted, will not add)**
- When users provide following fields, system shall create a co-learning space with a new number adding one to last created space number.
    - Content (Required): No character limitation.
    - Title (Required): This field shall have maximum 50 characters

- Members: Registered users are displayed in this field.

Adding Learning Steps

- When a space member or creator provide following fields in a specific space that he/she is a member of or creator, system shall add a learning step with a new number adding one to last created step.
  - Content (Required): This field shall have maximum 50o characters
  - Title (Required): This field shall have maximum 50 characters
  - Attachment (Required): Registered users shall view this field.

Sending Message

- When a space member or creator provide following fields in a specific space that he/she is a member of or creator, system shall send a message within this specific space.
  - Member Space (Required): Title of the specific space
  - Message (Required): Message content

Co-learning:

- Members and the creator of the spaces shall write instant messages in the spaces that are member or creator.
- A members of the spaces shall comment on the other members' instant messages in a spaces. **(incompleted, will be added)**
-
- A members of the spaces shall attach any document, video or audio files to the attachment part of a space.
- When a creator or a member of a specific space clicks the attachment in the learning steps, system shall display the content of this attachment.

Blackboard (Incomplete - these issues were in the first milestone and removed in here.)

Requirements for Badge Implementation

- System shall provide space creators with an option of implementing badges for users' avatars on the space
- Admins of a space shall be able to select the number of badge categories that are going to be used in the space
- Admins of a space shall be able to select the number of badge levels for each category of badges
- System shall let admins to upload icon image for each category of badges
- Admins shall select for each badge category the type of allocation of badge level. Badge level shall be optional for users to allocate themselves or there will be a determination system based on a parameter like rating from other users

Requirements for Glossary

- Content of the glossary shall only be displayed by the co-learning platform members.
- Members and the creator of the spaces shall define the terms related to the space content and edit them.
- Steps of each term shall be indicated by members or the creator of the spaces.
- Requirements for Replying to Discussion Board Messages
- Members and the creator of the spaces shall be able to reply to the messages in the discussion board.
- Members and the creator of the spaces shall be able to reply to the replied messages in the discussion board.

Requirements for Quiz Pages

- Users shall be able to create quizzes.
- Users shall be able to view the results of their taken quizzes.
- Users shall be able to view how many other users completed the quizzes that are created by them.
- Users shall be able to search for a quiz by the name of the quiz.
- Users shall be able to attempt a quiz.
- Users shall be able to view other subject related quizzes as annonation.

Requirements for Annotation

- Members and the creator of the spaces shall add annotations to the words by double clicking into that word.
- When a creator or a member of a specific space double clicks a word, system shall display a window in which creator of the annotation shall be able to write the content of that annotation.
- When an annotation added to a word, members of the platform shall be able to display the content, creator, time of that annotation.

- Annotations shall be visible to all co-learning space members when a member put the cursor into the annotated word.

Requirements for Activity Streams

- The system shall generate activity streams based on users' actions in the website.
- The system shall create activity streams with an actor, an object, a verb and a target.
- The system shall display the activity streams in co-learning spaces.

Requirements for Content Relations

- System shall display content relations graph in learning space.
- User shall add topic and prerequisite relation.
- User shall edit topic and prerequisite relation.
- User shall delete topic and prerequisite relation.
- User shall add text annotation to node.
- System shall display users text annotations.

Requirements for Recommendation

- System shall find search results using semantic data from wikidata.
- User shall add tag and label while creating space.
- System shall display tags in space details page.

Requirements for Resources

- Content of the resources shall only be displayed by the co-learning platform members.
- Members and the creator of the spaces shall define the content of the resources.
- Creator and Members of the space shall add attachment as pdf or picture.
- Creator and Members of the space shall update or delete the resources' content and attachment.
- System shall display the modifier and modified date of the resources.

Relation Between Resources and Learning Steps

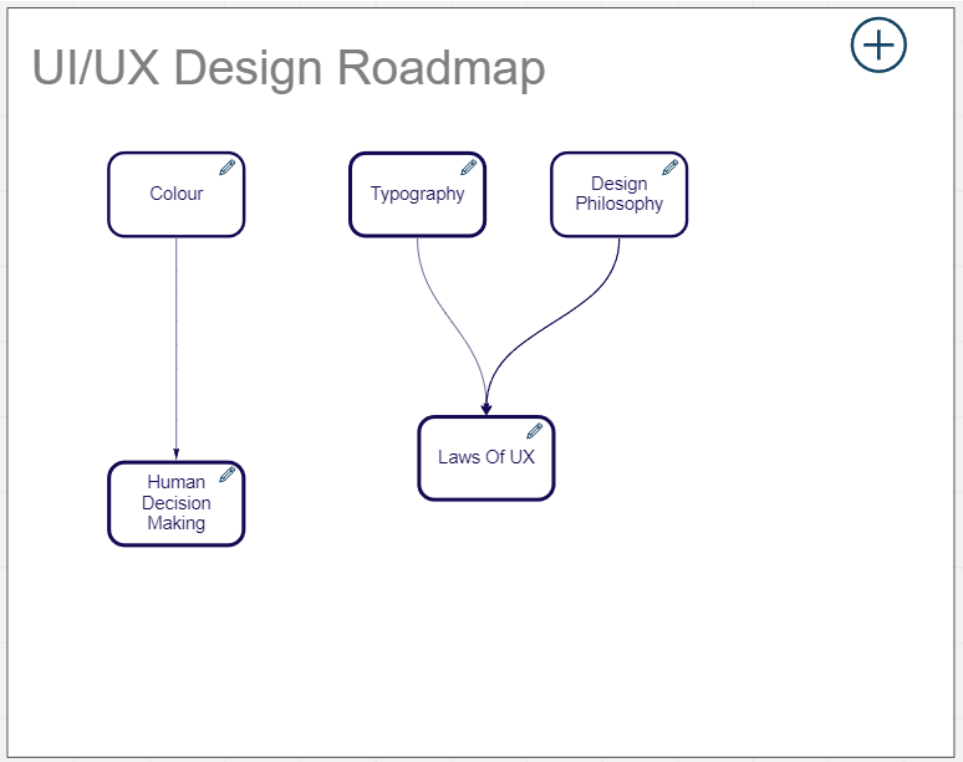
- Space members and creator shall select the related source while creating the learning step.
- Space members and creator shall go to the related resource by clicking the link for the related resource in the learning steps section.

User Profiles

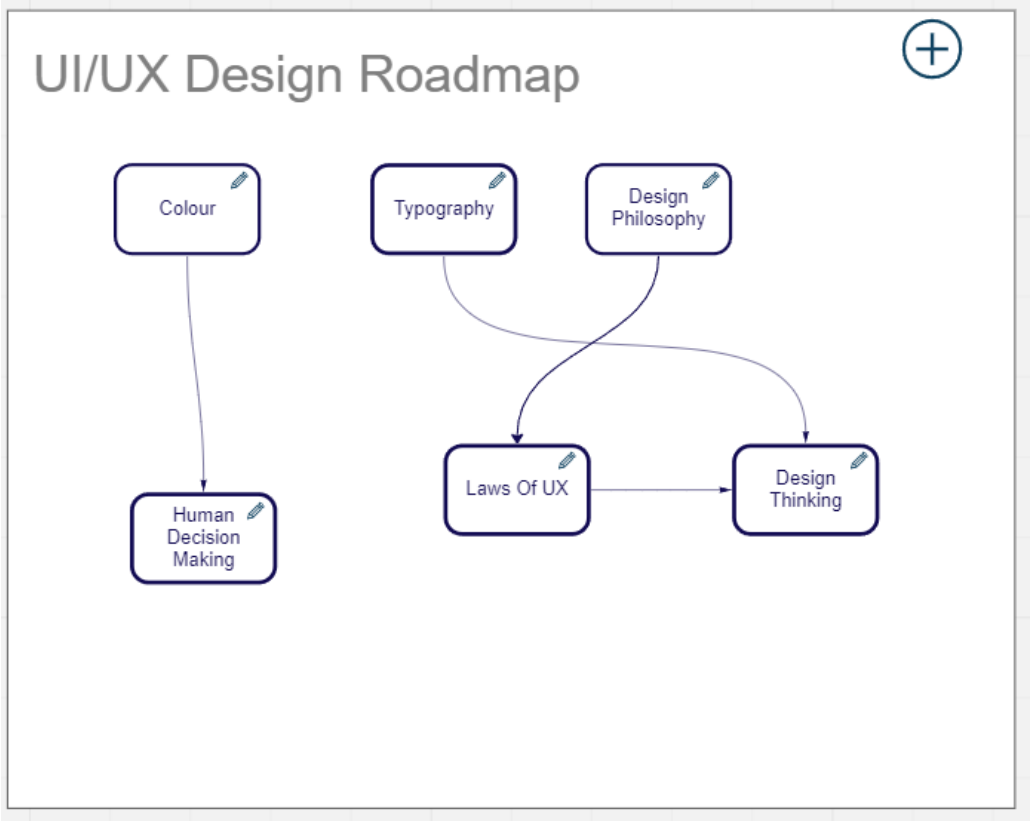
- Users shall be edit and change the user profile page and also area of interests.
- User profiles of the space members shall only be displayed by the co-learning platform members and creator.

Mockups

Display Content Relations



Add Relation



Edit Relation

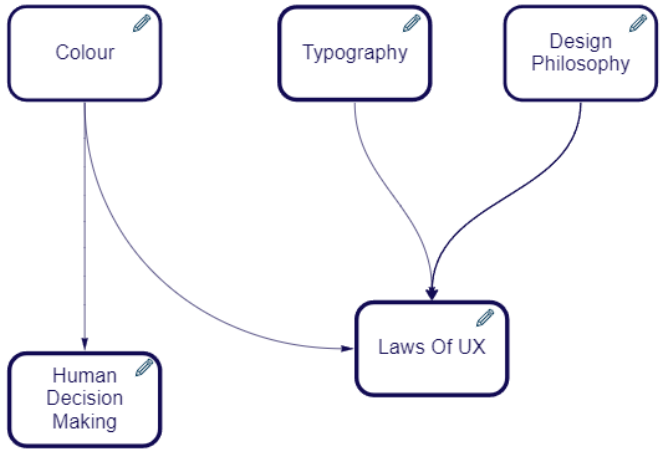
Name : Laws Of UX and UI

Prerequisites

- [x] Colour
- [x] Typography
- [ ] Design Philosophy
- [ ] Human Decision Making
- [x] Laws Of UX

