AR College Magazine

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Abstract - *Augmented Reality is an emerging technology and the applica- tions of technology are still not fully unveiled. This paper explores a new application of augmented reality for a new direction in ed- ucational book publishing, which aims to bring interactive learn-ing experience to life. The project takes printed images on book to the next level by applying Augmented Reality technology to provide a unique fascinating experience to its readers on mobile devices. Augmented Reality (AR) technology composing with an- imation brings new digital entertainment experience to the reader of books. The key feature of this paper uses the technology presents auxiliary information in the field of view of an object printed on book automatically without human intervention. The project uses the technology with iPad mobile device to display 3D models, 3D animations, video splaying, websites and web server connectivity for children education. The results and evaluation of the project shows the interactive 3D animation and selfassessment functions significantly support students to improve their learning experience and performance. The software product of this project, from the business perspective, creates a new business marketing dimension in digital publishing and increases the selling profits in the book publication business.*

Key Words: **Augmented Reality, Mobile Computing, Multimedia Services, E-Learning**

1. INTRODUCTION

1.1 Title

College Magazine using Augmented Reality

1.2 Project Option

Internal Project

1.3 Internal guide

Prof. Jaya Mane and Prof. Shobha Raskar

1.4 Problem Definition

Developing an Augmented Reality application on, College's yearly magazine, trying to make it feasible, innovative and interesting.

1.5 Motivation

We intend to make college brochures contactless, exciting and future ready.
The motivation for this project comes from our college it-self,for which we wish to implement AR based brochures and magazines.
This will not only make our college the trail blazers but also showcase our college as technology driven and future ready!

1.6 Goals and Objectives

We intend to take college Brochure and magazine to the next level by Augmented Reality.
This will make the experience of the user immersive and contactless.
By using Augmented Reality (AR) we are also removing the boundaries of showcasing information through images and illustrations.

2. Literature survey

We surveyed for some researches done on some similar projects. There are some researches done in this area

Basic Development of the Active Textbook System consisted of a General book and a Portable Electronic Terminal[1] Elsevier B.V. Peer-review under responsibility of KES International,2017

Improvement of the Active Textbook System[2] Grant-in-Aid for scientific research from the Min- istry of Education, Culture, Sports, Science and Technology of Japan,2017

Augmented Reality Books: An Immersive Approach to Learning[3] Information Technology Dwarkadas J. Sanghvi Col-

Markerless 3D gesture-based interaction for hand-held Augmented Reality interfaces[4] 2013 IEEE International Symposium on Mixed and Augmented Reality (ISMAR)

3. Software Requirement Specification

3.1 Purpose & Scope of Document

This document is intended to give detail description of a system where Augmented Reality will enhance the magazine into a new three dimensional way.

3.2 Scope of Project

This will be all new mobile application for viewing the brochures and magazines in android(future plans for IOS) devices with AR enabled.

The download QR for application will be placed around hotspots of the college such as entrance and library.

Once the application is installed on the device ,by pointing the camera on surface you can view the brochures and magazines in their full glory.

This will also contain 3D objects,hovering videos and graphics for full immersive experience.

Our augmented brochures and magazines will also contain text information as the traditional one.

4. Publishing with Augmented Reality

The paper explores a new application of augmented reality for a new direction in educational book publishing, which aims to bring interactive learning experience to life.

4.1 E-Learning and Augmented Reality

Pushing e-learning becomes a trend in most countries, which, from environmental point of view, can reduce the use of tons of papers in printing, and, from physical health, cut down the weight of chil- dren's school bag. Another critical reason is that, from educa- tional aspect, e-learning can improve the experience, quality and efficiency of learning of students. This paper aims to apply the Augmented Reality (AR) Technology to educational book publish- ing, which can not only improve the learning quality through e- learning approach, but also provide related extra content of the textbook, such as 3D models 3D animations, audios, videos and websites for reference. They can increase the student's interest in learning and build the independence of selflearning skills.

4.2 Continual Updates Learning Platform

Educational Publishing with Augmented Reality is not only bring- ing the knowledge to life with the help of augmented reality tech- nology, but also providing more number of up to date information, adding a unique and innovative track to this revolutionary technol- ogy. We consider one good example in applying augmented reality features on teaching the topic in stars and constellations in science subject by providing a galaxy model of with 3D animation which pulls out from the web site server. The web server is the platform provides continual updates from the professional and amateur as- tronomers who share what they

learnt and expressed in words or video format to best describe they found. This feature allowed the readers to see the latest information in real time by using the Augmented Reality app via their smartphones or tablets.

5. System Design and Implementation

This project has chosen Qualcomm's Vuforia Engine to develop the application. Qualcomm is a chipset manufacturer who focuses on mobile devices and lots of smart phones are using Qualcomm's chipsets. Vuforia Engine is an outstanding product of Qualcomm. It has an AR software development kit (SDK) that supports Unity 3D, XCode and Eclipse and truly integrates and seamlessly work with them. Vuforia is free to developers and keeps adding remarkable features which help developers to implement interactive gaming applications. Compared with other toolkits, Vuforia En- gine provides detailed development documentations and examples and resources which have thus far not been found in other engines. One most favorable feature is that the output of Vuforia Engine can be installed on iOS environment and android as well, which definitely reduces the development costs, time, and recourses in projects if the applications are required to provide software ver- sions on both iOS and Android environments. Our project employs Vuforia which is one of best choices to develop AR application to meet two mobile business worlds. The system architecture of the software has been divided into three major components they are: Target Management System, Vuforia Engine, and Rendering Engine.

