A MAJOR PROJECT REPORT ON
"RealCommerce app based on Augmented Reality"

Submitted to

Netaji Subhash Engineering College

In Partial Fulfillment of the Requirement for the Award of
Bachelor of Technology

By

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CERTIFICATE

It is certified that the work contained in the project report titled

"RealCommerce app based on Augmented Reality" by

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has been carried out under our supervision and that this work

has not been submitted elsewhere for a degree.

Date: 01st July 2021

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ACKNOWLEDGEMENT

Our team has taken efforts in this project. However, it would not have been possible without the kind support and help of many individuals and organizations. I would like to extend my sincere thanks to all of them.
We are highly indebted to **Prof. Suparna Mitra** for their guidance and constant supervision as well as for providing necessary information regarding the project & also for their support in completing the project. We would like to express our gratitude towards our **HOD, Dr Chandan Banerjee** and our college for their kind cooperation and encouragement which helped us in completion of this project.
We are thankful and fortunate enough to get constant encouragement, support and guidance from all teaching staff and friends which helped us successfully complete the project work.

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Rahul Gupta

Nikhil Kumar

ABSTRACT

Augmented reality (AR) is the concept of enhancing real physical world with an extra layer of information. Additionally, this should be done in real-time and also provide some means of interaction. In a computer application this can be achieved by analyzing a video capture feed using image analysis and computer vision algorithms and then rendering some object on top of the video image. Determining where and how to render the objects can be done in numerous ways. It is possible to use positioning systems such as GPS, gyroscopic sensors or different image analysis and computer vision algorithms to detect markers in the video feed. The latter is the approach discussed in this report. The main problem, and what is common for all approaches, is how to determine where the viewer is positioned and oriented in the real physical world. Augmented Reality is a relatively new field, where most of the researches have occurred in the past four years. AR will remain a vibrant area of research in the several coming years.

The goal of this project is to display the various items of an online shopping website in real world to have an approximate view of the products in real world.

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Chapter 1
Introduction

Augmented reality (AR) is the concept of enhancing real physical world with an extra layer of information. Additionally, this should be done in real-time and also provide some means of interaction. In a computer application this can be achieved by analyzing a video capture feed using image analysis and computer vision algorithms and then rendering some object on top of the video image. Determining where and how to render the objects can be done in numerous ways. It is possible to use positioning systems such as GPS, gyroscopic sensors or different image analysis and computer vision algorithms to detect markers in the video feed. The latter is the approach discussed in this report. The main problem, and what is common for all approaches, is how to determine where the viewer is positioned and oriented in the real physical world.

Augmented Reality is a relatively new field, where most of the research efforts have occurred in the last four years. Because of the numerous challenges and unexplored avenues in this area, AR will remain a vibrant area of research for atleast the next several years.

After the basic problems with AR are solved, the ultimate goal will be to generate virtual objects that are so realistic that they are virtually indistinguishable from the real environment.

Chapter 2
Literature Survey

This section signifies some of the scholarly and research works in the field of Augmented Reality and understanding its importance in todays' world. Augmented Reality is a relatively new field, where most of the research efforts have occurred in the past four years.

The objects in the real and virtual worlds must be properly aligned with respect to each other, or the illusion that the two worlds coexist will be compromised. Moreover, many applications demand accurate registration. The registration requirements for AR are difficult to satisfy, but a few systems have achieved good results.

The registration problem is far from solved. Many systems assume a static viewpoint, static objects, or even both. Even if the viewpoint or objects are allowed to move, they are often restricted in how far they can travel. Registration is shown under controlled circumstances, often with only a small number of real-world objects, or where the objects are already well-known to the system. For example, registration may only work on one object marked with fiducially, and not on any other objects in the scene. Much more work needs to be done to increase the domains in which registration is robust. Duplicating registration methods remains a nontrivial task, due to both the complexity of the methods and the additional hardware required. If simple yet effective solutions could be developed, that would speed the acceptance of AR systems.