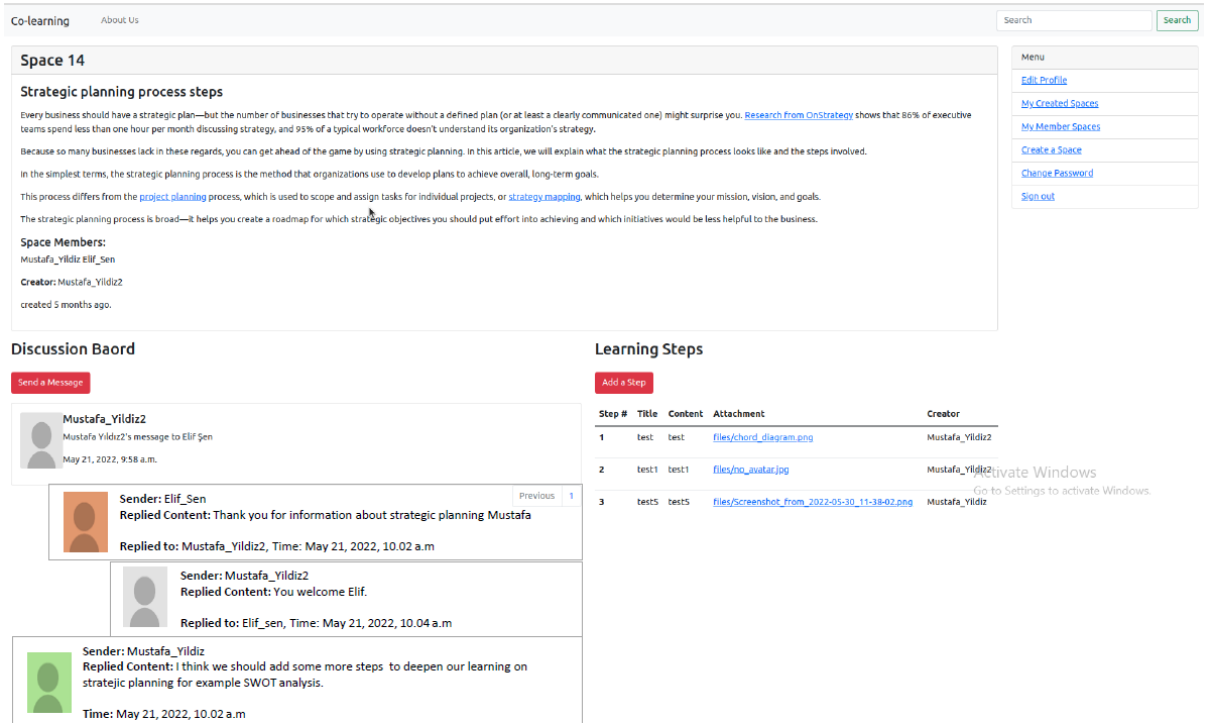
Save

UI/UX Design Roadmap

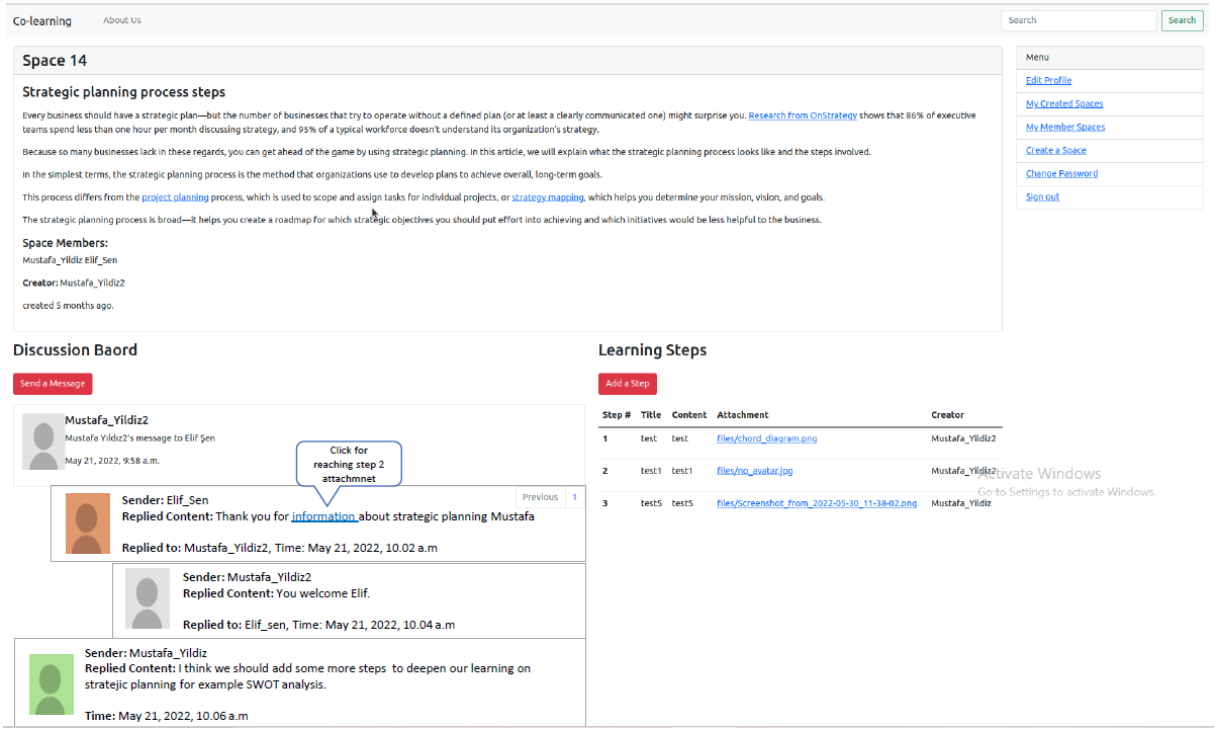


User Interaction

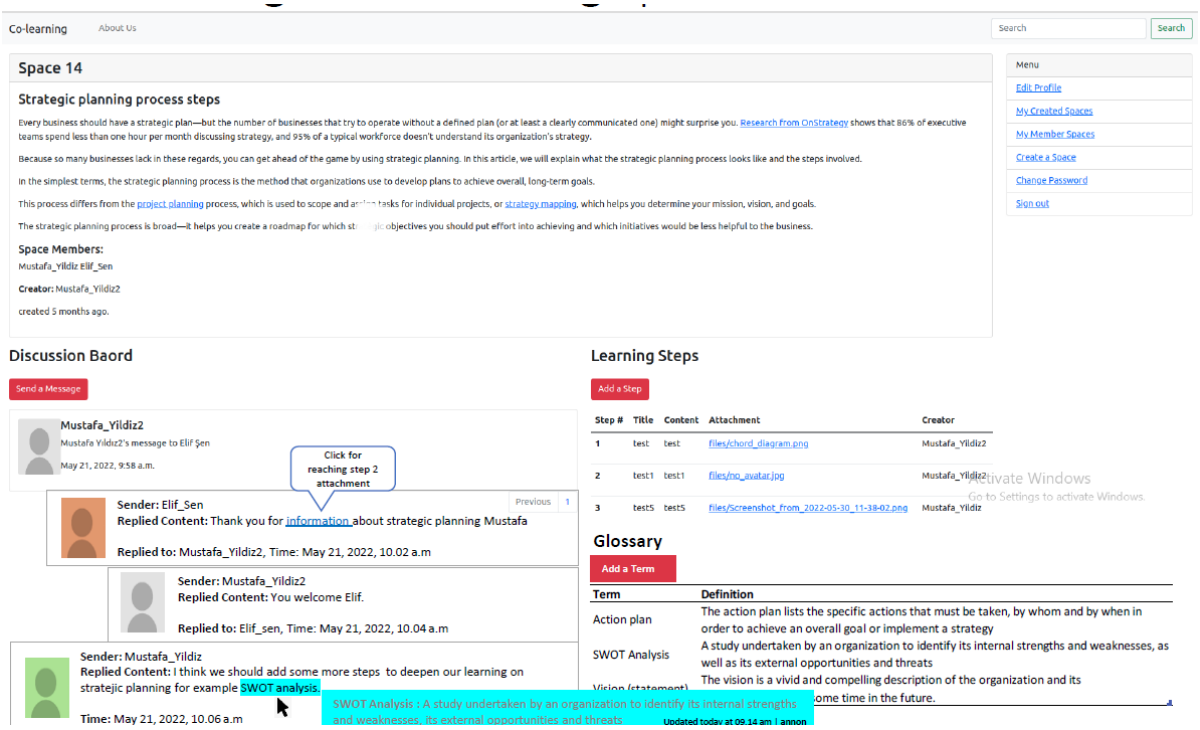
Message Replies



Joining Contents

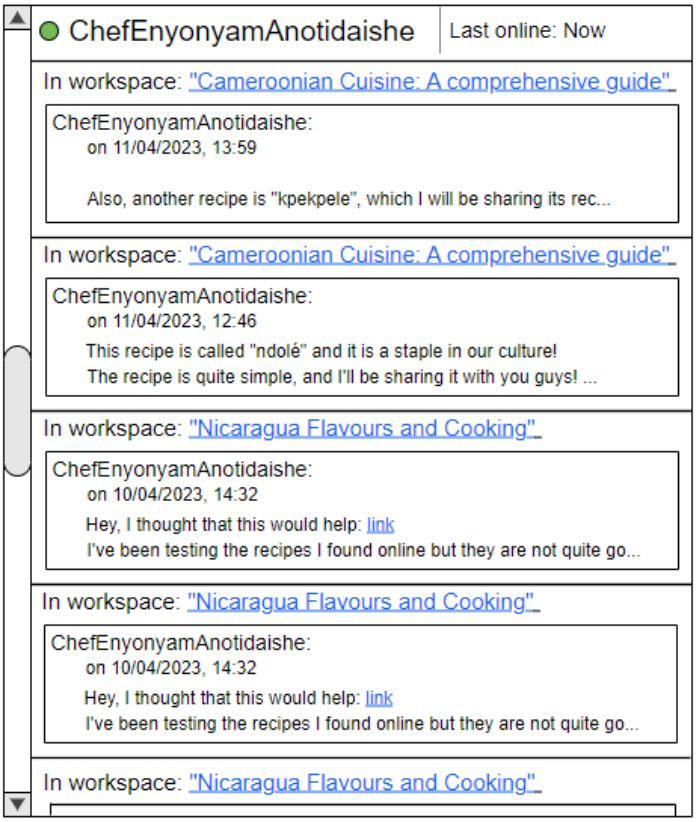


Glossary and Annotations



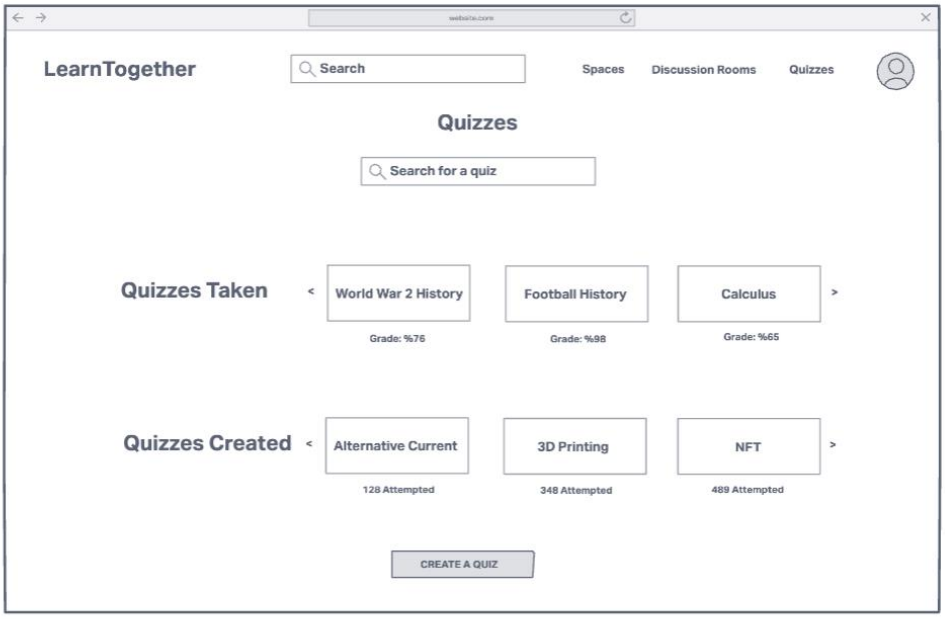
Mockup for activity stream

Stream:

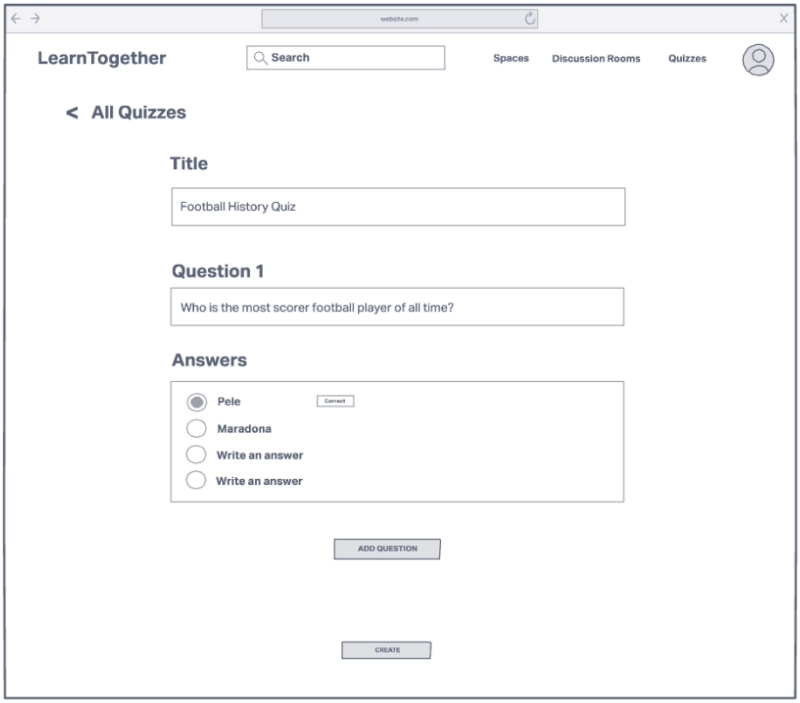


Mockup For Quizzes

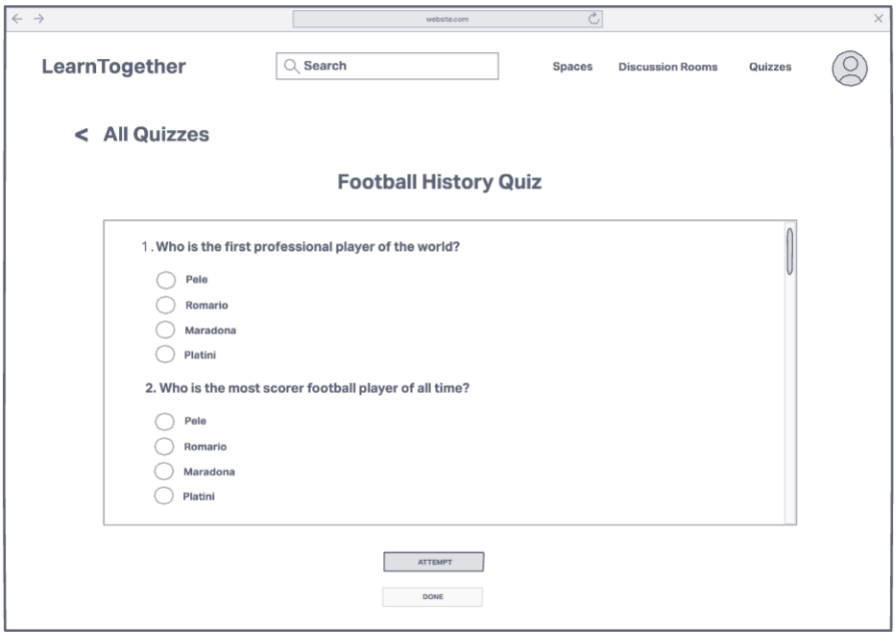
Quizzes Homepage



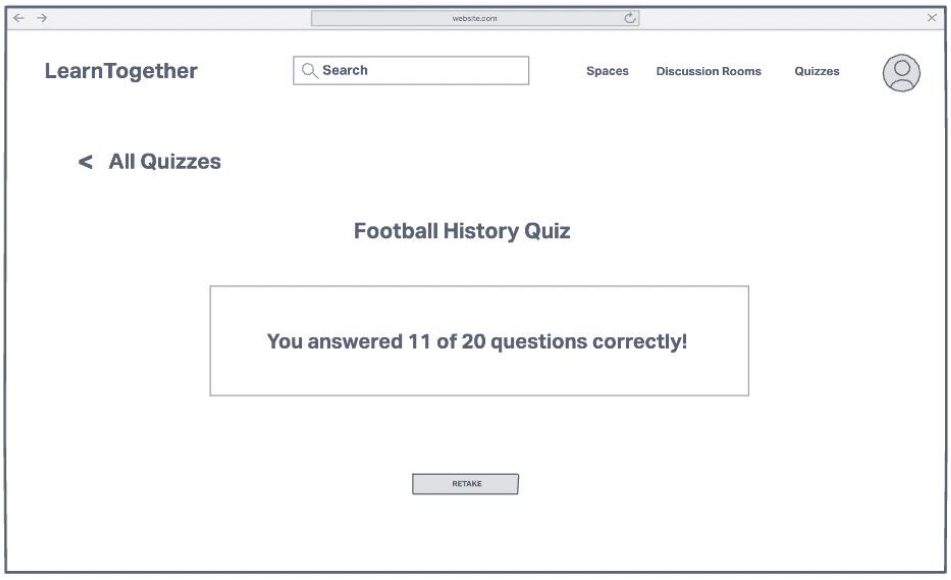
New Quiz Page



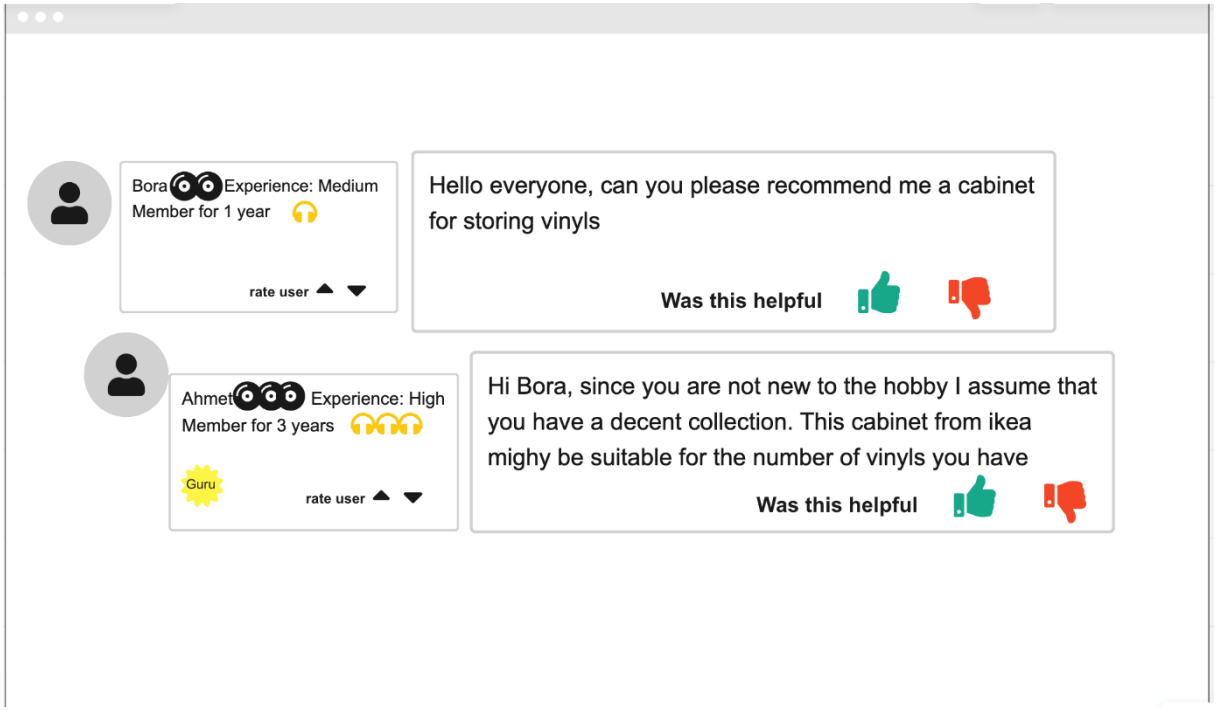
Quiz Detail Page



Quiz Results Page



Mockup For Badges on Avatars



Scenarios

Scenario for activity streams

Actor: John is an amateur chef and pursues culinary arts as a hobby. His interests involves a wide variety of world cuisines and to his surprise he has found multiple hobbyists and chefs of his caliber in various workspaces related to different cuisines of the world, and he is keen on following their contributions on other workspaces that he is not aware of. He would like to see his peers' contributions on culinary workspaces, names of these workspaces and last login times and dates. He is in need of this functionality to accomplish his goals.

Scenario: John, while checking out the workspaces he is currently on and browsing workspaces in general as he usually does, searching for new recipes, culinary content and guides on Nicaraguan cuisine, he finds a person whose interests coincides with that of his own, which is worldwide cuisine especially of less popular culinary cultures. He is interested to see which workspaces this person contributes to and what he actually contributed to these workspaces and he sets out to do just that by taking a look at the activities in the persons profile. He navigates to the persons profile and he clicks on one of the workspaces in the activity stream. He finds

out that there was a workspace on Cameroonian cuisine which the person he was interested in is actively contributing to, so he takes a look at that to learn more about these less known culinary wisdom. He starts learning the recipes for Cameroonian dishes ndolé and kpekpele by following the step-by-step guide provided by other users in that workspace. From here, he knows where to look to find new and interesting ideas about his interests.

Scenarios for Content Relations

Actor: James

Scenario: James is a web developer who knows coding well. However, his web sites look bad visually and he wants to learn design. He is not a type of person that can read and study alone because he is bored. Also, he sometimes starts from the advanced topics and he does not give up easily. Although, it is not a bad thing, he feels overwhelmed after short amount of time and give up eventually. Therefore, It will be better for him, if he can see the relationships between contents so that he can start from the correct point. In addition to this, he wants to see the contents of the learning space because he wants to check whether that learning space is suitable his goal or not.

Actor: Mary

Scenario: Mary is an UI/UX desıgner with more than 10 years professional experience. She likes to participate and contribute in learning spaces. She is an expert in product design thinking. However, she knows that before learning design thinking, knowing typography is necessary. Therefore, she wants to display this knowledge in the learning space for newcomers because they ask lots of questions related to this topic which blocks quality questions. Also, she will be happy if she can show that a relationship between contents is a must or nice to have depending on the contents.

Scenarios for badge implementation

Use Case 1: Adding badges to spaces
Actor: Space creator
Flow: A user creates a space on the website about C++ with the intention of co-learning with other users by allowing them to create subjects for discussions or posting questions related to an issue they came up while learning c++. The creator of the space wants to add badges to the space for indentifying the members' knowledge levels of c++ or how long and active they have been in this particular space. When creating the space the system provides the creator with a choice of whether or not they are going to prefer badges to be added to users avatars. If creator chooses so the system shows them a badge creation page where they can create as many badges as they want by giving the badge type a title and entering how many levels are there going to be for this category

Use Case 2: Bora wants to add his experience level on vinyl collecting to his avatar on a space
Actor: Bora
Flow: Bora is a vinyl collector for about a year and has a small collection of vinyls and a moderate knowledge on the topic. He has joined a space on vinyl collecting and wants to improve himself on vinyls and audiophile music listening. He wants to Show his experience level on the subject since other users assume his level otherwise and answer his questions with a language that only experts on the subject can understand or have a hardtime on explaining something by assuming that he is a beginner. Fortunately this space provides experience level badges for users to choose from. There are 4 levels that each user can select from starting from beginner to expert

Use Case 3: Badges for rating levels
Actor: Ayşe
Flow: Ayşe is a member of a space called sourdough bread making and likes to interract with others and helping them. She likes there to be a feature in the space that can represent how much time she spends there and how helpful she has been to others. The space allows users to rate each others regarding how helpful their comments been to them or how knowledgable they think the particular user is. The system then awards the user with a badge that is proportional to her rating. The system also awards the user with a badge that represents how many years the user has been a member to the space.

Use Case 4: Post badges for classification
Actor: Space admins
Flow: Admins of a space are bothered by the messiness of the space because of how many posts are shared on the space with differentiating contexts and they are worried that a new çömer can get lost between them. In order to categorize these posts and offer a context to other users before openning it, the admins create badges for the topics that are posted about the most. When someone creates a post in this space they are required to select badges that indicates the context of this post.

Scenarios for Quizzes

Use Case 1: Answering a Quiz

Actor: Logged in User

Flow: Mehmetcan is a mathematic enthusiast outside of his job. He likes to learn new math concepts and theorems in his free time. Therefore, he likes to challenge himself and refresh his existing knowledge. So, he would like to take quizzes related to different topics of mathematics to evaluate his level of knowledge in these areas. He would select any quizzes that are located under a specific space and will be able to solve the quiz by answering the multiple choice questions.

Use Case 2: Creating a Quiz

Actor: Logged in User

Flow: Selin is a UX/UI designer and likes to discuss about web design with her friends and colleagues. She thinks that a person should always seek for new knowledge and perspective to maintain creativity. She wants to get together with the people who have the same interest and knowledge so that she can have a brainstorming and discussion to improve herself. That's why she wanted to create creative quizzes to find people who have similar interests. She wants to communicate with the ones who have good scores on her quiz. So, she would be able to create quizzes under the space that she wants

Scenario for Adding Comment to Messages

Scenario: Ayşe sets up a Learning Space to make homemade yogurt. Ayşe by clicking "Send Message", a new window opens and Ayşe fill the title, content and select the space that she wants to send the message. Ayşe Learning Space titled "How to make delicious homemade yoghurt?" and content "No special heirloom yogurt cultures or fancy incubating equipment required. You could even make a batch tonight and have homemade yogurt for breakfast by tomorrow morning". While establishing Space, he adds Zeynep and Elif as members. Zeynep send a message to Discussion Board with content as "I've been making yogurt at home for a long time?". Elif, on the other hand, leaves a comment as "Great!" under Zeynep's message.

