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| Report 1 Part 2 Team 16 |
| System design and implementation strategy |

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System design

A text on a white background

Description automatically generated

Feedback points mentioned in the demonstration:

-Having a light/dark mode would improve website aesthetics

-Change add task to assign task for consistency (both do the same thing but in different places). Add task was just a shortcut when an employee is selected from a Team Leader’s dashboard or manager’s dashboard.

-Some projects are confidential so only users assigned to a certain project can access these

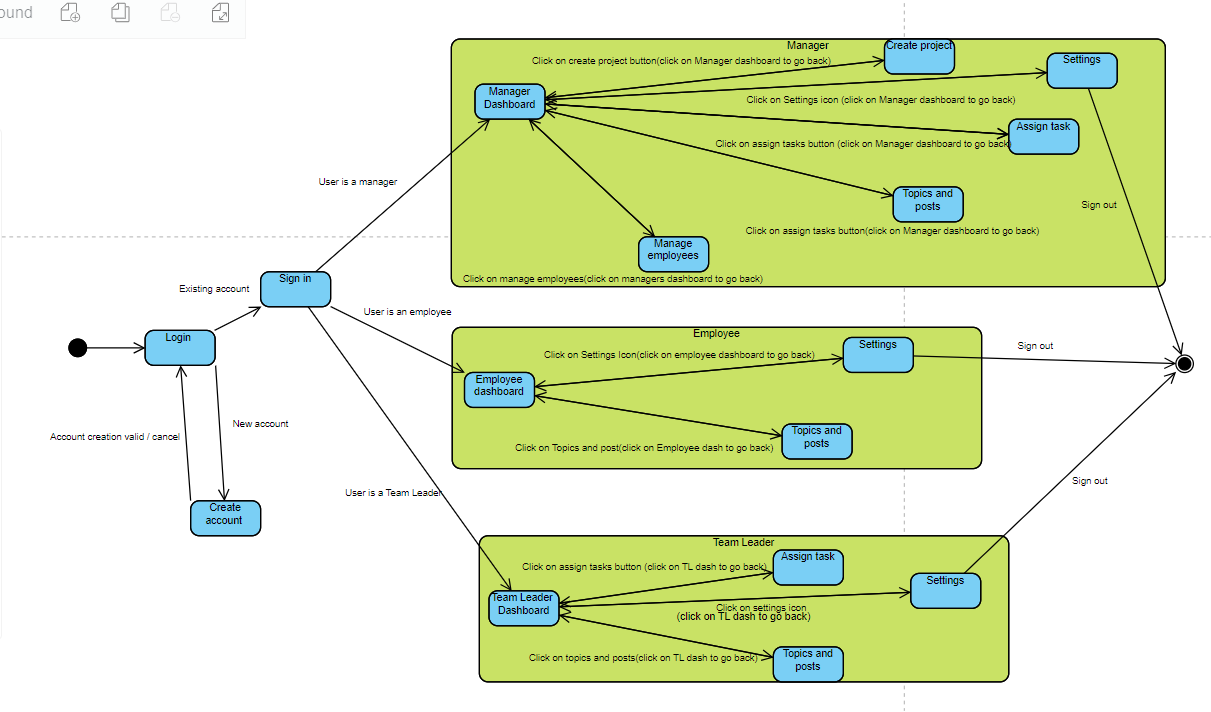
-Search for tasks / team members should be added for ease of use for managers

System design - Product breakdown structure diagram of the different components

A screenshot of a computer

Description automatically generatedIt follows on that each of the subtasks should be an individual page.

State machine diagram to model the system’s behaviour.