Chapter 3

APPLICATION OF AUGMENTED REALITY IN E-COMMERCE

In this Topic, we have seen how to approach this project starting from problem statement to each and every step. We found what are the method, tools, platform and some basic codes.

3.1: PROBLEM STATEMENT

With constant increase in demand on the e-commerce websites there is a needfor innovative ideas. People need a better medium to understand the services they are using regularly and a change is always around the corner. With improvements in technology and the changes in our society, new and innovative methods or techniques always prove to be impactful.

3.2: PLATFORM AND TECHNOLOGY

3.2.1: Augmentation

Besides adding objects to a real environment, Augmented Reality also has the potential to remove them. Current work has focused on adding virtual objects to a real environment. However, graphic overlays might also be used to remove or hide parts of the real environment from a user.

Augmented Reality might apply to all senses, not just sight. So far, researchers have focused on blending real and virtual images and graphics. However, AR could be extended to include sound. The user would wear headphones equipped with microphones on the outside. The headphones would add synthetic, directional 3–D sound, while the external microphones would detect incoming sounds from the environment.

3.2.2: Unity 3D

Unity enables developers to create engaging AR experiences and reach the broadest possible audience. Deploy your AR project across a wide selection of hand held and head worn devices for Android and UWP and unlock new categories of apps by overlaying digital content on physical 3d objects.

We used the platform to develop our application and used the features of Unity to export the file to use in Android.

3.2.3: Vuforia

Vuforia is an Augmented Reality Software Development Kit (SDK) for mobile devices that enables the creation of Augmented Reality applications. It uses Computer Vision technology to recognize and track planar images and simple 3D objects, such as boxes, in real-time. This image registration capability enables developers to position and orient virtual objects, such as 3D models and other media, in relation to real world images when these are viewed through the camera of a mobile device. The virtual object then tracks the position and orientation of the image in real-time so that the viewer's perspective on the object corresponds with their perspective on the Image Target, so that it appears that the virtual object is a part of the real world scene.

It was used to convert our images to augmentable image which was further used to create the desired image.
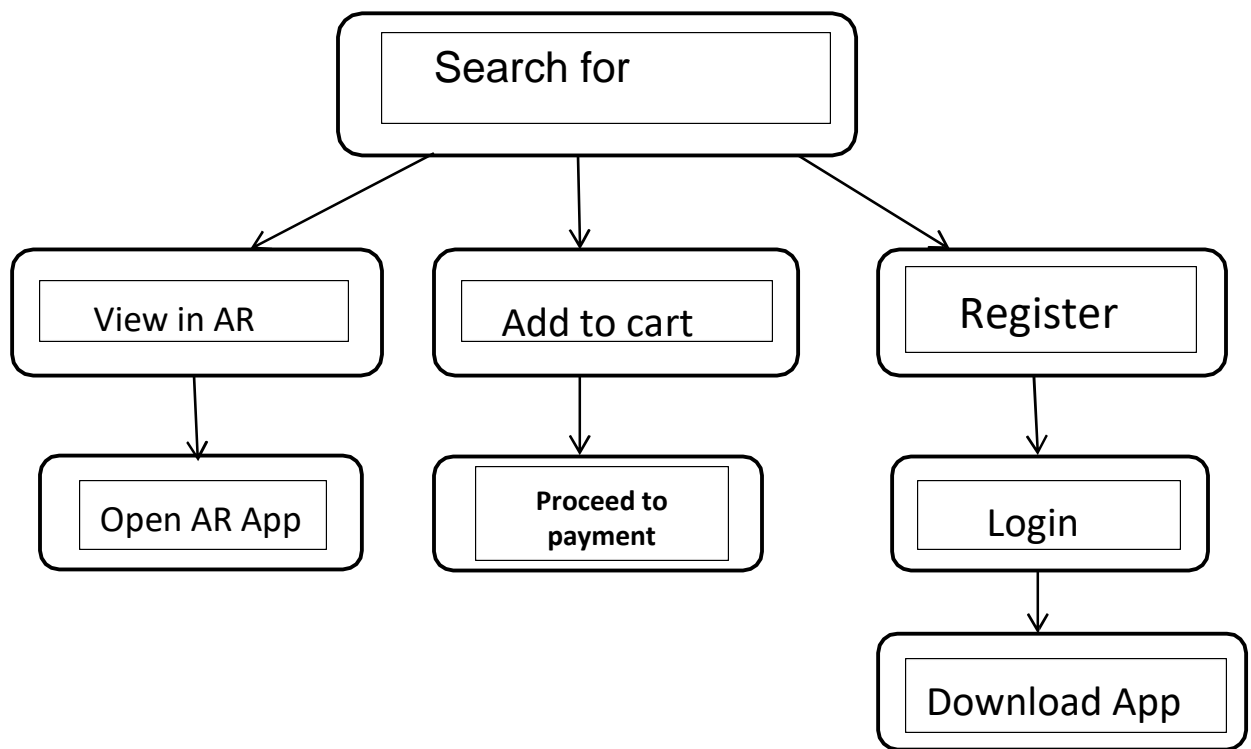
3.2.4: Coral Draw

