Deliverable B:

Needs Identification and Problem Statement

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Abstract

This document was created with the purpose of identifying the needs of our client, and creating a problem statement for our project. This document will cover the following topics: a brief introduction of Ellis Don, their limitations, their needs and details about the problem they wish to address.

1.0 Introduction

EllisDon is a construction company that builds, maintains, furnishes and equips different buildings around the nation, earning near $3.5 billion in annual revenues[1]. As impressive those numbers are, their construction sites still lack digitization which limits their productivity, especially with the increase in labor shortages and building complexities. This could explain why we see an increase in productivity/revenues in other sectors such as product development but not in the construction sector. Another limitation in the productivity in construction for this company would be the use of 2 Dimensional plans which can create misunderstandings and thus a lack of communication when trying to interpret a 2D plan into the real world which is 3D. For example, the architect starts with a 3D mental image which he must convert onto a 2D plan, then the workers must recreate this 2D plan to a 3D building from the blueprints provided to them. As we can see, this process is inefficient thus, eliminating this back and forth movement between 3D and 2D plans, we could avoid confusion among workers and ensure that everyone is on the same page.

This is where an Augmented Reality (AR) app comes into play. An AR app would allow everyone on the construction site to access a virtual 3D plan of the infrastructure through their phone (the app would include building structure, electrical and the mechanical components of the building). By implementing such technology in the construction industry, we could increase productivity among laborers, increase communication between the headquarters and the site supervisor, and decrease the risk of confusion when interpreting the construction plans.

[1] EllisDon (2016)

2.0 Needs identification

Table 1 - Customer Needs Identification

Group	Customer Statement	Interpreted Need	Importance
Increasing Productivity	I want to get rid of the 2D step in the design process and develop everything in 3D	The software allows the user to view 3D models of a building in AR	5
	I want to use technology to tackle increasingly complex projects	The software can handle complex designs	3
Cost	I want to find a cheap (ideally, free) product	The software is extremely affordable	4
User friendly	I don't want to spend time and money on training	The software can be used by anyone regardless of technical expertise	5
Compatibility	I want the software to be compatible with most mobile devices	The software is compatible with most mobile devices	5
	Compatibility with tablets and iPads would be a nice touch	The software is compatible with tablets and iPads	3
	I want to avoid having to use a VR headset or remote control	The software can be used without a VR headset or remote control	4
	I want to use the app on-sight	The software works on-sight	5
	I just want to be able to view the design that's already been developed; I don't want to develop the design myself or make changes to the design	The software allows the user to view a design that has been developed without changing it	4
	I want to be able to use the mobile device with a 3D model in real life and overlay everything on-site	The software's AR allows the user to overlay the virtual on top of reality	5
	I want to be able to look at the building from outside and walk around it	The software captures the entire building from outside	4

Visualization	I want to be able to select a specific room in real life and then use the AR	The software allows the user to select any specific room within the building	4
	I want to see multidiscipline, just the walls and doors; I want to see what's behind the walls and what's behind the ceilings (i.e. mechanical, structural, electrical systems)	The software integrates with multiple disciplines ranging from architectural to mechanical, structural, and electrical	4
	It would be nice to access 2D plans in the software	The software contains 2D documentation	2
	I want a first-person view	The software represents the 3D models in first-person perspective	4
	I want the product to be developed for a single user	The software is developed for a single user	5
	It would be nice if the product had multiple-user functionality too	The software is also suited for multiple users	3
Add/Extract More Information on Building	It would be nice if I could click on an object and learn about its properties (dimensions, material, etc.)	The software allows the user to click on any specific object and learn about its characteristics	2
	It would be nice if I could add annotations	The software allows the user to create annotations within the model	2
Other Assets	I don't want to rely on Wi-Fi to access the software	The software works off-line	4
	It would be nice if I could also view the model when not on-sight	The software gives the user the option to view a model remotely	3

3.0 Conclusion: Problem Statement

To increase productivity and efficiency in the construction industry, companies like Ellisdon need to replace 2D blueprints and other outdated systems with more modern means of communication through digitalization by adopting cost-efficient and easy-to-use AR/VR technology.

4.0 References

EllisDon, (July 2016). *EllisDon Ranked #2 by On-Site Magazine's list of Top 40 Canadian Contractors*. URL: https://www.ellisdon.com/news/ellisdon-ranked-2-by-on-site-magazines-list-of-top-40-canadian-subcontractors/