COMP3850 Project Deliverable Certificate

Name of Deliverable	*Feasibility Study & Team Manual*
Date Submitted	*07 / 03 /2024*
Project Group Number	*26*
Rubric stream being followed for this deliverable (highlight one) *Note: the feasibility study has the same rubric for all streams.*	SOFTWARE Rubric *GAMES Rubric* *CYBERSECURITY Rubric* *DATA SCIENCE Rubric*

We, the undersigned members of the above Project Group, collectively and individually certify that the above Project Deliverable, as submitted, **is entirely our own work**, other than where explicitly indicated in the deliverable documentation.

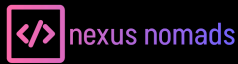| INITIALS	SURNAME	GIVEN NAME	STUDENT NUMBER	SIGNATURE *(IN-PERSON OR DIGITAL)*
LT	*Long*	*Trinh*	*46281657*	*LongT*
KP	*Kritchanon*	*Prasbojaturaporn*	*46122206*	*KritchanonP*
KH	*Karl*	*Holzmann*	*47092475*	*KarlH*
SH	*Shuo*	*Huang*	*45671680*	*ShuoH*
OB	*Bush*	*Oliver*	*46534032*	*OliverB*

NB: please write all details clearly (if handwritten).

© Macquarie University, 2021

<u>List of tasks completed for the deliverable and activities since last deliverable certificate with totals for each individual team member and whole team</u> *(copy individual total row for each member and copy pages if more pages needed)*

Performed by *(Student Names)*	Duration *(hrs)*	Complexity *(L, M, H)*	Name of task	Checked by *(Initials)*
Long Trinh	4	M	'Introduction' of Feasibility report	KH
Long Trinh	2	L	'Team Organisation and Structure' of Team Manual	KH
Long Trinh	2	L	Worked on the Architecture report for sponsor	KH
Long Trinh	2	L	Researched for better understanding of Rapid Analysis API and related API	KH
Long Trinh Total	10			
Karl Holzmann	2	L	'Current Situation' of Feasibility report	LT
Karl Holzmann	3	L	'Project Management Approach and Tools' of Team Manual	LT
Karl Holzmann	3	L	Setup the basic Architecture of the bot	LT
Karl Holzmann	2	L	Researched for better understanding of Rapid Analysis API and related API	LT
Karl Holzmann Total	10			
Shuo Huang	4	M	'Benefits' of Feasibility report	OB
Shuo Huang	2	L	'Team Values & ACS Code of Professional Conduct' of Team Manual	OB
Shuo Huang	4	M	Researched for better understanding of Discord API	LT
Shuo Huang Total	10			
Oliver Bush	2	L	'Recommended Solution' of Feasibility report	SH
Oliver Bush	2	L	'Communication Plan and Meeting Schedule' of Team Manual	SH
Oliver Bush	2	L	Worked on the Architecture report for sponsor	LT
Oliver Bush	4	M	Researched for better understanding of Discord API	LT
Oliver Bush Total	10			

Kritchanon Prasbojaturaporn	4	M	'Alternative Solutions' of Feasibility report	KH
Kritchanon Prasbojaturaporn	2	L	'Change Management and Conflict Resolution' of Team Manual	OB
Kritchanon Prasbojaturaporn	4	M	Researched on visible functions to add	LT
Kritchanon Prasbojaturaporn Total	10			
Team Total	50			

Nexus Nomads
Feasibility Study

Discord chat summarising bot with Rapid Analysis Large Language Model through API

Version 03, 07/03/2024

Contents

1.   Introduction

1.1. Problem Identification

- The main issue we may encounter are compatibility issues between RapidAnalysis and Discord. For example, Discord has message length and file size restrictions and RapidAnalysis may have text length restrictions also. Access to message content on Discord by bots is a restricted permission and we would have to apply for permission as our bot grows beyond 100 servers which may result in service disruption.
- The LLM's accuracy and coherence may not meet user expectations. Ensuring the summaries returned by the LLM are accurate, relevant, and helpful to end users is a top priority.
- As Discord is a platform used by people from many countries worldwide, the bot may encounter issues when analysing text containing slang, regional dialects of English or other languages entirely.
- Response time from the API is an important metric for a real time conversation platform such as Discord. Performance issues may impact the perceived value of our project.
- Pricing of the RapidAnalysis API outside of free limits would have to be researched to be able to provide this service to users for free.
- The project must be able to be easily updated to account for updates and changes to the Discord API which may occur down the line to ensure long term compatibility.

