STUDENTS AS CO-CREATORS

A Curriculum Design Collaboration

Project Title: Student Cabinet for SMARTEST

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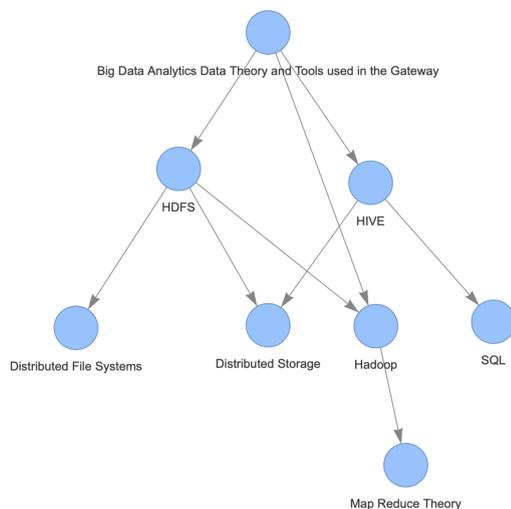
School of Computer Science and Engineering

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1. Executive Summary

1. Initial project meeting to brief everyone on the basic premise and technologies for the project.
2. Development team meeting to introduce team members to the technologies used in the meeting. Team members were given permissions to access GitHub repositories. Tasks were allocated to investigate SMARTEST API codebase, Node.js, Express.js and Bootstrap, in preparation for future development.
3. Design and prototyping of the final product
4. Implementation of the final product
5. Project evaluation and reflection

2. Background and Aims

SMARTEST is a graph-based e-learning platform which structures learning content visually and mentally through graphs. A graph, in the context of SMARTEST, is a computer science concept describing a collection of nodes and edges. In the image below, nodes are represented by circles and edges are represented by arrows pointing one node to another.

Each node carries the ability to store metadata on a certain topic. For example, it is possible that each node in a graph stores a description and keywords for a topic in a mathematics module. An edge in a graph represents a relationship between two nodes. Multiple edges can be used to chain several nodes together in a linear fashion, to represent a sequence of steps, or used to show a hierarchy of one higher-level concept to a lower-level concept (like algebra is a part of mathematics), for example.

For this project, our aim was to introduce an aspect of a "student cabinet" feature to SMARTEST to personalise users' learning experiences.

The concept of a student cabinet comes from the idea of having a "cabinet" and/or personal toolbelt of utilities that a student can access when they want to have a more personal learning experience, that generic module content, or the current SMARTEST e-learning platform, may not currently provide. This could be, for example, a personal progress dashboard that keeps track of various metrics that a student may find valuable or beneficial towards their learning process or experience.

The aspect of the student cabinet feature we decided to implement was a "node annotating" feature (like when annotating a diagram on a whiteboard), where a student would be able to add one or multiple notes to any node in a graph, and then see the notes as if they were whiteboard annotations above/on nodes in a graph.

Students would also be able to publicise their notes so other SMARTEST users can view them, and so others can see them as annotations too. Through this, students would be able to see all notes made public by others alongside their own notes. We also came up with an idea to implement a feature where students could access all the notes they have written in SMARTEST in one central location, as opposed to having to access each graph to view its notes.

3. Methods and Design

The project team used weekly team meetings to coordinate and review progress with tasks, and a Trello kanban board to track weekly tasks and progress.

