Statement of Work

Version 6.0
Date: 6th Aug. 2021

1. Overview

1.1 Introduction of the Client

Cinefly is a media-tech company which aims to develop the most advanced patented storytelling platform. Cinefly formed a team of professional directors to design storyboards which can be directly used by users. Storyboards are patterns that help creators to determine the frame and split of the video, serving as guidance for those creators. Cinefly believes that they can help users become extraordinary storytellers, with students, researchers, volunteers, business, government, and other industries engaging together to share ideas, stories, and experiences. Cinefly shares these videos to have positive effects on the society, with the goals of tackling global issues such as Climate Change, Food and Plastic Waste and Poverty.

Cinefly hopes to add user profile creation and analysis functions to its existing products, to provide users with advanced functions such as customized storyboard generation, product recommendations, and ultimately improve the usability of the product.

1.2 Project Goal

Cinefly commissioned the team to complete two tasks:

First, the team should develop a set of machine learning algorithms to automatically create user profiles instead of using traditional methods such as online forms. This algorithm will use videos that contain users' information provided by Cinefly as input, and output the target tagged information defined by Cinefly, such as the user's age, gender, address, hobbies, etc. The result should meet the accuracy requirements specified in this document.

Second, the team should integrate the data extracted in the previous step into three categories: demographics, psychographics, and behavioristics. And develop a database to store them, thus facilitating the future use of the client. This task is not included in the minimum deliverable product of this project.

This is a continuous project. In the previous stage of work, the team has used computer vision technology to complete the task of identifying the age, gender, facial expressions, and activities of

the characters in every given video. In this stage of work, the team will mainly use natural language processing technology to extract the remaining information specified by the client in this document.

The team aims to complete the tasks assigned by the client with high standards, and enhance the commercial value of the client's products, so that the client can use the user profile we built to provide its users with more customized services and the client's company can be more attractive to its investors.

1.3 Stakeholders

Our project stakeholders consist of 4 groups: client, customers of Cinefly, sponsors of Cinefly, directors.

• Client is Mr. Kai Eris, who is also the product manager of the company Cinefly.

• Sponsors are the investors of the Cinefly company, our output can help improve the performance of the product of Cinefly, so sponsors can make more profits from it.

• Customer is the user of the website, who can use the app Cinefly to create videos based on storyboards.

• Directors are employees working together to create storyboards for users.

2. Project Details

2.1 Project Scope

This project will use Python as programming language, employ computer vision and natural language processing technology, develop machine learning algorithms to extract key information from a given video and save it as a file. At the same time, a database will be constructed to facilitate subsequent use of the information. The boundary of the project is defined as follows:

Field	Value
Programming language	*Python 3*
Product interface	*Non-visual, can be run in IDE or console*
Technical field	*Computer vision, natural language processing, common machine learning algorithms, software development, database construction*
Technical component	*General Python library, common open-source library used in CV and NLP, open-source library available on the Internet, client agreed APIs available on the Internet, only machine learning algorithms from external libraries*
Input	*Raw videos provided by the client strictly in accordance with the Cinefly storyboard standardization.*
Output	*A csv file, including all the required label information.*

|	
Output label structure	*Only the labels appeared in the Cinefly storyboard will be included. The specific content is subject to negotiation with the client and will be updated in subsequent versions of the SoW.*
Model accuracy requirement	*The specific content is to be determined through negotiation with the client and will be updated in subsequent versions of the SoW.*
Database requirement and parameter setting	*The specific content is to be determined through negotiation with the client and will be updated in subsequent versions of the SoW.*

2.2 Technical and Other Constraints

| Field	Reason	Types
Developer skills	*Most developers have not researched the field of natural language processing and are not familiar with the current popular technologies. Team members may need a certain amount of time to understand and learn about current technical means.*	*Technical constraint*
Programming language	*The program will have the function of outputting data files, and the limitation of python may affect the running speed of the program.*	*Technical constraint*
User privacy	*Both input and output data will carry a lot of personal information. The use and processing of such personal information will be restricted by law.*	*Safety constraint*

2.3 Deliverables

- An algorithm to standardize input videos with quality control, each video should be split into different shots and set of videos should be split into training and testing set.

- A design of label structure used to categorize different types of videos with quality control, all labels should be reasonable and related to the information it represents.

- A speech recognition model with quality control, recognition accuracy should be higher than 85%.

- A document of comparison of the difference between the model from AWS and Googles with quality control, the advantages, and disadvantages of the two model should be described clearly and the team should make recommendations to the client and get approval.