1.2. Opportunities

- This project may be able to generate revenue through the use of the Monetisation APIs provided by Discord, allowing users to easily sign up for a monthly subscription within the Discord app itself either before adding it to their server or to access features not available within a theoretical free version of our project.
- There is potential for our bot to be able to perform analysis over the conversations that occur and provide a dashboard to administrators of these servers which can show common discussion topics, user participation and more. This dashboard can be placed behind a monthly subscription.

- Although this project was developed for Discord, there is potential for it to be adapted to other social media platforms such as Slack and Reddit. Expanding to these platforms can help improve our customer base and market reach.
- RapidAnalysis' API does provide many other services such as image manipulation which have potential to also be implemented within our Discord bot.
- As we are on the forefront of AI tool integration on Discord, we have the potential to set a standard for equivalent products other companies may create. Our use of a freemium model can help spread the word of our product to a wider audience, potentially becoming a pseudo "household name" for Discord chat summarisation.
- Responses to users can be personalised to users' unique interests and knowledge on specific topics, helping to improve understanding or avoid explaining topics which a user may be familiar with.

1.3. Mandates

- The project may be required to investigate novel techniques, technologies, or approaches in the field of text summarization and chatbot creation, therefore enhancing academic understanding and technological advancement.
- **Statutory Mandates:**
    + **Adherence to Discord's Terms of Service:** Complying with Discord's terms of service and developer standards is an essential need, guaranteeing that the bot functions within the limits provided. This includes the adherence to user privacy and to guarantee data security.
    + **Data Protection and Privacy Compliance:** Ensuring compliance with data protection requirements such as the General Data Protection Regulation (GDPR) for European users, as well as other relevant privacy laws worldwide necessitates strong data management procedures, which include obtaining user permission where necessary, providing transparent details about data use and storage, and establishing safeguards to prevent unauthorised access or breaches of personal information.
- **Managerial Mandates:**
    + **Functionality:** The main goal is to guarantee that the bot operates with a high level of precision, efficiently condensing conversation records while retaining crucial information. This requires the construction of complex algorithms and ongoing optimisation to effectively manage the diverse nature of conversation on Discord, guaranteeing that the bot provides a genuine benefit towards users.
    + **User Experience:** The bot should be created to ensure that it is user-friendly, intuitive, and improves the Discord experience. These features include a straightforward user interface, clear instructions for operation, and a willingness to incorporate user input for continuous enhancements.

1.4. Assumptions

- **Access to Resources:**
  + We have access to Discord and any necessary APIs from Rapid Analysis for development purposes.
  + Rapid Analysis will provide certain cloud computing resources if we need.
- **Scope of the System:** The system will be tested in a controlled environment with a limited number of users.
- **Support Provided:**
  + We will receive academic guidance from Rob Newport - Rapid Analysis representative and possibly technical support from the university's IT department.
  + Peer support is expected as part of collaborative learning.
- **Platform Used:** the project will be developed for and deployed within the Discord platform, utilising its API for chat interactions.
- **Platform Stability:** Discord platform and Rapid Analysis API will remain stable and consistent in their functionality and policies during the development and first deployment phases of the project. This stability is important for uninterrupted development and user experience.
- **Technical Capabilities:** The team has or will acquire the technical skills to use the APIs properly, such as programming languages suitable for bot development (like Python or JavaScript) and natural language processing techniques.

2. Current Situation

Many businesses and communities use Discord to communicate and organise events. However, as communities grow, activity in these servers can very easily grow to levels where average users cannot keep up with all the activity which occurs during the course of a day. This can result in users simply marking entire conversation threads as read and potentially missing important information.

To solve this problem, our project aims to create a Discord bot which utilises RapidAnalysis' API to summarise conversation threads, allowing users to absorb the main talking points of conversations without having to search through many channels and messages. This results in users being able to contribute to conversations and absorb important information easily and quickly.

Creating a conversation summarisation bot would directly enhance the user experience on Discord as it helps to increase user engagement and help simplify complex topics which can come up within conversations. The creation of this bot helps meet the requirements of not only Discord but also many other online forums,

3. Benefits

3.1. Tangible Benefits

Identify these in 3 categories.

