

# Product Information Finder

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## 1. Introduction

Picture a scenario in today's world where almost each and every one of us visit a supermarket at least once a week. Most often we see a new product, wonder what it is, ask the storekeeper to provide us with information on what exactly the product is, how to use it, what is it used for or simply look at the nutrition information on it. This application could save us a ton of time and effort not to mention the other uses it has. The user simple points his camera towards the product he needs to know about and using the image as an identifier the application tells you everything you need to know.

The primary goal here is to track live objects using the AR camera on the device and this is established using the ImageTarget feature on Vuforia. By using Vuforia's license key we can create databases and import them into unity (details on third party software used provided in section 3).

- How does it work?

To use the app simply download and install the .apk file posted on [box.com](#). Once installed the app will prompt you to permit the use of camera and audio, please provide yes to both as the app requires both of these features to function properly.

Note – No user data is stored in the device or the cloud.

Once Installed simply point the camera to the object about which you need more information. E.g.- a packet of chips - adjust the object and bring it closer if required for the app to detect it and once detected a template will be seen next to it along with the object augmented onto the screen (as shown in the image below). A Video is played on how to use the product or its commercial advertisement available in the database.



Image 1: Template displaying the information about the product along with the Video

This template will contain information about the origin and the nutritional facts. More information can be added onto the template if required.

## 2.AR Application Design

- Accuracy

Perhaps the biggest advantage of using this application is the accuracy. The image recognition is very accurate and identifies each and every feature on the label. Other alternatives such as barcode scanners are not accurate and it's difficult to find the scanner label on some of the products.

- Ease of access

Users most often like to watch a video on how to use the product rather than reading textual instructions. This makes it more effective when competing with other alternatives. It is very easy to update the database when a new product is added on to the inventory and most of the stores have a fixed inventory. It is also easy to replace the target image when and if the label gets changed.

### 3. Integration

- Unity 3d with Vuforia Engine

Having worked with AWS Sumerian before this is a new experience with Unity3d. I downloaded and installed the latest version (Unity 2020.4.13f1). This platform was chosen because it is compatible with Vuforia AR engine and it is very easy to compile/build the code and deploy on to any platform such as Android or IOS.

- About Vuforia

Vuforia is an augmented reality software development kit for mobile devices that enables the creation of augmented reality applications. It uses computer vision technology to recognize and track planar images and 3D objects in real time.

It comes with an AR library on the Vuforia Engine which enables image tracking and is to be used later in the project to identify images and augment 3d objects on top of it.

### 4. User experience

All the requirements such as combining real and virtual world, Realtime interaction, music have been added to the application. The only feature that has not been added is the voice recognition feature since it was not seen as a required one considering the use cases of the application. In place of the voice recognition the video player has been added to make the user experience better.

### 5. Conclusion

The design of the application was altered considering a few different scenarios since the development started 2 months ago. The initial plan of including an advanced after-effects video to augment on the screen was replaced with a simple template made using adobe photoshop. The primary reason for this is the cost associated with purchasing the license for applications that are used to create the after-effects and also the complexity of using such software. They require a lot of user training and many of the features are not available for free versions.

The second design change was using an image for identification instead of a Realtime 3d object. 3d Objects have a .od extension and can be created using the Vuforia object scanner app which is an android app that scans a 3d object and creates a .od file. The problem with Vuforia object scanner app is that it does not detect the size of the object accurately. Many attempts were

made to capture the object (shown in Image 2) but none of them could be used as a marker. Often the dome which detects the size of the object expands too much decreasing the accuracy of the model.

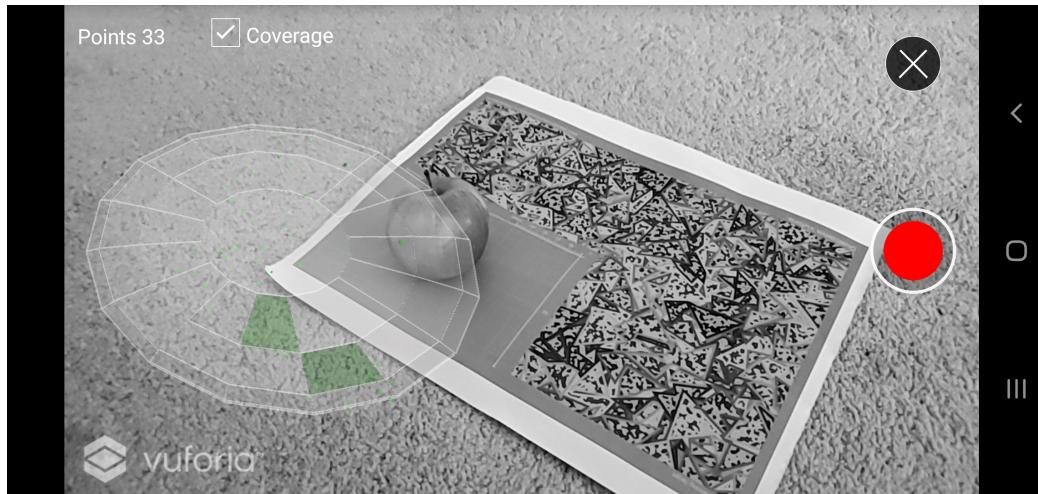


Image 2: a snapshot of the Vuforia object scanner app failing to detect the true size of an object (apple)

The Vuforia object scanner app needs a lot of work and although it is very easy to use it does not serve its purpose due to the inaccuracy in detecting the true size of an object.

## 6. Future Scope

There are several upgrades that could be made to the application such as updating the prices dynamically in the template. We could use advanced search using Artificial Intelligence and display the product availability across different stores and use recommendations to let the user choose the best product. The second one is including the share to different user option which lets the second person receive the information on his phone while the first person is in the store.

## 7.Appendix

- **Lessons learned**

Building this application has been a pleasant experience for me. It has induced me to think about the future of AR and the immense potential it has in shaping how we perceive a new world using this technology. Learning to build applications on unity was one of the outcomes that I had hoped for and I am happy that I have been able to do so. I had problems initially with the build versions for unity since there are many updates that are launched often. I had some trouble deploying the application on android and majority of my time was spent on configuring it for android using android SDK and this almost took a week to resolve. Finally, I was able to install the correct version of SDK which was compatible with unity and deployed the application on my phone.

I also got to learn a few tricks and hacks on how to use adobe photoshop effectively and I have a newfound respect for graphic designers since now I know how difficult it is to create after effect graphics which we often see in sci-fi movies. All in all, this project turned out to be better than the VR project in my opinion since the support of unity and Vuforia on the internet is excellent.

- **Feedback**

The project really helps us practically understand the course and provides us with a real opportunity to apply our understanding of AR applications. I have had great support from Mobai which was an added advantage as compared to the VR project. The guidance has been thorough and detailed on which platform to be used and which of them would suit my requirement. Although there are a few doubts regarding AR/VR as an upcoming and booming technology in the next few years learning and educating people on how to use them would definitely improve the scope this subject has and I would recommend others to take this course.

- **User Guide**

The application can be only be deployed on android devices. The installation and usage has been covered in detail in section 1.1 of this document.