

**ENHANCING CONVERSATIONAL AI MODEL
PERFORMANCE AND EXPLAINABILITY FOR
SINHALA-ENGLISH BILINGUAL SPEAKERS**

2022-056

Project Status Document - I

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B.Sc. (Hons) Degree in Information Technology Specialising in Data
Science

Department of Information Technology

Sri Lanka Institute of Information Technology
Sri Lanka

May 2022

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DECLARATION, COPYRIGHT STATEMENT

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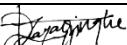
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Sakalasooriya S.A.H.A.	IT19051208	

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1. MICROSOFT TEAMS SCREENSHOT

1.1 Calls with the team

The following screenshots include all the calls that were taken via the Microsoft Teams channel, created for the Research project team.

Team Meetings

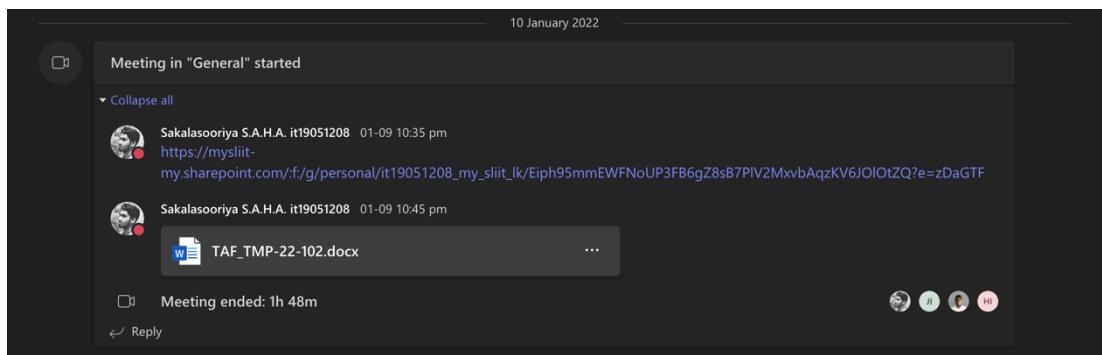


Figure 1.1. 1. Topic assessment form preparation discussion meeting

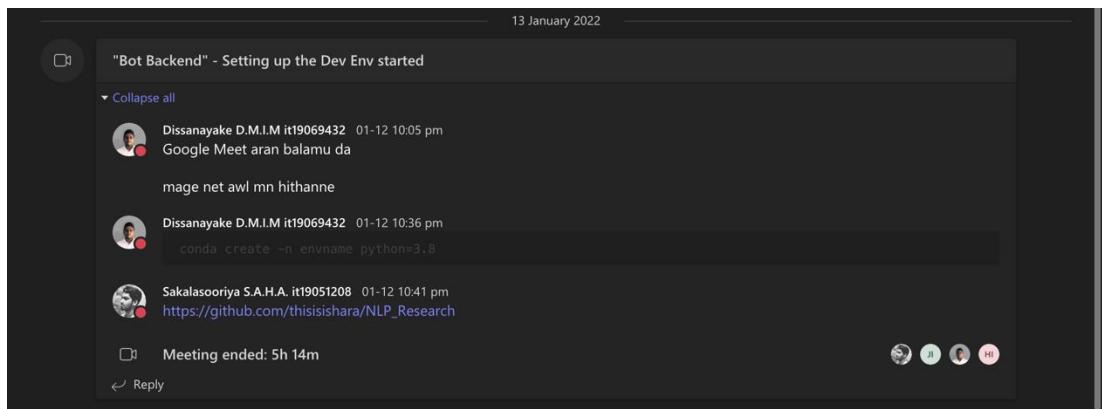


Figure 1.1. 2. Chatbot backend design planning meeting

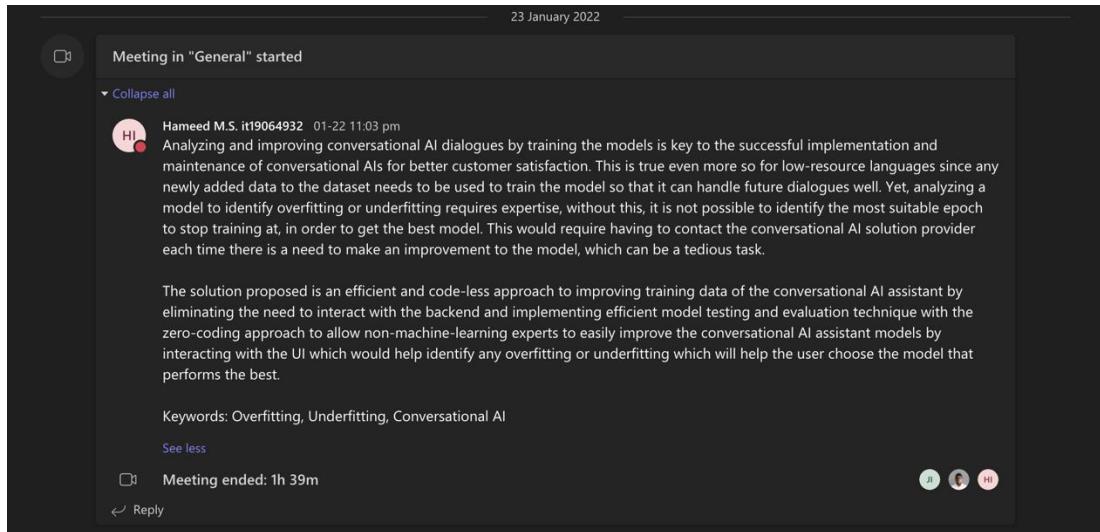


Figure 1.1. 3. Charter document preparation team discussion - I

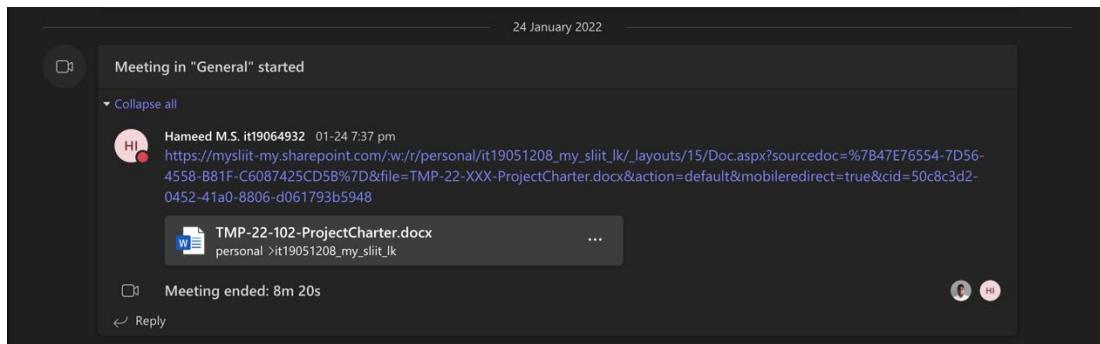


Figure 1.1. 4 Charter document preparation team discussion - II

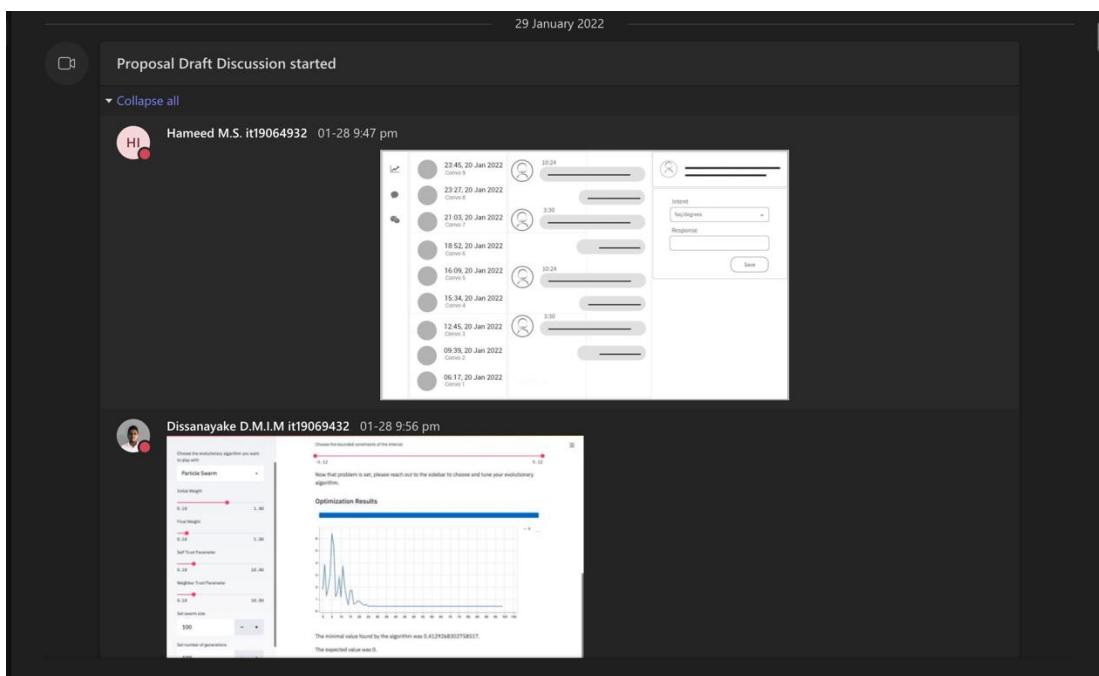


Figure 1.1. 5. Research proposal draft preparation discussion meeting

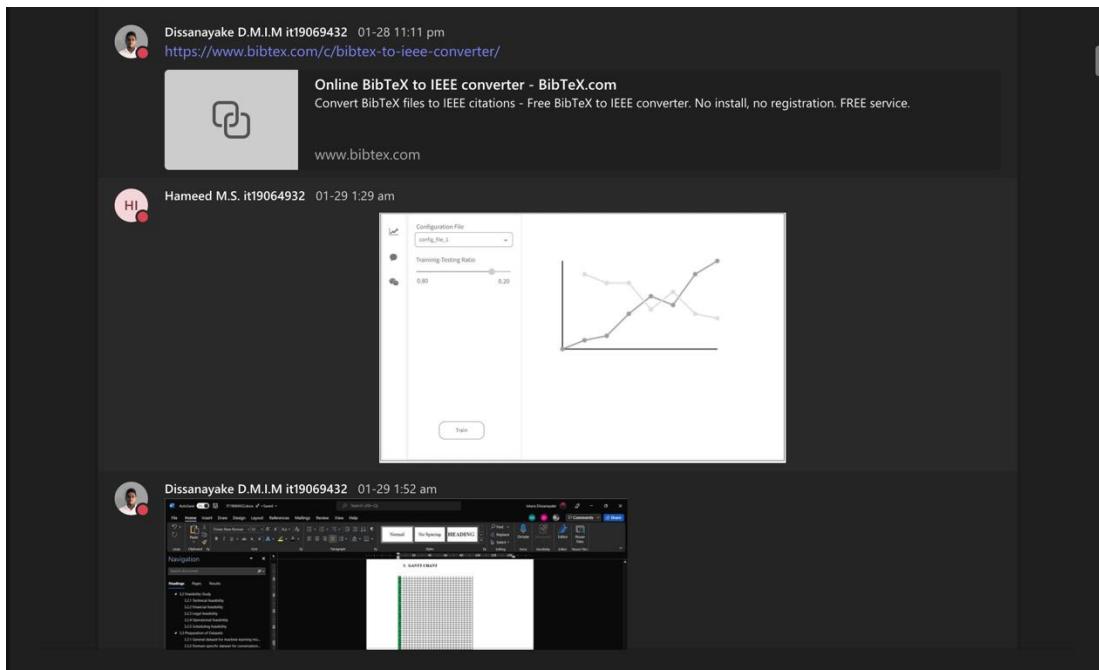


Figure 1.1. 6 Files shared during the project proposal draft meeting - I

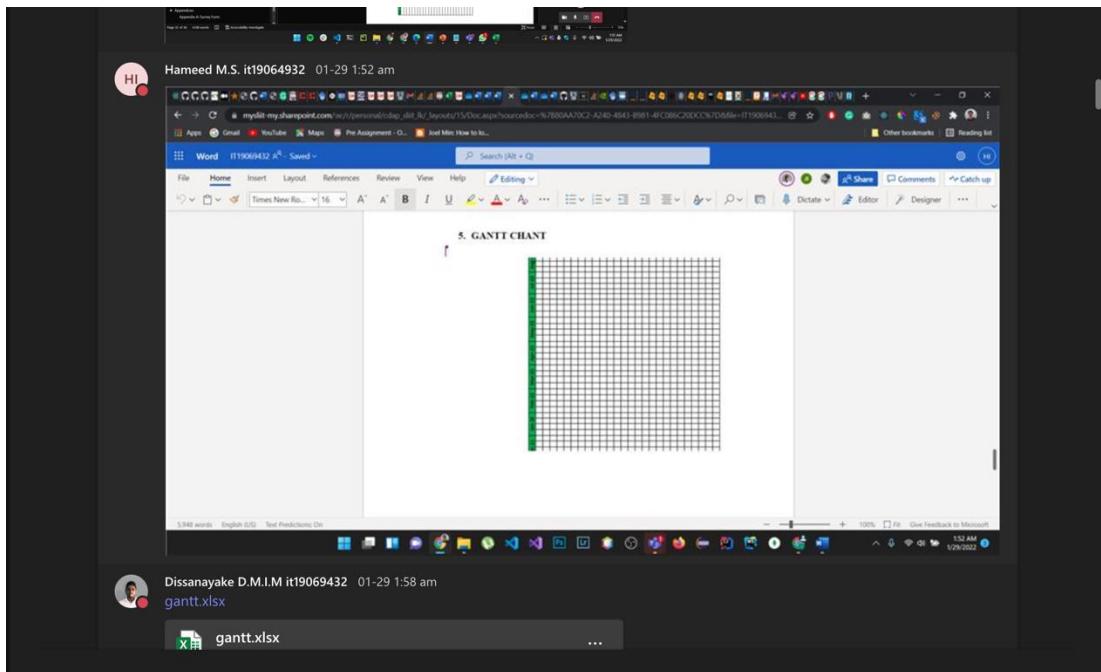


Figure 1.1. 7 Gantt chart designed during the proposal draft discussion meeting - I