During meetings, skills sessions were held to decrease the skill gap between team members. Design sessions were also held, where team members brainstormed the student cabinet's design and implementation plan.
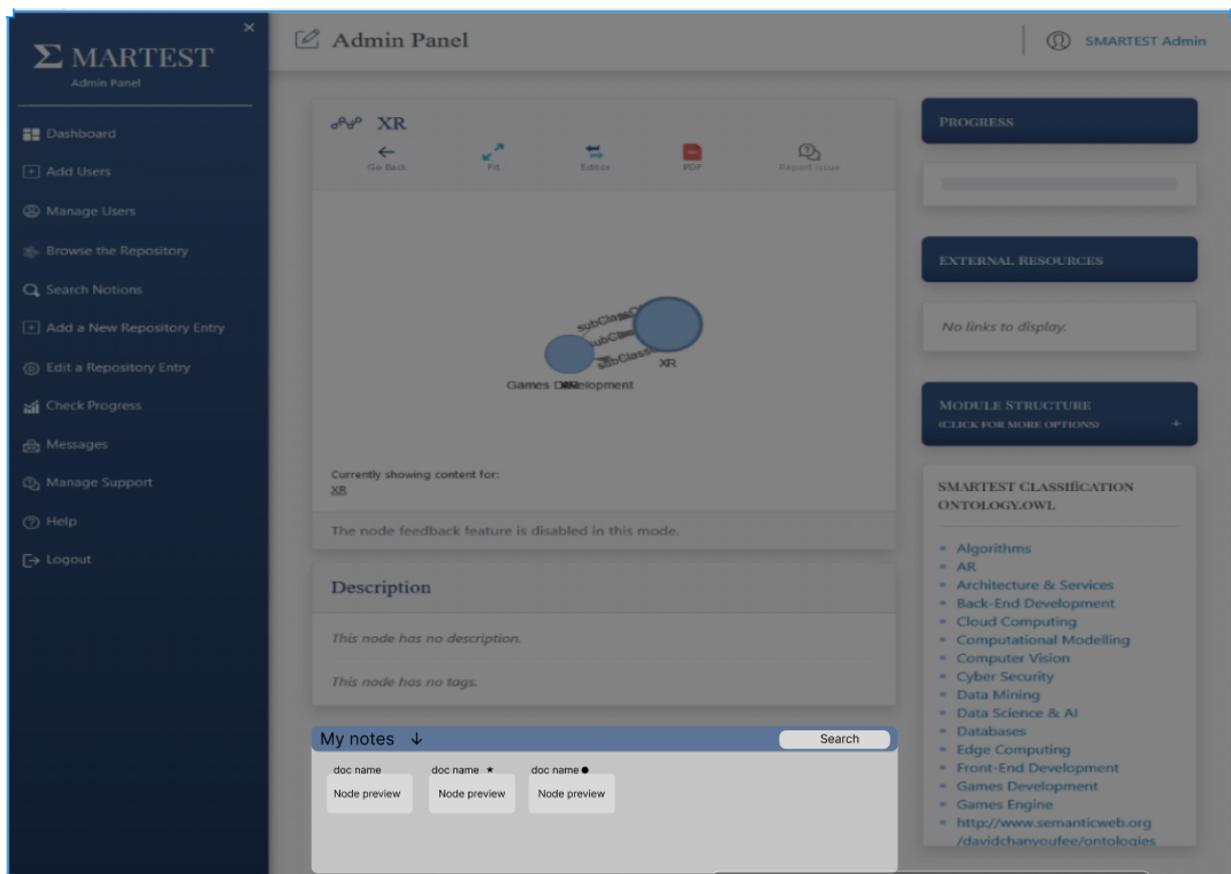
The design was created in Figma, with the intention of eventually integrating it into the SMARTEST website. With this in mind, the design was edited on top of a screenshot of the SMARTEST website.

The main feature that we decided to add was a notes section, which we added to the node metadata page. The screenshot below shows the new section titled as, "My notes", and is inserted after the node description section. This new section would allow a user to create and access all their own notes for a particular graph node.

