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Review JoOSDT

AR Based Digital Newspaper

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Abstract

Traditional newspapers and magazines are a popular way to keep up with current events and new items. Furthermore, these printed materials only provide static information to readers. The Indian newspaper industry grew by relying on advertising, which started to fall apart before the pandemic. As a result of the Pandemic Shutdown, news outlets have closed and journalists have lost their jobs. To resurrect their fortunes, they are attempting to generate income through the digital medium. The increased use of online search functions, mainly through Google, has also influenced reader habits. Augmented Reality in newspaper publication can help readers become acquainted with a new reading pattern. Augmented Reality Technology for Newspapers can be an intriguing feature that takes readers beyond the printed pages. Thanks to advancements in Unity and Vuforia, Augmented reality can help journalists provide information more conveniently while also providing viewers with a closer look at news stories. The results and evaluation of the newspaper expressions the interactive way of reading newspaper experience and can increase newspapers circulation.

Keywords: Augmented Reality, Vuforia, Unity, Newspaper, Digital Medium

INTRODUCTION

Augmented reality is such a technology within which we are able to see the objects in physical world visually, providing a composite read. Reading newspapers is a popular way to keep up with current events and politics. Moreover, these printed materials only provide readers with the static information. Readers may seek to know more about a product mentioned in an article or watch video clips related to an event mentioned in the news at the time they read the article or news. We are developing an application for mobile devices that will provide additional information and multimedia to readers by incorporating augmented reality into traditional newspapers. By viewing an article in a traditional newspaper through his or her mobile device, a user can enjoy extra rich multimedia information on a product or news on his/her own mobile device.

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The system detects image in article and then it shows video related to detected image in a mobile device and provides a reader with video subtitles and voice over for news. AR technology creates models from the content that elevate a brand new experience for readers of all ages. In this project, we are executing an app in which we will be taking an communicating newspaper with collaborative news images. The live images in the newspapers will add extra detail and colour to living and adapting. We will use Vuforia's most recent feature to transform our newspaper into a magical newspaper that can play content relevant to the image that is being detected. Our method

will transform the newspaper into something interesting, re-creating the experience of reading a newspaper.

LITERATURE SURVEY

In Paper [1], AR Image Registration methods were compared. The traditional fast and rotated ORB oriented BRIEF algorithm has a low rate of registration, inefficient real-time performance when it comes to Augmented Reality (AR) image registration. Experiments show that, when compared to both the ORB algorithm and the FREAK feature, the proposed algorithm's registration rate is up by 1.1% and 8.4%, respectively, and the generation time is down by 0.13s and 0.12s. They concluded that the proposed AR image recordkeeping systems can achieve a higher feature point registration rate, resulting in improved real-time performance and better satisfying the needs for AR image registration application.

In Paper [2], they are developing an Augmented Reality Application for Newspapers, which will include an interactive newspaper with interactive images. Their newspapers will include live images, adding a new dimension to newspaper reading. They used the features of ARK it to transform a print newspaper into a newspaper that plays media related to the image that is being detected. It is essentially a framework for implementing augmented reality and is similar to other frameworks for implementing augmented reality. Currently popular frameworks for implementing augmented reality, particularly when working with Unity.

They argued about the use of augmented reality in the journalism industry in Paper [3]. In the news, photorealistic images are used to support journalistic standards of accuracy, authenticity and Visual journalism, According to these lofty goals, news should present events in a comprehensive, realistic, and truthful manner. These norms lay the groundwork for journalism's role in society as a truth-teller. AR, like video and multimedia, has the potential to transform newspapers and journalism through its image recognition and object recognition capabilities.

In Paper [4], they investigated AR Image Recognition Technologies Using Deep Learning Algorithms in MNIST database recognition tasks, Furthermore CIFAR-10 database compared by modifying the activation function, pooling selection, and other feature maps of improved convolutional neural network. The research According to research findings, dynamic image recognition results in the MNIST database have dropped to a very low error rate under certain experimental conditions and the error rate in CIFAR-10 database was also ideal.