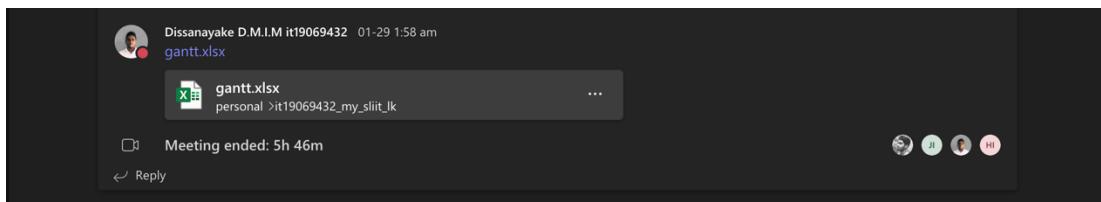


Figure 1.1. 8 Gantt chart designed during the proposal draft discussion meeting - II

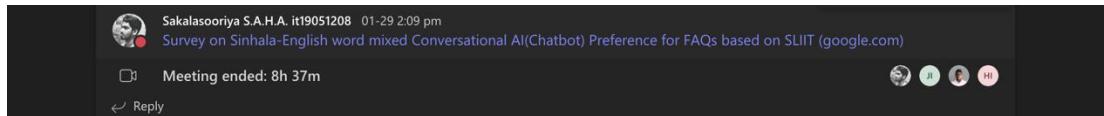


Figure 1.1. 9 Survey planning and designing meeting

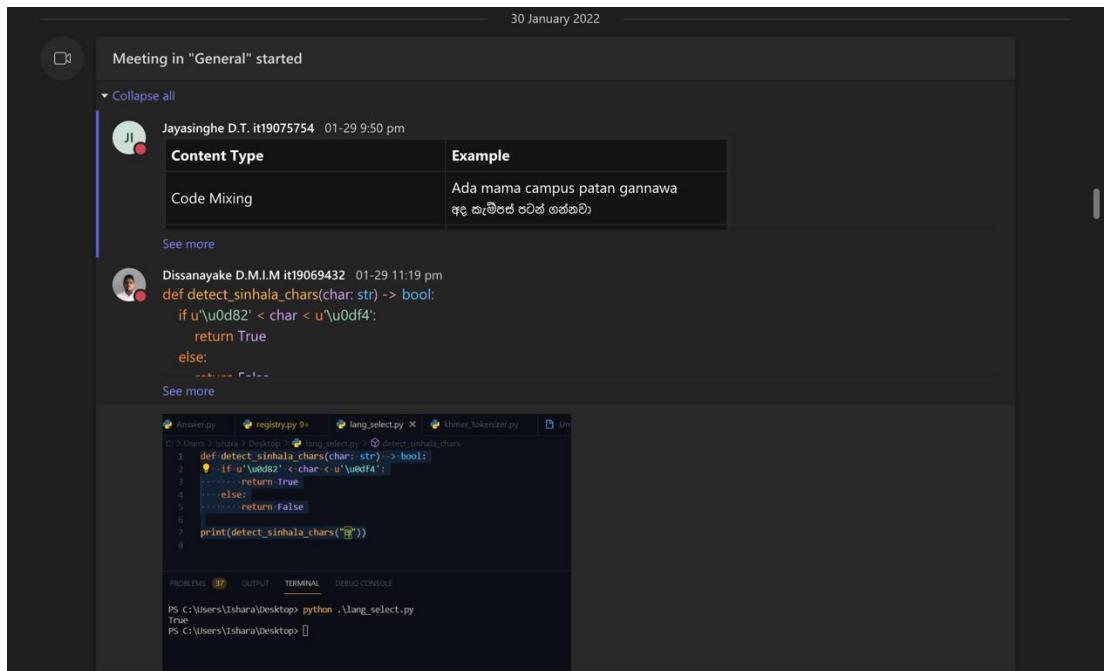


Figure 1.1. 10 Files shared during the project proposal draft meeting - II

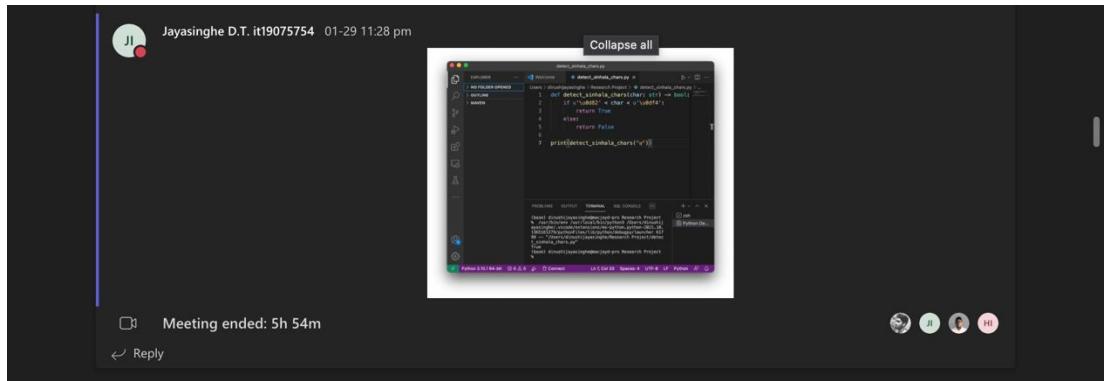


Figure 1.1. 11 Files shared during the project proposal draft meeting - III

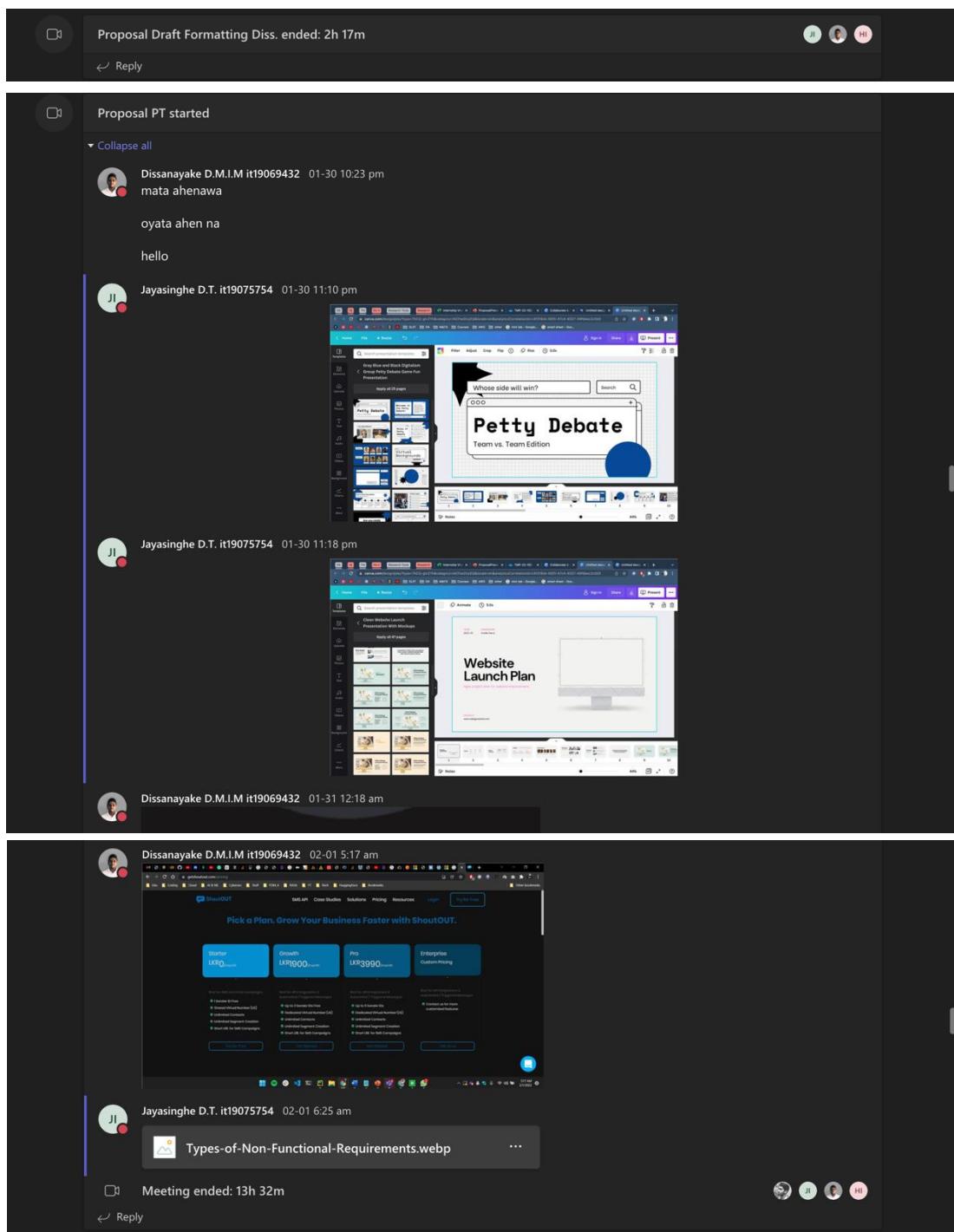


Figure 1.1. 12. Ideas shared during proposal presentation planning discussion - I

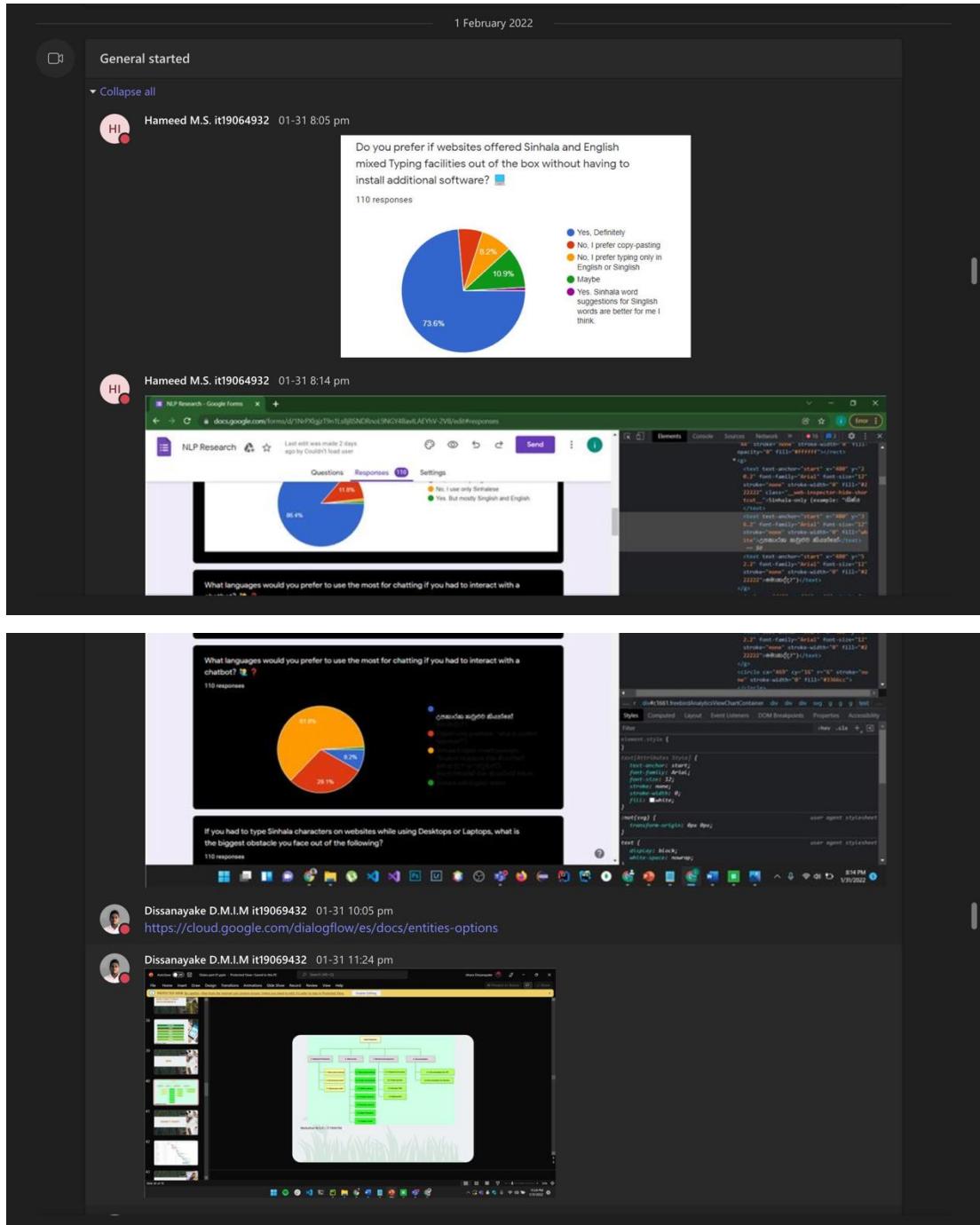


Figure 1.1. 13. Ideas shared during proposal presentation planning discussion - II

