Université d'Ottawa



L'Université canadienne Canada's university

<u>GNG1103 – A.R.C.</u>

Deliverable E

By: Caine Myrah 5722319

University of Ottawa

Table of Contents

GNG1103 – A.R.C.	0
Document Template	0
Table of Contents	1
1. Introduction	2
2. Tasks to be Completed	2
3. Gantt Chart	4
4. Associated Risks	4
5. Cost Estimate	6
6. Summary	7
7. References	7

1. Introduction

As was discussed in previous documents, EllisDon is currently seeking an Augmented Reality design solution to assist in communicating their designs to the various collaborators executing the implementation. To accomplish this, the client was interviewed and a project scope has been ascertained. From this information, numerous design solutions were formulated and separated into separate subsystems that will be developed. In order to fulfill the requirements outlined thus far, a project plan and cost analysis had to be developed. Additionally, any inherent risks associated with the project needed to be carefully considered, from risks to the completion of the project itself to those present for the end user. After careful considerations, the plan that was developed below should act as a sufficient guide to the completion of the desired prototype stages.

2. Tasks to be Completed

<u>Associated</u> <u>Deliverable</u>	Task	<u>Estimated Time</u> <u>Requirement</u>	<u>Those</u> <u>Responsible</u>			
Prototype 1	Display 3D models:	2-3 days	Caine M.			
feedback	Intuitive Interface:	2-3 days	Aunonto B.			
	- Directional controls:	1 day	Caine M.			
	Switch Layers:	2-3 days	Mike S.			
	Access/Update 3D models:	1-2 days	Melanie P.			
	Phase 1 test:	1-3 days	Group			
Prototype 2 and	Develop AR mode (Automated position and orientation relative to	2-4 days	Caine M./ Melanie P.			

Customer	model):					
Feedback	Phase 2 test:	1-3 days	Group			
Prototype 3	Warning System:	2-3 days	Aunonto B.			
and Customer	Saving Annotations:	2-3 days	Mike S.			
Feedback	Tutorial Tips:	3-4 days	Group			
	Phase 3 test	1-3 days	Group			
User Manual	Tutorial Videos	3-6 days	Group			

3. Gantt Chart



A 10	දී බීං BigPicture									
		Gantt 🏟								
🖆 Data 👻 🐵 View 🗸 \leftrightarrow 🗸	/ ^ * < > 窗	Feedback 🔀								
	November, 2020									
LIST TITLE DUE DATE LABELS	* 5 26 27 28 29 30 31 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 01	I 02 03 04 05 06 07								
Major D Project Sci 2020/10/28	x and Cost									
Major D Prototype 2020/11/05	Prototype I and Customer Feedback									
Caine N Phase 1 - 2020/11/02	Phase 1 - Develop 3D display feature - Phase 1: Develop 3D display feature in Unity									
Aunontc Phase 1 - 2020/11/02	Phase 1 - Intuitive interface									
Aunontc Phase 1 - 2020/11/02	Phase 1 - Direct Positional Input - Phase 1 - Direct Positional Input	U								
Mike Sh Phase 1 - 5 2020/11/02	Phase 1 - Switch layers functionality – Phase 1 - Switch layers functionality									
Melanie Phase 1 - / 2020/11/02	Phase 1 - Access/Update 3D models - Phase 1 Access/Update 3D models									
To Do Phase 1 - F 2020/11/05	Phase 1 - Pro- Phase 1 - Prototype Test									
Major D Prototype 2020/11/12	Prototype II and Customer Feedl- 1 Prototype II and Customer Feedback									
To Do Phase 2 - 2020/11/09	Chase 2 - Displays- Phase 2 - Displays AR									
To Do Phase 2 - / 2020/11/09	Phase 2 - Automated Positional Data									
To Do Phase 2 - / 2020/11/09	Chase 2 - Automat – Phase 2 - Automated Orientation Data									
T- D- D 0 = 0000/44/40										





â	20						BigPicture									0 ×																					
															Gantt 🏟																						
	Data	- 0	View -	↔ -	ø	^		*	4	:	>	Ô																							🗗 Feed	lback	×
1	IST	TITLE	DUE DATE	LABELS	~																			1	Novem	nber, 2	020										
	major o	Designing	LULUTINED			20 2	1 22	23	24 25	5 26	27	28 2	9 30	31 (01 02	2 03	04	05 06	07	08 0	09 1	0 11	12	13 1	14 15	5 16	17	18	19 2	0 21	22	23 2	4 25	26	27 28	29 30	01 0
	Major D	Project Pro	2020/11/30		\$2																													4	Project Pr	resentaio	- Pro
	Major D	Archive/U:	2020/12/01		\$2																															1	Arch
	Done	Thursday (2020/10/15		\$2	ər 15																															
	Done	Tuesday 0	2020/10/20		☆	Tues	Tues	iay Oc	ober 20	0																											
	Mike Sh	Test out p	2020/11/20		\$2		Test o									litches		ardwa																			
	Caine N	Explore via	2020/11/24		\$	lore via	ability	of cont	rol inte	erface	s/devic	es wit	nin bu	dget																			Ţ				
Í	Done	Develop a	2020/10/23		☆																																
İ	Done	Post Gene	2020/10/02		✨																																
ĺ	Done	Come up v	2020/10/23		\sim				c	come i	up with	2 que	stions	for the	client	meetir	ng tom	orrow																			
ĺ	Done	Develop m	2020/10/09		銢	,																															
	Done	Submit tor	2020/10/23		☆																																
	Done	Deliverable	2020/09/24		\$																																
1	~				~								-																								