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| **Number** | **Requirement**  **(From part 1)** | **In what part of the breakdown structure diagram is it used, and what page is it assigned to?** |
| 1. *Login and inviting users* |  |  |
| 1.1 | A user must be registered to access the system. | -Sign-in page under the login section |
| 1.2 | Every user must be able to invite users to the system using a link. | -Create invite code under the settings section |
| 1.3 | A verified staff email address is required to register to the system. | -Create account within the login section checks the email address is verified and is on the database. |
| 1.4 | First name and surname are required from the user to register to the system. | -Under create account there is authentication functions ensuring the fields aren’t empty |
| 1.5 | A password must contain at least 8 characters, including an uppercase character, a lowercase character, a number, and a special character. | -Under create account there is authentication functions ensuring the fields aren’t empty |
| 1.6 | A password must not contain any of the user’s credentials, such as first name or surname. | -Create account, one of the authentication function checks under the login section |
| 1.7 | A maximum of one account per member of staff. | -Create account, one of the authentication function checks |
| 1.8 | Managers should be able to add new managers to the system. | -Manage employees, a manager can change the role of an employee |
| 1. *Managing teams* |  |  |
| 2.1 | Managers must be able to start a new project and assign a team leader. | -Create project page |
| 2.2 | Managers and team leaders must be able to create tasks for employees. | -Create task page |
| 2.3 | Assigning a task to an employee should assign the employee to the respective team. | -Assign task page |
| 2.4 | If an employee no longer has tasks related to a team, they should be removed from the team. | -Employee dashboard displays the tasks, if they have no task then that project will also not show |
| 2.5 | Managers and team leaders should be able to view team members and tasks allocated to the team they are responsible for. | -Managers dashboard page  -Team leader dashboard page |
| 2.6 | Managers can view and access all teams. | -Manage employees page |
| 2.7 | There should be a visual way for managers and team leaders to compare how tasks are allocated amongst team members. | -Manager’s dashboard page  -Team leader’s dashboard page |
| 2.8 | A progress bar should be shown for each team which states how many tasks have been completed. | -Manager’s dashboard page  -Team leader’s dashboard page |
| 2.9 | There should be a list of employees which state how many tasks each employee has been assigned. | -Manage employees page |
| 2.10 | Employees should be able to receive tasks from, and be part of, multiple teams at a time. | -Assign task page (receive tasks)  -Employee dashboard (shows they are part of multiple teams) |
| 2.11 | Team leaders can manage more than one team at a time. | -Team Leader dashboard page |
| 2.12 | Team leaders can be set tasks. | -Assign task page |
| 1. *Employees and tasks* |  |  |
| 3.1 | Tasks should have a set time constraint. | -Assign task page |
| 3.2 | Employees should be able to see their tasks in a list form. | -Employee dashboard page |
| 3.3 | Employees should have a to-do list that they can add to. | -Employee dashboard page |
| 1. *Documenting knowledge* |  |  |
| 4.1 | All users can create a topic. | -Create topic page |
| 4.2 | For each topic, users can create posts within the topic to share knowledge. | -Create posts page |
| 4.3 | Posts can contain text and pictures to share knowledge. | - view posts page  -create post page  -view individual posts and replies page |
| 4.4 | Every user can see the posts shared in the topics. | -View posts page |
| 4.5 | Users should be able to reply to posts shared in topics. | -Individual post and replies page |
| 1. *Aesthetics and functionality* |  |  |
| 5.1 | The website should use light themes for the aesthetics of the website. | -Settings page: light/dark mode button |
| 5.2 | JavaScript and PHP should be used to create the website and MYSQL should be used to interact with the database. | JavaScript, PHP and MYSQL have been used to create all pages on the website. |

Implementation strategy

As the client already liked the overall look and navigation of the prototype the team decided that it would be a good idea to evolve the prototype into the eventual delivered product (feature of an evolutionary model from a throw-away prototype). This saves on development time as the components are being reused in the final implementation and ensures that the aesthetics of the website don’t change too much ensuring validation.

After breaking down the problem into individual and easier to manage problems using the product breakdown diagram it is now easier to develop an implementation strategy. With multiple people working on the project but on different aspects, it suffices that mostly using a waterfall approach for the reasons detailed below.

-The waterfall model is focused on activities. This works well as the product breakdown structure above easily splits up each section of the project into easier to manage and simpler sub tasks. Each team member can now work on a different sub task to increase the productivity of each member and thus the whole team.

-The project has well defined requirements so that the requirements don’t need to be revisited and the client doesn’t have to be too involved which further speeds up the development process as time is saved from not interacting with the client. Furthermore, requirements aren’t also added throughout the development process which means time is further saved from modifying the requirements via validation from the original specification (apart from the added requirements from the demonstration).