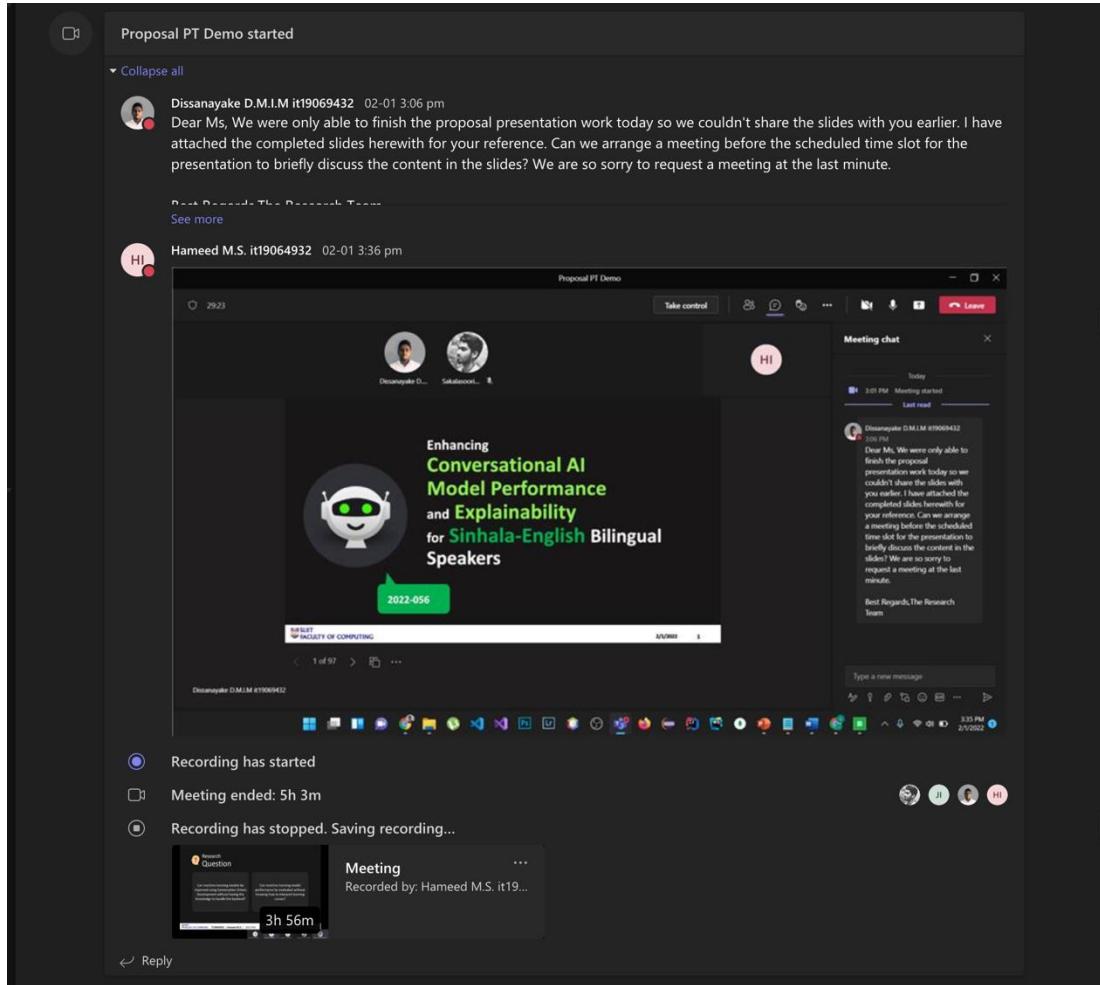


Figure 1.1. 14. Proposal presentation demo meeting

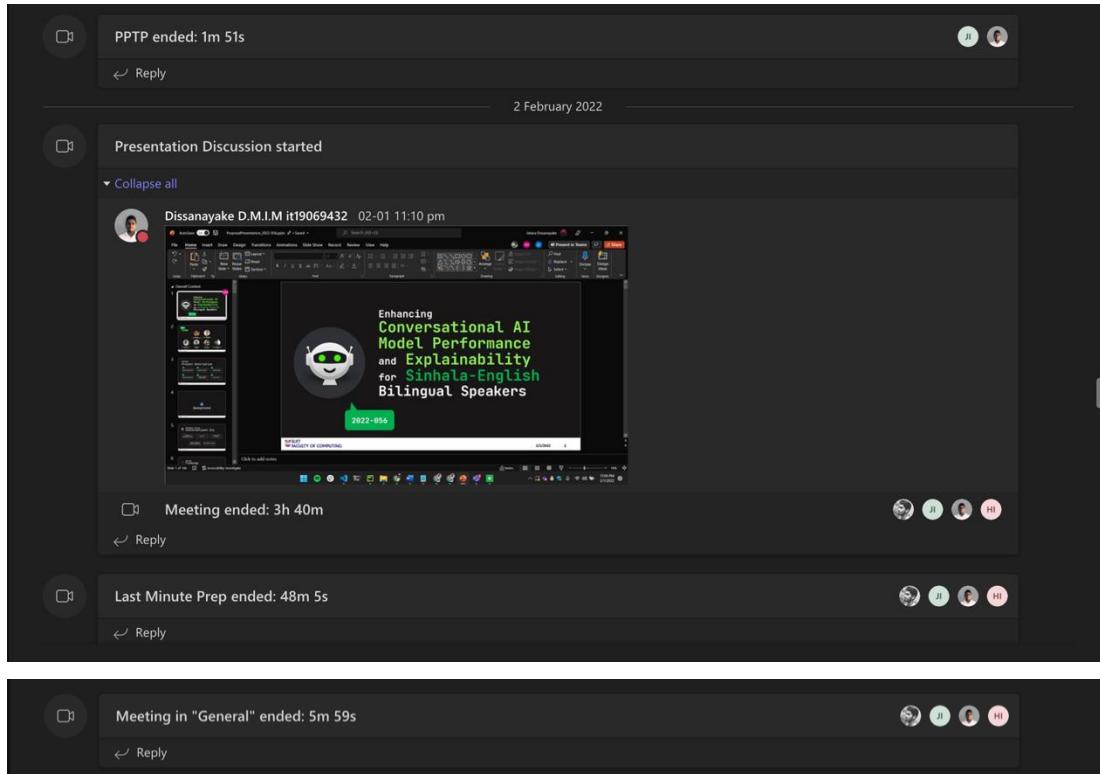


Figure 1.1. 15. Proposal presentation last-minute preparation meetings

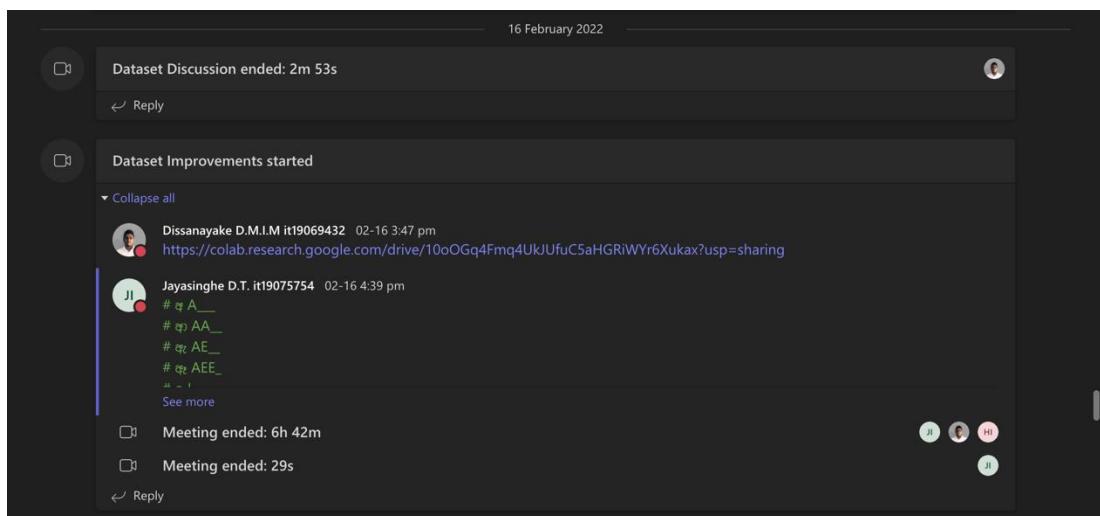


Figure 1.1. 16. Initial dataset preparation planning discussion meeting

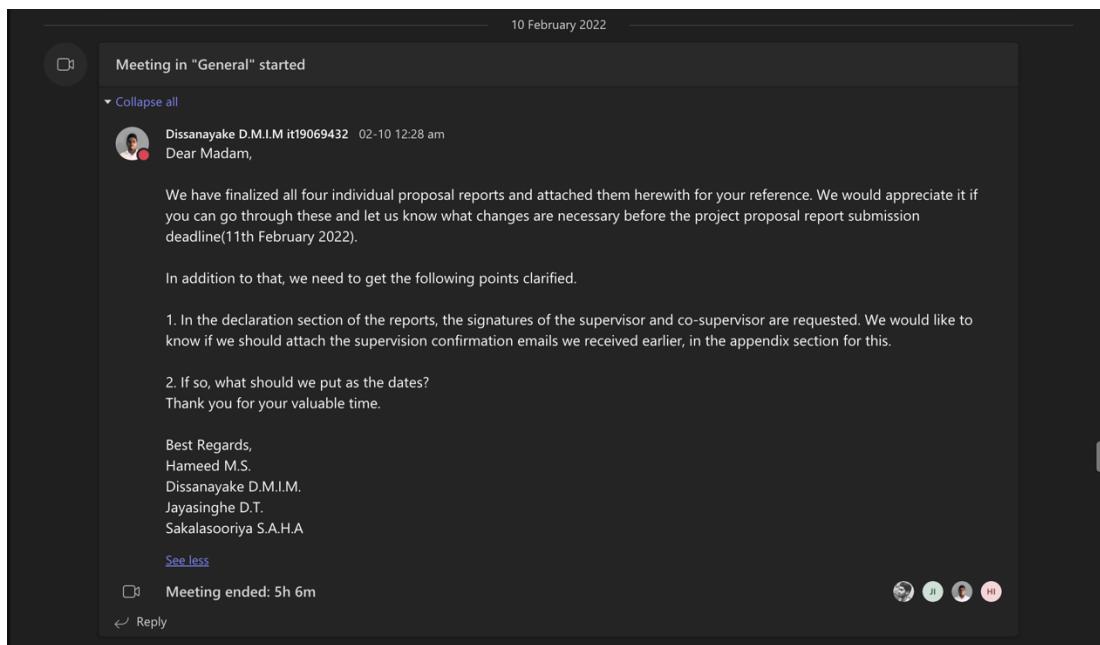


Figure 1.1. 17. Proposal draft submission finalization meeting

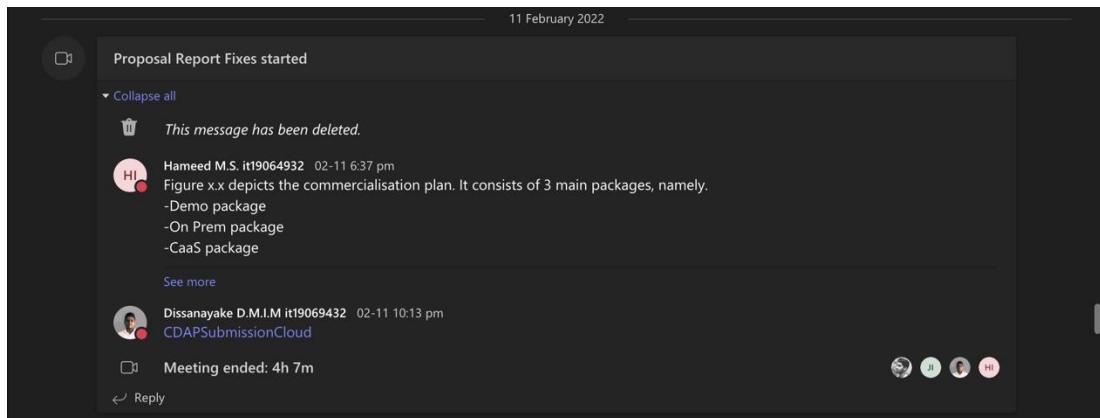


Figure 1.1. 18. Proposal draft review and proofreading discussion

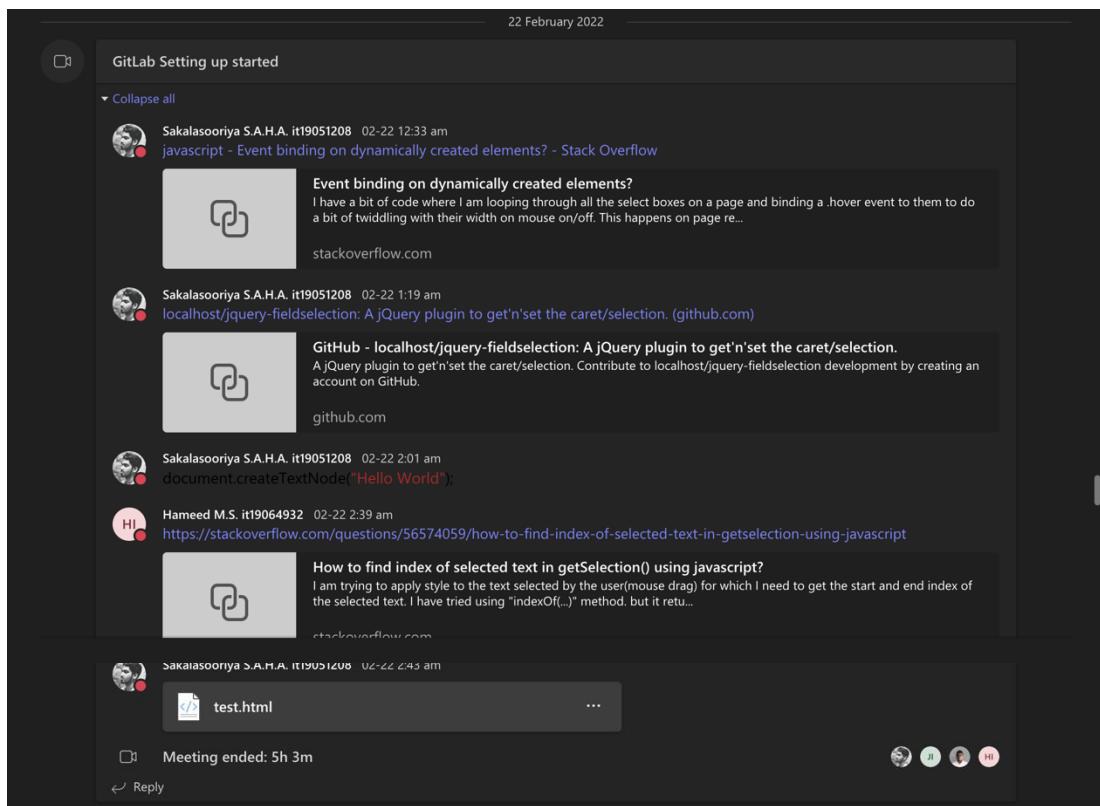


Figure 1.1. 19 GitLab repository setting up meeting

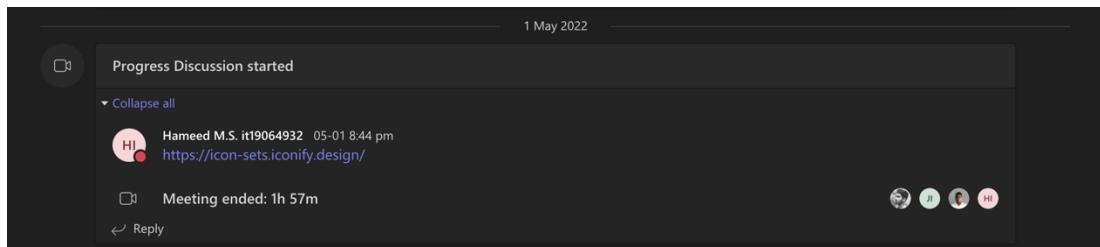


Figure 1.1. 20. Research 50% progress discussion meeting with the four members

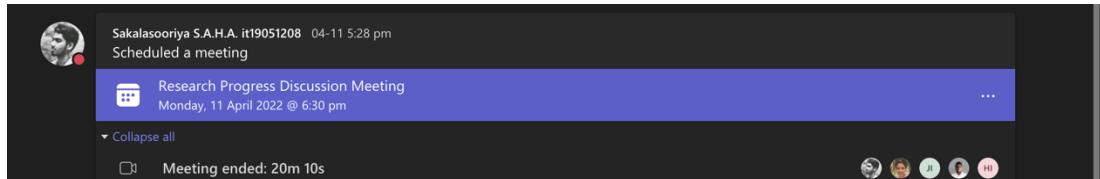


Figure 1.1. 21 Research 50% progress discussion meeting with the team including supervisors