- An algorithm of processing demographic information (E.g., name, gender, income), psychographic information (E.g., Hobbies), behavioural information. (E.g., How do they want to spend their money)

- A user manual used to help users understand how to use the program we developed and what the program can do.

- Some bonus tasks not included in the MVP: development of a database used for storing the extracted information.

2.4 User Story Map (USM) and Minimum Viable Product (MVP)
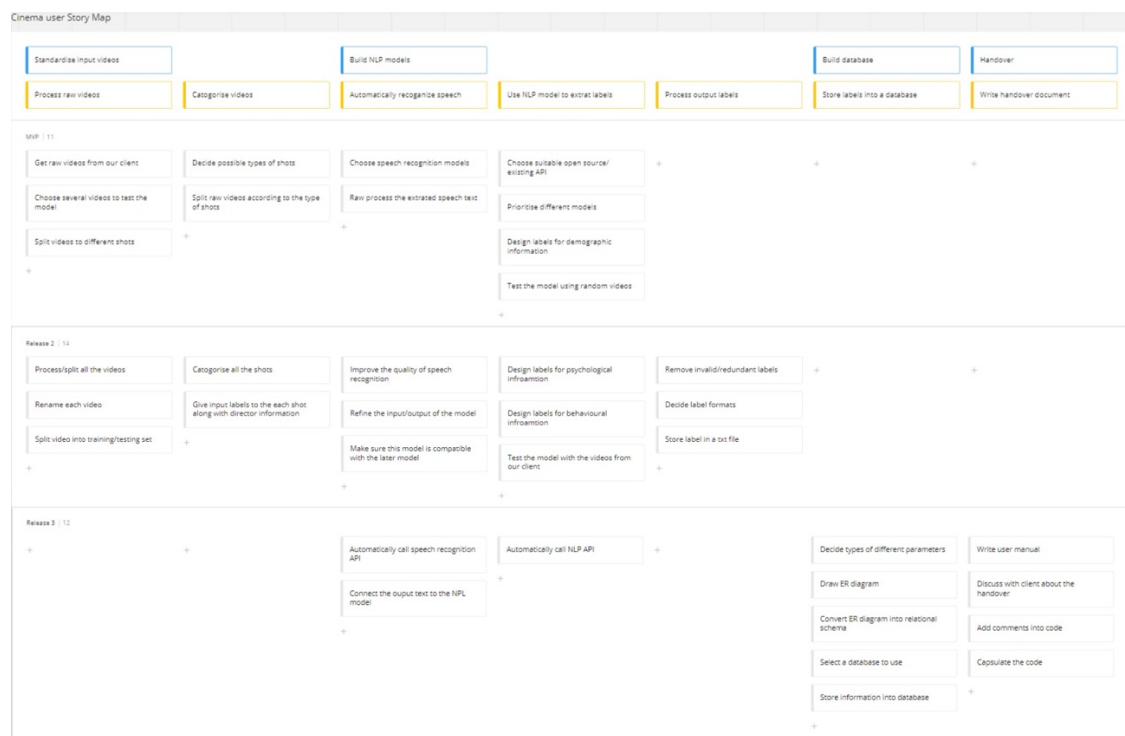
2.5 Timeline and Milestones