4. Associated Risks

- 1. Purchasing/shipping delays with items such as the headset
 - a. Poor Outcome: Users are unable to work hands free using the app
 - i. Severity is not too bad as users will be able to use the app outside of the headset.
 - ii. We can mitigate this by ordering the headset in advance to give it enough time to arrive and/or possibly limiting the amount of features that would require users to use both their hands
 - iii. Likelihood is ~75% considering we are in the middle of a pandemic.
- 2. Certain features could be too complicated and take too much time to develop
 - a. Worst case scenario is that deadlines will not be met and the project will not be finished on time
 - i. Severity can be incredibly high as it may result in failing to meet the client's needs.
 - Can be solved by creating detailed plans as to what tasks need to be completed by what time, communicating with other group members if any difficulties arise and possibly creating a more simpler feature in place of the more complicated one in order to to save time
 - iii. ~20% likelihood, seeing as we are all fairly new to the development software and are not entirely proficient with how to use it.

- 3. ARkit Compatibility Issues
 - a. Likely to cause work delays that may affect subsequent tasks
 - i. Having to troubleshoot issues with the Add-on takes time
 - ii. Worst case scenario an alternative AR Add-on must be attained
 - iii. Best course of action to prevent issues is to work with ARkit to establish its viability as early as possible.
 - iv. ~20% chance of occurance (most members have successfully downloaded and installed Unity 2019 V3.15)
- 4. End user devices do not meet the minimum requirements
 - a. For development this could impact the ability of the affected team member to test out the program, increasing development time.
 - i. Highly unlikely, AR apps developed with Unity are compatible back to Android 7.0 (nougat) and iOS 11.
 - ii. One potential way to reduce this risk would be to develop a basic AR scene with the AR Add-on to ensure successful builds. If an issue does arise, seeking an alternative hardware solution may be prudent.
 - iii. \sim 5% chance (in case of unexpected catastrophic phone failure)
- 5. Android/iOS compatibility Issues
 - a. If it becomes difficult to build the app to a specific operating system, it will increase production time.
 - i. ³/₄ group members are using Android, so if problems arise the others may be able to assist reducing the time needed to resolve the issue..
 - ii. Only one group member is able to test for iOS compatibility. As such they will have to complete most troubleshooting on their own. Or the project will have to abandon multiple OS compatibility until the next deliverable
 - iii. 25% (risk most associated with Iphone user)
- 6. App may have bugs that might make use not optimal.
 - a. the App may not be optimal when using the battery, causing the phone to overheat, drain too much battery and cause it to crash and lose all progress.
 - b. the likelihood of the risk depends on the end users phone however an average of %20 (risk increases with older generation phones/ tablets)
- 7. Failure of the warning system
 - a. The severity of this risk would be high as people could be severely injured, or even killed if the warning system was unable to detect a potential risk.

- i. The likelihood of this occurring would depend on how many times the warning system is tested, the updated locations of risk in the building, and the user itself. The more times the warning system is tested and proven to work, the less likely this risk will occur.
- ii. Could be due to GPS failure
- iii. Ways that this will be optimized is by testing the warning system and making sure that it is 99.9% accurate. Another way would be to continuously update the areas which pose the biggest risk to the user so that they will always get the most accurate results and understand where each new danger zone is located.
- iv. 30% chance (multiple possible points of failure).
- 8. File size being too big.
 - a. The severity of this would be high since people would not be able to run the program or download the model. This would cause many problems amongst teams since some people won't be able to access the file.
 - i. The likelihood of this occurring would be quite low due to the fact that most people nowadays have the most up to date technology (phones, computers, etc) with a good amount of storage. However there is a chance that a small group of individuals, around 10%, would not have enough space.
 - Ways to reduce this is to make the app take up very little space on the phone. Also optimize the app in a way to make each file take up less space. Not only will this benefit the user allowing them to have more space on the phone, they will also be able to send smaller file sizes via email, message, etc.

5. Cost Estimate

<u>Item</u>	<u>Purpose</u>	Cost
Software	App development	Free
Phone	Display Virtual Environment	**End User Owned

**Headset	Allows Hands Free Operation	\$22.99 plus shipping
	Total	\$22.99

6. Summary

In conclusion, our team has created a succinct project plan, separated into three phases, which will provide us with a much more structured outline of what needs to be accomplished as we move forward with the development of prototypes. Phase 1 involves the development of the core 3D model interface, Phase 2 will implement the AR mode and Phase 3 includes the addition of any extra features that will aid the user in their work. Group members have also been assigned specific tasks to work on within each phase so that each prototype can be completed within the deadlines that have been set. A cost analysis has been completed so that the team may be fully aware of any financial constraints that may present themselves and any risks involved with the project, such as compatibility issues and failure of certain components have also been discussed in detail, regarding the severity and likelihood. In the event that these risks do create an obstacle for the team, we have produced various solutions in order to mitigate or even completely prevent any adverse effects from taking place. Therefore, taking all of this into account, our team believes that we now have an acceptable guide that will allow us to achieve the desired quality with our prototypes and fulfill the needs of our client.

7. References

I Am Cardboard VR Kit: The Best Google Cardboard VR Headset for iPhone and Android: Google Cardboard v2 VR Viewer Inspired: Small and Unique Travel Gift Under 25 Dollars (Black). (n.d.). Retrieved October 28, 2020, from https://www.amazon.ca/v2-0-AM-CARDBOARD%C2%AE-CARDBOARD-KIT/dp/B00 YF5Z14Q