The symbols next to each note represent the status of each note and identify the type of note, where:
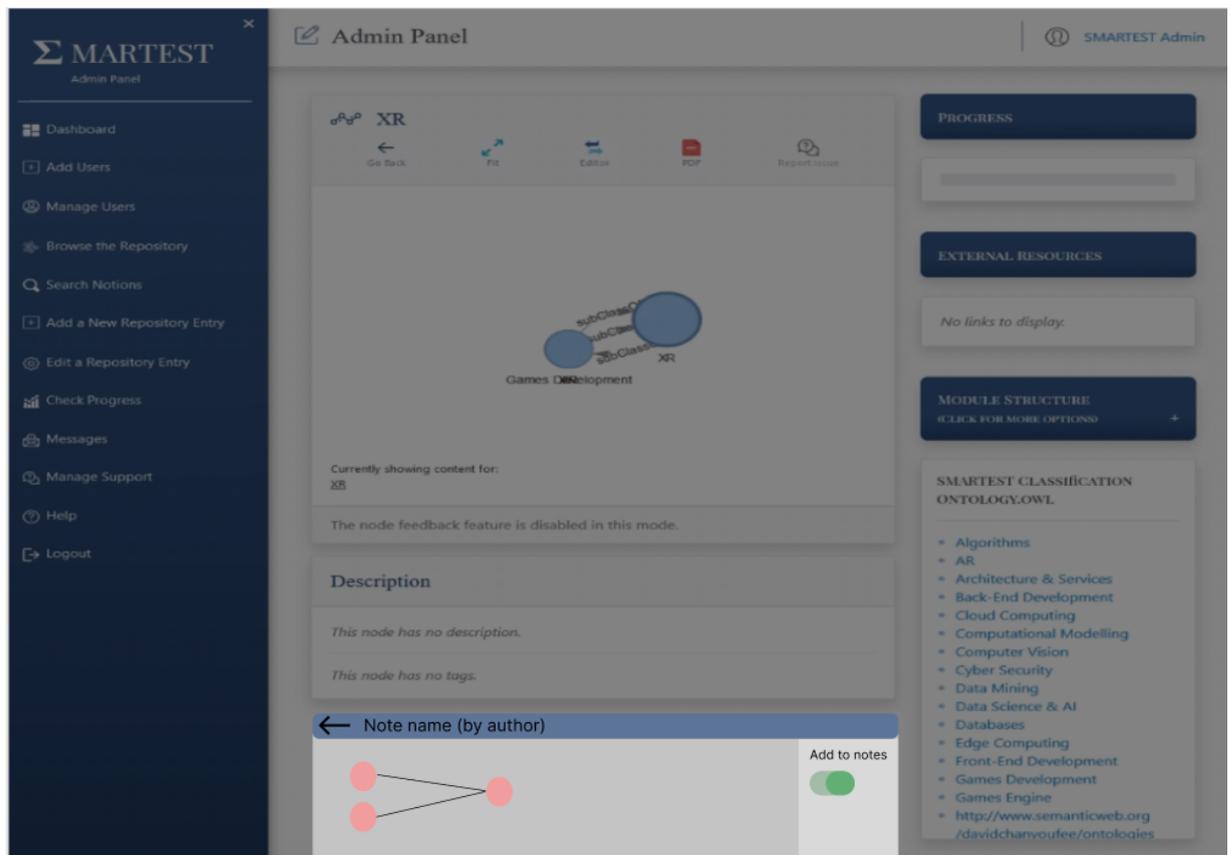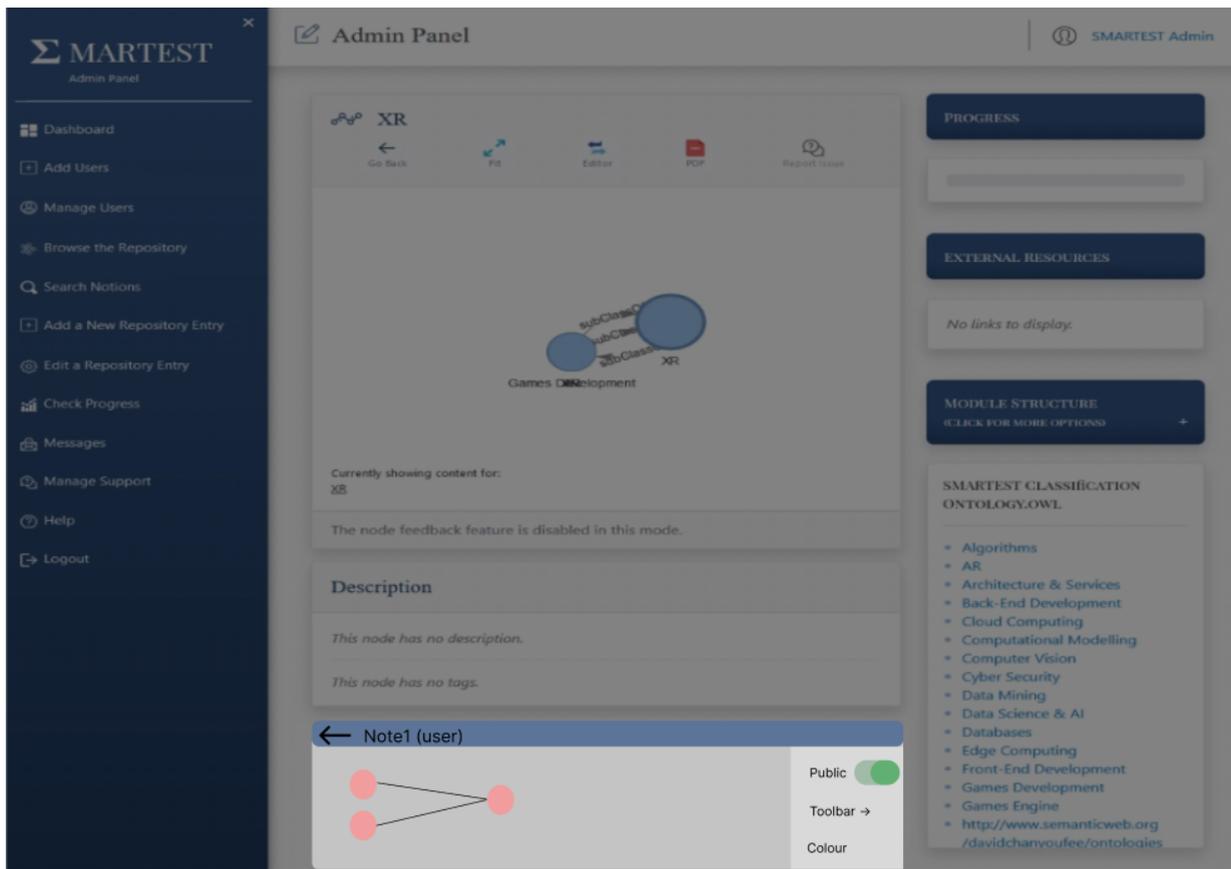- The star symbol represents that a student has made their notes public to other students
- The circle symbol represents notes published by other students
- No symbol means a student has created the note, but has not published the note yet.