- **Cost savings (cost reduction, increased revenue etc)**
  - The use of automated conversation summaries greatly reduces the need for human moderation and structuring of chat logs, resulting in immediate cost savings on expenses related to these activities.
  - Optimising the procedure for managing substantial amounts of chat improves operational effectiveness by minimising the resources needed for data administration. This enables the allocation of funding to other activities that enrich the community.

- **Time savings (staff time gained through improved throughput)**
  - Fast summaries allow users to quickly grasp the essence of discussions without reading through every message, saving considerable time, especially in active or large groups.
  - For server administrators, they save time on content moderation and information dissemination, enabling them to focus on community building and engagement strategies.

- **New products and services and who would benefit from them**
  - **Server Administrators** get advantages from efficient community administration and enhanced involvement.
  - **Community members** benefit from an improved user experience that provides them with more convenient access to crucial information.
  - **Developers and entrepreneurs** have the opportunity to discover and enter new industries by creating additional products or services that use summarization technology.

3.2. Intangible Benefits

- **Increased control:** the bot can provide more accurate data analysis and summarisation to users to help them understand and manage Discord activities. A full in-depth analysis of this data may allow users to take control, understand more about the group and act accordingly.
- **Improved morale:** Provide automatic chat summary services, the bot can lighten the load of users and put them to more meaningful work. This automation tool might boost morale of team members to help handle Discord group activities.
- **Better decision-making:** With more accurate and rich chat analysis, the bot can help team members understand dynamics within and outside the team and make better decisions. This enhanced decision making ability can improve the organisation's competitive advantage and long-term performance.
- **Community Cohesion:** The summarisation bot helps users catch up on conversations and connects Discord communities. Even in highly active servers users feel more connected and engaged.
- **Accessibility for All Users:** The bot breaks down long discussions into digestible summaries that help users who can't keep up 'due to time's constraints, cognitive overload or language barriers.
- **Promotion of Constructive Conversations:** Summarisation might induce users to contribute more meaningful and relevant content knowing that their discussions will be summarised for others. This may improve the discourse in the community.
- **Evolution of Chat Dynamics:** The bot might influence the structure of conversations, as users adapt their communication styles to capture key points in summaries to promote more focused digital communication.

4.   Alternative Solutions

4.1. Alternative 1: In-house Development of Summarisation Model

4.1.1. Advantages

- **Flexibility & customisation:** An in-house solution can be tailored specifically to the project's needs and the specific nuances of the server chat logs.
- **Cost:** Long-term, an in-house solution could be more cost-effective.
- **Data Privacy:** There will be no information is sent externally which will lead to lowering the risk of a data breach.

4.1.2. Disadvantages

- **Risk of Inferior Performance**: There is a risk that the in-house model won't perform as well as RapidAnalysis's proven LLM, leading to inferior results for end-users.
- **Resource Intensive**: Developing and training a custom LLM requires significant resources, expertise, and time.

4.2. Alternative 2: Utilising Open-Source Summarisation Tools

4.2.1. Advantages

- **Economic:** Low initial cost by leveraging free, open-source software**.**
- **Technical:** Access to a wide range of tools and the flexibility to modify the code to suit specific needs.
- **Operational:** Benefits from community support and continuous improvements by contributors.

4.2.2. Disadvantages

- **Technical:** Requires technical expertise to customise and potentially integrate multiple tools to achieve the desired functionality.
- **Operational:** Possible stability and support issues, as open-source projects can vary in quality and longevity.
- **Strategic:** May not provide a competitive edge if the solution does not offer unique features or superior performance.

4.3. Alternative 3: AI-Based Summarisation Widgets for Discord Servers

4.3.1. Advantages

- **Technical:** Leverages AI to provide dynamic, context-aware summarisations directly within the Discord interface.

- **Operational:** Can be deployed as an add-on widget within Discord, offering a seamless user experience without requiring external applications.
- **Strategic:** Enhances server functionality and could be marketed directly to server admins as a value-adding feature.

4.3.2. Disadvantages

- **Economic:** Development of sophisticated AI widgets could be resource-intensive, requiring significant upfront investment.
- **Operational:** May depend on Discord's support for widgets and integrations, which could limit control over deployment and updates.
- **Technical:** Challenges in ensuring the widget works uniformly across Discord's various client applications (web, desktop, mobile).