The scope of the project of this stage will span the second semester of 2021.
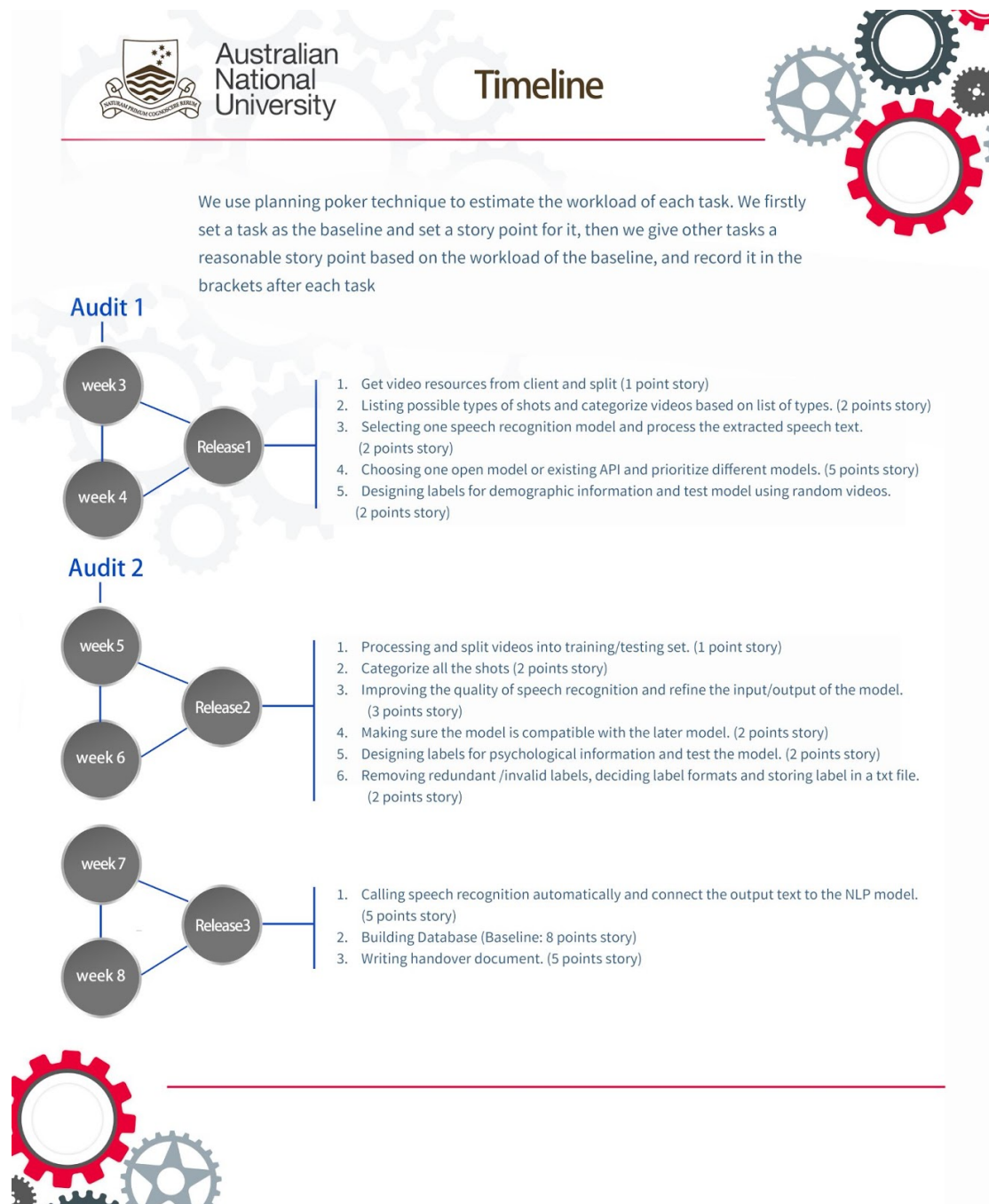
2.6 Location

There will be both on-campus meetings in Canberra and online meetings because some of our members are currently overseas.

2.7 Quality and Risk Control

2.7.1 The Goals of Quality

• Correctness and Reliability

In the developed product, the functions should be correct and meet the requirements of the client. In addition, all functions should be reasonable and legal, and should not be harmful to the rights and interests of stakeholders.

This product can maintain certain performance. In addition, the product should be able to maintain the integrity of output data and input video. In the process of processing and analysing the video, the original video resources should not be damaged. When an incorrect type of input occurs, such as wrong file type or irrelative videos, the product could recognize and give notice in time.

• Usability

The developer should provide sufficient instructions when delivering the product, which means that the user can independently master the method of use. When the product is transferred, the content of the transfer should include a user manual.

In addition, product developers should provide sufficient code comments and instructions to ensure the maintainability of the product. There should be clear and distinct comments about important functions in the product's code. If necessary, the developers should explain and comment on the parameters used in algorithms and models.

• Maintainability

The product should be designed with future maintenance and upgrades in mind. Customers and other users should be able to easily modify the parameters of algorithms and models. When the client wants to add more functions or make it learning at a deeper level, the development team does not need to make subversive modifications to the existing code. The developer's design should focus on facilitating maintenance, modification, and testing.

2.7.2 The Methods of Quality Control

• Perform performance testing

In the different stages of product development and algorithm construction, performance tests would be carried out according to the current development progress, including the accuracy of the output labels, the algorithm calculation speed, and the frequency of the missing labels. After that, according

to the client's needs and the development schedule, it would be determined whether it is necessary to further improve the performance.