The capabilities of AR Core and AR Kit Framework were compared in Paper [5]. They compared both platforms using specific parameters, created test applications, and ran comparison tests. Their discovered results can help in selecting the best framework to accelerate the prototype and development of AR/VR applications. Their work includes a comprehensive comparison of these original frameworks via universal presentation, external plan mapping, the effect of light on scanning and mapping quality, and so on.

In Paper [6], 3D object detection was done using Vuforia for augmented reality and analysis of research based on Vuforia working principle was done. The study was also carried out by covering a portion of the object's surface. Their final concluded results showed that the Vuforia was able to detect those objects well with a success rate of 87.5%. That achievement rate of object recognition strongly partial by features.

COMPARATIVE ANALYSIS

In Figure 1, we performed a comparative analysis by comparing the items they used and distinguishing their similarities and differences.

Papers / Parameter	An augmented reality image registration method based on improved ORB	Augmented reality application for newspapers	Examining augmented reality in journalism: presence, knowledge gain, and perceived visual authenticity	Augmented reality dynamic image recognition technology based on deep learning algorithm	Capabilities of ARcore and ARKit platforms for AR/VR applications	Performance analysis of augmented reality based on Vuforia using 3D marker detection
AR used	Yes	Yes	Yes	Yes	Yes	Yes
ARCore used	No	No	No	No	Yes	No
ARKit used	No	Yes	No	No	Yes	No
Vuforia used	No	No	No	No	No	Yes
Deep learning used	No	No	No	Yes	No	No
ORB used	Yes	No	No	No	No	No
Android app	No	Yes	No	No	No	No

Figure 1. Comparative Analysis of Literature survey

PROBLEM STATEMENT

Newspaper Reader habits have changed due to the increased usage of the online search function, mainly through the big search engines notably Google. Instead of reading general interest media such as newspapers, readers are more likely to use specialised searches to find specific writers, blogs, or sources of information, rendering newspapers largely obsolete. India's newspapers grew by relying on advertising revenue, a reliance that began to fray before the pandemic. Some newspapers have gone out of business, and also many reporters and journalists lost jobs as a result of pandemic shutdown. To resurrect their success, they are now, belatedly, attempting to transition into digital media for income generation. So, we are using Augmented Reality and taking advantages of new digital news boom for readers to return to newspapers again. We will be using latest feature of Vuforia to turn our newspaper into a magical newspaper that can play the content that is relevant to the image that is being detected. This will turn boring newspaper into something that is useful and recreate experience of reading the newspaper. This visualisation has the potential to entice readers to return to newspapers. Our AR Smart newspaper will play a role in assisting journalists in revealing information more simply while providing viewers with a more in-depth understanding of articles.

PROPOSED SYSTEM

The Primary goal of our project is to create an android newspaper application which uses augmented reality and languages used will be swift, ShadderLab, C#. We will use Vuforia's most recent feature to transform our newspaper into a magical newspaper that will play content relevant to the image that is being detected. We will include news for various categories and will include relevant content related to it in our application.

We are using unity for development of aur application, we will be creating multiple image targets for different types of news in our project. For database we are using Vuforia sdk. We will build our application for android using unity android sdk. In our application, the device camera searches for a scene, and when it recognises the scene using Vuforia Image Tracking, by scanning the image in the newspaper, the video is played in its position, enhancing the reading experience [7].

From a business standpoint, the software product of this project creates new business marketing dimensions in digital publishing and increases selling profits. Our AR Smart Newspaper could be very helpful for newspapers to attract young audience to newspapers due to augmented reality experience and it can also attract older. By reading an article in a traditional newspaper, the audience of a

newspaper as a user can enjoy extra rich multimedia information on a product or a news story via his or her mobile device [8].

Flowchart

Figure 2 depicts the project's actual flow. The user will first launch the application, and the camera in the application will attempt to detect an image on the newspaper using a marker. Following the reading of the marker, a video contest related to the image will be played on the image in our application.