Individual Teams meetings

Individual meetings were held to get unclear parts of the initial project development environment setup clarified. Most of the calls were taken between two to three team members.

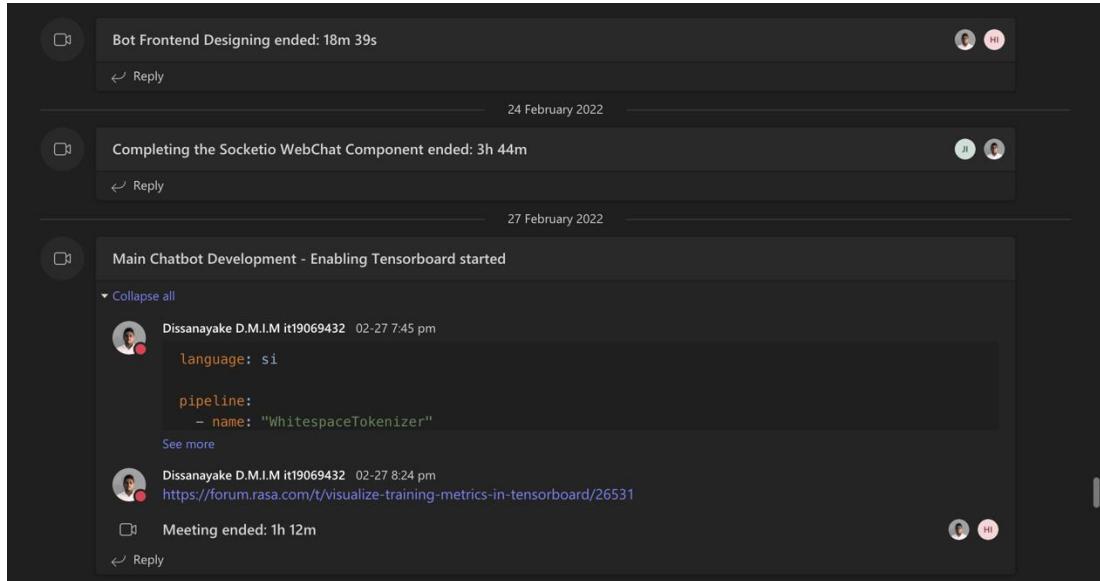


Figure 1.1. 22. Meetings with (1) Hameed M.S. to discuss frontend design, (2) With Jayasinghe D.T. on webchat component connection, (3) With Hameed M.S. to perform TensorBoard enabling

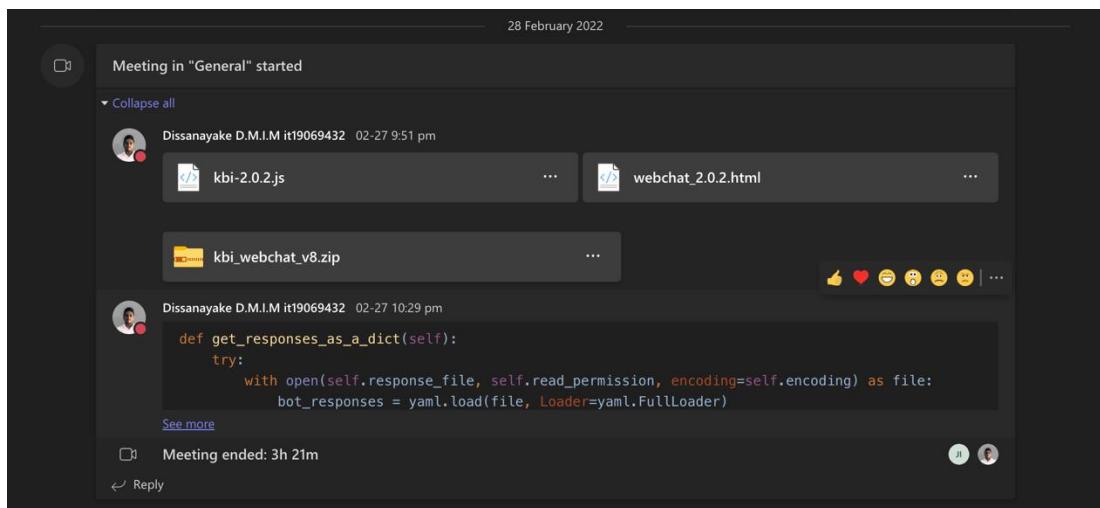


Figure 1.1. 23. Meeting with Jayasinghe D.T. to discuss and brainstorm on keyboard interface development process and attaching it to any website

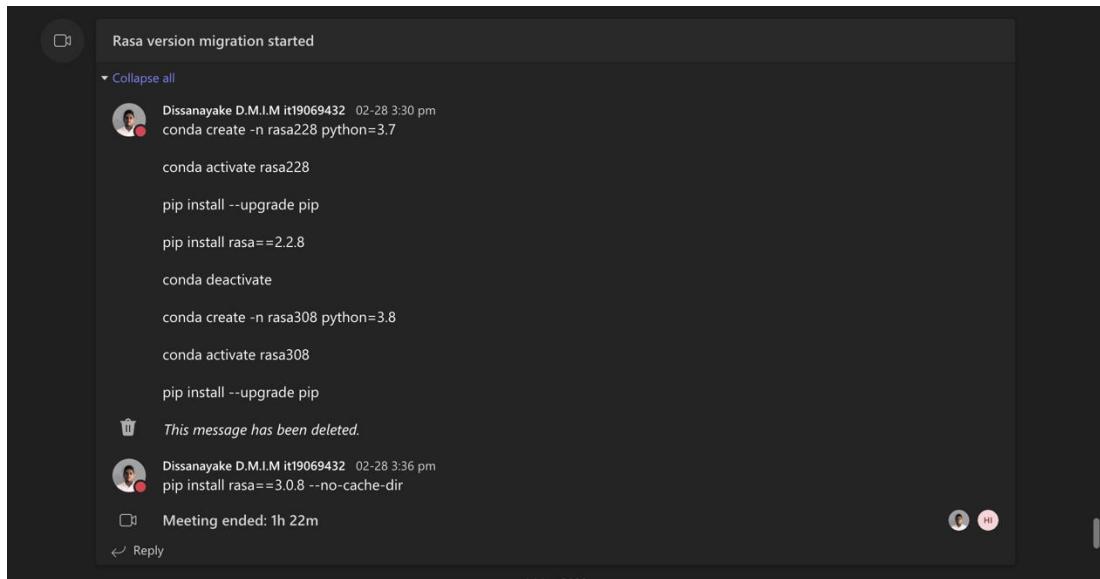


Figure 1.1. 24. Meeting with Hameed M.S. on Rasa version migration

1.2 Conversations with the team

Following screenshots include all the conversations that took place via the Microsoft Teams channel, created for the Research project team.