A search bar has been included so that a user is able to search for a particular note by keyword. This was an important part of the design as it gave students the ability to filter through a large quantity of notes much more easily than just browsing through them.
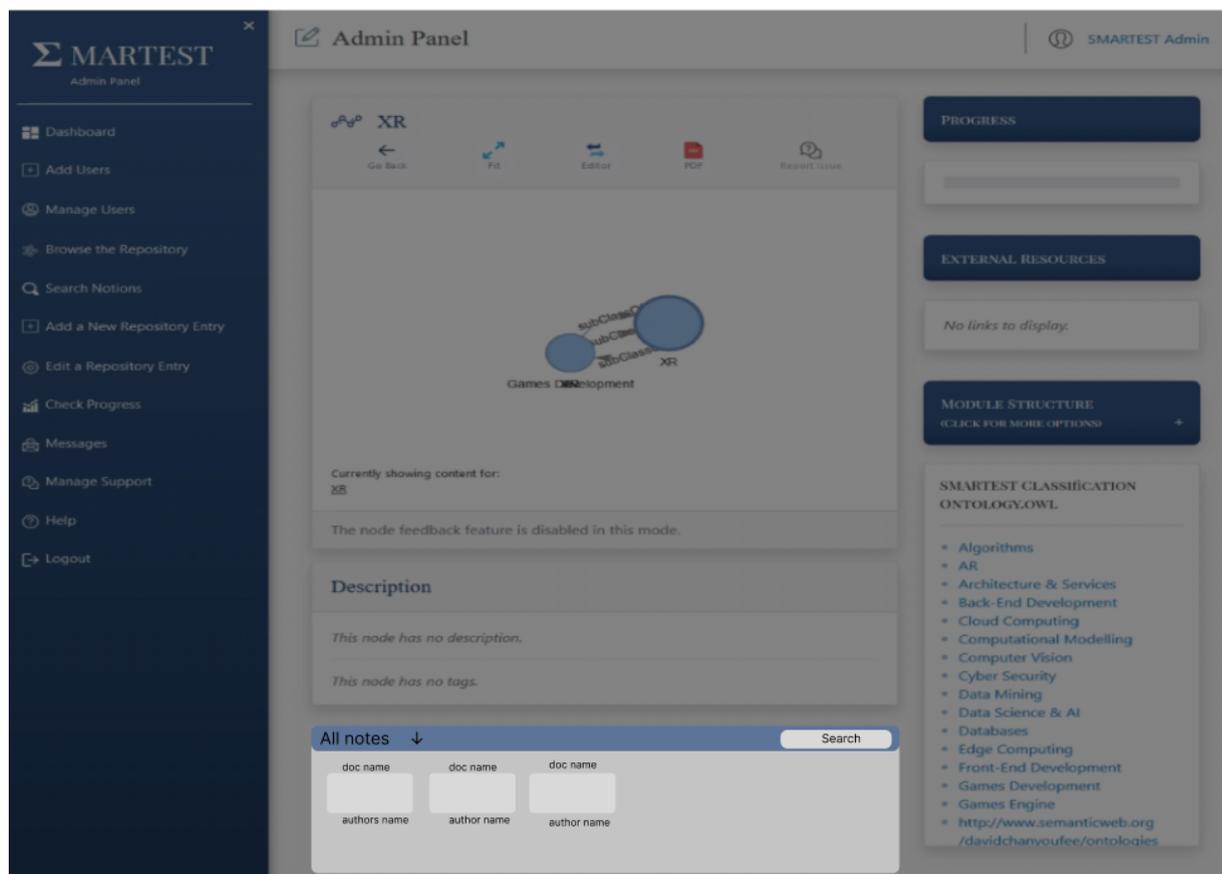