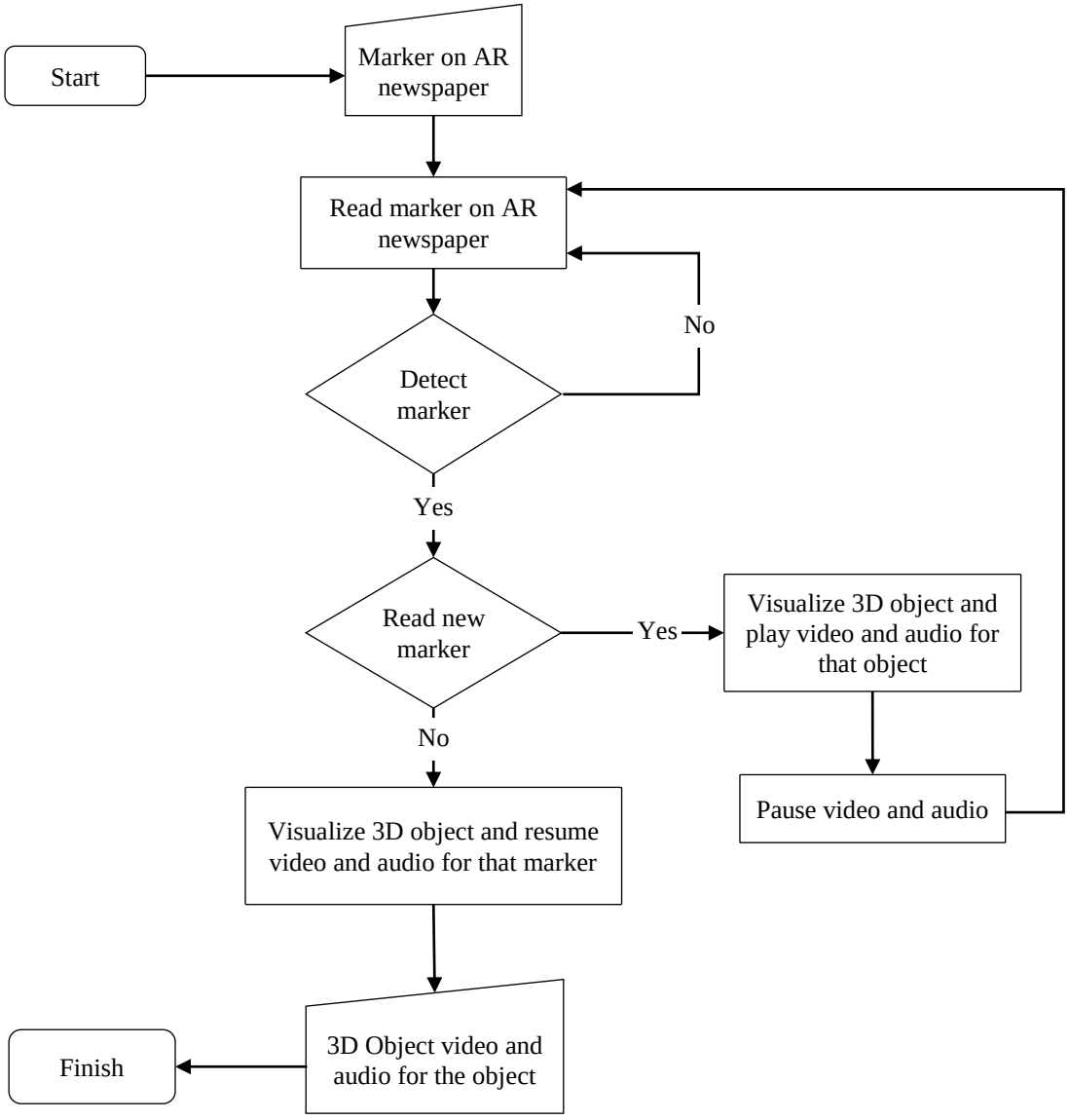

Figure 2. Flowchart.