Group conversations

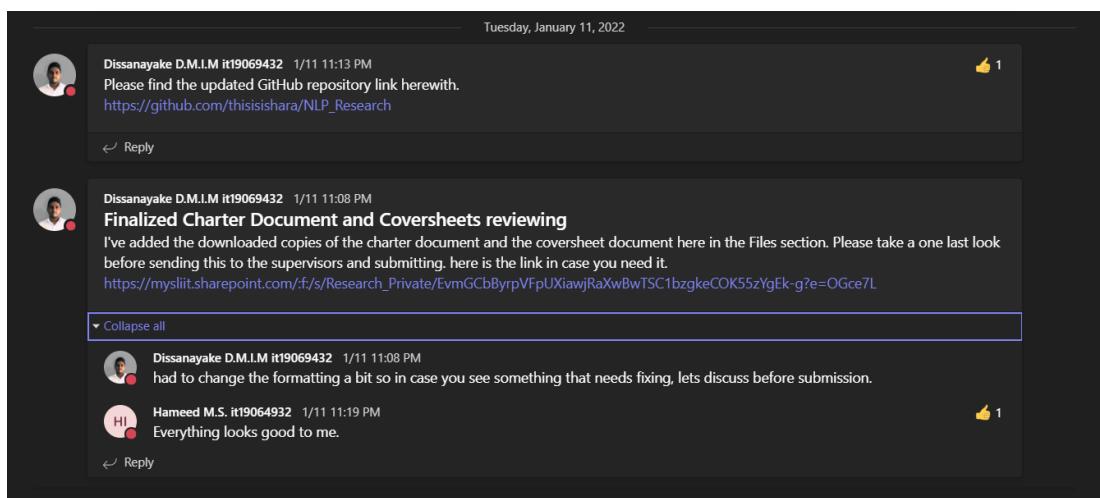


Figure 1.2. 1. Charter document review conversation

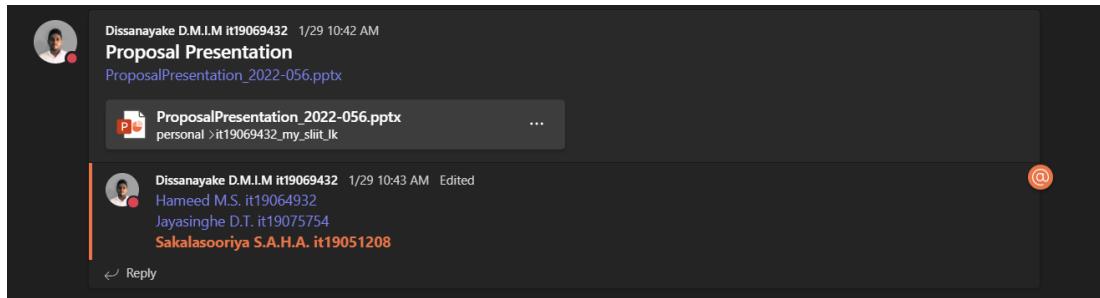


Figure 1.2. 2 Initial proposal presentation sharing and discussion

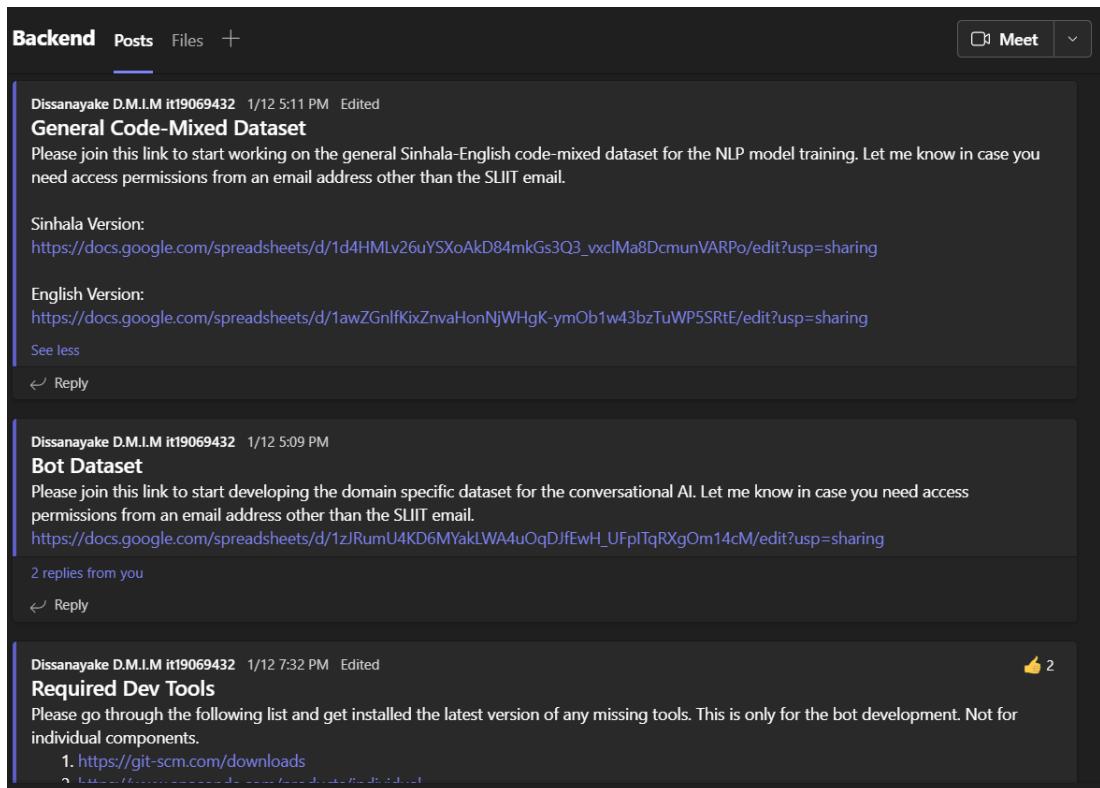


Figure 1.2. 3. Discussion / Resources sharing on dataset and development tools

Individual conversations / replies

The screenshot shows a Slack interface with the 'General' channel selected. A message from 'Lakmini Abeywardhana' is displayed, stating: 'Meeting ended: 20m 10s' and 'How's your progress every one?'. Below this, another message from 'Dissanayake D.M.I.M it19069432' says: 'I was able to complete up to around 50% of the XAI research component miss.' A detailed status update follows, listing completed tasks (1-9) and remaining tasks (1-4). A 'New conversation' button is visible at the bottom left.

Meeting ended: 20m 10s

Lakmini Abeywardhana Monday 6:35 PM

How's your progress every one?

Dissanayake D.M.I.M it19069432 3:22 PM

I was able to complete up to around 50% of the XAI research component miss.

STATUS as of 5/12/2022

The completed tasks are:

1. Global feature Importance
2. Feature selection based on the global feature importance
3. Implement core DIME (the algorithm) methods to load datasets and RASA machine learning models
4. Completely Built a CLI Interface to run DIME and generate explanations without having to code
5. Built the DIME package as a Installable PIP package, the alpha release is available at <https://pypi.org/project/dime-xai/0.0.3a4/>
6. Added the required functionality to save a generated explanation as a portable JSON file which can be later visualized using any device that has DIME python package installed.
7. Created a visualizer and integrated with DIME CLI which can visualize generated explanations
8. Built the initial version of the DIME server, which is a GUI for interacting with DIME.
9. Tested and verified that DIME can be used within Jupyter notebooks/ Colab to explain Remote Rasa models. (through REST API)

The remaining tasks:

1. Implement Local feature importance calculation (Introducing this as Dual feature Importance, because we do feature selection based on Global feature importance calculated above)
2. Complete the DIME Server GUI
3. Enhance Jupyter Notebook support through a dedicated notebook interface
4. Integrate with the overall solution

New conversation

Figure 1.2. 4. Project 50% status update given to supervisor

1.3 MS Teams Planner Project Backlog

Following screenshots include all the project backlogs created using Boards in Microsoft Teams Planner.

The screenshot shows a Microsoft Teams Planner board titled "Planner". The board is filtered to show tasks assigned to the user "IT19069432". The tasks are organized into three columns: "Not started", "In progress", and "Completed".

- Not started:**
 - Research progress tracker: Preparation for Progress presentation II (Due 09/30)
 - Research progress tracker: Integration testing (Due 08/31)
 - Research progress tracker: Intergration of all components (Due 08/31)
 - Research progress tracker: Preparation of research paper (Due 07/07)
 - Research progress tracker: Preparation for presentation and viva (Due 11/21)
- In progress:**
 - Research progress tracker: Developing the DIME algorithm (Due 09/07)
 - Research progress tracker: Developing the Individual Component Frontend (Due 06/21)
 - Research progress tracker: Overall component testing - DIME (Due 06/30)
 - Research progress tracker: Status document/Logbook preparation (Due 10/07)
- Completed:**
 - Completed by Sakalasooriya S.A.: Preparation of project charter and cover-sheets
 - Completed by Sakalasooriya S.A.: Preparation of datasets
 - Completed by Sakalasooriya S.A.: Deciding the research components and the scope
 - Completed by Sakalasooriya S.A.: Filing topic evaluation form

Figure 1.3. 1. Project backlog with individually assigned tasks to IT19069432

1.4 MS Teams Planner Charts

Following screenshots include all the charts and other statistics generated by Microsoft Teams planner.

Group charts

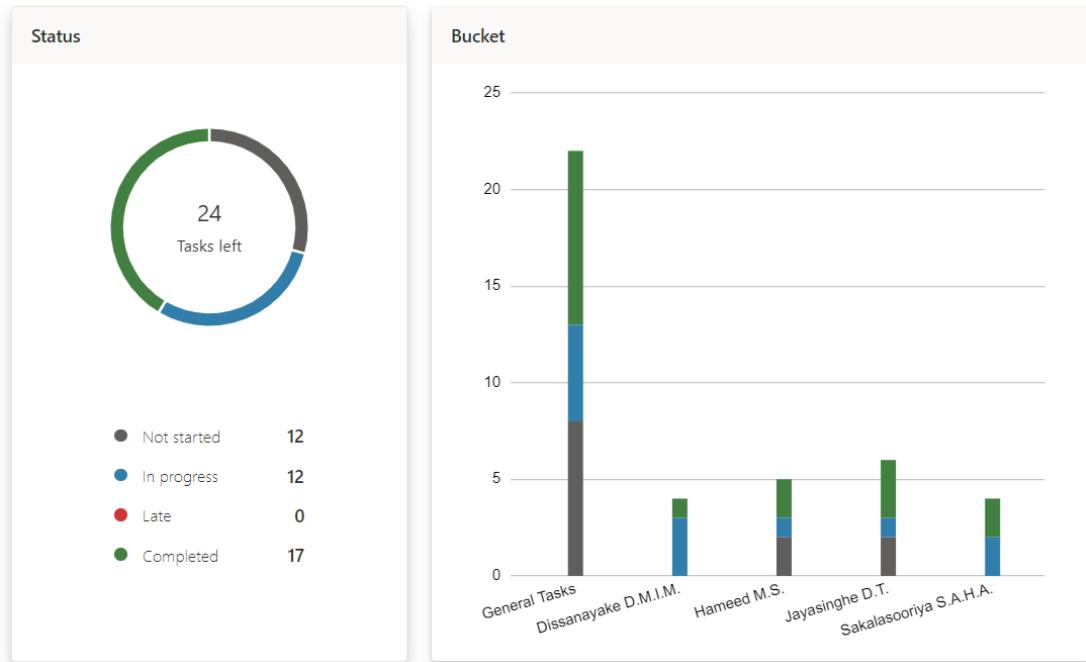


Figure 1.4. 1 Number of total tasks and tasks assigned to each member

Individual charts

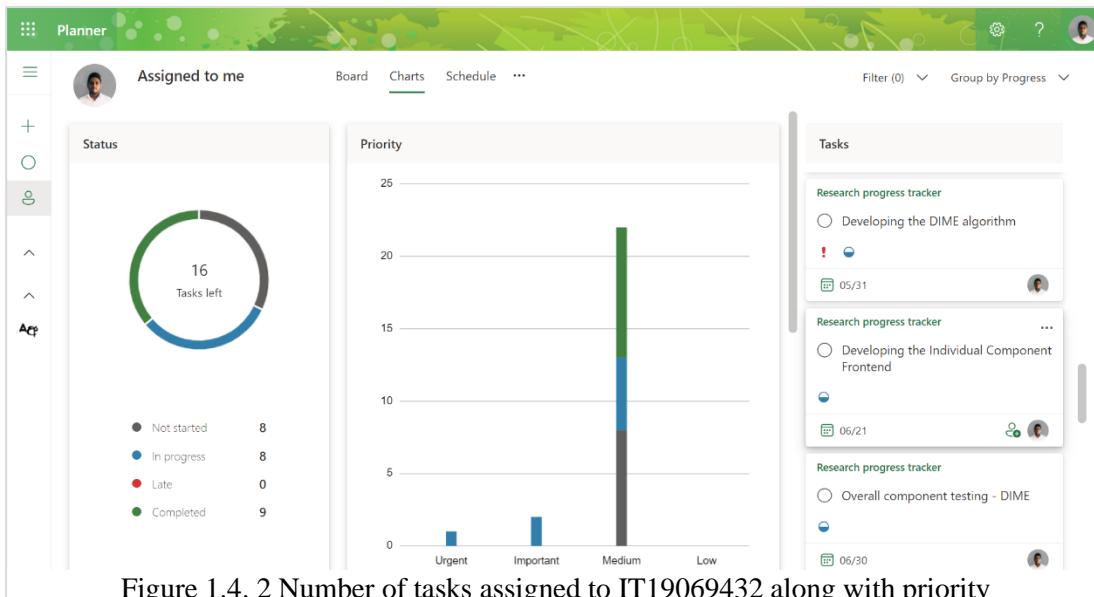


Figure 1.4. 2 Number of tasks assigned to IT19069432 along with priority

2. GIT LOGS

2.1 GitLab Branch

The following screenshot shows the Gitlab branches created to manage each research component. All the changes will be merged into the main branch once the individual development is completed.

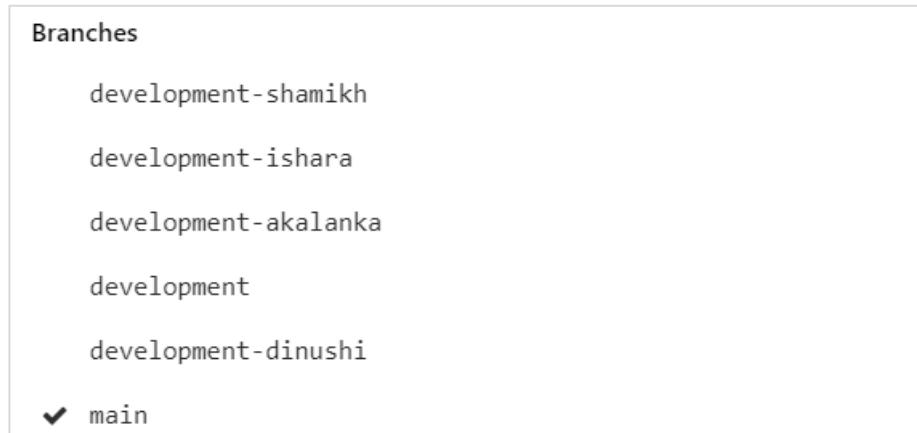


Figure 2.1. 1 GitLab branches created

2.2 GitLab Contributions

The following screenshots include latest contributions done on Gitlab.