Scenario for Content Relations

Scenario: Zeynep creates the first Learning Step by clicking the "Add a Step" button and selecting the title, content and attachment in the window that opens. As the Learning Step 1, Zeynep selects a picture with "Doings" in the title, "doings for making yogurt" in the content, and the “doings” as an attachment. Since there is sourdough among these doings, she wants to add a term with the “Add a term button” in the dictionary to explain it. In the window opened by clicking the “Add a term” button, “sourdough” is written in the term part and “Yogurt sourdough starter is a live culture made by fermenting milk, yogurt, and flour” in the explanation part. Relationship is established with the relevant Learning Step by selecting the associated Learning Step title. Later, while looking at the terms in the dictionary, Elif sees the term sourdough. After reading the explanation, he clicks on the Learning Step title next to it and opens the attachment in the relevant Step and looks at the picture of the sourdough.

Scenario Block Chain

Erdem is an 18-year-old high school student. He is a curious about blockchain. He has heard something about the topic in the school and he didn’t understand the full scope. He didn’t want to ask his friends because he thought they were going to make fun of him. Instead, he wanted to make research about the topic and tried to understand the logic behind the blockchain technology. He also wanted to discuss about the concept of blockchain and the future of it with the other blockchain enthusiasts.

So that, he needs a place to have a discussion with the other enthusiasts. He also knows that his knowledge is not enough about the blockchain. He needs to learn more; however, he is not sure what to research and which topics are the most significant for the blockchain and bitcoin currently. Therefore, he also needs to test his knowledge and to learn about his mistakes. Thereby, he will be able to know what he is missing and what kind of resources he can examine in order to increase his knowledge.

He enters the co-learning platform and sees an existing blockchain space. He gets excited about being able to communicate with the other blockchain enthusiasts. He explores the space and sees from the activity stream that it is being actively used and people are eager to both asking questions and answering other people’s questions. He can see every action in the latest activity section and understand how busy the space is and which users are the most active ones.

Then, he explores the glossary section. He sees that there are different terms and definitions related to blockchain. That’s great for him! It is because now, he knows which terms, he needs to be familiar with if he wants to know more about blockchain. He explores the page and

examines different terms and what they all mean. If the definition doesn't satisfy him, he can also post to the discussion board to learn about it more.

After exploring the content inside, he feels unsure about where to start. The learning steps and the steps in glossary give him an idea but then he discovers the relationship graph. This relationship graph tells him where to start and how to proceed. The graph also describes the relation between different subjects related to blockchain. So, it is very useful for his learning process.

After spending some time in the space, he thinks that he learnt some staff, but he is not sure how to test his knowledge and his learning process. At that moment, he recognizes the quiz section. In this section, he can attempt different quizzes related to the blockchain which are created by different co-learners. There are also references for each question so that if a user gives a wrong answer to a question, s/he can go to the reference and learn about the details of the subject. Then, he also figures out that he is also able to create quizzes like any other user. So, after spending some time and gaining knowledge in the space, he also creates a quiz to test the other users.

Scenario Crowd Funding

Introduction

AndyRuiz's recent intense investor interest in startups has drawn his attention. Due to the high returns in the sector, he also wants to learn how to invest in this field. He has established a learning space with BethNorman, TiagoDecker and NicoleButler, who are interested in the same subject. While creating space, AndyRuiz first wrote what he understood about crowdfunding as much as he followed and made a short compilation from several sources.

Space Members

- BethNorman
- TiagoDecker
- NicoleButler
- AndyRuiz

Space

Crowdfunding is a method of raising capital through customers, family, friends, and investors on crowdfunding sites or platforms. Throughout the crowdfunding process, a business owner may use a number of platforms and crowdfunding sites to help raise capital.

Crowdfunding is transforming financial strategies for many businesses and organizations. One source predicts crowdfunding will become a $300 billion industry by the year 2025.

You may be wondering who uses crowdfunding. Some types of organizations and businesses that utilize crowdfunding include:

- Entrepreneurial ventures or startups
- Struggling businesses
- Nonprofits
- Not-for-profit organizations
- Charities
- Churches
- Individuals raising money for others (e.g., medical expenses)
- Organizations looking to fund expenses for animals (e.g., vet bills)
- Communities raising capital for projects

Crowdfunding is the use of small amounts of capital from a large number of individuals to finance a new business venture.

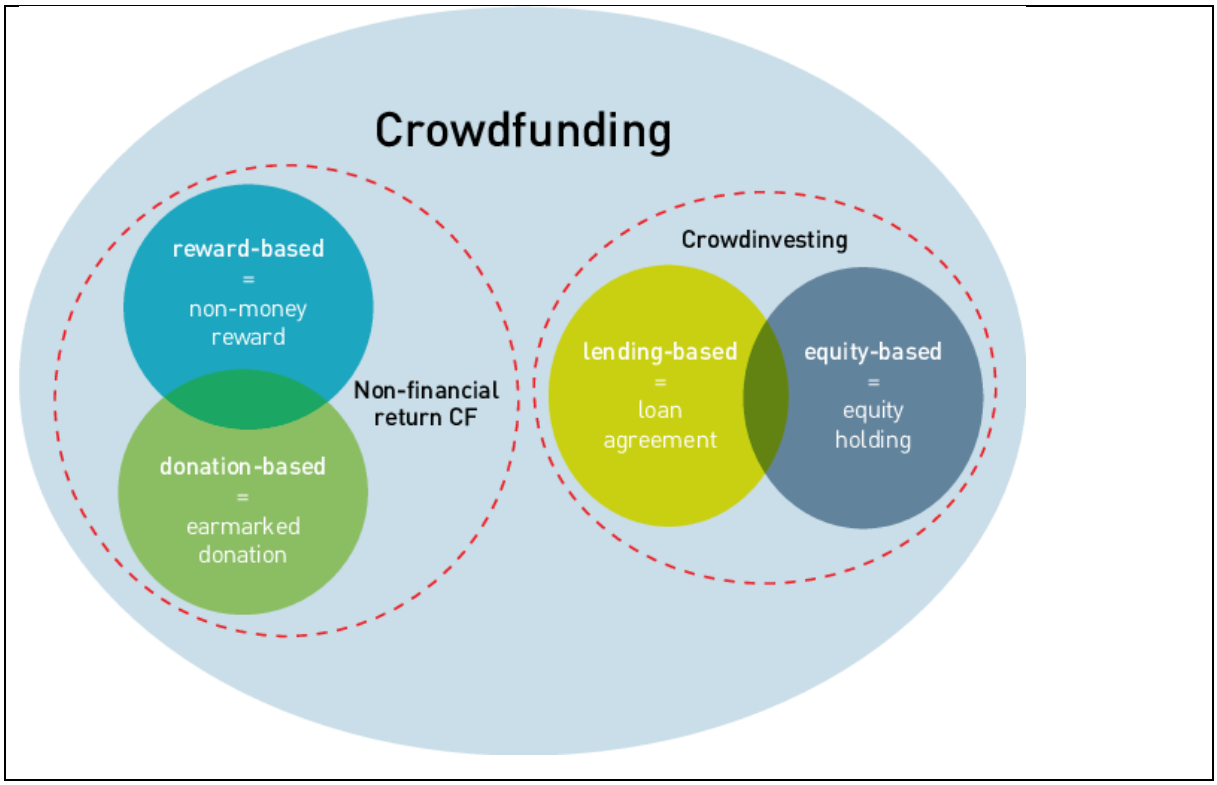
Benefits of crowdfunding

Crowdfunding offers a wide range of benefits, including flexibility and helping to tap into a wider investor pool.

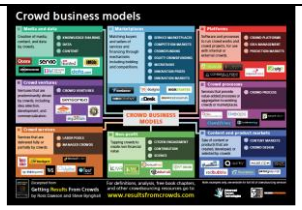
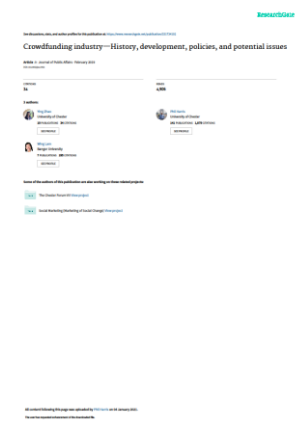
Some additional advantages of crowdfunding for business include marketing your business, accessing many potential investors, and having a more efficient way to fundraise.

Be sure to weigh the pros and cons of crowdfunding before deciding to implement it for your small business or organization.

Do you need a simple way to track your crowdfunding transactions? Patriot's online accounting software lets you easily record income and expenses. Try it for free today!



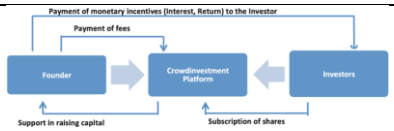
Resources

Resource	Information	Attachment	Attacher
crowdfunding crowdsourcing crowdlending	Crowd based transactions		BethNorman
Major Crowdfunding Types	The two most traditional uses of the term reflect the type of crowdfunding done by start-up companies looking to bring a product or service into the world and by individuals who experienced some type of emergency. Many individuals affected by a natural disaster, hefty medical expense, or another tragic event such as a house fire have received an amount of financial relief they wouldn't otherwise have had		TiagoDecker

	access to thanks to crowdfunding platforms. 1. Donation-based crowdfunding One of the most popular types of fundraising, donation-based crowdfunding is simply asking for a small donation from a large number of people to raise money for something you care about. How does donation-based crowdfunding work? Donation-based crowdfunding is best used to raise money for personal needs as well as community-based projects. You can share your fundraiser with your own network and on social media as a way to amplify awareness and encourage more donations. Examples of donation-based crowdfunding include raising money to cover medical expenses or an unexpected financial crisis or raising funds for local projects like a community garden or new park. 2. Reward-based crowdfunding Rewards-based crowdfunding is another common type of crowdfunding, typically used to raise funds for a new startup or organization that offers a product or service.		

	How does reward-based crowdfunding work? With rewards-based crowdfunding, donors can earn rewards based on the amount they donate. Common rewards include handmade items, prizes donated by partner companies, or free products or services offered by the fundraiser organizer. For example, an artist raising funds to start an art collective and gallery could offer original signed artwork, replica prints, or even a free art workshop based on the amount donated. 3. Equity crowdfunding Also known as crowd-investing, investment crowdfunding, and crowd equity, equity crowdfunding is best for small to medium-sized companies that are seeking a large amount of capital to launch or grow their business. How does equity crowdfunding work? In exchange for donations, donors receive a percentage ownership in the company. This percentage varies depending on the business and can be a great way for companies to quickly raise funds without the headache of a traditional business loan. Usually, equity fundraising requires large fundraising minimums, typically into the thousands of dollars.		

	4. Debt Crowdfunding Also known as peer-to-peer lending and crowdlending, debt crowdfunding is a fast and easy way for both individuals and businesses to raise the money they need when they need it. How does debt crowdfunding work? Debt crowdfunding works by collecting donations with the promise to pay them back at a later date. Debt crowdfunding is usually used by businesses that need capital, and that prefer to pay back the funds rather than give out equity. Individuals also used debt crowdfunding when they need money to pay off a loan or other financial obligation. With a debt fundraiser, make sure to clearly state what the money is needed for and when donors can expect repayment. 5. Real estate crowdfunding Among the recent types of crowdfunding models, real estate crowdfunding is becoming more popular for investors who want to put their money in real estate, without the hassle of getting a traditional loan or the obligation of owning all of a single property. How does real estate crowdfunding work?		

	Typically, an individual or a real estate company will collect funds from investors to pay for a large property, like an apartment building. With real estate crowdfunding, investors can contribute much smaller amounts of money—usually starting at $5,000—depending on how much of the property they would like to own. Investors will then receive payouts each quarter, depending on how much revenue the property generates.		
Equity Based Crowdfunding	3. Equity crowdfunding Also known as crowd-investing, investment crowdfunding, and crowd equity, equity crowdfunding is best for small to medium-sized companies that are seeking a large amount of capital to launch or grow their business. How does equity crowdfunding work? In exchange for donations, donors receive a percentage ownership in the company. This percentage varies depending on the business and can be a great way for companies to quickly raise funds without the headache of a traditional business loan. Usually, equity fundraising requires large fundraising minimums, typically into the thousands of dollars.		NicoleButler
How Crowdfunding Works	In most jurisdictions, restrictions apply to who can fund a new business and how much they are allowed to		AndyRuiz

	contribute. Similar to the restrictions on hedge fund investing, these regulations are supposed to protect unsophisticated or non-wealthy investors from putting too much of their savings at risk. Because so many new businesses fail, their investors face a high risk of losing their principal. Crowdfunding has created the opportunity for entrepreneurs to raise hundreds of thousands or millions of dollars from anyone with money to invest. Crowdfunding provides a forum to anyone with an idea to pitch it in front of waiting investors. One of the more amusing projects to receive funding was from an individual who wanted to create a new potato salad recipe. His fundraising goal was $10, but he raised more than $55,000 from 6,911 backers. Investors can select from hundreds of projects and invest as little as $10. Crowdfunding sites generate revenue from a percentage of the funds raised.		
Examples of Crowdfunding	Many of the products and businesses crowdfunded on Kickstarter became very successful and lucrative endeavors. For instance, Oculus VR, an American company specializing in virtual reality hardware and software products, was funded through the site. In 2012, founder Palmer Luckey launched a Kickstarter campaign to raise money to make virtual reality headsets designed for video gaming available to developers. The campaign crowdfunded		NicoleButler

	$2.4 million, ten times the original goal of $250,000. 6 In March 2014, Facebook, now Meta (META), acquired Oculus VR for $2.3 billion in cash and stock. Another example of a company that rose to success through the help of Kickstarter campaigns is M3D, a company founded by two friends that manufacture small 3D printers. David Jones and Michael Armani raised $3.4 million for their Micro 3D printer on the crowdfunding site in 2014. 7 The tiny 3D printer, which comes with a variety of durable 3D inks, is now available at Staples, Amazon.com, Inc. (AMZN), Brookstone, and elsewhere. In April 2019, Critical Role, a weekly live-streamed tabletop roleplaying game featuring a group of prominent voice actors, raised $4.7 million in just 24 hours for its latest animated special “The Legend of Vox Machina.” No other 2019 Kickstarter campaign raised that amount over their entire 30- to 60-day raising period. 8		

Annotation

Word	Definition/Explanation	Related Resource
Crowdfunding	The term option refers to a financial instrument that is based on the value of underlying securities such as stocks.	crowdfunding crowdsourcing crowdlending
Types of Crowdfunding	Donation-based Reward-based Equity-based Debt-based	Major Crowdfunding Types

Discussion Baord

Message	Sender
This space has been so good, I've always wondered about crowdfunding.	BethNorman
Yes, I agree with you, if we share well, it will be very useful for all of us.	TiagoDecker
I already made the first post, you can look at the resource section.	AndyRuiz
I also added a new resource.	NicoleButler
Let's also prepare learnign steps, we follow the order here.	BethNorman
Yes, that would be fine.	TiagoDecker
I have added some terms.	BethNorman
I have also add a few terms as well which are related to learning steps.	TiagoDecker
We can also prepare a graph on how to trade startup shares.	AndyRuiz
Finally, we can prepare quizzes and check whether we have really learned or not.	NicoleButler

Learning Steps

#	Title	Content	Related Resource	Creator
1	Crowd-based business models	First of all, it would be helpful to learn about crowd-based business models. In this step you can see the differences between crowdfunding and other crowd-based business models.	crowdfunding crowdsourcing crowdlending	AndyRuiz
2	Types of crow fundings	Obtaining information about different types of crowdfunding and learning the differences between them will enable to master the crowdfunding details.	Major Crowdfunding Types	NicoleButler
3	Crowdfunding for start-ups	Getting information about how start-up shares are crowdfunded is the main topic of this space.	Equity Based Crowdfunding	TiagoDecker
4	Global best practices on crowdfunding	In this step, space members will be informed about global examples of Equity Based Crowdfunding.	Examples of Crowdfunding	BethNorman
5	Trade in crowdfunding	Resources on how investors buy and sell start-up shares will be examined in this step.	How Crowdfunding Works	AndyRuiz

Quizzes

Quiz1

Quiz Details:	
Title	Crowdfunding Types
Description	
Question Details:	
Statement	Which one of the following is not an underlying for crowdfunding?
Option1	Equity
Option2	Debt
Option3	Reward
Option4	Futures
Choose correct option	Futures

Quiz2

Quiz Details:	
Title	Crowdfunding Trading
Description	
Question Details:	
Statement	Which of the following organizations does not use in equity based crowdfunding trading?
Option1	Stock Exchange
Option2	Crowdfunding Platform
Option3	Central Depository
Option4	Commercial Bank
Choose correct option	Stock Exchange

Glossary

#	Term	Definition	Related Step
1	Crowdfunding	The term option refers to a financial instrument that is based on the value of underlying securities such as stocks.	1
2	Equity Based Crowdfunding	Equity crowdfunding is a method of raising capital online from investors in order to fund a private business.	3
3	Crowdfunding Trade	Financial crowdfunding has only primary market. There is not an organized market for financial crowdfunding.	5
4	Debt Based Crowdfunding	Debt-based crowdfunding encompasses several different types of crowd based lending. These include mini-bonds, peer-to-peer lending (sometimes known as 'peer-2-peer' or 'P2P' lending) and invoice financing.	2
5	Indiegogo	Indiegogo is an American crowdfunding website founded in 2008. The site is one of the first sites to offer crowd funding. It is claimed that Indiegogo is the best crowdfunding platform globally.	4

Relationship Graph

Title	Node Number	Prerequisites (as Node Numbers)
Startups shares	1	
Startups	2	1
Funds	3	
Bank Account	4	

Investors	5	3, 4
Crowdfunding platform	6	2, 5
Central Depository	7	2, 5, 6
OTC Trade	8	2, 5, 7

Scenario For Futures

Introduction

MustafaYildiz has been following the stock market for a long time. Although he trades in the spot markets, he is curious about what is happening in other markets as well. He is especially curious about leveraged transactions. It wants to get higher returns by using the experience in the spot market in the futures markets. Due to the risky nature of the futures markets, they first want to have information about this market in order not to make a wrong investment. He has established a learning space with AydosIlgazi, ErdemBilgin and SametTasti, who have the same interests. While creating space, MustafaYildiz first wrote what he understood about derivative products as much as he followed and made a short compilation from several sources.

