A REPORT

ON

AUGMENTED REALITY IN eCOMMERCE

MARKETING

By

Vishal Dheeraj Donkada   2018A7PS0239H

AT

SAMSUNG

Samsung R&D Institute - Bangalore

A Practice School II Station of

BIRLA INSTITUTE OF TECHNOLOGY & SCIENCE

PILANI, Hyderabad Campus

(March, 2022)

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ACKNOWLEDGEMENTS

ABSTRACT SHEET

BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE

PILANI,HYDERABAD CAMPUS

Practice School Division

Station: Samsung Research Institute   **Centre:** Bangalore

Duration: 6 months   **Date of Start:** January 17,2022

Date of Submission: March 29, 2022

Title of the Project: Augmented Reality in eCommerce Marketing

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1. Praveen Kumar, Staff Engineer Manager II, R&D Project Management, SRIB

2. Srivatsan Deenadayalan, Staff Engineer Manager, Android Application,SRIB

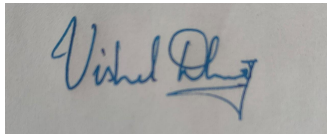3. Amit Bhandarkar, Senior Chief Engineer, Service, Service Framework,SRIB

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Key Words: Service Monetization, My Galaxy, eCommerce, Augmented Reality, Android Application

Project Areas: Augmented Reality, Android Development

Abstract:

The report discusses the impact Augmented Reality can have in the field of eCommerce and different ways of implementing it for the Samsung My Galaxy android application. We decided to implement the project with Android Sceneform, a wrapper for ARCore, before we go ahead with ARCore to get a better understanding of Augmented Reality and understand what this way of implementation is lacking compared to its complex yet sophisticated version.

Signature of Student   Signature of PS Faculty

Date – March 29, 2022

BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE
PILANI (RAJASTHAN)

PRACTICE SCHOOL DIVISION

Response Option Sheet

Station: Samsung R&D India   Center: Bangalore
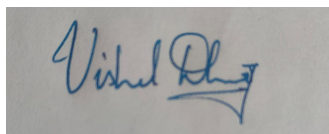
ID No. & Name(s): 2018A7PS0239H   Vishal Dheeraj Donkada

Title of the Project: Augmented Reality in eCommerce Marketing

Usefulness of the project to the on-campus courses of study in various disciplines. Project should be scrutinized keeping in view the following response options. Write Course No. and Course Name against the option under which the project comes.

Refer Bulletin for Course No. and Course Name.

Code No.	Response Option	Course No.(s) & Name
1.	A new course can be designed out of this project.	Augmented Reality
2.	The project can help modification of the course content of some of the existing Courses	NA
3.	The project can be used directly in some of the existing Compulsory Discipline Courses (CDC)/ Discipline Courses Other than Compulsory (DCOC)/ Emerging Area (EA), etc. Courses	NA
4.	The project can be used in preparatory courses like Analysis and Application Oriented Courses (AAOC)/ Engineering Science (ES)/ Technical Art (TA) and Core Courses.	NA
5.	This project cannot come under any of the above mentioned options as it relates to the professional work of the host organization.	NA

Signature of Student   Signature of Faculty
Date: 29 March 2022   Date:

TABLE OF CONTENTS

1. INTRODUCTION

Samsung Electronics Co., Ltd is a South Korean multinational electronics company headquartered in the Yeongtong District of Suwon. Samsung Electronics has assembly plants and sales networks in 74 countries and employs around 290,000 people globally. It is the world's largest manufacturer of consumer electronics in terms of revenue. As of 2021, Samsung Electronics is the world's second-largest technology company by revenue INR 78,651.20 crores, and its market capitalization stood at INR 3,25,58,45 crores, the 14th largest in the world. Samsung is a key producer of electronic components for Apple, Sony, HTC, and Nokia, including lithium-ion batteries, semiconductors, image sensors, camera modules, and screens.

It is the world's largest manufacturer of mobile phones and smartphones, owing to the success of the Samsung Galaxy brand of devices, which began with the original Samsung Solstice. The corporation is also a big seller of tablets, particularly its Android-powered Samsung Galaxy Tab line, and is credited with pioneering the phablet market with its Samsung Galaxy Note line of smartphones.

It has also created 5G-capable smartphones, like the Galaxy S22, as well as foldable phones, such as the Galaxy Z Fold 3. Since 2006, Samsung has been the world's largest television manufacturer, and from 2011 through 2021, it has been the world's leading mobile phone manufacturer. It is also the largest memory chip

manufacturer in the world, and from 2017 to 2018, it was the world's largest semiconductor corporation, briefly dethroning Intel, the long-time leader in the sector.

1.1 Samsung Research & Development Institute, Bangalore

Samsung R&D Institute India-Bangalore (SRI-B) is Samsung's largest research and development center outside of South Korea and a key innovation hub in the Samsung group. The research facility serves two key purposes for the Samsung group of industries: researching and creating unique services and products which can be integrated with Samsung's flagship products on a global scale across various sectors like AI, Networking, Multimedia amongst many others. The second key purpose of this research hub is to innovate and cater to the needs of the diverse consumer population of India. The Managing Director of SRI-B is Mr. Dipesh Shah.