• Black box testing

After the construction of the algorithm and model have been basically completed, a certain number of black box tests should be performed with the training set of the video. Extensive tests would be performed to figure out if there are any vulnerabilities and bugs that have not been considered. Once these problems are discovered, the developer needs to immediately make corrections and record them in the current work log.

• Wrong Input Types Testing

After the basic structure of the product has been completed, the developer should try to use input with wrong types to test the program's ability of handling errors, including but not limited to the wrong file format, wrong video format, and video whose contents are irrelative to the labels.

• Peer Review

After the code comments and the user guideline are completed, each member of the development team must conduct a peer review of the parts completed by others. When it is found that there is ambiguity, or the content is not detailed enough, it would be necessary to promptly give feedback to the members who wrote the part. Missing code comments or confusing variable names also need to be improved.

• Client Review

In each meeting with the client, show the latest progress, and ask the client for views and opinions on quality.

2.7.3 Risk prediction

The table below records the identified potential risks and evaluates the level of risk. As the project progresses, different risk levels will change. Meanwhile, the table will also add new identified risks. The updated table will be displayed in the project repository.

High		Medium		Low	

	Risk Description	Probability of Occurrence	Loss Size (Days)	Risk Exposure (Days)	Risk Label
A	Insufficient QA time to validate by abundant training video.	45%	7	3.15	Development Plan
B	Too optimistic plan	35%	20	7	Development Plan
C	Insufficient product performance, some algorithms need to be redesigned	30%	14	4.2	Product
D	Lacking sufficient training resources	20%	10	2	Development environment
E	According to testing, user guideline or comments need to be completed.	10%	2	0.2	Client
F	It is difficult for developers to implement a necessary function.	10%	15	1.5	Personnel
G	External resource libraries cannot be used.	5%	5	0.25	Development environment
H	Feature creep	5%	5	0.25	Development Plan
I	Conflicts and Inequality between members	5%	10	0.5	Personnel
	Total Risk Exposure			19.05	

2.7.4 Risk solution

For the identified risks, the following table is the solution. For the risk changes that occur as the project progresses, the updated table will be displayed in the project repository.

Risk Event	Contingency Plan	Who is Responsible	Potential Cost
A	Set aside time for QA and focus based on quality assurance	Manager	Null
B	a) Use multiple estimation practices b) Development based on schedule	Manager	More planning time
C	Set aside time for QA and focus based on quality assurance	Manager	Null
D	a) Communicate with client in advance about available training resources b) Assign to someone to be responsible for collecting resources	Spokesman Manager	Collecting resources may lead to cost consumption
E	Set aside time for QA and focus based on quality assurance	Manager	Null
F	a) Reserve key members before the project starts b) Tutorial	Manager	Tutorials may lead to cost consumption.
G	Immediately switch to using other external libraries	Manager	External libraires tend to need money
H	Use user-based practices	Manager	Null
I	a) Communicate immediately to resolve conflicts b) Re-assign tasks	Spokesman	May cause delays in progress

2.8 Resources and Tools

2.8.1 Communication Tools

• WeChat Group: used for daily communication among team members.

• Zoom: used for weekly internal meetings and client meetings.

• Git: used as a development platform for team coding and sharing.

• Google Drive: a backup tool used as the storage space for project documents.

2.8.2 Technical Tools

• PyCharm: IDE used to develop the software.

2.8.3 Project Resources

The resources available for this project include:

• Videos in the database provided by the Client (Cinefly).

• Materials in the ANU library and resources provided by the TechLaunch project.

• Open-source algorithms or codes from online communities, such as from YouTube videos, GitHub.

• Paid services provided by some development platforms, such as AWS and Google.

2.8.4 Costs and Risks

The first three resources are free of charge and have little risks to use. However, paid services from those development platforms will cost money. Even though the client would like to bear the cost, there remains potential risks for our team to integrate our former functions into those APIs. Thus, we need to have a thorough investigation into and comparison with these paid services. Then we can make a suitable choice for the project and finally get a satisfactory product.

2.9 Client's Responsibility

• Attending meetings regularly with the team

• Attending audit meeting if possible, giving comments about the audit and repository

• Providing target labels that appears in the storyboard guideline

• Providing raw source videos

• Providing necessary access to external API

• Providing access to the Cinefly platform

• Providing other necessary resources after negotiation with the team

3. Team Charter

This part can be retrieved at:

Link: https://github.com/ch4ser/21-S2-2-C-Cinema/tree/main/01_Team_Charter

Signatures

Client

Kai Eris

Team

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Tao Qu   Yixian Qiu

Jiaye Li