5.1 Vuforia Engine

As previously stated, Vuforia Engine consists of an AR software development kit (SDK) that has to work with Unity 3D, XCode and Eclipse. Vuforia has libraries that provides software components for augmented reality (AR) software developers in programming interactive 3D animation on mobile devices.

Target management is the database in Augmented Reality. After the database created, the augmented reality applications can use Vuforia Engine to control the mobile visual devices operations such as start the camera, read the image from the camera, and compare and identify object with the AR database which stores the tracking objects information. This engine is the heart in the application in Augmented Reality technology. The functions provided in engine form the core and technical parts of our software system.

5.2 Rendering Engine

Rendering Engine lets developers to integrate the programming scripts, assets and coding logic to form an application. The design and implementation of the project is fully based on the object oriented approach with the functions provided in engine to construct the core and technical parts of the software system.

The Vuforia Engine tracks the objects and searches on the database; and the rendering engine renders the virtual object placed in. Fur- thermore, the virtual objects allow to code

with different program- ming scripts producing the 3D motions of the targeting object, and let users to control motions of the objects, such as rotating, play- ing the sound and audio and video. Hence, this rending engine focuses on the implementation of the interface and interaction of the application developed by programmers.
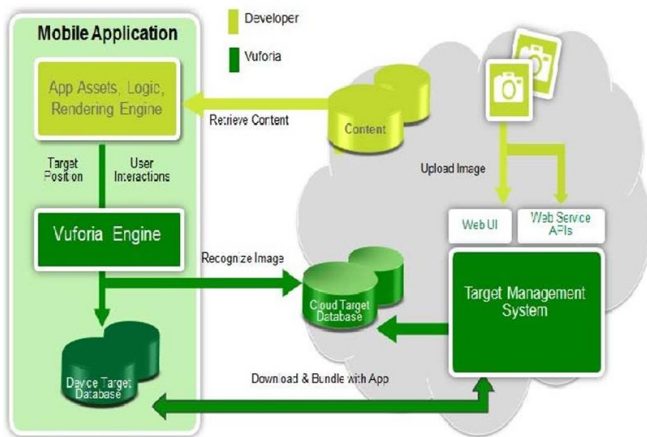
5.3   System Implementation Flowchart

Figure 1. System Architecture

Figure 5.1: System Implementation Flowchart
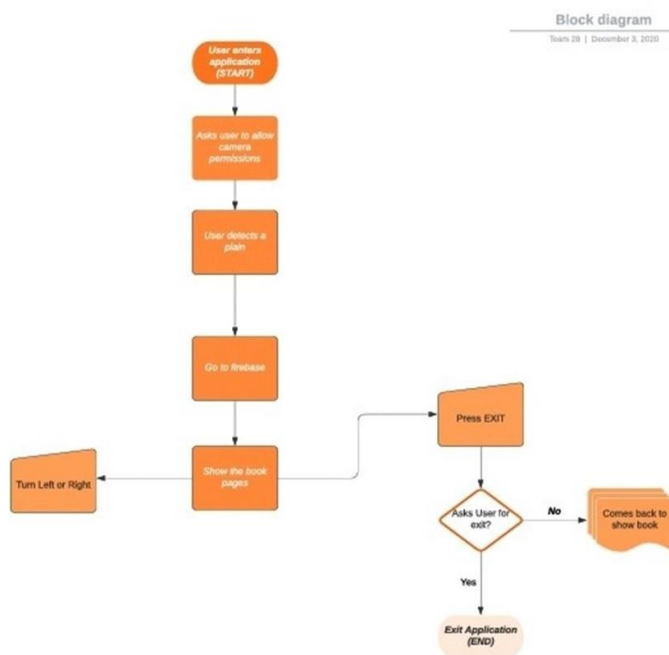
6. Block Diagram

Figure 6.1: Working of App

7. CONCLUSIONS

 Augmented Reality (AR) is an emerging technology area. The ap- plications of AR technology are still not fully unveiled. AR technology enhances a user's perception of and interaction with the real world. The virtual objects display information that the user cannot directly detect with user's own sense. The information conveyed by the virtual objects helps the user to perform real-world tasks. This new form of human-computer interaction can be applied to different industry areas including digital book publishing. We foresee that Augmented Reality (AR) technology would be one of the major technologies to revitalize the digital composition of animation with real scenes and to bring new digital entertainment experience to the viewers. We propose to apply Augmented Reality technology for digital entertainment by building an enabling environment to support the development of Augmented Reality entertainment applications for digital book publishing. We will bring in the new business opportunity enabled by Augmented Reality technology for education and entertainment sectors. We believe the project can make new services possible for book publication business with cost effective technology for daily use in content creations, and generate innovative, brand new entertainment experience for the readers.

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