Space Members

- MustafaYildiz
- AydosIlgazi
- ErdemBilgin
- SametTasti

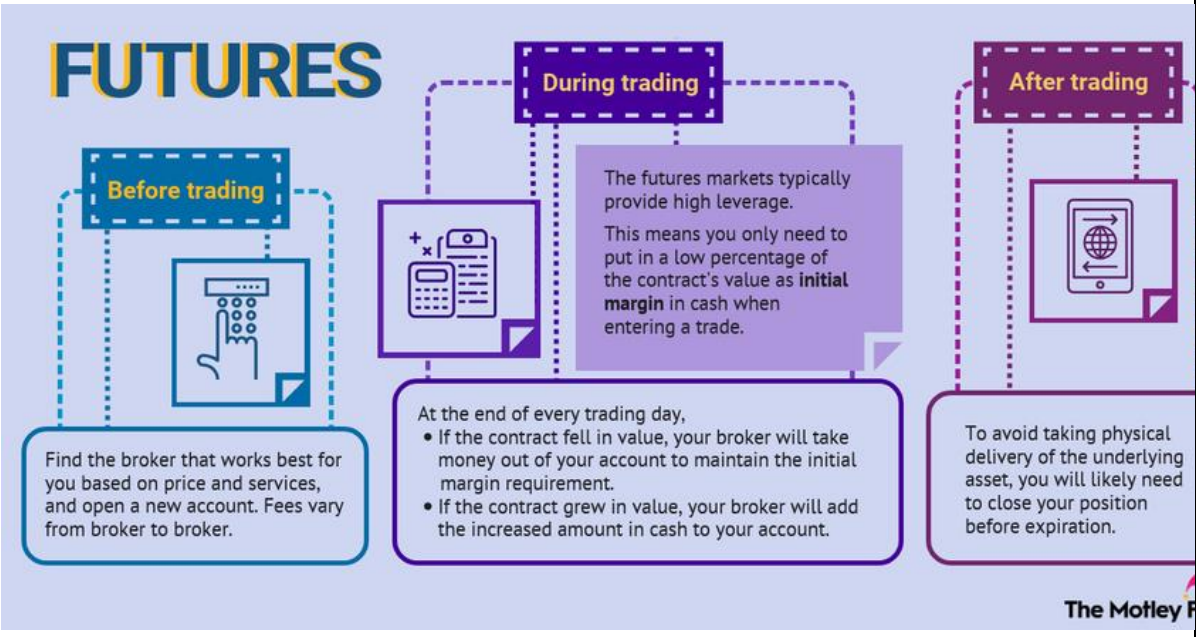
Space

Capital Market: Capital market refers to a broad spectrum of tradeable assets that includes the stock market as well as other venues for trading different financial products. Capital markets may trade in other financial securities including bonds; derivative contracts such as options, various loans, and other debt instruments, and commodity futures. Other financial instruments may be sold in capital markets and these products are becoming increasingly sophisticated.

Stock Exchange: A stock exchange is where different financial instruments are traded, including equities, commodities, and bonds. Exchanges bring corporations and governments, together with investors. Exchanges help provide liquidity in the market, meaning there are enough buyers and sellers so that trades can be processed efficiently without delays. Exchanges also ensure that trading occurs in an orderly and fair manner so important financial information can be transmitted to investors and financial professionals.

What Is a Derivative?

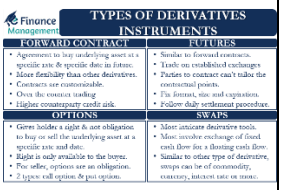
The term derivative refers to a type of financial contract whose value is dependent on an underlying asset, group of assets, or benchmark. A derivative is set between two or more parties that can trade on an exchange or over-the-counter (OTC).



AydosIlgazi, like MustafaYildiz, thinks that he has some deficiencies in trading in the stock market. However, unlike Ali, he made a few transactions in the futures market in the stock market. ErdemBilgin

has no information about the products traded on the stock exchange, but she wants to have information about it due to the interest of her friends. SametTasti is a professional investor. Its aim is to provide information to people who want to have information about capital markets and derivatives and to contribute to financial literacy.

Resources

Resource	Information	Attachment	Attacher
Derivatives	Types of derivatives has attached as Picture.		MustafaYildiz
Widely used derivatives	1. Options 2. Single Stock Futures (SSF) 3. Warrants 4. Index Return Swaps 5. Contract for Difference (CFD)		AydosIlgazi
Options	Options allow investors to hedge risk or to speculate by taking additional risk. Buying a call or put option obtains the right but not the obligation to buy (call options) or to sell (put options) shares or futures contracts at a set price before or on an expiration date. 2 They are traded on exchanges and centrally cleared, providing liquidity and transparency, two critical factors when taking derivatives exposure. Primary factors that determine the value of an option:	ch_21.pdf	ErdemBilgin

	Time premium that decays as the option approaches expiration Intrinsic value that varies with the price of the underlying security Volatility of the stock or contract		
Single Stock Futures	SSF is a contract to deliver 100 shares of a specified stock on a designated expiration date. The SSF market price is based on the price of the underlying security plus the carrying cost of interest, less dividends paid over the term of the contract. Trading SSFs requires a lower margin than buying or selling the underlying security, often in the 15-20% range, giving investors more leverage. SSFs are not subject to SEC day trading restrictions or to the short sellers' uptick rule. An SSF tends to track the price of the underlying asset so common investing strategies can be applied. Here are five common SSF applications: An inexpensive method to buy a stock A cost-effective hedge for open equity positions Protection for a long equity position against volatility or short-term declines in the price of the underlying asset.	 presentation_eurex-single-stock-futures.pdf	SametTasti

	Long and short pairs that provide exposure to an exploitable market Exposure to specific economic sectors		
Trading of derivatives	Derivative trading is when traders speculate on the future price action of an asset via the buying or selling of derivative contracts with the aim of achieving enhanced gains when compared with buying the underlying asset outright. Derivative trading has grown in popularity since the 1980s, and investors can now trade derivatives on a range of financial markets including stocks, currencies, and commodities. Traders can also use derivatives for hedging purposes in order to alleviate risk against an existing position. With derivatives, traders are able to go short and profit from falling asset prices. Therefore, they can use derivatives to hedge against any existing long positions. https://www.cmcmarkets.com/en/trading-guides/derivative-trading		AydosIlgazi

Underlyings	Commonly used underlyings for derivatives are listed in the picture		MustafaYildiz
Specific Features of the Derivative Market	In spot markets, you buy or sell the actual asset, but in derivatives markets, you buy a contract that its value is derived from the underlying asset's price in the spot market. In other words, buy and sell orders of market participants determine the asset's price in spot markets and, therefore, the contract value in derivatives. Also, you receive the purchased asset immediately after buying it, but in derivatives -futures specifically- the underlying assets will deliver at the pre-defined time or date in the contract. Moreover, derivatives markets are primarily used for hedging, although many traders trade there because the leverages make derivatives trading super lucrative.		SametTasti
The Power of Leverage	Derivatives can greatly increase leverage. For derivatives, leverage refers to the opportunity to control a sizable contract value with a relatively small amount of money. Leveraging through options works especially well in volatile markets. When the price of the underlying asset moves		ErdemBilgin

	significantly and in a favorable direction, options magnify this movement.		

Annotation

Word	**Definition/Explanation**	**Related Resource**
Option	The term option refers to a financial instrument that is based on the value of underlying securities such as stocks.	Options
SSF	Single Stock Futures	Single Stock Futures

Discussion Baord

Message	**Sender**
I think we should add some resources first.	AydosIlgazi
I agree with you Aydos.	MustafaYildiz
I have added the first resources.	ErdemBilgin

Just now, I have listed the widely used derivatives at the resource section.	SametTasti
What about learning steps, can someone write down the learnign step with order?	ErdemBilgin
Ok, I will write them.	MustafaYildiz

Learning Steps

#	Title	Content	Related Resource	Cerator
1	Spot vs Derivative Market	The easiest way to learn something is to bencmark it with its opposite. So comparing two markets can be the first step for learnign the derivative market.	Specific Features of the Derivative Market	MustafaYildiz
2	Derivative Products	Getting information on mainstream derivative products rather than exotic products will be more beneficial in terms of understanding overall derivative markets.	Widely used derivatives	MustafaYildiz
3	Futures	Futures are the simplest and most general structure among the derivative products. Focusing futures and forwards and grasping the deatils of these products.	Single Stock Futures	MustafaYildiz
4	Trading	Türev alım satım'deki önemli nokta göstergelerinin verilerini geçici olarak bekledikleri fiyat özelliklerine göre posizyon almalarıdır.	Trading of derivatives	AydosIlgazi

5	Leverage	Leverage is an issue that investors should consider in derivatives trading.	The Power of Leverage	AydosIlgazi

Quizez

Quiz1

Quiz Details:	
Title	Derivative Types
Description	
Question Details:	
Statement	Which one of the following is not a derivative product?
Option1	Options
Option2	Futures
Option3	Swaps
Option4	Equities
Choose correct option	Equities

Quiz2 s

Quiz Details:	
Title	Derivative Trading
Description	
Question Details:	
Statement	Which of the following organizations does not an investor use in derivative product trading?
Option1	Stock Exchange
Option2	Brokerage House
Option3	Central Depository
Option4	Central Bank
Choose correct option	Central Bank

Glossary

#	Term	Definition	Related Step
1	Option	The term option refers to a financial instrument that is based on the value of underlying securities such as stocks.	2
2	Futures	Futures are derivative financial contracts that obligate parties to buy or sell an asset at a predetermined future date and price.	3
3	Trade	Trade is the voluntary exchange of goods or services between different economic actors.	4
4	Leverage	Financial leverage results from using borrowed capital as a funding source when investing to expand the firm's asset base and generate returns on risk capital.	5
5	Spot Market	The spot market is where financial instruments, such as commodities, currencies, and securities, are traded for immediate delivery.	1

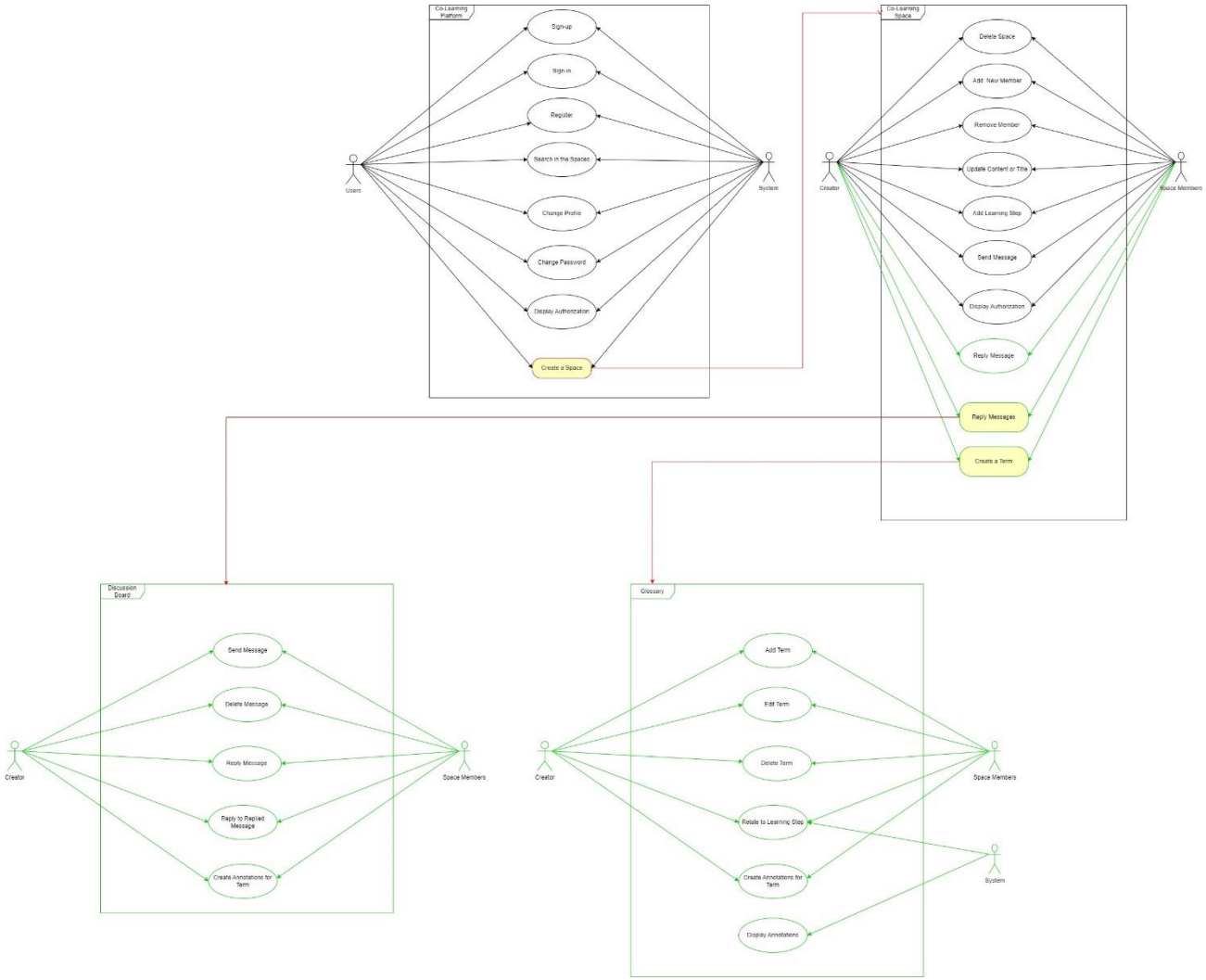
Relationship Graph

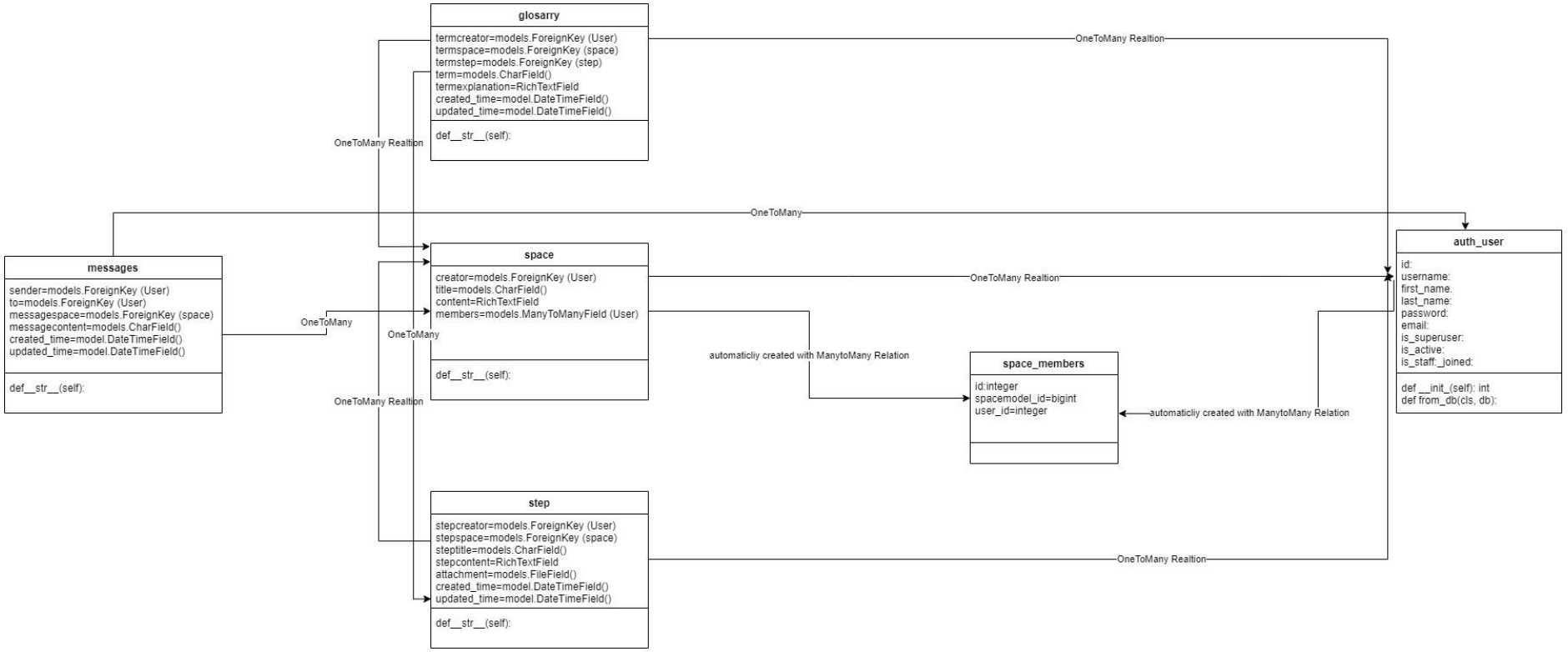
Title	Node Number	Prerequisites (as Node Numbers)
Risk Free Rate	1	
Maturity	2	
Underlying Price	3	
Price of the Derivative	4	1,2,3

Investor	5	4
Cerate a Brokorage House Account	6	5
Send Order	7	4,5,6
Stock Exchange	8	7
Clearing and Settlement	9	7,8
Receive Fund at Maturity	10	5