When a user clicks or taps on a particular note, they should be able to access that note.

Shown in the screenshot below is an interface where a user can create, read, update, publish and delete a note. There is a button on the right-hand side that opens a dedicated toolbar to allow a user to personalise their note (e.g., change the font, font colour, font weight, etc.). On the other hand, if a user does not own a note, then the note should open in a read-only mode.

The team also designed a section in which all the notes related to a particular course are displayed in one place so that the user can access all the course's notes in one window. The aim of this feature was to increase the accessibility of notes, which may be important in situations when a student is trying to revise or is

reading through all their notes. This feature shares a similar design to the "My notes" design, such as having the search bar as well as being able to access to all notes by clicking on a particular note.

4. Results

The project team implemented creating, editing and deleting functionalities of the node annotating feature, where a user is able to add, edit, delete and view notes of a node.

With regards to the note publicising feature, the project team decided not to implement it as it seemed unfeasible to maintain, with the expected resources it would need for a dedicated moderator/moderators, that the SMARTEST website team does not currently have, to regularly moderate notes made public to other students.

Due to commitments external to the project, other features mentioned earlier in this report were unable to be implemented.

5. Discussion

The purpose of a student cabinet was to allow users to more deeply personalise their learning experience with SMARTEST, and aimed to improve aspects such as usefulness for learning and enjoyment whilst using the platform.

The idea of a student cabinet can be seen throughout various e-learning platforms. For example, the LinkedIn Learning website has a "My Learning" page which keeps track of aspects like your learning history, progress with unfinished courses and a "weekly learning goal" (e.g., aim to watch 30 minutes of various course videos per week), as well as a "My Collections" section, to categorise saved educational courses into distinct groups. Khan Academy, in contrast, has a badge system, which users can accrue by reaching certain goals. These can then be seen in any user's "My Profile" page (if they decide to make it publicly viewable), which shows off things like metrics and badges.