CorelDraw is a vector graphics editor developed and marketed by Corel Corporation. It is also the name of Corel's Graphics Suite, which bundles CorelDraw with bitmap-image editor Corel Photo-Paint as well as other graphics-related programs.

<u>Chapter 4</u>

<u>Website Introduction</u>

Our project involves the usage of AR to display real time images of the mentioned products on our site. The objective of our project is to propose a new marketing strategy using the concept of AR. For which we created an e- commerce website which shows the basic model of how our idea is supposed to work.

```
                    ┌─────────────────┐
                    │   Search for    │
                    └─────────────────┘
              ┌───────────┼───────────┐
              ▼           ▼           ▼
        ┌──────────┐ ┌──────────┐ ┌──────────┐
        │ View in AR│ │Add to cart│ │ Register │
        └──────────┘ └──────────┘ └──────────┘
              ▼           ▼           ▼
        ┌──────────┐ ┌──────────┐ ┌──────────┐
        │Open AR App│ │Proceed to│ │  Login   │
        │          │ │ payment  │ │          │
        └──────────┘ └──────────┘ └──────────┘
                                       ▼
                                 ┌──────────────┐
                                 │ Download App │
                                 └──────────────┘
```

In every step in the framework it involves many sub-tasks.

Screenshot of Website
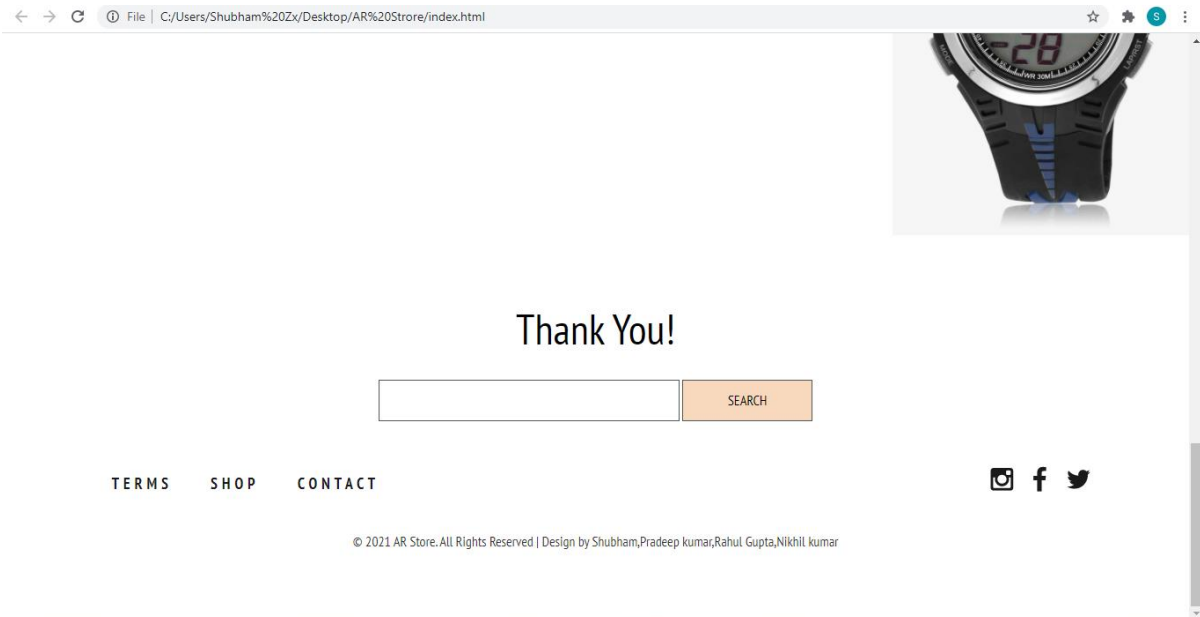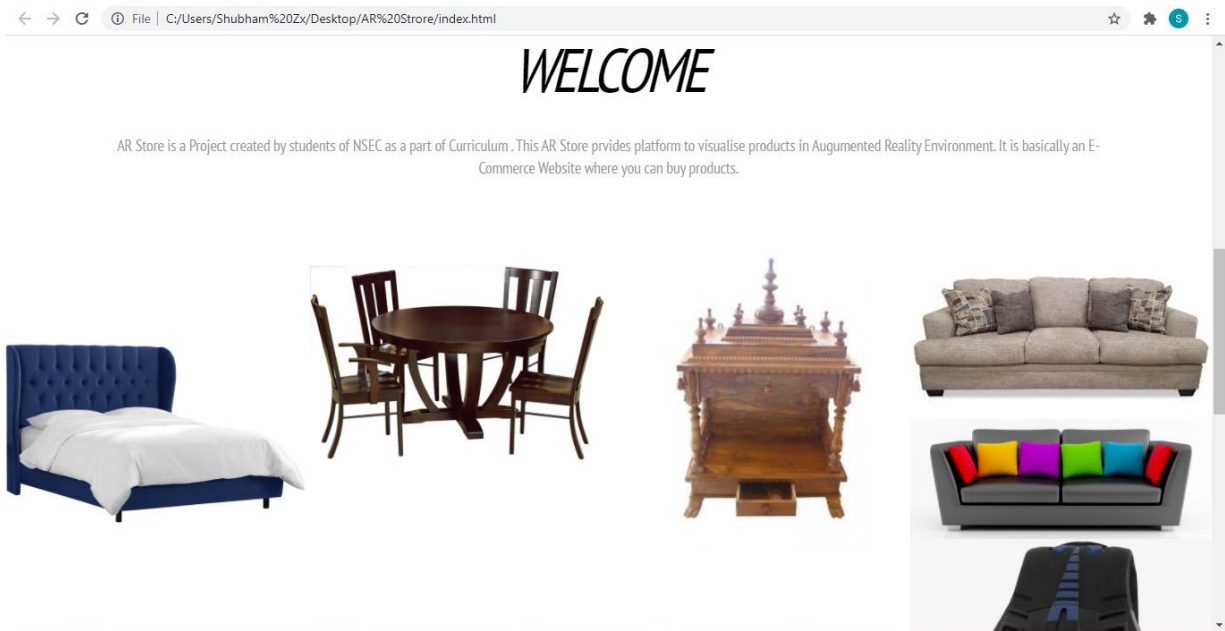
Architecture of Website

- Index.html

- This is the home page of our website. It is created using BootstrapPlatform.

- Brands.html
  This is used to display the products available in stock.

- Checkout.html
  This is used when a costumer has to proceed the payment process.

- Contact.html
  This contains details of every member involved in making this site.

- Download.html
  Lets us download the Reality AR application.

- Login.html
  Lets us login in the our account on site.

- Register.html
 Lets us register in case of a first time user.

Counstruction of website :

We used NetBeans IDE for developing the website and referred to bootstrapfor designing.