1.2 Samsung My Galaxy

Samsung's My Galaxy, an app which initially used to offer very selective features, has undergone many changes in the recent 2 years to appeal to a larger audience. It now is a hub for Entertainment, Shopping, Samsung Care and other Samsung exclusive features. The team aims to make the app a one-stop solution for all the custom needs. The project assigned is an extension to the Samsung Shop which currently is the platform for users to buy Samsung electronics to

create an interactive and engaging experience for the consumer whilst buying electronics from the comfort of his home.

2. Integrating Augmented Reality into Samsung My Galaxy app

2.1 Augmented Reality

Augmented Reality is relatively a recent development in the field of Computer Science, it creates an interactive experience by rendering computer generated graphic content into the real world we reside in. The technology can be used to enhance the physical world we see through modalities including visual content and audio. As mentioned in the official wiki page, Augmented Reality can be defined as a system that incorporates three basic features: a combination of real and virtual worlds, real-time interaction, and accurate 3D registration of virtual and real objects.

2.2 Integrating Samsung Galaxy Shop with Augmented Reality

The project aims to enhance the shopping experience for users by making use of the features Augmented Reality has to offer.

a. Scan the physical space where the user wants to place the electronic device

b. Calculate the physical distances between the boundary points of the selected space

c. Display a list of items of selected category that can be fit into the space

d. Render the AR model of the electronic to give the user an insight into how the electronic might fit into his living space

e. Let's the user interact with an AR model from his phone and respond accordingly

We are trying out Android Sceneform, a wrapper on ARCore and plan to explore ARCore [a platform developed by Google to build augmented reality experiences] in the later phase of the project.

2.3 Implementations of Augmented Reality

2.3.1 Android AR Sceneform

AR Sceneform is an SDK wrapper developed around ARCore for simpler use cases with easier implementation. Though rendering AR content at any virtual point on a horizontal plane is pretty much straight forward, it limits the developer's freedom with a lot of restrictions while implementation. We decided to dabble with it to get a basic understanding of Augmented Reality and gain some experience that might make our lives easier when we work with ARCore at a later point of time. The google AR Sceneform was officially archived by Google in 2020 and will no longer be maintained as mentioned in an announcement.However, an unofficially maintained and seemingly popular version of Sceneform is available.

2.3.2 Elements in AR Sceneform

a. **Session :** A class which maintains AR system state and handles the session

lifecycle. It is the main entry point into the API. This class lets the user create,configure,start and stop a session

b. **ARFragment** : Fragment is a piece of Android activity which enables enhanced modular activity. A fragment has its own layout and its own behavior with its own life cycle callbacks and it should not be confused with a sub-activity. ARFragment implements a AR required fragment which does not require any additional permissions. This also lets the developer access ARSceneView and ARCoreSession.

c. **ARSceneView :** It is a Surface View that integrates ARCore to render a Scene. It renders camera images from the session to its surface. Displays animation to guide the user scan the surroundings better and highlights the renderable planes.

d. **Renderable :** A 3D model that can be placed on a Node anywhere in the scene. Generally, a Renderable consists of meshers, materials and textures.

e. **Node :** A node represents a transformation scene within a graph's hierarchy. It can contain a renderable for the engine to render. A node can have any number of children but has only one parent (another node or the Scene).

f. **Scene :**   The Scene maintains the hierarchical organization of a scene's content (Scenegraph).

g. **Anchor :** Anchor is a fixed location in the real world and has a fixed orientation even if we pan or rotate the phone camera.

h. **AnchorNode :** A Node that is automatically positioned in world space based on ARCore Anchor.

2.4 Understanding ARCore

ARCore is Google's platform for building augmented reality experiences. Using different APIs, ARCore enables your phone to sense its environment, understand the world and interact with information. Some of the APIs are available across Android and iOS to enable shared AR experiences.

ARCore uses three key capabilities to integrate virtual content with the real world as seen through your phone's camera:

Motion tracking allows the phone to understand and track its position relative to the world.

Environmental understanding allows the phone to detect the size and location of all types of surfaces: horizontal, vertical and angled surfaces like the ground, a coffee table or walls.

Light estimation allows the phone to estimate the environment's current lighting conditions.

2.5 Android Sceneform vs Google ARCore

Using Android Sceneform, we were able to measure distance between multiple points on a horizontal plane and render 3D models when we tap anywhere on the plane. The model is unable to read a vertical plane such as a wall, since the system requires a lot of detailing on a wall for it to make sense of its surroundings. The 3D model we rendered was also lacking some features such as lighting and shading.

Google ARCore is more like the fuller version of Sceneform and has more capabilities. It allows the developer to give more detailing to the 3D model with shading and lighting effects. We hope to achieve better performance and accuracy when scanning surroundings and render a more realistic model which is in more sync with the location the user wants to place it.

CONCLUSION

The report talks about how augmented reality can create a more interactive and informative experience for users from the comfort of their home. Up until mid sem we learnt about Google Android Sceneform and tried to implement as many features as possible with it. Though we were able to achieve only some basic functionality, it helped us understand the fundamentals of Augmented Reality and we hope to use this experience as an instrument to better comprehend the situation when we move to ARCore, the more complex yet sophisticated way of implementing Augmented Reality.

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