Analysing these e-learning platforms' differing approaches to a "student cabinet", it can be seen that each has their own unique aspects. Khan Academy appears to apply a gamification aspect to their student cabinet

implementation, using a badge system to incentivise users to reach their goals, and a "My Profile" page to allow users to review their achievements and inspire a sense of pride in users, and a public profile aspect, as a way to advertise stats and achievements to other users, possibly as a way to encourage competition or inspire other users to reach their goals. LinkedIn Learning takes a slightly different approach, still providing a progress review facility and "courses in progress" facility, but instead adding a course curation facility and a slightly higher-level of personalisation, with business-oriented facilities. This can be seen with the "My Collections" functionality, which allows users to curate a personal playlist of educational videos collected from one or more courses. The "Assigned by *<insert organisation name here>*" functionality and "Recommended by *<insert organisation name here>*" functionalities are business-oriented, which a user can use to keep in touch with what their organisation wants employees to stay up-to-date with. It can also be concluded that each platforms' approaches appeal to a different range of age groups, with the gamification aspect of Khan Academy being more likely to appeal to a younger audience.

Regarding SMARTEST, one of the SMARTEST platform's intended uses was to help students with their revision. Reflecting on this, notes seemed like a suitable addition for personalising user experience, as a user could be revising a topic on SMARTEST and would have the ability to record key comments and clarifications for themselves.

It could also be argued that a note-taking facility is *that* personal a feature, and so more research could be done in the future to aim personalisation efforts towards a more specific audience, probably University of Westminster (UoW) students or a subset of UoW students, which the SMARTEST platform will primarily be used by.

The project was also useful in recruiting and implementing current student perspectives on what they look for in an e-learning platform like SMARTEST, and it also allowed students to continue to be a part of the fundamental design and development of the SMARTEST platform.

6. **Conclusion and Recommendations**

In conclusion, we established that the additional feature of making notes and being able to make them visible for other students raised into question the maintainability of the feature - who would moderate the note submitted for publication after the project was over? How much extra workload would this place on module leaders? Does the amount of additional work compensate for the implementation of such a tool?

While discussing the benefits that the implementation of such a tool would bring into the platform, we have concluded that it would prove to be very beneficial since it would allow users to have a more personal approach towards the revision of the contents provided. However, when just glancing over a learning path, such a tool would not provide the amount of benefits needed to be considered useful enough.

In terms of recommendations for further development of the SMARTEST platform, a note categorisation approach was considered. Meaning that this feature would allow the user to order/categorise the already existing notes into branches such as "Important", "Less important" and etc.
Moreover, in case the note publication feature is implemented, it is essential to have a team responsible for moderating the publication of such notes with the aim of keeping the publicised notes civilised.

7. **Dissemination**

How our team will disseminate the project results to others (e.g. through a journal publication, a project fair, like the SCC fair where all the other project teams will be presenting their results).

The project team has decided to disseminate the project through a presentation at the SCC fair. The SMARTEST platform was presented to academic members and students showcasing how and why it would be a useful tool to assist students in their learning and how module leaders and tutors can make use of it in their teaching.

In addition to that, the project team will carry out a workshop aimed at students. The workshop would allow the team to present the SMARTEST platform to students to showcase its different functionalities and how it can be a useful tool when learning new topics as well as revising for exams. This would also be useful in order to collect feedback from the students and understand their needs, which would allow us to understand what improvements can be made.

8. **Team Reflection**

At the beginning of the project, the team was quite organised by ensuring that everyone had allocated tasks. Weekly meetings were scheduled where discussion towards the tasks' progress was discussed while also ensuring that the project was moving forward and that the students were able to advance without any difficulties.

By the end of the semester, the team did not have as much time as they wished for the project due to students and other academic team members being busy with their final year projects and other final deadlines, which has led to the project not following the initial timeline that we had set out.

Regarding what could have been done differently as a team, the team could have had better communication and coordination. Although this was good at the beginning of the project, communication was not regularly maintained further on in the project, so it became harder to understand what to do as time went on. Additionally, a deadline in which the tasks had to be produced would be effective since some of the students were not as familiar with the technical skills needed in the project, which led to spending more time on some tasks than initially planned, due to team members having to learn the skills before applying them in the project.

To better manage these problems in the future, we think communication should be maintained more regularly, like for example, keeping team members informed of other commitments which may impact their work on the project. We also felt barriers to communication could be reduced by building rapport between team members. This could involve, for example, holding more in-person meetings, to help team members get to know each other more, which would allow for better team collaboration and communication.