UML diagrams and images

UML Diagrams for User Interaction and Glossary




glosarry
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termstep=models.ForeignKey (step)
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termexplanation=RichTextField
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updated_time=model.DateTimeField()
def__str__(self):
OneToMany Realtion
OneToMany
auth_user
id:
username:
first_name:
last_name:
password:
email:
is_superuser:
is_active:
is_staff:_joined:
def __init_(self): int
def from_db(cls, db):
messages
sender=models.ForeignKey (User)
to=models.ForeignKey (User)
messagespace=models.ForeignKey (space)
messagecontent=models.CharField()
created_time=model.DateTimeField()
updated_time=model.DateTimeField()
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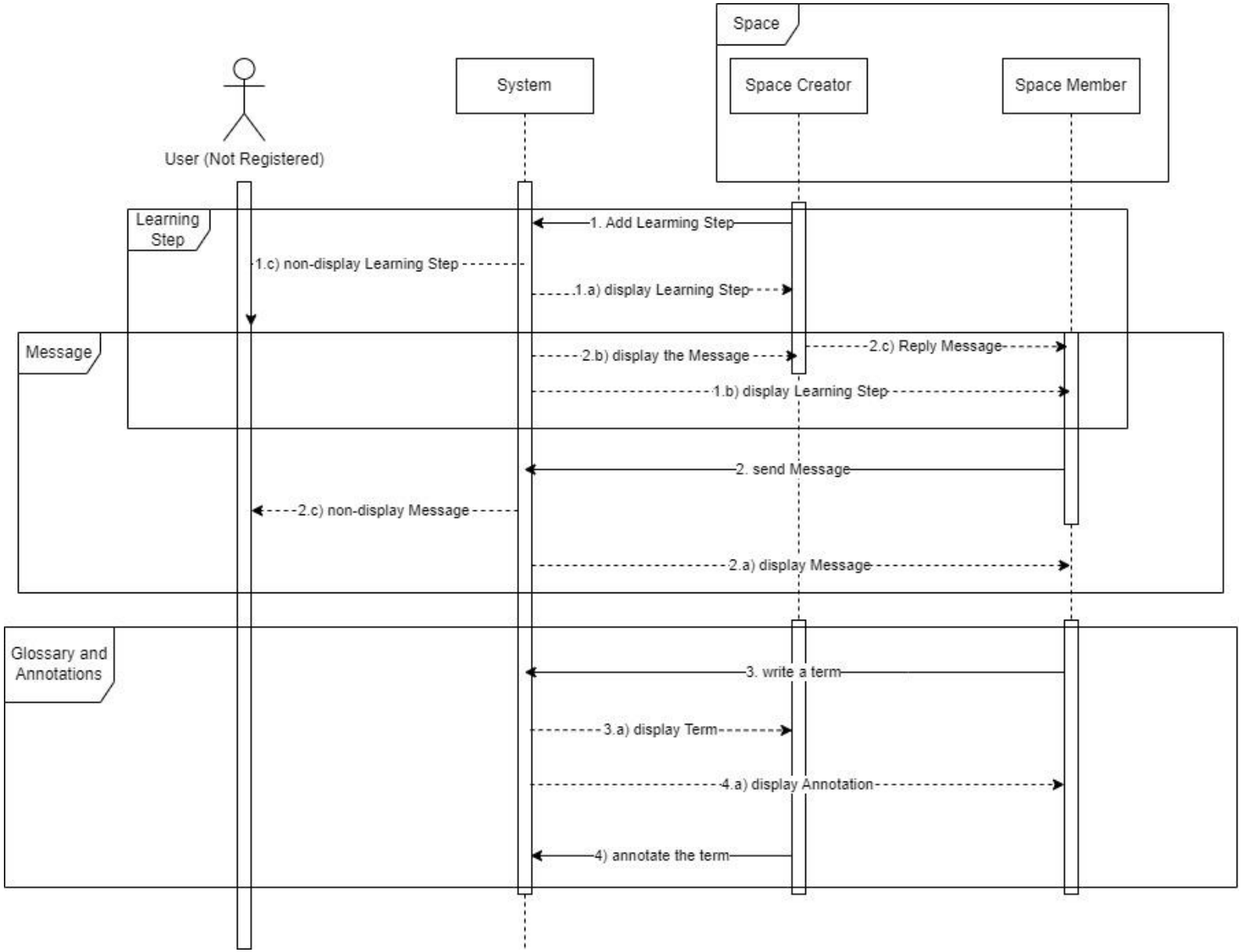
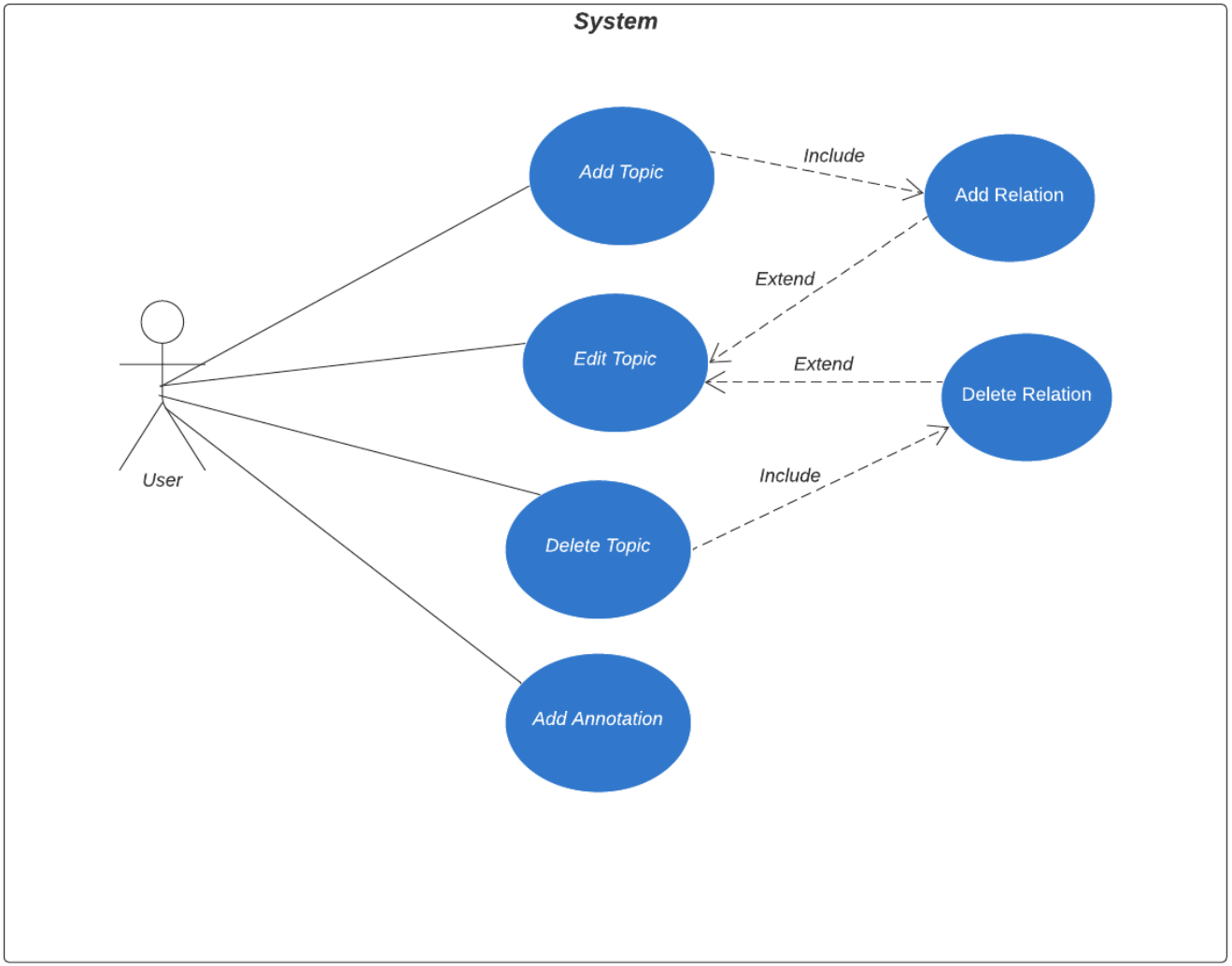
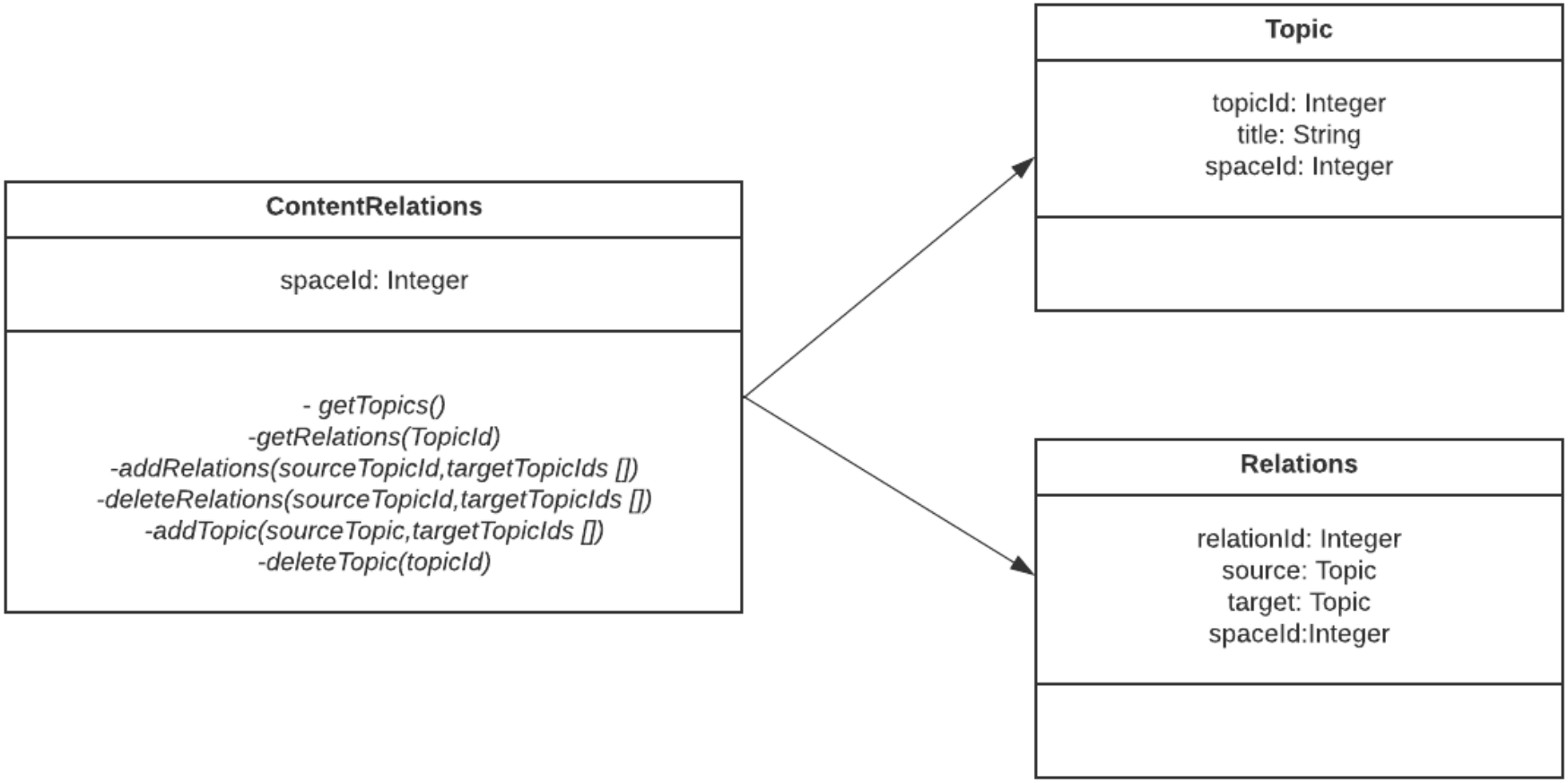
OneToMany
space
creator=models.ForeignKey (User)
title=models.CharField()
content=RichTextField
members=models.ManyToManyField (User)
def__str__(self):
automaticliy created with ManytoMany Relation
space_members
id:integer
spacemodel_id=bigint
user_id=integer
automaticliy created with ManytoMany Relation
step
stepcreator=models.ForeignKey (User)
stepspace=models.ForeignKey (space)
steptitle=models.CharField()
stepcontent=RichTextField
attachment=models.FileField()
created_time=model.DateTimeField()
updated_time=model.DateTimeField()
def__str__(self):


Space
System
Space Creator
Space Member
User (Not Registered)
Learning Step
1. Add Learming Step
1.c) non-display Learning Step
1.a) display Learning Step
Message
2.b) display the Message
2.c) Reply Message
1.b) display Learning Step
2. send Message
2.c) non-display Message
2.a) display Message
Glossary and Annotations
3. write a term
3.a) display Term
4.a) display Annotation
4) annotate the term