4.4. Alternative 4: Manual Curation Teams

4.4.1. Advantages

- **High-Quality Summaries:** Human curators can understand context, sarcasm, and nuance better than AI, potentially producing more accurate and relevant summaries.
- **Adaptability:** Human teams can quickly adapt to changes in chat topics, community culture, and language use without the need for retraining, as might be necessary for AI models.

4.4.2. Disadvantages

- **Scalability Issues:** When it comes to huge or very busy Discord servers, human curation isn't scalable since it requires a lot of work.
- **Consistency Challenges:** There is no guarantee of consistency in manual summarization as many curators may place different values on the most crucial pieces of information.

4.5. Alternative 5: No Action

4.5.1. Advantages

- **Economic:** Saves budget by not having to pay for the creation, operation, or licencing of a new solution.
- **Operational:** Preserves the current state of affairs without imposing any new demands on server administrators or users.

4.5.2. Disadvantages

- **Lack of Innovation**: The potential advantages of summarization for server chat logs will go unrealized until a solution is put into place.
- **Inefficiency:** Users may face the challenge of manually sorting through massive volumes of conversation data in the absence of a summarization bot.

5.   Recommended Solution

The goal of this project is to build a bot that can summarise conversations on Discord. One possible method is to use Rapid Analysis's tried-and-true LLM. When compared to competing alternatives, this one has several advantages.

- Reliability: LLM from Rapid Analysis has shown to be helpful in text summarising - assignments before. When compared to an in-house solution, using an existing technology lowers the risk of subpar performance.
- Development efficiency: The project may be finished fast and with few resources spent on development by using Rapid Analysis's technology.
- Decreased Risk: By repurposing an existing technology, the risks linked to technical difficulties and performance unknowns are decreased.
- Conformity: The Rapid Analysis API conforms to the developer standards and Terms of Service of Discord.
- Rapid Analysis's LLM can scale to accommodate ever-increasing amounts of Discord conversation data, which is essential for communities that experience rapid growth.

The mentioned problem may be effectively solved by selecting for Rapid Analysis's LLM. This solution addresses compatibility difficulties, ensures correctness, and facilitates efficient summaries of Discord conversation logs. With this method, you can get the most out of your resources and reduce the likelihood of failure.

TEAM MANUAL

1.   Team Organisation and Structure

1.1. Team Organisation

- There are 3 main roles in our team: Project Manager, Lead Developer and Developers. Project Manager and Lead Developer will be given to other team members every sprint (after each deliverable ideally). In that way, the team members will be able to enhance their leadership and management skills. They will also be able to add more of their characters into the project.
- **Project Manager:** Keeps an eye on the project's development, making sure all deadlines are fulfilled and that tasks and resources are distributed wisely.
- **Lead Developer:** In charge of the development process, making important technical choices, and solving technical problems as they arise.

- **Developer:** This is the role that most team member will experience in project life cycle. They will mainly ensure the tasks to be done timely, accurately and efficiently. They will also have responsibility to help PM and LD if they need.

1.2. Structure

The team structure is intentionally intended to be adaptable, enabling the allocation of tasks to be adjusted according to the project phase and individual workload. This framework facilitates cross-functional cooperation, allowing team members to make contributions outside their core responsibilities as required. Regular meetings and updates guarantee that the team functions harmoniously and that any changes to roles or task assignments are done openly and with agreement.

2. Team Values & ACS Code of Professional Conduct

2.1. Team Values

- **Collaboration:** We place our trust in the efficacy of cooperation, merging our expertise and understanding to efficiently accomplish our project objectives.
- **Integrity:** We pledge to uphold honesty and openness in all our acts, guaranteeing that our work is carried out with ethical and responsible practices.
- **Respect:** We maintain a culture of reverence for all team members, appreciating varied viewpoints and nurturing an atmosphere that includes everyone.
- **Honesty:** We are unwavering in our dedication to honesty in all of our conversations and activities.

2.2. ACS Code of Professional Conduct

- As members of the wider computer community, we adhere to the Australian Computer Society (ACS) Code of Professional Conduct, which prioritises:

- **Honesty**: We are going to always be truthful in our actions and communications.
- **Reliability**: Every member of our team knows they can count on each other because of how regularly and reliably our team operates.
- **Respect**: Each team member's worth, viewpoint, and participation are highly valued.