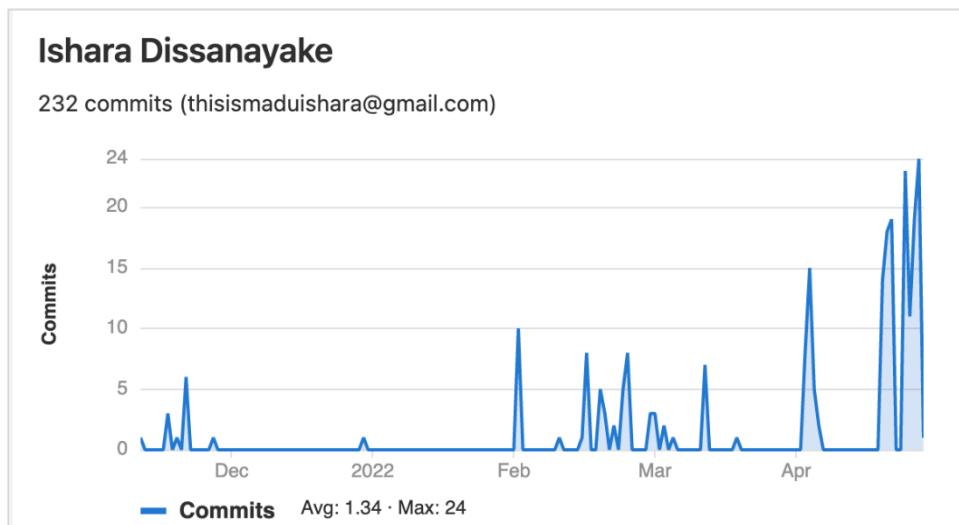


Figure 2.2. 1. GitLab commits overtime

Projects Groups More

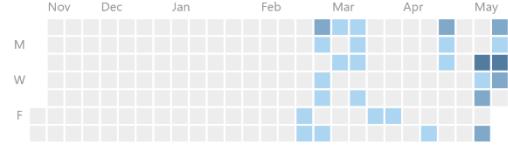


Dissanayake D.M.I.M.

Busy Coding
@IT19069432 · Member since February 21, 2022

SLIIT · Final Year Data Science Undergrad @ SLIIT

Overview Activity Groups Contributed projects Personal projects Starred projects Snippets



Issues, merge requests, pushes, and comments.

Activity

[View all](#)

- o Dissanayake D.M.I.M. @IT19069432 17 hours ago
Pushed to branch [development-ishara](#) at 2022-056 / 2022-056
[b1079e20](#) · gitignore updates
- o Dissanayake D.M.I.M. @IT19069432 20 hours ago
Pushed to branch [development-ishara](#) at 2022-056 / 2022-056
[1a03756f](#) · alpha version bump
- o Dissanayake D.M.I.M. @IT19069432 20 hours ago
Pushed to branch [development-ishara](#) at 2022-056 / 2022-056
[79072f36](#) · minor refinements
- o Dissanayake D.M.I.M. @IT19069432 20 hours ago
Pushed to branch [development-ishara](#) at 2022-056 / 2022-056
[8e2868c7](#) · softmax to normalization transition consideration
- o Dissanayake D.M.I.M. @IT19069432 20 hours ago
Pushed to branch [development-ishara](#) at 2022-056 / 2022-056
[76a99941](#) · softmax to normalization transition consideration
- o Dissanayake D.M.I.M. @IT19069432 20 hours ago
Pushed to branch [development-ishara](#) at 2022-056 / 2022-056
[cfe3853b](#) · implementation of min max normalization
- o Dissanayake D.M.I.M. @IT19069432 1 day ago
Pushed to branch [development-ishara](#) at 2022-056 / 2022-056
[45f8d05a](#) · added NLU_FALLBACK as a class label to be assigned to low confidenc...
- o Dissanayake D.M.I.M. @IT19069432 1 day ago
Pushed to branch [development-ishara](#) at 2022-056 / 2022-056
[86a826d2](#) · added exception handling for RASA REST models
- o Dissanayake D.M.I.M. @IT19069432 1 day ago
Pushed to branch [development-ishara](#) at 2022-056 / 2022-056
[d73d48ed](#) · implemented DIET compatibility check for confidence GFI
- o Dissanayake D.M.I.M. @IT19069432 1 day ago

Figure 2.2. 2 GitLab recent activity

2.3 Individual GitHub Repositories

The following screenshots include some of the contributions done on GitHub.

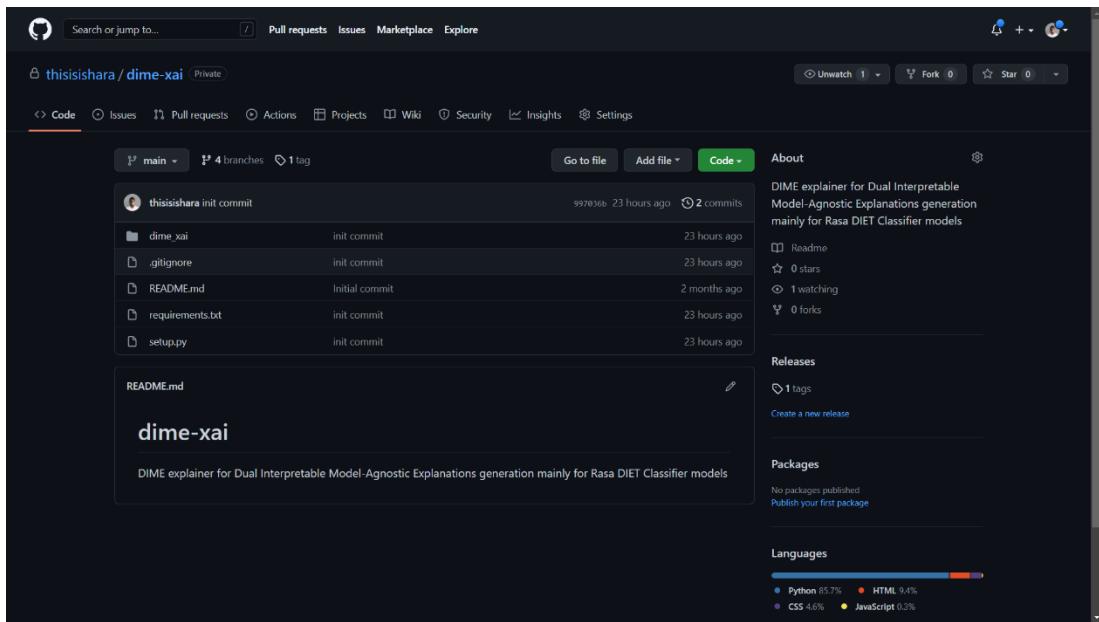


Figure 2.3. 1 Separately maintained GitHub repository to manage DIME versioning at <https://github.com/thisishishara/dime-xai>

The reason to create a separate GitHub repository is that it allows to manage versioning of the individual research components as they yield a individually installable/usable solutions which needs to be versioned and released separately prior to uploading to any package management repository such as PyPI.

3. EMAILS

The following screenshots include some of the emails sent to the supervisors in charge.