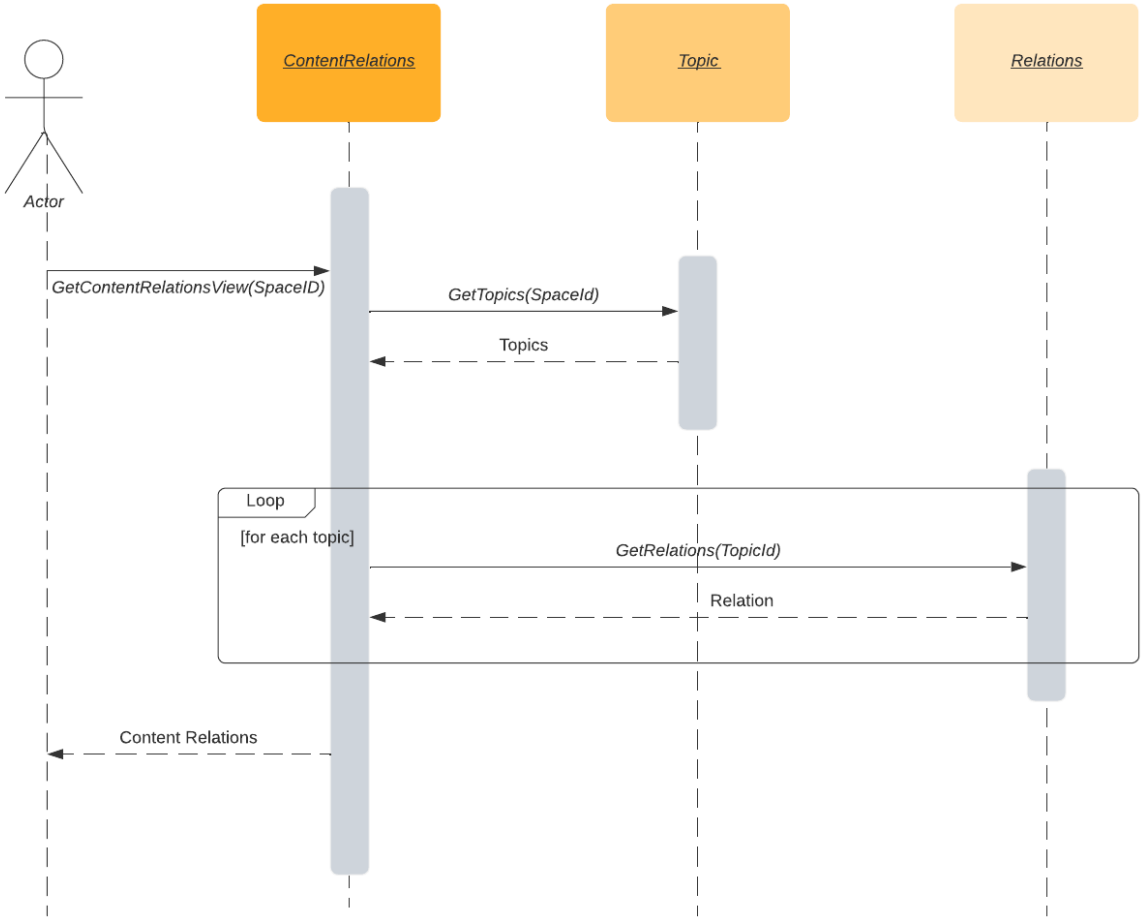
Use Case Diagram for Content Relations



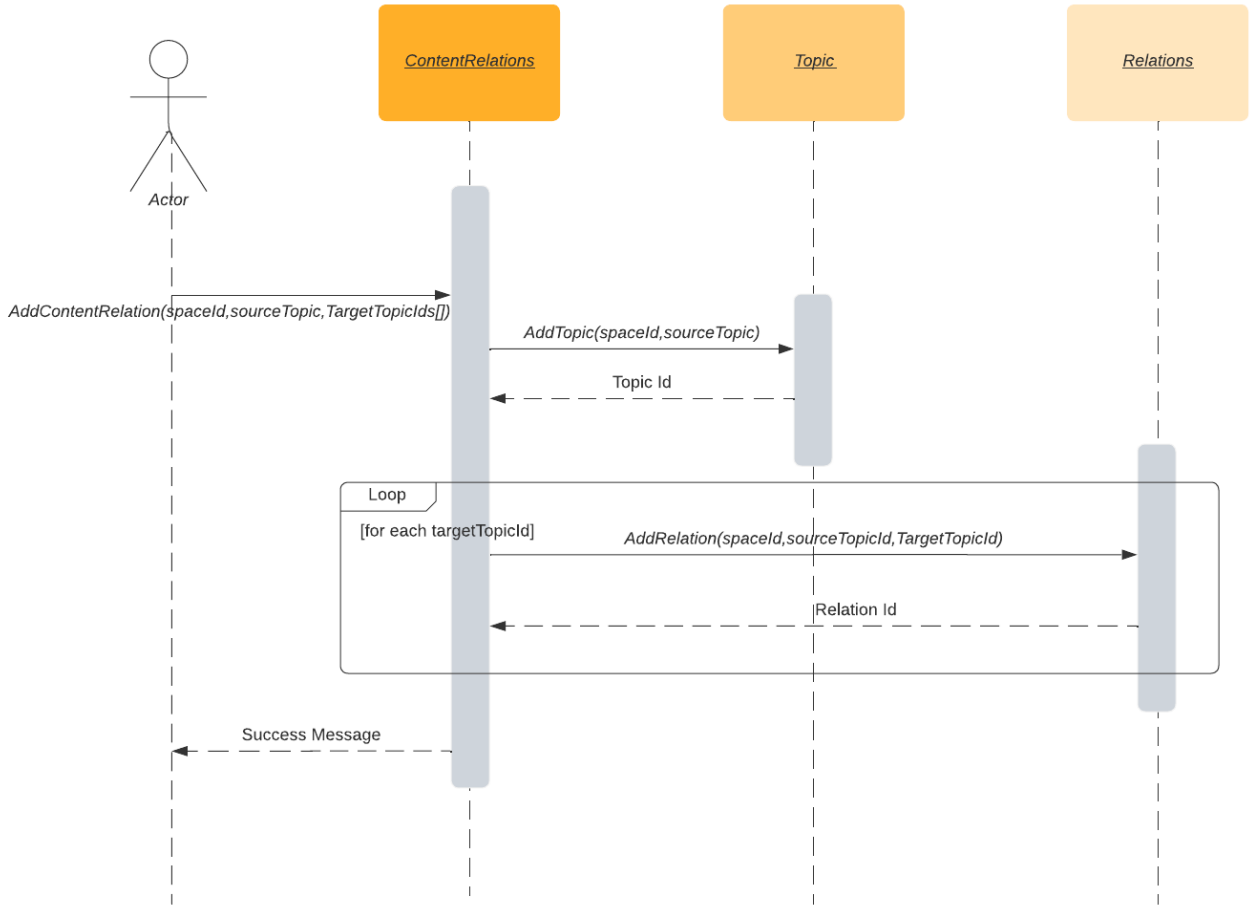
Class Diagram for Content Relations



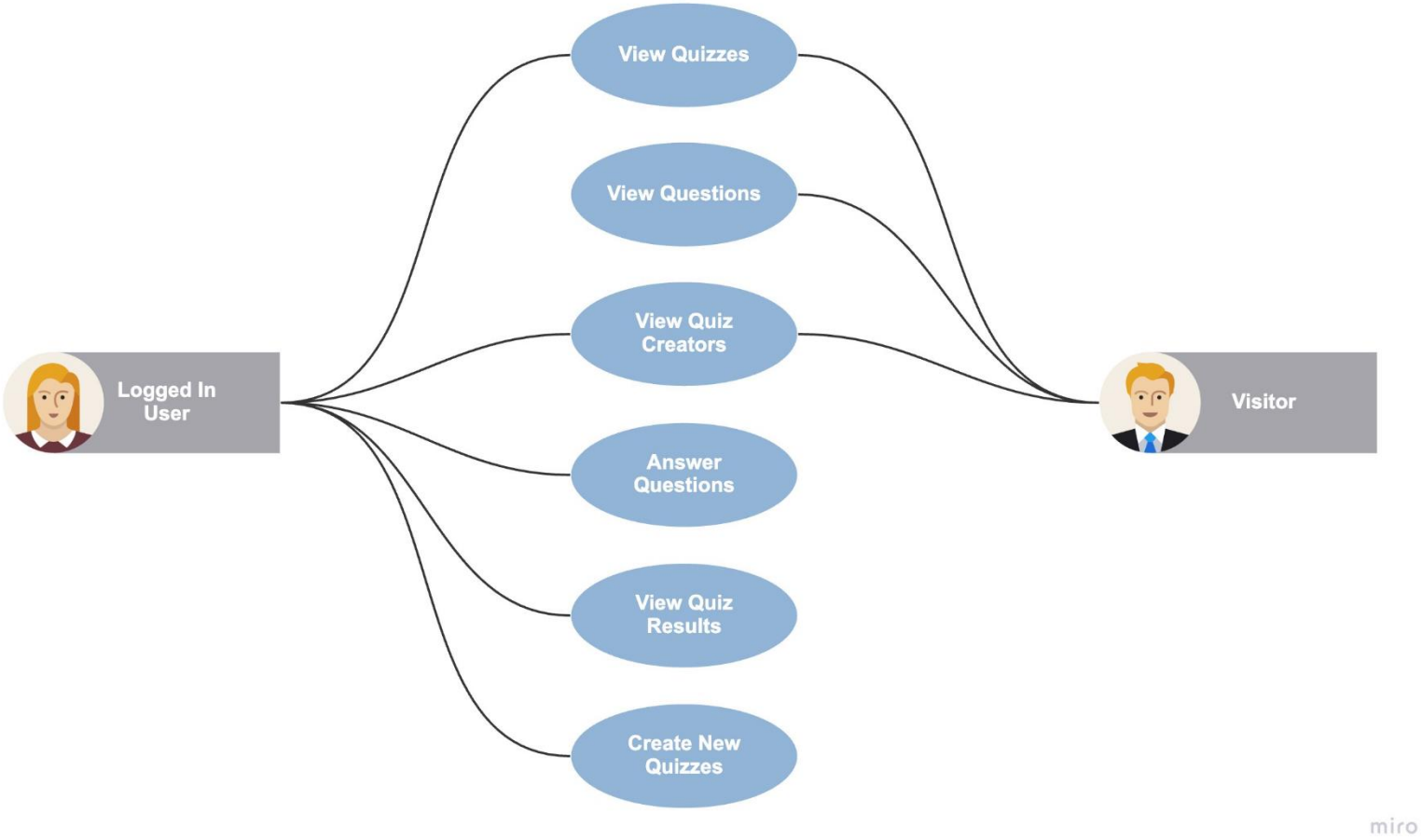
Sequence Diagram for Content Relations



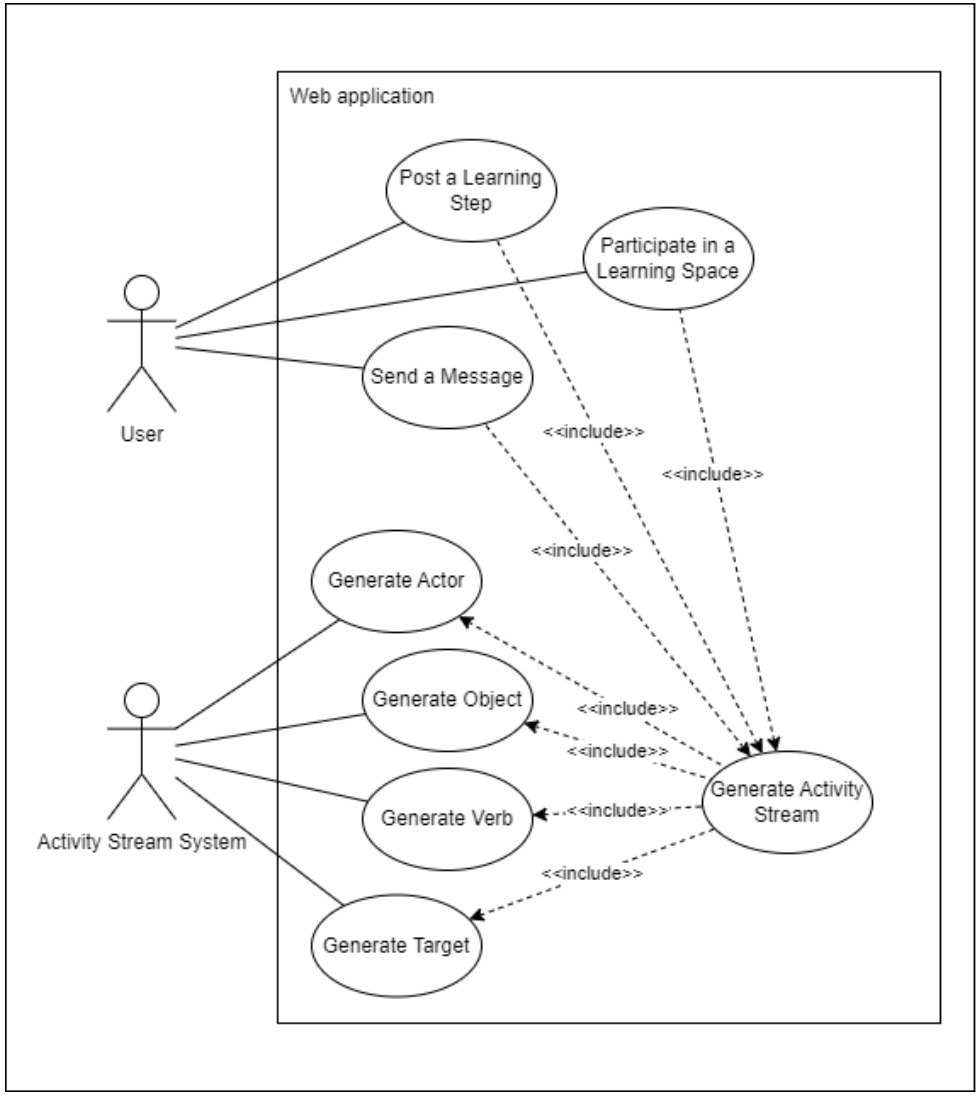
Add Content Relations



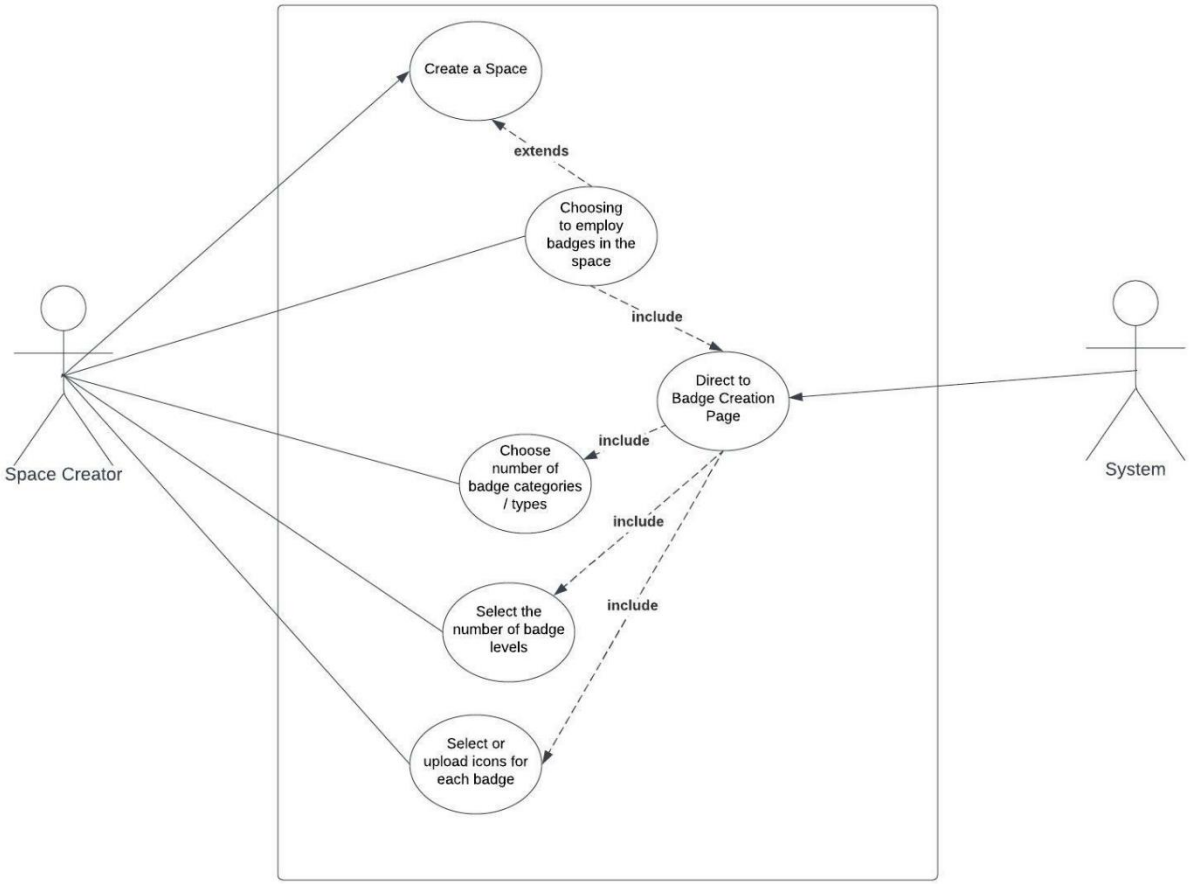
Use Case for Quiz Pages

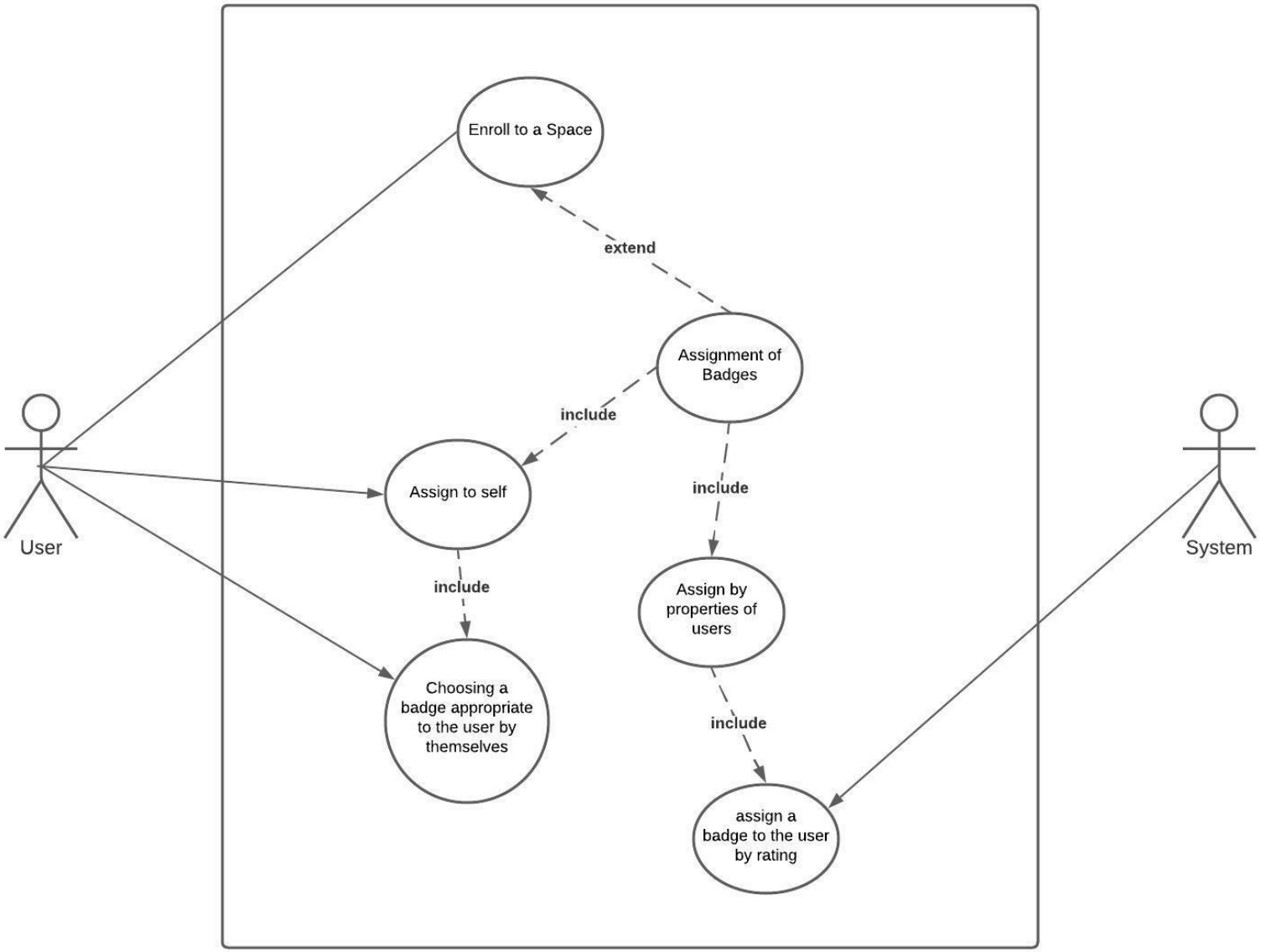


Use Case for Activity Stream



UML Diagrams for Badges




Enroll to a Space
extend
Assignment of Badges
include
Assign to self
include
include
Assign by properties of users
include
Choosing a badge appropriate to the user by themselves
assign a badge to the user by rating
User
System

Project Status

Requirements Status

System shall record the membership information, sign-in and sign-out times and unsuccessful sign-in attempts	Not Completed
A members of the spaces shall comment on the other members' instant messages in a spaces	Completed
System shall provide space creators with an option of implementing badges for users' avatars on the space	Not Completed
Admins of a space shall be able to select the number of badge categories that are going to be used in the space	Not Completed
Admins of a space shall be able to select the number of badge levels for each category of badges	Not Completed
System shall let admins to upload icon image for each category of badges	Not Completed

Admins shall select for each badge category the type of allocation of badge level.	Not Completed
Content of the glossary shall only be displayed by the co-learning platform members.	Completed
Members and the creator of the spaces shall define the terms related to the space content and edit them.	Completed
Steps of each term shall be indicated by members or the creator of the spaces.	Completed
Members and the creator of the spaces shall be able to reply to the messages in the discussion board.	Completed
Members and the creator of the spaces shall be able to reply to the replied messages in the discussion board.	Completed
Users shall be able to create quizzes.	Completed
Users shall be able to view the results of their taken quizzes.	Completed
Users shall be able to view how many other users completed the quizzes that are created by them.	Not Completed

Users shall be able to search for a quiz by the name of the quiz.	Not Completed
Users shall be able to attempt a quiz.	Completed
Users shall be able to view other subject related quizzes as annonation.	Not Completed
Members and the creator of the spaces shall add annotations to the words by clicking into that word.	Completed
When a creator or a member of a specific space clicks a word, system shall display a window in which creator of the annotation shall be able to write the content of that annotation.	Completed
When an annotation added to a word, members of the platform shall be able to display the content, creator, time of that annotation.	Completed
Annotations shall be visible to all co-learning space members when a member put the cursor into the annotated word.	Completed
The system shall generate activity streams based on users' actions in the website.	Completed
The system shall create activity streams with an actor, an object, a verb and a target.	Completed

The system shall display the activity streams in co-learning spaces.	Completed
System shall display content relations graph in learning space.	Completed
User shall add topic and prerequisite relation.	Completed
User shall edit topic and prerequisite relation.	Completed
User shall delete topic and prerequisite relation.	Completed
User shall add text annotation to node in content relations graph.	Not Completed
System shall display users text annotations in content relations graph.	Not Completed
System shall find search results using semantic data from wikidata.	Completed
User shall add tag and label while creating space.	Completed
System shall display tags in space details page.	Completed
Content of the resources shall only be displayed by the co-learning platform members.	Completed
Members and the creator of the spaces shall define the content of the resources.	Completed

Creator and Members of the space shall add attachment as pdf or picture.	Completed
Creator and Members of the space shall update or delete the resources' content and attachment.	Completed
System shall display the modifier and modified date of the resources.	Completed
Space members and creator shall select the related source while creating the learning step.	Completed
Space members and creator shall go to the related resource by clicking the link for the related resource in the learning steps section.	Completed
Users shall be edit and change the user profile page and also area of interests.	Completed
User profiles of the space members shall only be displayed by the co-learning platform members and creator.	Completed

Deployment Status

Project is dockerized, deployed and regularly updated throughout semester.