-Medium sized projects like the make-it-it all system tend well towards waterfall as low levels of complexity and organisational skills are needed. Our team of 6 members had weekly meetings to discuss how the project was moving forward communicating on difficulties and challenges we faced and as a result required no manager to oversee progress of each member. This uses ideas from a Scrum methodology where the team is self-organizing, and the team is going to have weekly meetings to discuss progress and setbacks contributing to continuous improvement.

-As waterfall is sequential in nature this means that it is easy to track the progress of the project and gives a good indication if the project is running on time. I have made an activity on Node diagram to help with progress indication which will be discussed in weekly meetings that is based upon the MoSCow method and the activity on node diagram.

-Waterfall also minimises the risk of scope creep and gold plating which helps focus the team and ensure that all the team know what tasks to complete and in what order through the MoSCoW method described below.

The website is being deployed using a ‘big bang’ approach so all the features will be deployed at the end and each webpage will work together as required by the specification. As the original specification letter emphasised on security, a system that that is deployed in increments would take a lot longer to develop as each increment would need to have testing after each increment before deployment which would slow done development time. Big bang allows most of the testing to happen at the end so that requirements are hit before more thorough testing occurring at the end of the project.

Planning and prioritising tasks: Using the MoSCoW method.

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| Must (7-10/10) | Should (4-6/10) | Could (1-3/10) |
| -Some projects are confidential so only users that are part of the confidential project can access these -requested in demonstration  Would be a security risk if other users not part of the team could access confidential posts | -Change add task name to assign task- requested in demonstration | -Light/dark mode – requested in demonstration |
| Login including:  - sign-in page –requirement 1.1 in the specification  - create account including authentication – requirements 1.4- 1.7 | -Search for tasks / team members for ease of use -requested in demonstration |  |
| Managers – must be able to create a new manager to the system-  requirement 1.8 | -New password in the settings menu |  |
| Managers must be able to start a new project and assign a team leader. 2.1 | Users should be able to reply to posts shared in topics -  Requirement 4.5 |  |
| Managers and team leaders must be able to create tasks for employees. |  |  |
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|  | Edit tasks in case tasks are incorrectly |  |
|  | View topics view posts is asynchronous |  |
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A diagram of a company

Description automatically generatedActivity on node diagram to show how tasks are planned and prioritised.

Explanation following the Activity on node diagram.

-With the project broken down via the product breakdown structure and the tasks prioritised using the MoSCow method it is now sufficient to start planning the order in which tasks are completed.

-The first task is the database creating the tables which supplies the project with necessary tables containing data that is used in the subsequent tasks.

-Once the database has been made the login can be created (needs to access the database as a prerequisite to access valid login information) so that the 3 different types of users (Manager, Team Leader and employee) can be accessed

-Once the login functionality works new users can then be created and added to the database. Along with this authentication functions need to be made to ensure the data is valid and won’t cause bugs and errors to the database when they are needed when the user needs to sign into the account they have just created.

-I found it appropriate to place a milestone after the whole of the database and login section had been complete as this marks a monumental point of completion in the project

-Once the first milestone had been complete multiple pages could be worked on simultaneously this includes the dashboards (for the manager, team Leader and Employee), the settings page and the knowledge organization. This is because they all depend on who signs in which dictates what dashboard is shown being either as manager, team leader or Employee. Furthermore, once the login is complete the pages about knowledge organisation can be started with view topics. Once all the topics can be viewed it follows on that new posts can be added on top of the existing posts.

-Once the topics have been created view posts can then be created as all the posts of a certain topic will be displayed after the topic is selected.

-Once the Team Leader and Manager dashboards have been made an assign task page can be created as it is used in both dashboards, and it needs to work in both places.

-Also, once the Manager dashboard has been made two pages being the manage employees and create project can be made as these are dependent on the dashboard being made. They can be made in parallel as their functionalities are exclusive of one another.

A close-up of a white box

Description automatically generated-The settings page is just dependent on the login being created. The only essential feature here is sign out. This also includes features such as changing password and light/dark mode that aren’t essential to how the system operates.