3.1 Supervision requesting and confirmation emails

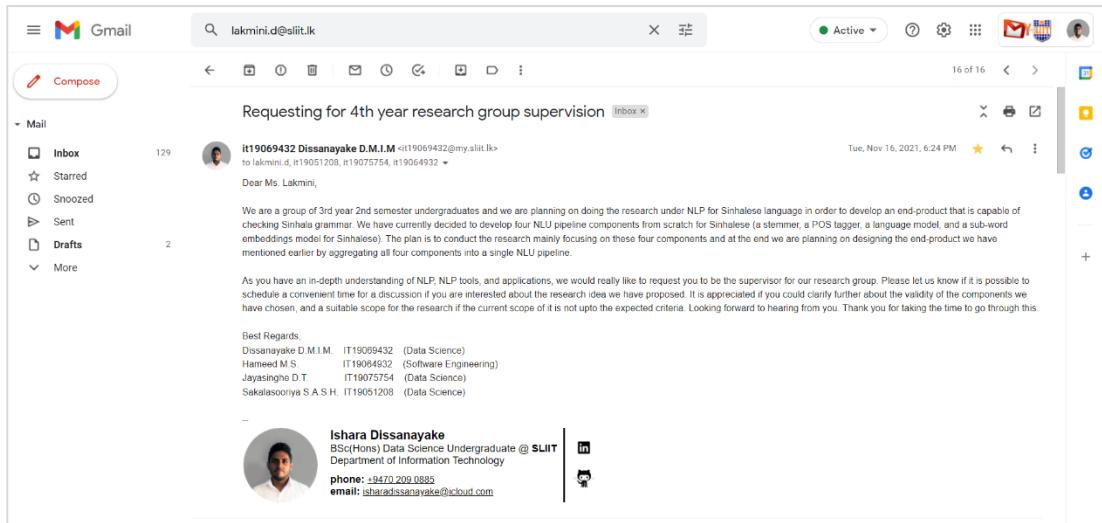


Figure 3.1. 1. Research supervision request email



Figure 3.1. 2. Research project supervision confirmation

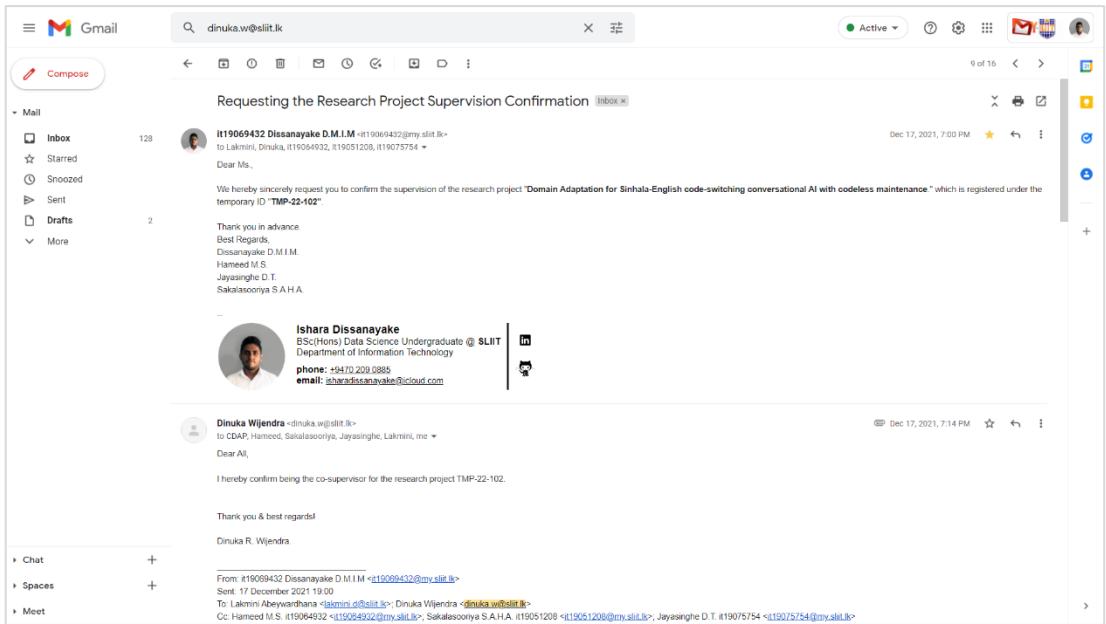


Figure 3.1. 3 Research project co-supervision request and response

3.2 Topic discussion meeting scheduling

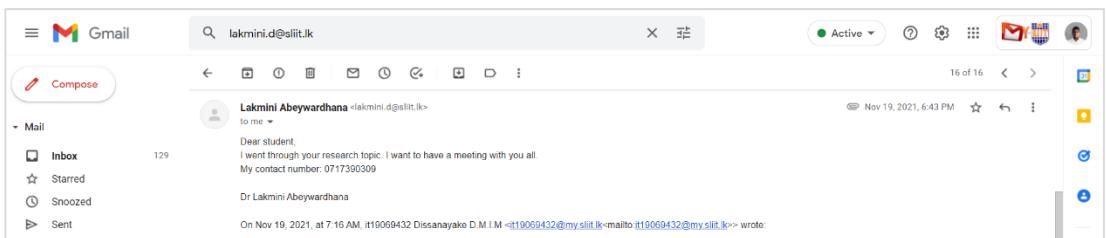


Figure 3.2. 1. Topic discussion meeting scheduling - I

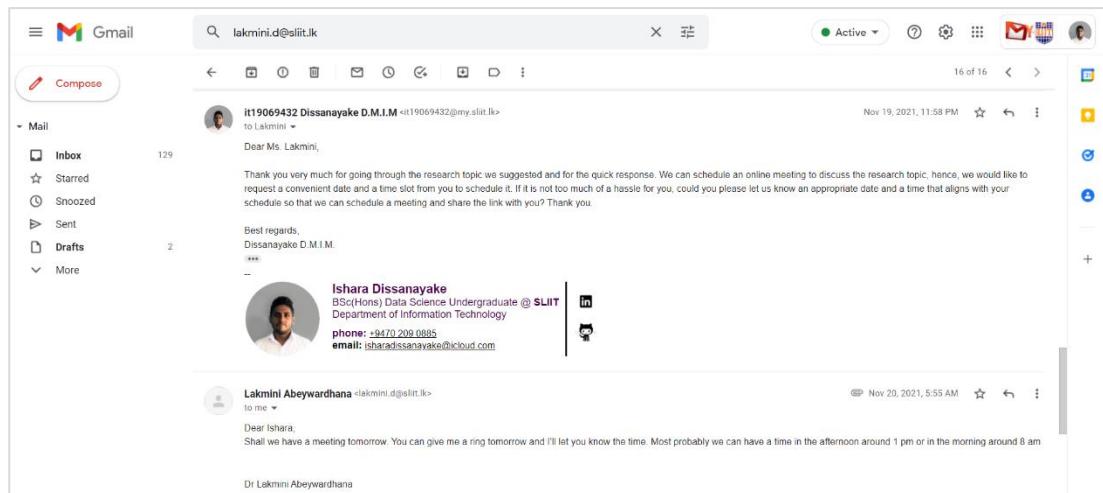


Figure 3.2. 2 Topic discussion meeting scheduling - II

3.3 Research proposal draft review requesting emails

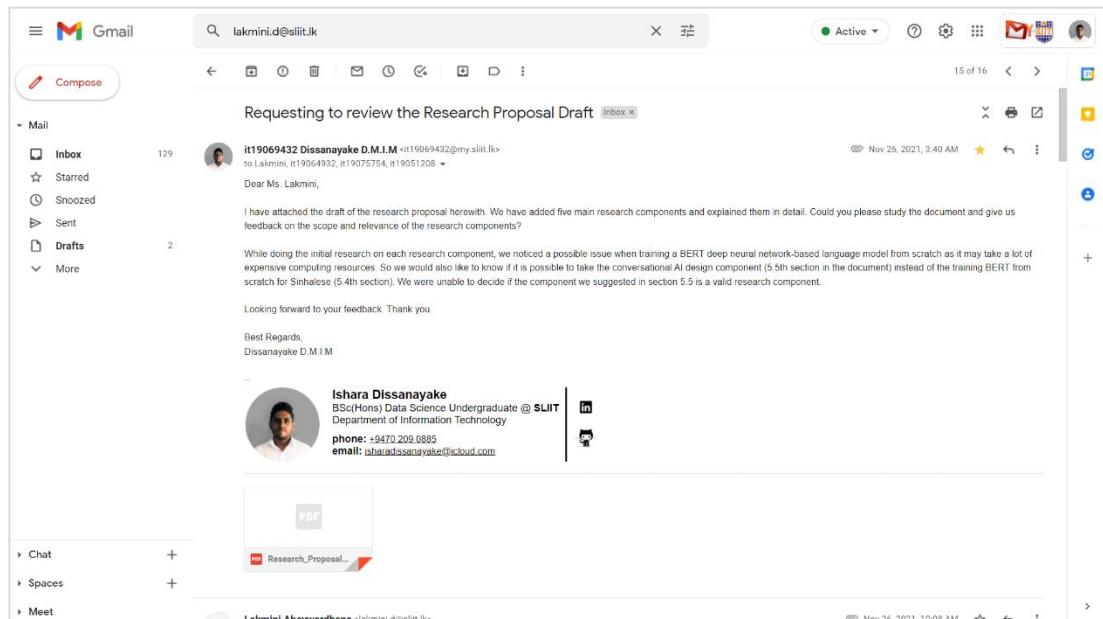


Figure 3.3. 1. Proposal drafts review request

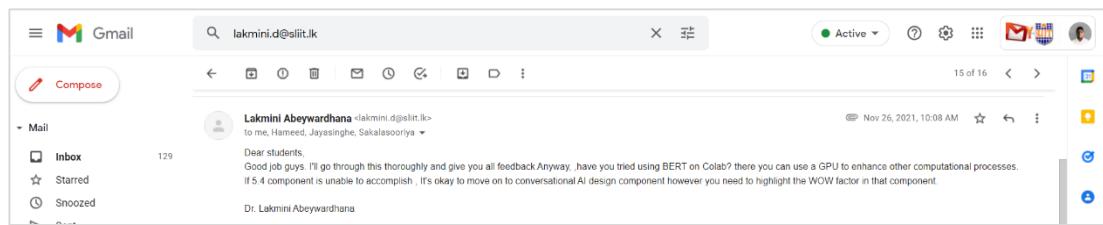


Figure 3.3. 2. Reply of the supervisor on proposal drafts review request

3.4 Progress discussion meeting scheduling

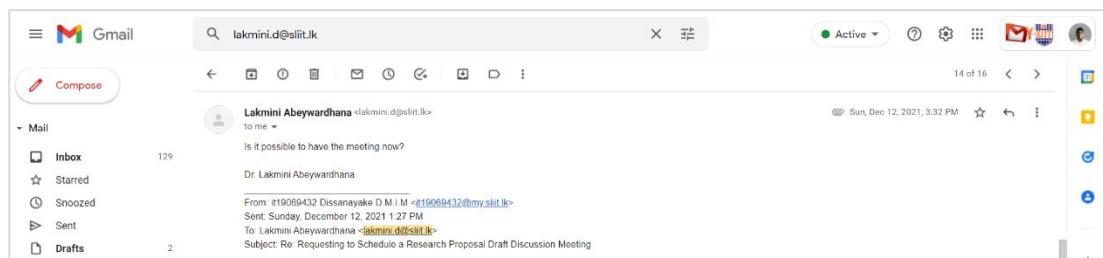


Figure 3.4. 1. Research progress discussion meeting request

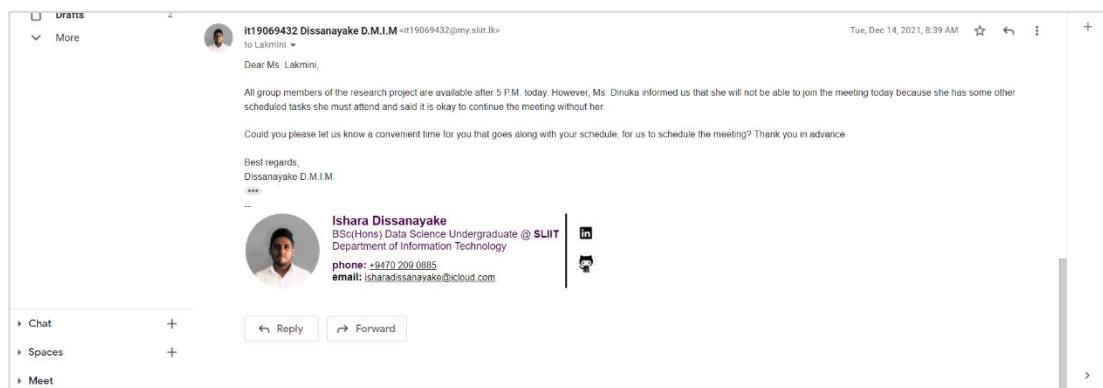


Figure 3.4. 2. Reply for the research progress discussion meeting request

3.5 Topic assessments form review request

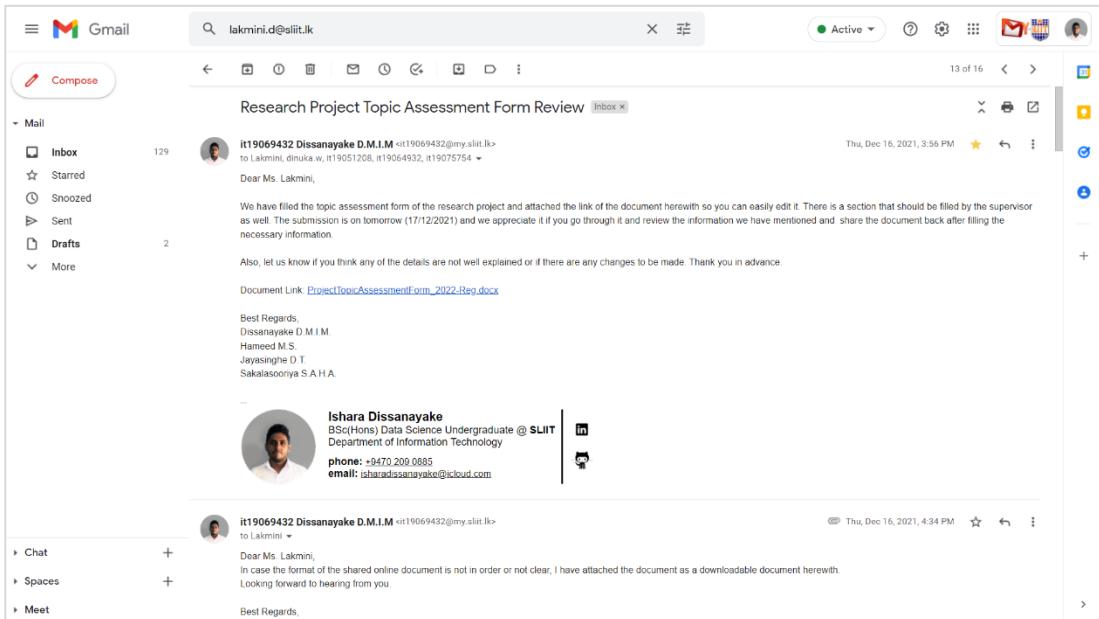


Figure 3.5. 1. Topic assessment form review request - I

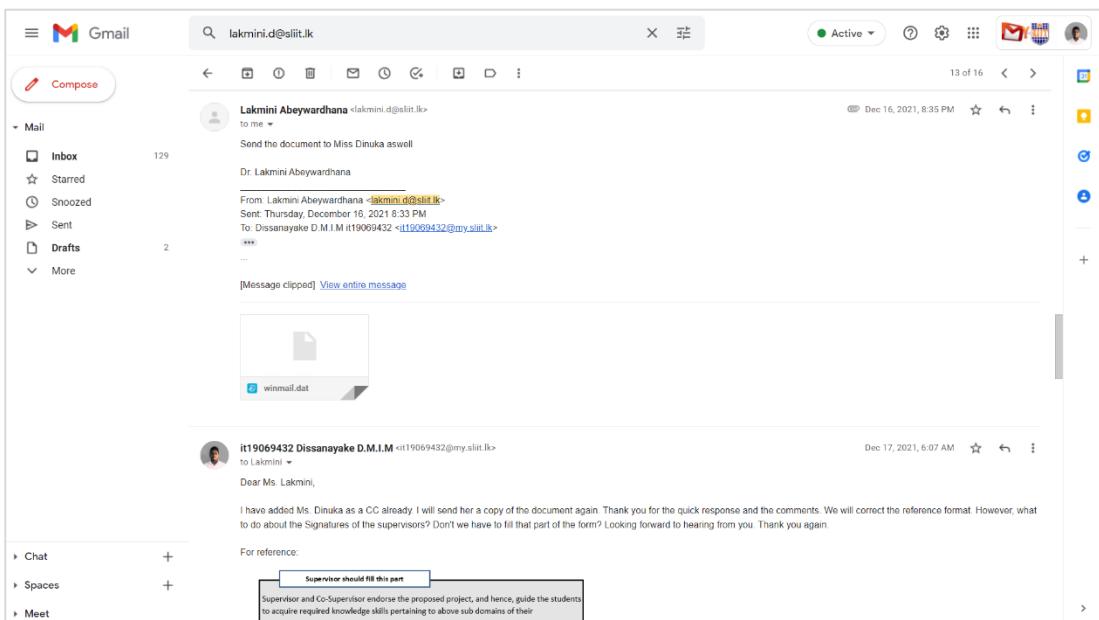


Figure 3.5. 2. Topic assessment form review -II

3.6 Research component changes review request

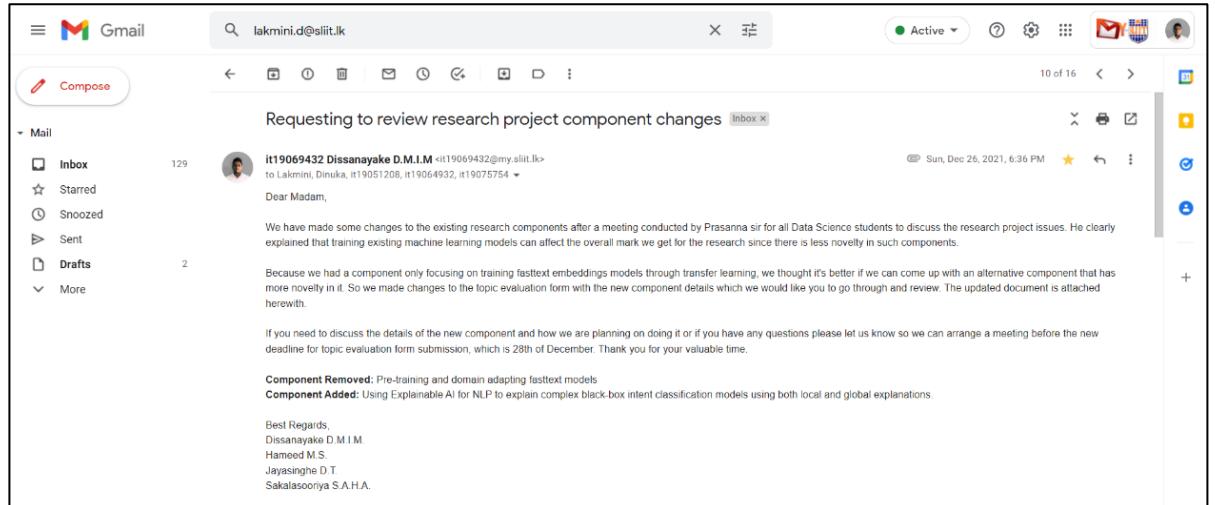


Figure 3.6. 1. Research component/component objective changes review request