Url: http://ec2-54-205-199-25.compute-1.amazonaws.com/

System Manual

Docker Version

Requires:

- Docker

Commands:

- Docker run -p 80:8000 aydosilgazi/swedeploy (latest version available on docker hub)

Local Run From GitHub Repo

Requires:

- Pip
- Pipenv
- Git

Commands:

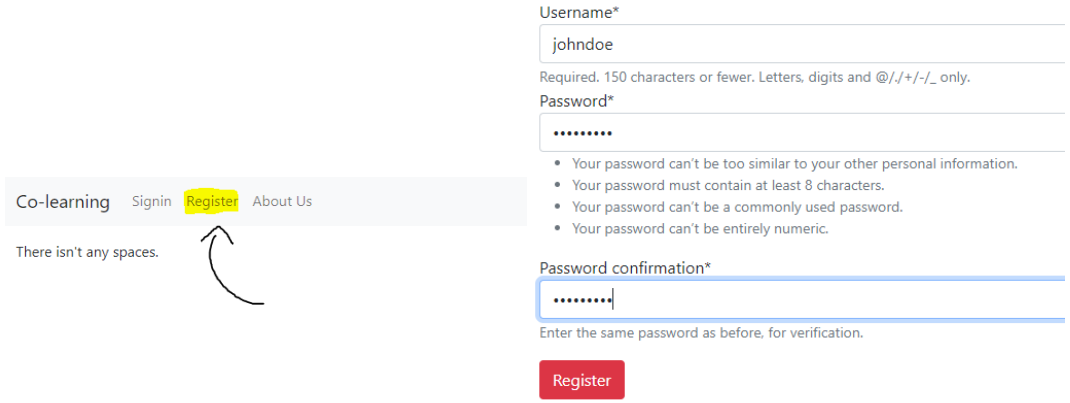
- Git clone https://github.com/bounswe574-G3/swe574_2022_repo.git
- Cd swe573_2022_repo
- Pipenv install
- Pipenv shell
- Python manage.py runserver

User Manual

1. Registration and signing in:

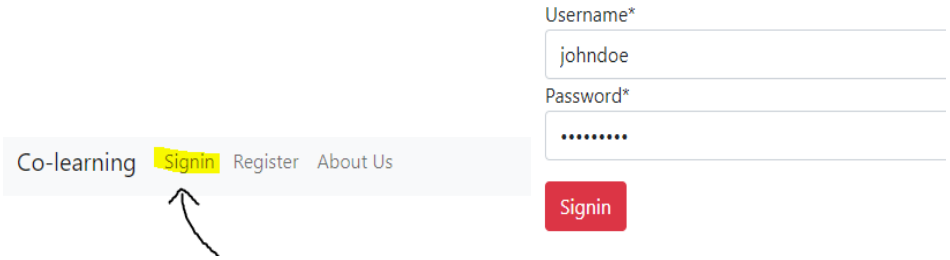
1.0. In order to use the system, the user first must register to the system if he or she does not have an existing account by clicking on the "Register" available at the top of the website and following the registration procedure.

> Registration and creating an account:



1.1. If the user has an existing account, he or she can login to the system with their valid credentials. The user now can utilize the website.

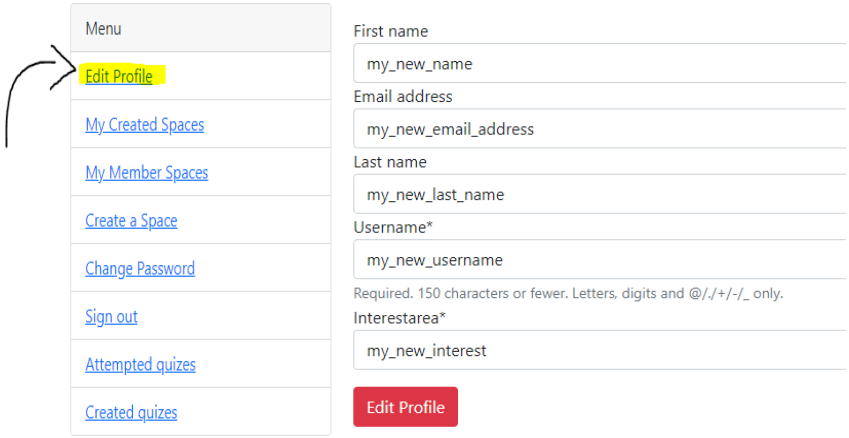
> Logging in with an existing account:



2. Editing the user profile:

2.0. After logging in, the user may change their account information by clicking on the "Edit Profile" on the menu on the right. On the page that has been opened, the user may supply new information regarding their account.

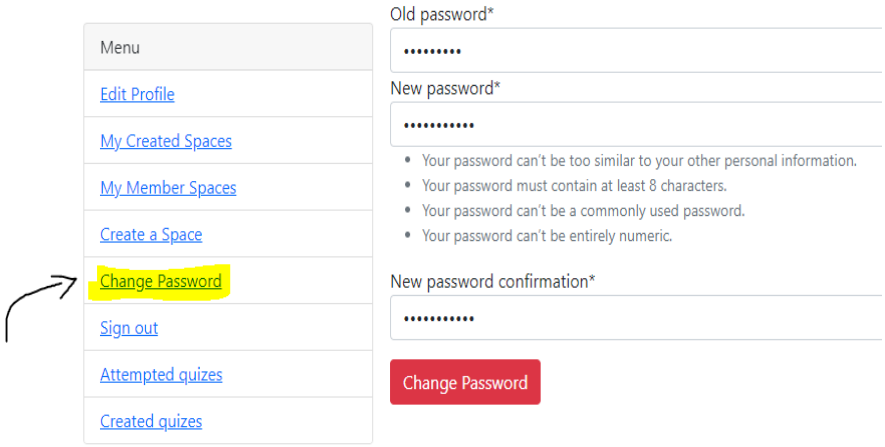
> Selecting "Edit Profile" and entering new account information:



3. Changing password:

3.1. After logging in, the user may change their password by clicking on the "Change Password" on the menu on the right. On the page that has been opened, the user may supply the system with their new password.

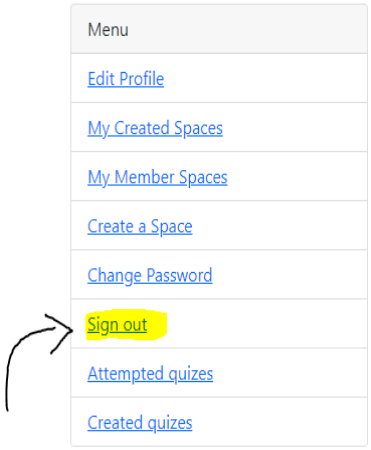
> Selecting "Change Password" and entering a new password:



4. Signing out:

4.1. After logging in, the user may sign out by clicking on the "Sign out" on the menu on the right.

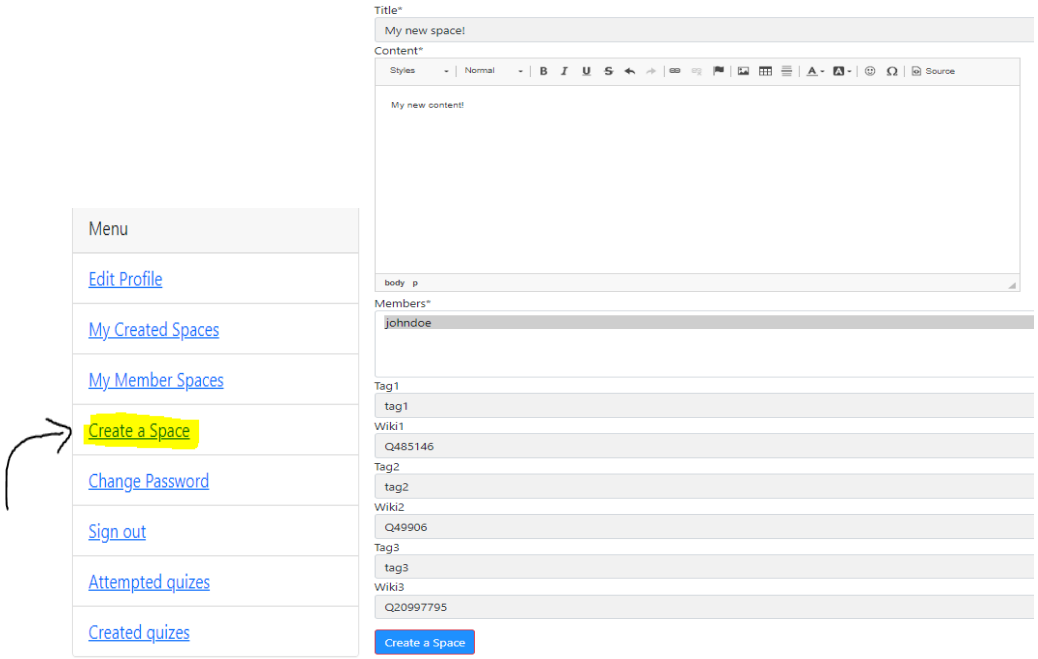
Signing out:



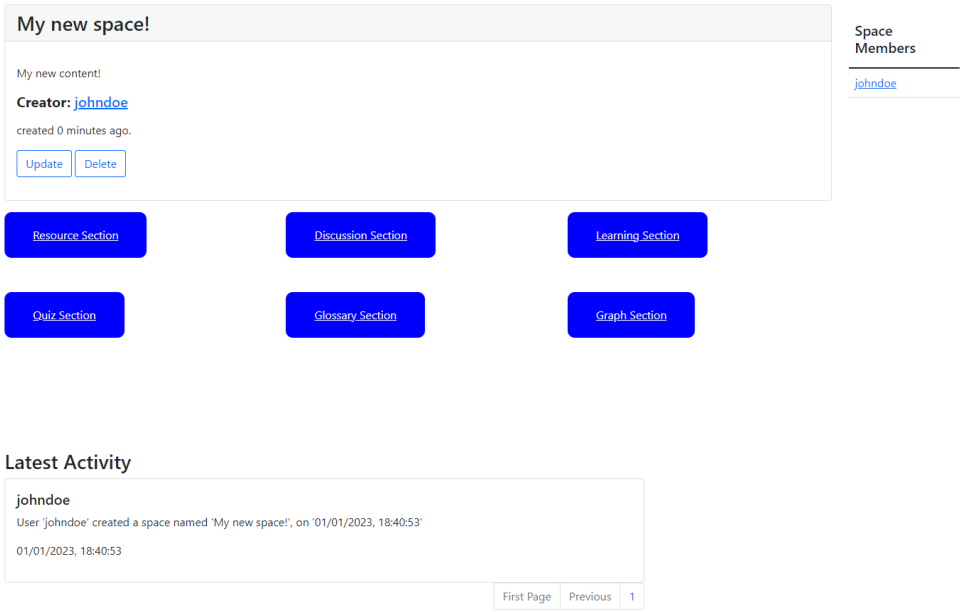
5. Creating a space:

5.1. After logging in, the user may create a new space by clicking on the "Create a Space" on the menu on the right. On the page that has been opened, the user may supply the data necessary to create a new space. After creating a space, the user is greeted with the space panel.

> Selecting "Create a Space" and entering new space related information:


Menu
Edit Profile
My Created Spaces
My Member Spaces
Create a Space
Change Password
Sign out
Attempted quizes
Created quizes
Title*
My new space!
Content*
Styles
Normal
Source
My new content!
body p
Members*
johndoe
Tag1
tag1
Wiki1
Q485146
Tag2
tag2
Wiki2
Q49906
Tag3
tag3
Wiki3
Q20997795
Create a Space

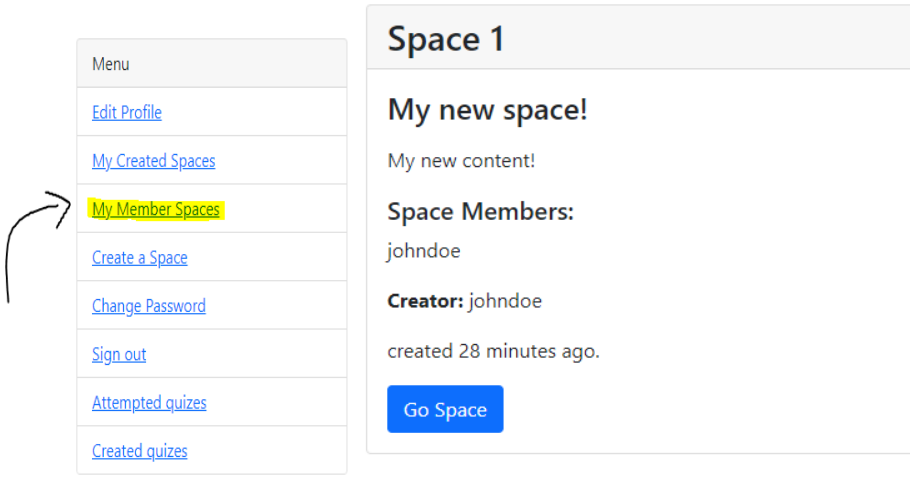
> Space panel:



6. Displaying the spaces the user is participating in:

6.1. After logging in, the user may see the spaces they are participating in by clicking on the " My Member Spaces" on the menu on the right. For any spaces to be displayed, the user first must be a participant in any spaces available on the website.

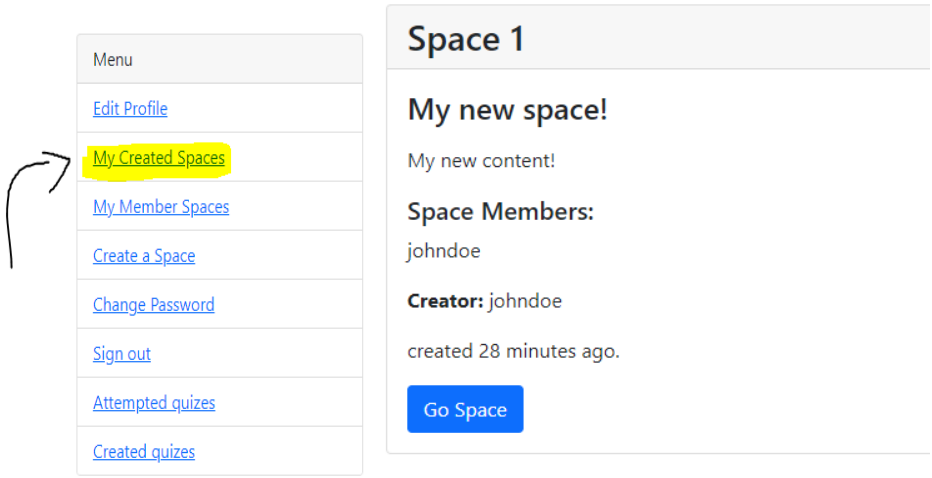
> Selecting "My Member Spaces" and seeing the currently participated spaces:



7. Displaying the spaces the user had created:

7.1. After logging in, the user may see the spaces they had created by clicking on the "My Created Spaces" on the menu on the right. For any spaces to be displayed, the user must have created a space prior to it.

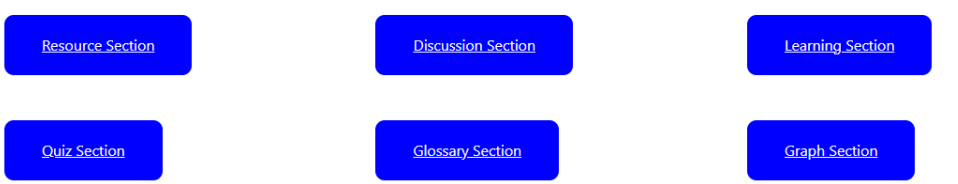
> Selecting "My Created Spaces" and seeing the created spaces:



8. Inside the space and space features:

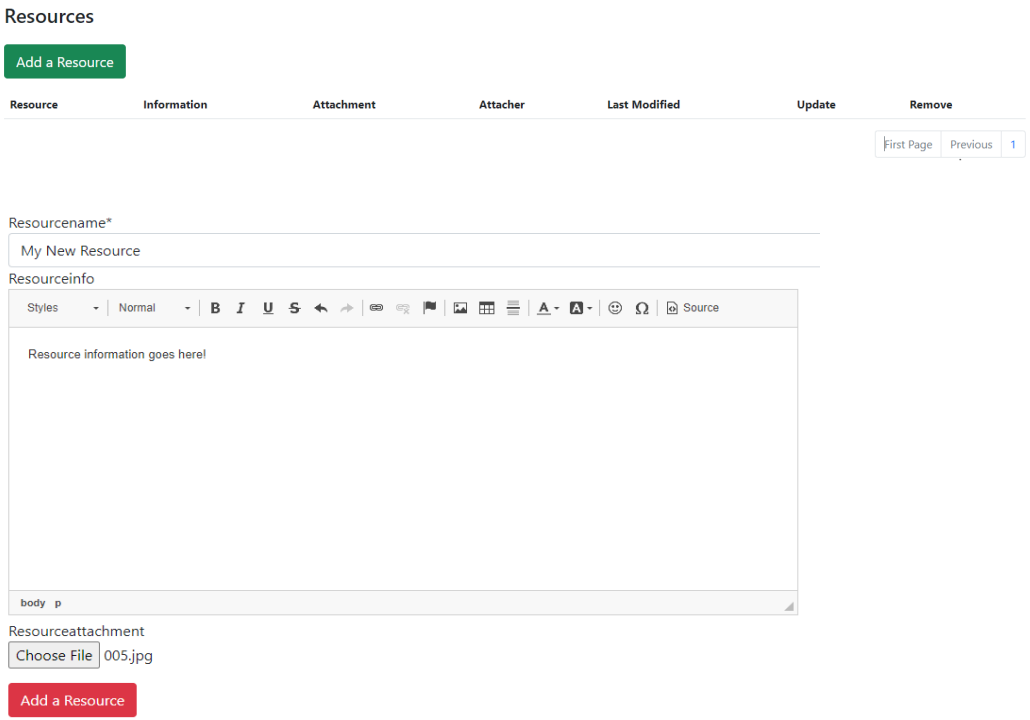
8.1. Inside a space, the user has several utilities he or she can make use of. In order to utilize these, the user must click on the corresponding feature. These are the features "Resource Section", "Discussion Section", "Learning Section", "Quiz Section", "Glossary Section" and "Graph Section". This section acts as a simple guide regarding the features' usages.