Block Diagram

Figure 3 depicts the application's architecture, which employs an AR camera to capture the real world and then processes it with a virtual object to generate a video output on a newspaper image. Using a mobile phone's built-in camera that supports Augmented Reality, the method scans newspaper images and matches their features to content stored in the Vuforia database. Following that, the unity 3D rendering unit will import Vuforia video content into the mobile application, and the video will be played on a newspaper image with subtitles related to that news [9, 10].

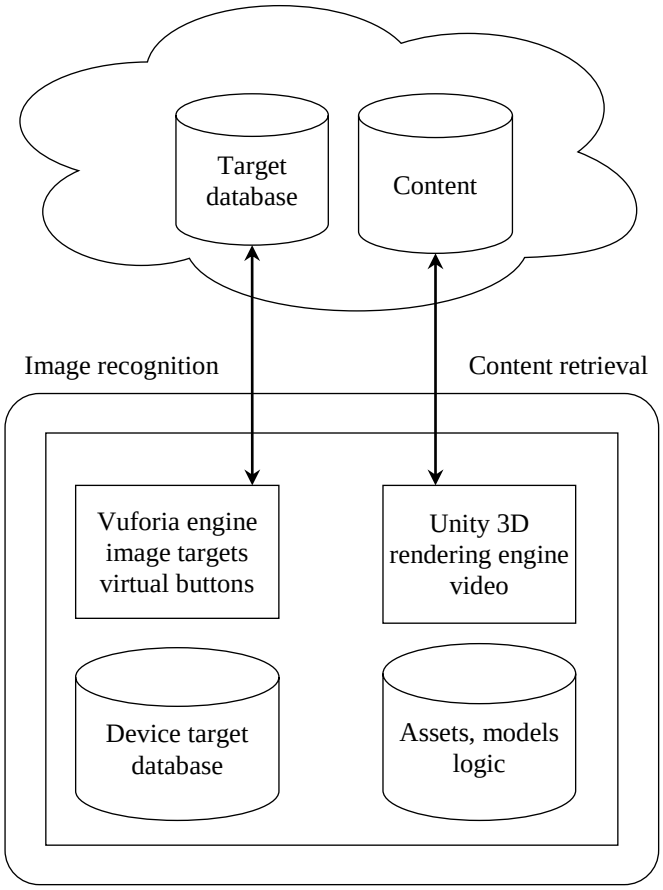

Figure 3. Block Diagram.

REQUIREMENT DETAILS

Software is a collection of instructions that run on a computer, whereas hardware is a physical device that is used in conjunction with or on the computer. The Technical descriptions of the computer's components hardware and software are listed below:

Hardware Specification

The basic hardware components used are:

- Android Smartphone
- I3+ Processor System
- Sensors like Accelerometer, Gyroscope, Magnetometer
- Camera

Software Specification

A software system description is provided below:

- Vuforia
- Unity
- Android Studio Sdk

IMPLEMENTATION

The main goal of our project is to make an android newspaper application which uses augmented reality. and languages used will be swift, ShadderLab, C#. We will be using latest feature of Vuforia to turn our newspaper into a magical newspaper that play the content that is relevant to the image that is being detected. We will include news for various categories and will include relevant content related to it in our application.