3. Project Management Approach and Tools

3.1. Approach

- We use Agile methodologies in our project management - adapted for dynamic academic projects and the fast growth of a Discord bot to summarize chat logs. Agile enables iterative development to react to change and feedback rapidly.
- **Iterative Development:** We propose developing our project in sprints, short consistent work cycles that allow regular evaluation and adaptation of our project plan based on real progress and feedback.
- **Flexibility:** This method also allows to prioritise tasks and functions to be flexible to new challenges or insights.
- **Continuous Feedback:** Regular meetings with stakeholders (potential users and academic advisors) will be key to collect feedback and feed back into later development phases.

3.2. Tools

- **GitHub:** GitHub will serve as our version control system, providing a platform for hosting our project's code. This will facilitate collaborative development and code review. GitHub's issue tracking system will be used to record and manage problems and feature requests and contributions from team members can be reviewed.
- **Zoom:** To facilitate our routine meetings and sprint reviews with our sponsor, we will use the video conferencing platform, Zoom. It allows us to carry out efficient remote meetings, which include the ability to share screens for presentations and to demonstrate progress.
- **Jira:** Jira facilitates the monitoring of progress, the management of backlogs, and the efficient allocation of jobs. It plays a crucial role in visualising our process and ensuring that all team members are cognizant of their duties and the current stage of the project.
- **Google Docs:** For collaborative document creation/sharing. Google Docs allows us to centralise our project documentation, meeting notes and reports so they are available to all team members. Its real-time collaboration features enable communication and documentation review.

4. Communication Plan and Meeting Schedule

4.1. Communication Plan

- Our communication plan aims at ensuring effective information exchange within the team and with external stakeholders. Supporting our project we use a multi-platform strategy:
- **Jira:** Central to our task and progress communication, Jira will be used to assign tasks, track progress and manage sprints. It's a running record of what is being worked on and what is next.
- **Discord:** Our primary channel for daily communication, quick updates, and informal check-ins. Discord's voice and text chat capabilities facilitate rapid problem-solving and decision-making discussions.

- **Email:** Utilised for formal communications, especially for updates to and from our sponsor. Email will be used for sending out meeting agendas, significant project updates, and collecting feedback.

4.2. Meeting Schedule

- To complement our communication plan, we have established a regular meeting schedule that balances the need for frequent check-ins with the importance of uninterrupted work time:
- **Weekly Team Meetings:** Held every Tuesday at 4 PM and one other day of the week via Zoom. All team members are expected to attend, contributing to discussions on project status, upcoming tasks, and strategic decisions.
- **Weekly Sponsor Meetings:** Held every Wednesday at 4 PM via Zoom. These meetings are dedicated to presenting our progress to our sponsor, discussing feedback, and aligning on expectations and requirements for the next phase of the project. Project Manager and Lead Developer are mandatory to attend.

5.   Change Management and Conflict Resolution

5.1. Change Management

Effective change management is essential in our project to flexibly handle any modifications in project scope, technology, team dynamics, or external variables. Our methodology is centred on adaptability, effective exchange of information, and thorough record-keeping:

- **Change Review Process:** Every change request will undergo evaluation at our weekly team meetings.
- **Decision Making:** The decision-making process for modification requests will include a collaborative evaluation of the project's goals, resources, timeframe, and the possible effects on quality and stakeholder satisfaction.
- **Implementation and Monitoring:** The approved adjustments will be executed in accordance with a plan that delineates the necessary actions, assigned duties, and schedule.

5.2. Conflict Resolution

- **Open Communication:** Promote a culture where team members feel comfortable and confident in voicing any concerns or difficulties promptly. Timely detection of problems often enables more straightforward settlements and aids in averting escalation.
- **Resolution at the Source:** Whenever feasible, those engaged in a disagreement are advised to address the matter immediately, use explicit and courteous communication. This strategy often results in expedited resolutions and contributes to the preservation of team cohesion.
- **Majority rule:** All suggestions in a conflict will be considered and assessed by all team members, and whichever of them gets more approval will be chosen. Each team member will be counted as one vote. If it leads to a draw, the sponsor will have the final decision.