Chapter 5

Application Introduction:

 Next step in our model contains the linking of images from our website to our android application. Once we enter the application, we are supposed to input an item code which is available on the site.

After which our AR image can be seen. Image can be used to adjust and modify our views on how the is supposed to look in a customers' home. This makes a very accurate positioning of the product in the surrounding which helps us understand the product better.
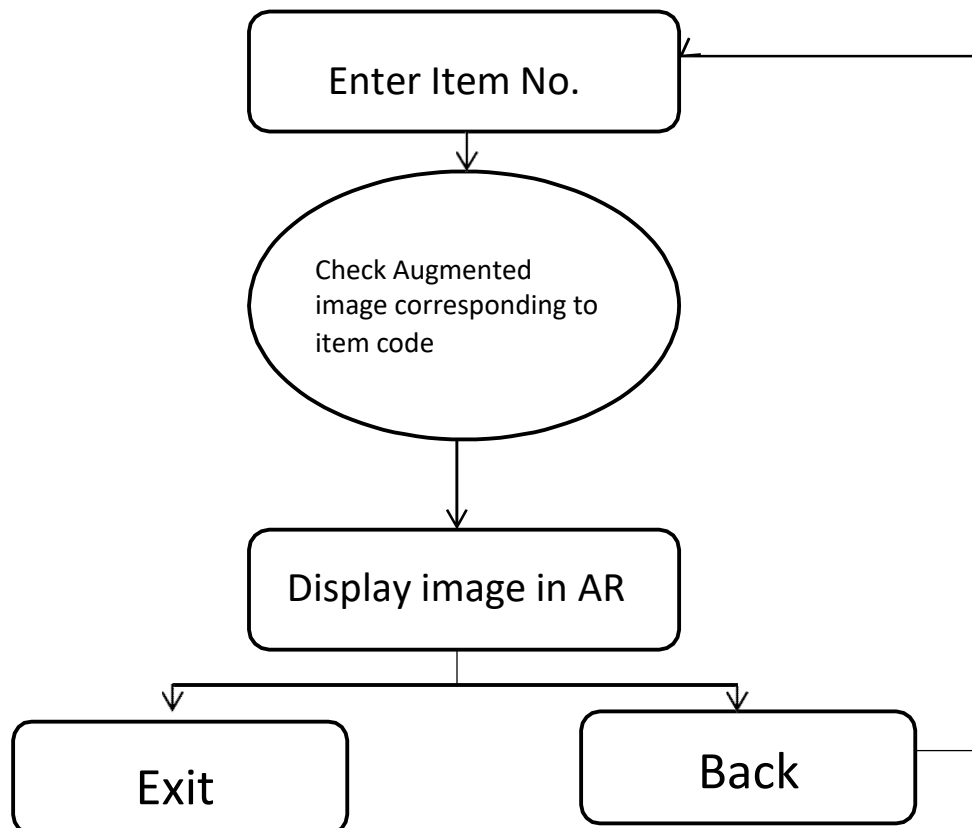
Screenshot of Application:
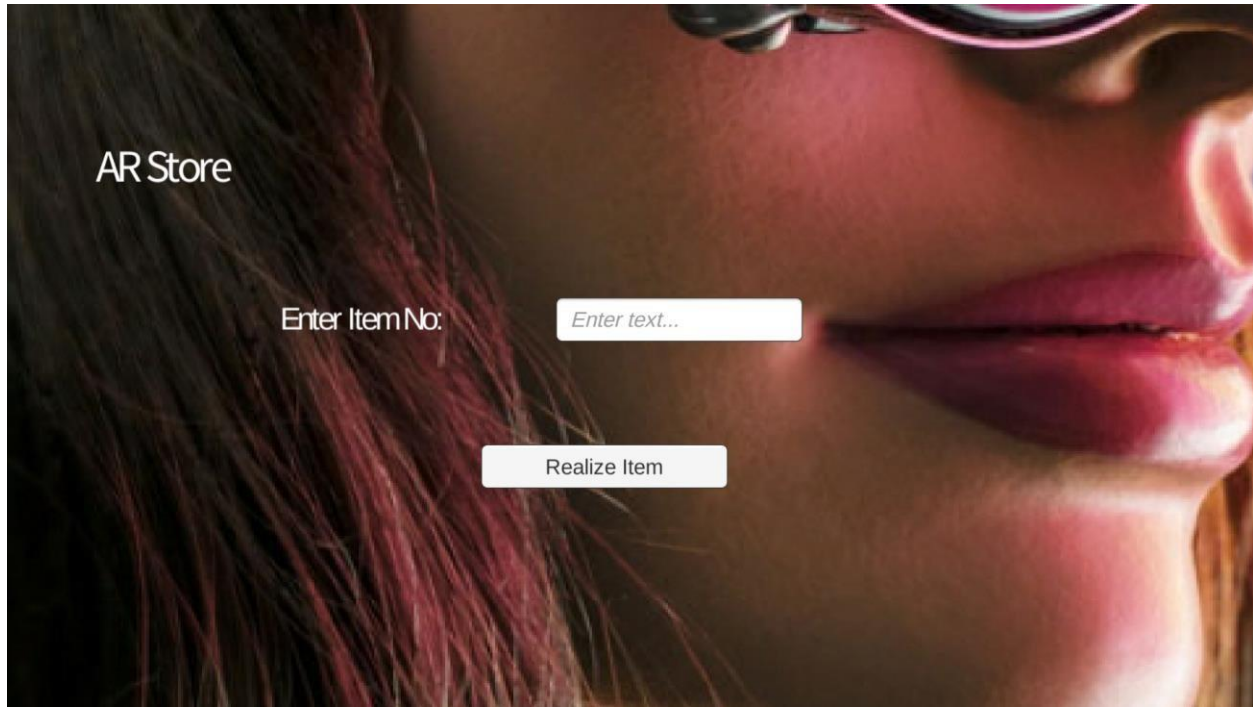
Construction of Application:

- Created using **unity IDE** for the front end development of the mobileapplication

- We used **Vuforia** to implement **AR Camera** to visualize products inreal-world.

- We used **Corel Draw** to make a object Augmented by removing itsbackground and re-pixelate it.

<u>Chapter 6</u>
CONCLUSION

Augmented Reality is far behind Virtual Environments in maturity. Several commercial vendors sell complete, turnkey Virtual Environment systems. A few monitor-based "virtual set" systems are available, but today AR systems are primarily found in academic and industrial research laboratories.

Taking a new approach towards e-commerce can be really fruitful and beneficial for our society. Changing our ways and being familiar with new technology will help us step into the new future with an edge.

Our heartfelt appreciation goes to **Mrs. Suparna Mitra** with regards to his feedback across the course of project from the initial phaseto the conclusion and for the valuable lessons learned along the way including collaboration within a group and the challenges involved in a large-scale software development effort.

Chapter 7
FUTURE REFRENCES

Our model lets our user experience the futuristic implications of AR. It makes it easier to use e-commerce sites. Which results in expansionof various business companies and lets a satisfying experience for ouruser.
It also helps us in the following:

- Saving time utilityshopping.
- Helping our customers to have a better understanding about ourproducts.
- Holds true for a Great Marketing Strategy.

From future perspective, our model can be extended to work and makeadjustment on the needs of people using this service. The performance of the AR can also be compared to many other technologies such VR. Furthermore, these models are limited to what they can do. Future implications may also include the current advancements being carried out right now, which can be implemented to increase the efficiency even more.

Chapter 8
BIBLIOGRAPHY

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- ECRC http://www.ecrc.de/

- MIT AI Lab http://www.ai.mit.edu/

- UNC Chapel Hill http://www.cs.unc.edu/

- U. Toronto http://vered.rose.utoronto.ca/etc-lab.html/

Chapter 9

Declaration

I declare that this written submission represents my ideas in my own words and where others' ideas or words have been included, I have adequately cited and referenced the original sources. I also declare that I have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in my submission. I understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

BY-

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