> *The features user can utilize, as displayed in the space:*

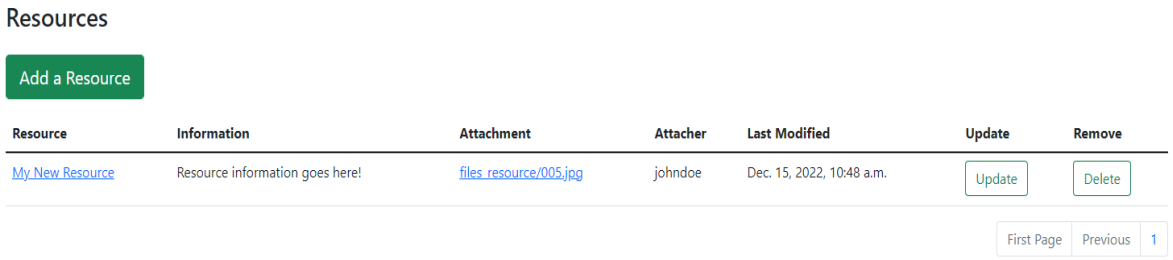


8.2. The "Resource Section" allows the user to create resources regarding the space.

> *Inside the resource section and resource creation:*

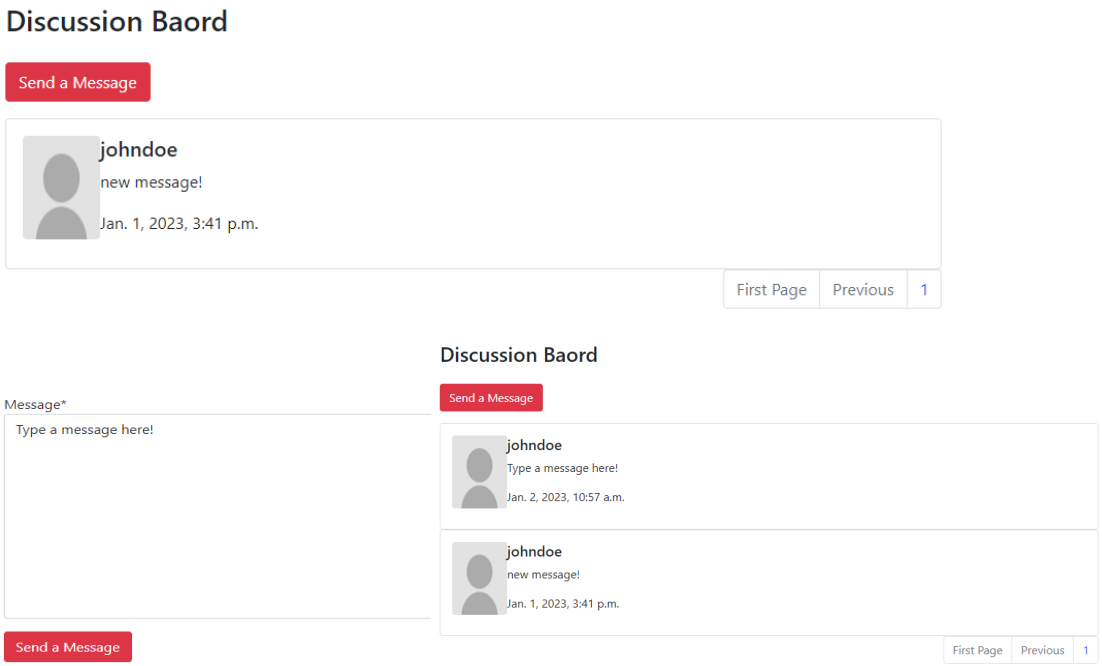


> *The user can observe added resources here and may also update or delete them:*



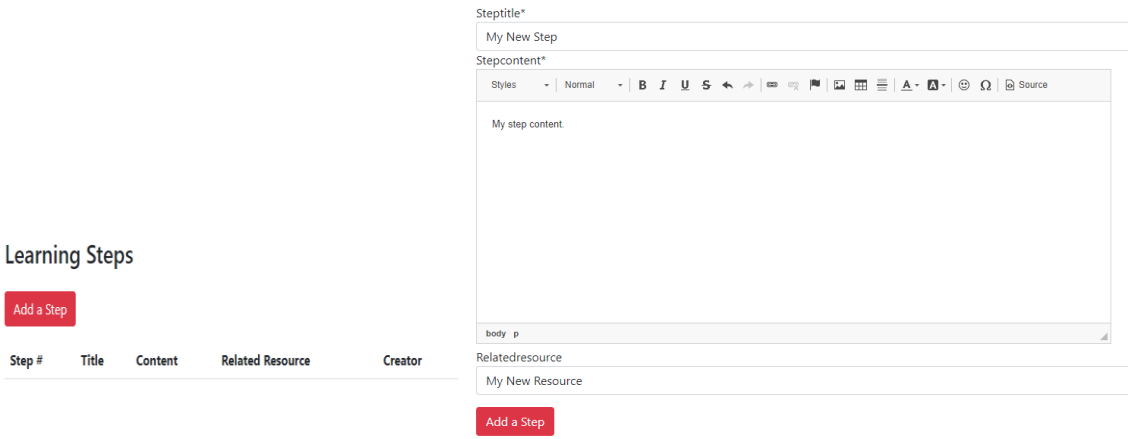
8.3. The "Discussion Section" allows the user to post messages and observe posted messages.

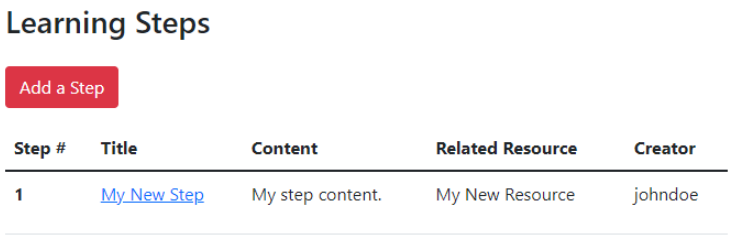
> *Inside the discussion section, posting a message and the updated discussion board in order: (don't mind the typo)*



8.4. The "Learning Section" allows the user to add learning steps.

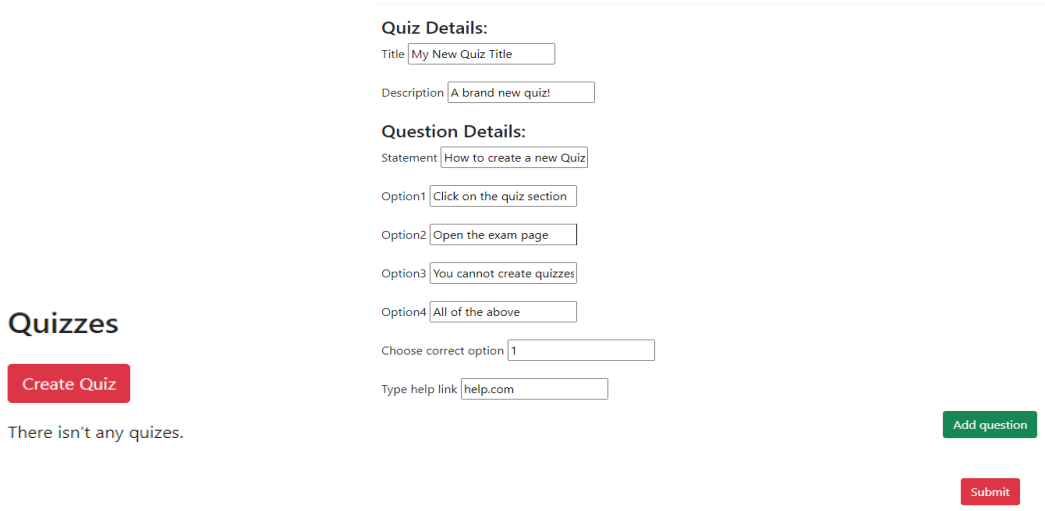
> *Inside the learning section, adding a step and available steps pages in order:*

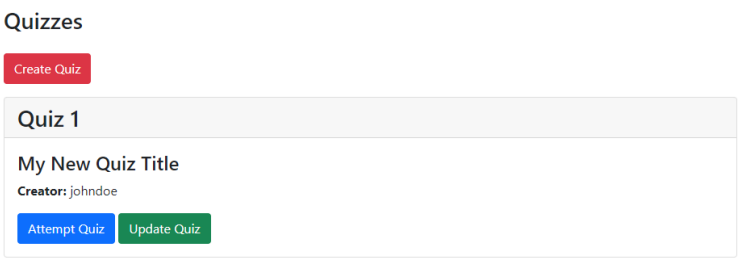




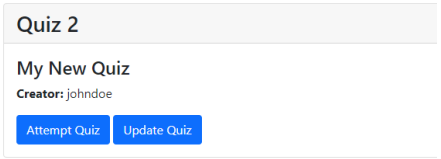
8.5. The "Quiz Section" allows the user to create quizzes. Also, on the menu on the right you can display the quizzes created by the user and quizzes attempted by the user, these are the options "Attempted quizzes" and "Created quizzes".

> *Inside the quiz section, creating a simple quiz and the available quizzes pages in order:*



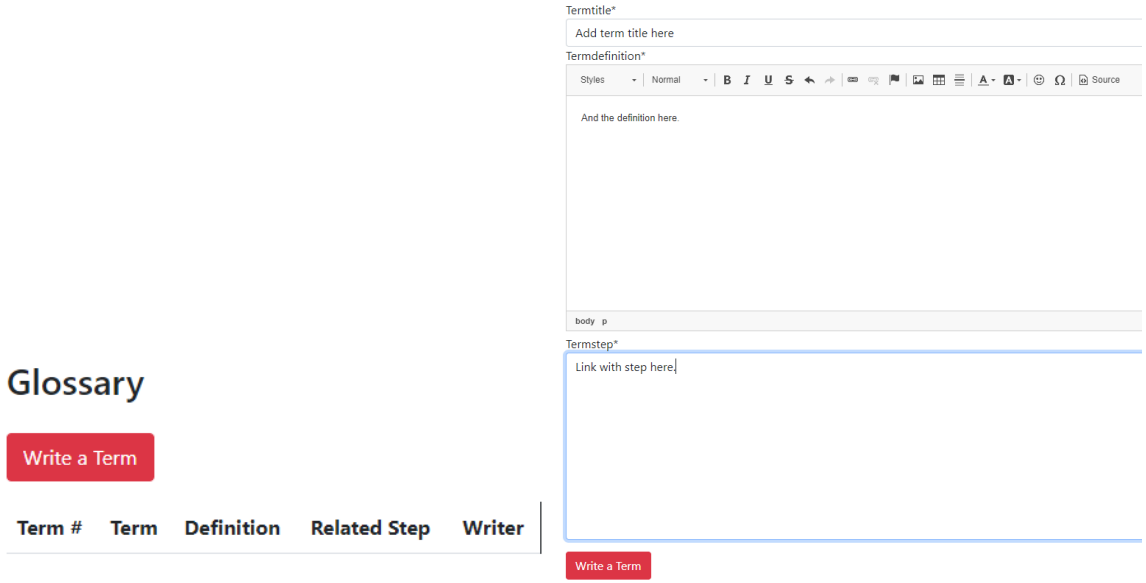


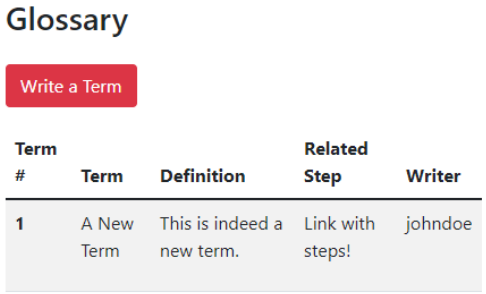
> *Created quizzes and attempted quizzes view (they are the same):*



8.6. The "Glossary Section" allows the user to write terms related to the space.

> *Inside the glossary section and adding a term:*

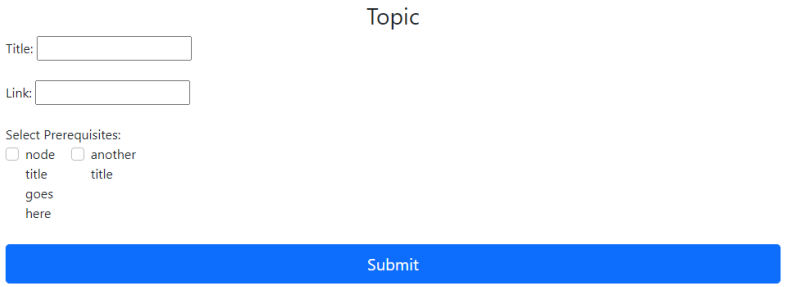




8.7. The "Graph Section" lets the user map related resources by adding nodes in a graph.

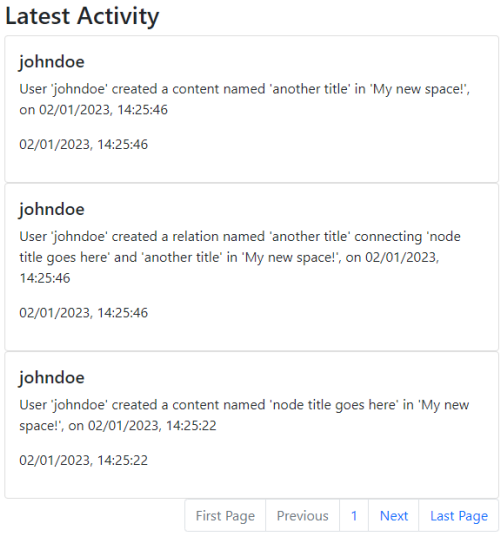
> Inside the graph section and adding some nodes: (what used to work got bugged and it could not be displayed in the user manual, but basically you map relationships of various topics under this graph section). Anyways, the first screen the user sees:

> *Adding a topic by entering the title and the link data while also selecting a prerequisite topic:*



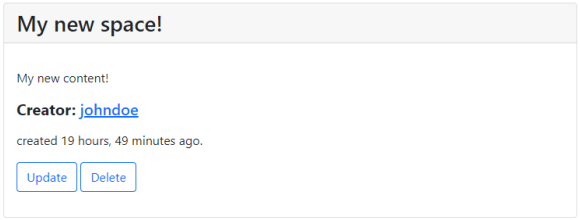
8.8. The activity stream is a feature that lets the user keep track of the latest activities that have happened in that space.

> *The activity stream which is displayed in the space, towards the end of the page:*

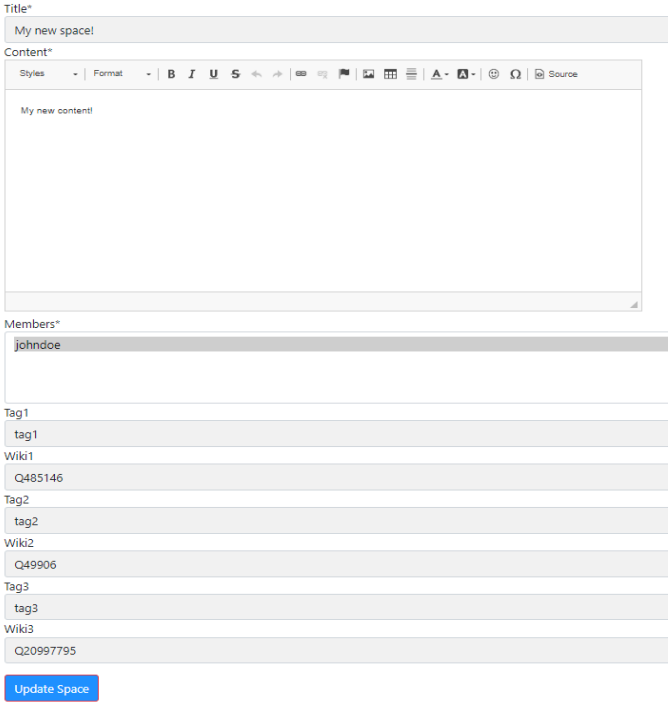


8.9. Updating and deleting the space can be done in the space screen and is available to the space author.

> *Updating and deleting options:*

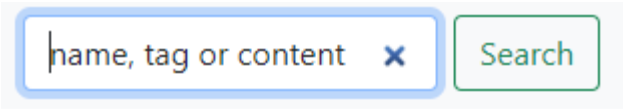


> *Update screen, basically the same page when creating a new space but populated with the current space details:*



8.10. The search functionality sitting atop of the page lets the user search available spaces by tags, by names or by their content.

> The search bar: (after the operation the system redirects to a page which displays spaces found)



This concludes the quick user manual.

Unit Test and User Test

1. About Unit Tests:

While developing the project, all members certainly did unit tests and tested the functions they had developed one by one by providing arguments and asserting the outputs, as is the regular approach. However, we did not use any automated testing frameworks and we lack the documentation regarding our unit tests.

2. **About User Tests:**

Ideally, the user test is done by letting the user use the system in their own natural way. By doing this, developers can gain insight into the nature of their own application which might not be apparent from the get-go. Amongst the user-generated data, a developer might see weird patterns and unorthodox ways of system utilization, which might not necessarily be planned as the "default" way by the developers in the first place and as such, valuable usage data can be observed in these types of tests. User tests may involve other types of tests such as testing the UI and enacting a user story etc. and, in our case, we tested the UI extensively while development (which certainly does not count as a "bona fide" user test, but it does count to some extent because the UI tests we did are a subset of all available UI usage combinations) and we considered users perspective and their way of utilizing the system while developing the project. We did not use any automated testing frameworks for user testing, and we again lack documentation regarding this type of test but overall, it is safe to assume that we did tests to some extent which are a combination of tests that could be stumbled upon for any developers that aim to do user test such as UI testing and considering user scenarios and enacting them.

This concludes the report, thanks for reading.