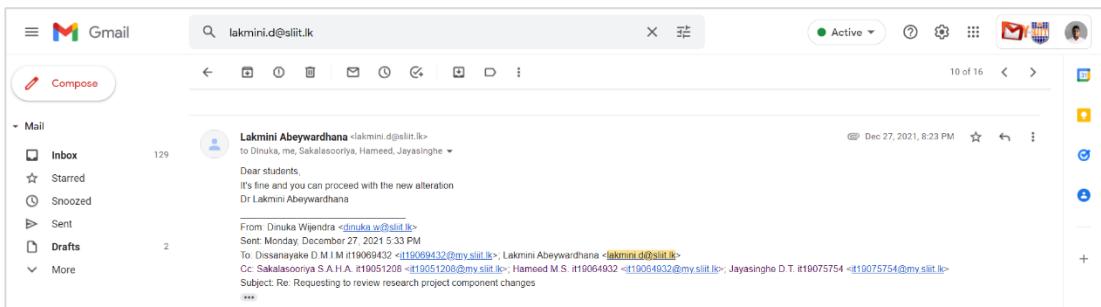


Figure 3.6. 2. Component changes approval of the supervisor

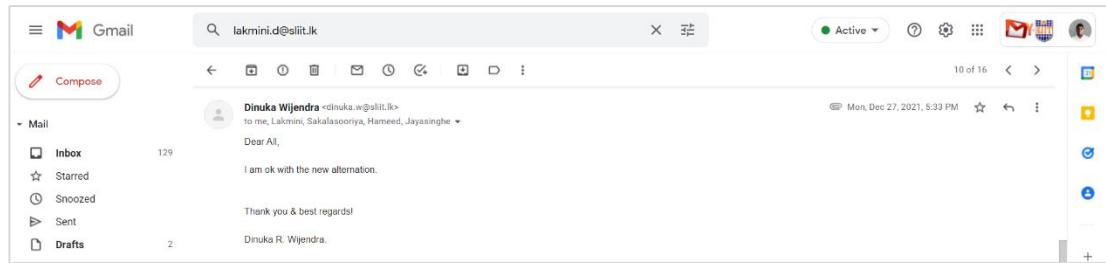


Figure 3.6. 3. Component changes approval of the co-supervisor

3.7 Topic changes review request after panel evaluation was done

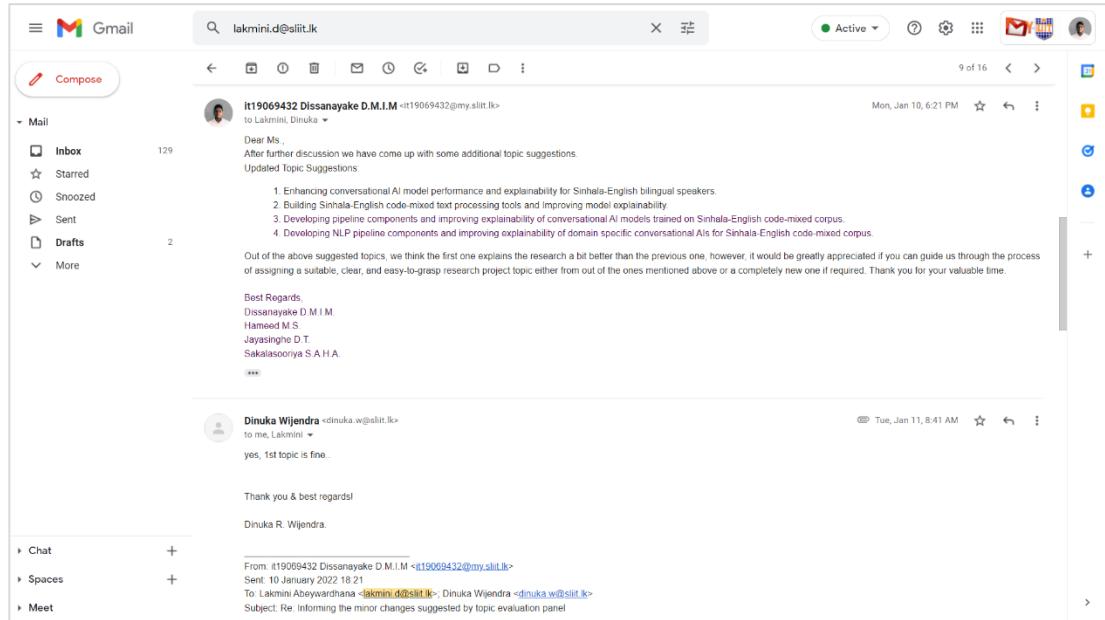


Figure 3.7. 1. Topics suggested by the members due to the suggestion made by the panel

3.8 Individual project proposal documents review request

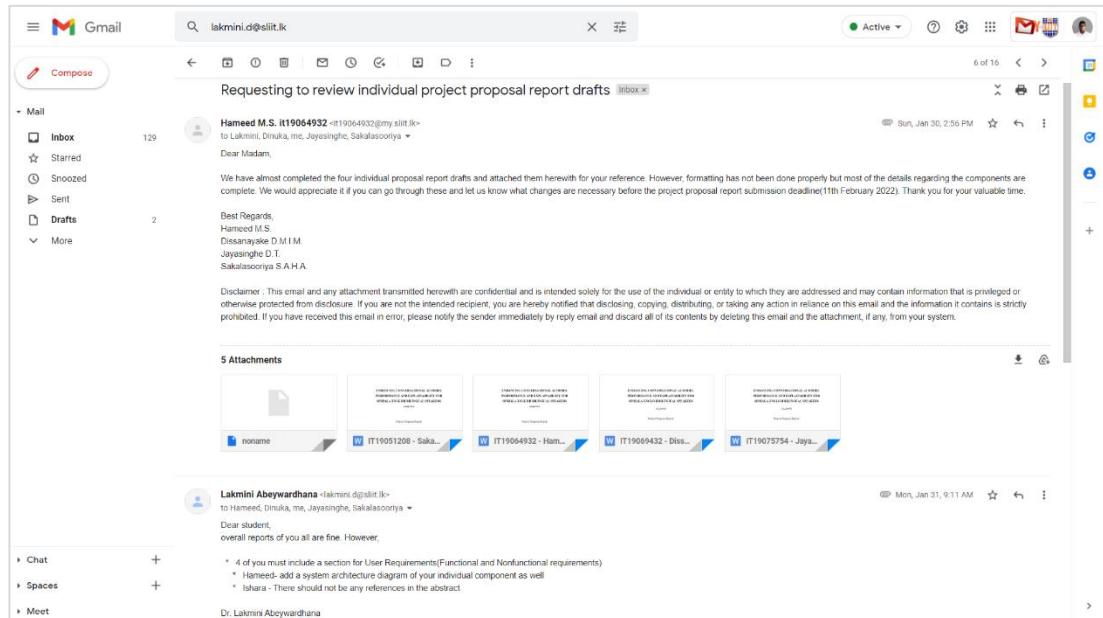


Figure 3.8. 1. Individual proposal draft review request

3.9 Sharing the updated proposal presentation slides deck

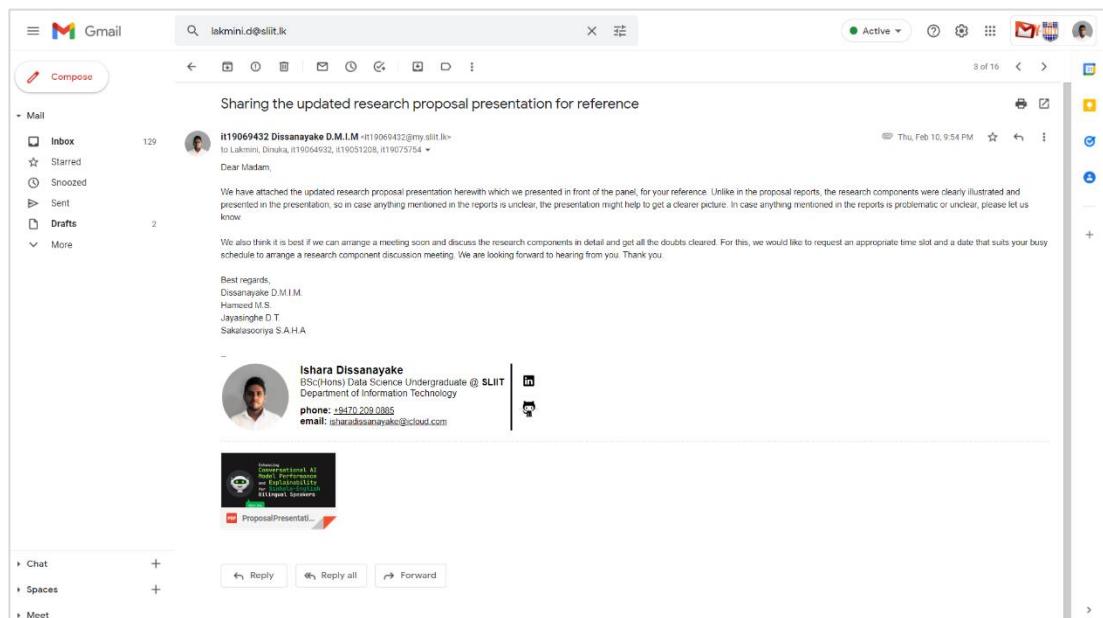


Figure 3.9. 1. Sharing the updated proposal slides deck

3.10 Research progress discussion meeting before progress presentation – I

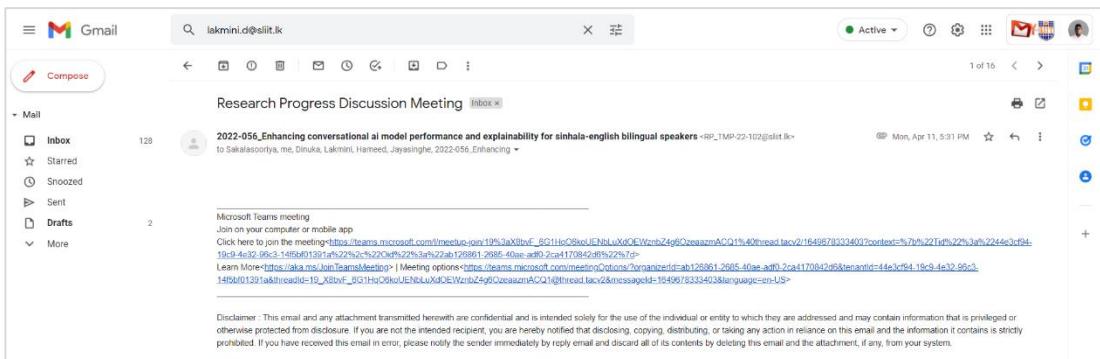


Figure 3.10. 1. 50% progress discussion meeting scheduling

4. GANTT CHART COMPARISON

Figure 4.1 breaks down all tasks of this individual research component under 5 main tasks.

Legend: █ Predicted █ Actual █ Remaining



Figure 4.1. Predicted Gantt chart vs actual completion comparison

5. WORK BREAKDOWN CHART WITH PENDING TASKS

The Figure 5.1 indicates the complete work breakdown of the individual research component and the tasks already completed have been clearly indicated with a tick.

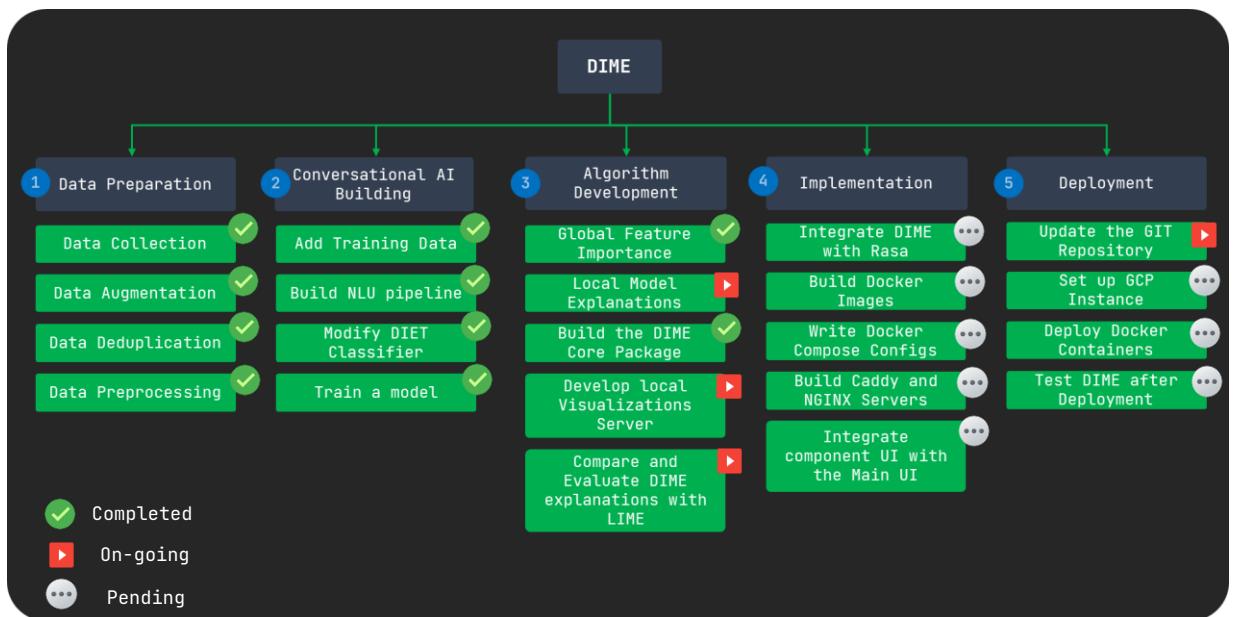


Figure 5. 1. Work breakdown and Task Status of the individual component