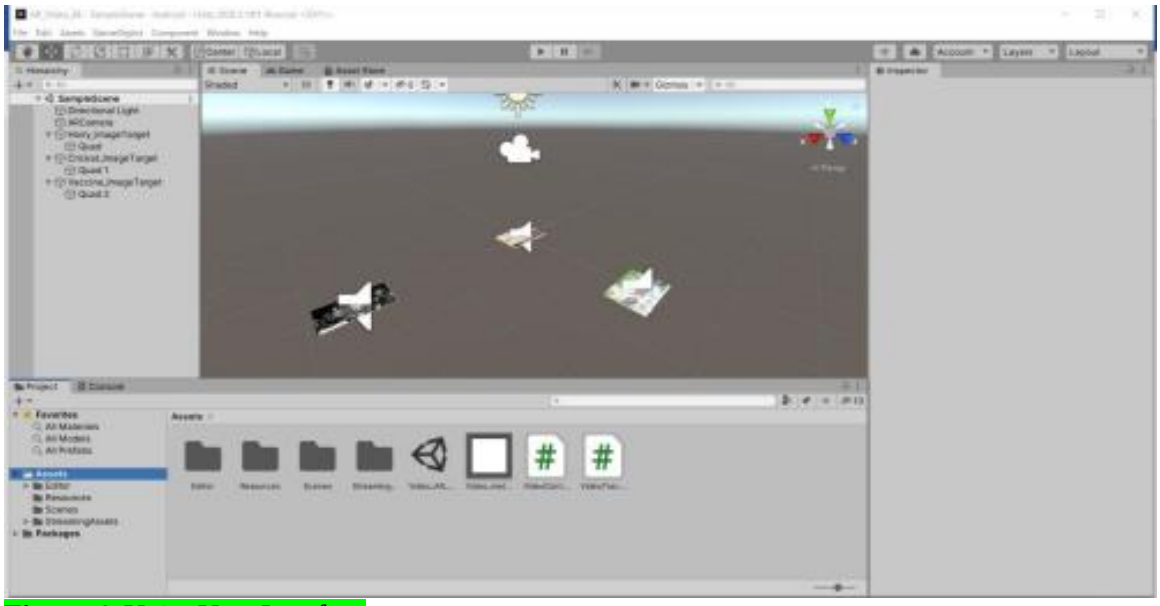

Figure 4. Unity User Interface

We have used Unity for texturing a rendering of elements and video, image assets (Figure 4). Then we loaded Assets into unity rendering scene hierarchy by using Game Objects like AR Camera and image target. We activated the vuforia engine play mode inside the game view by pressing the play button to watch our scene in action. The vuforia framework allows the user to set rendering play mode, that can used as mode to test vuforia targets (Figure 5).

We imported image assets from the Vuforia Target Manager via Image Target databases and added relevant target video to Unity Video Renderer. We have used C# script edited in Visual Studio to Play and Stop the Video Player by placing the script on the Image Target.

Figure 5. App Implementation in Unity.

For Exporting our Unity Application Rendering Project to android application in apk format we have used Android Studio SDK with Compatibility from Android 5.0 version to the latest edition of android. We used the Vuforia Engine for Android SDK to create our Vuforia image target assets. After Successful Build of project, we have exported it into an android application.

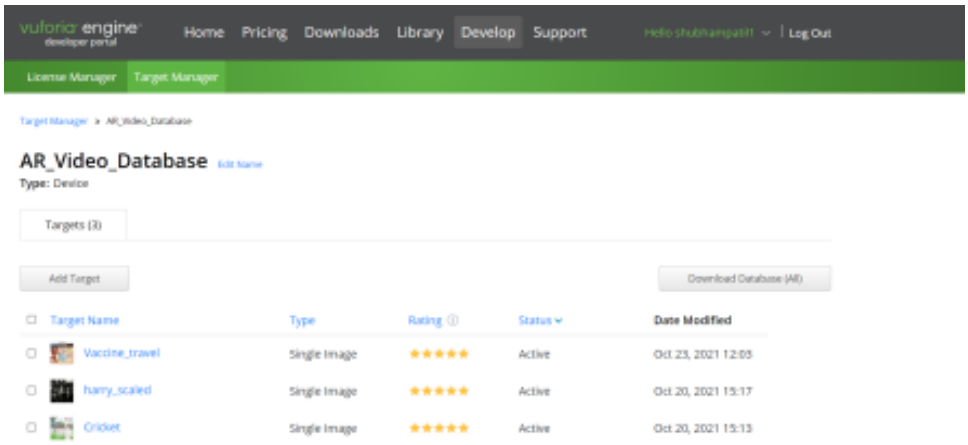

Figure 6. Vuforia Database.

We used Vuforia as a database for our Image Targets (Figure 6). The target manager then accesses the images and generates data as well as visual representations of the target's feature. Then we imported them as a package that can be used in both the application and Unity.

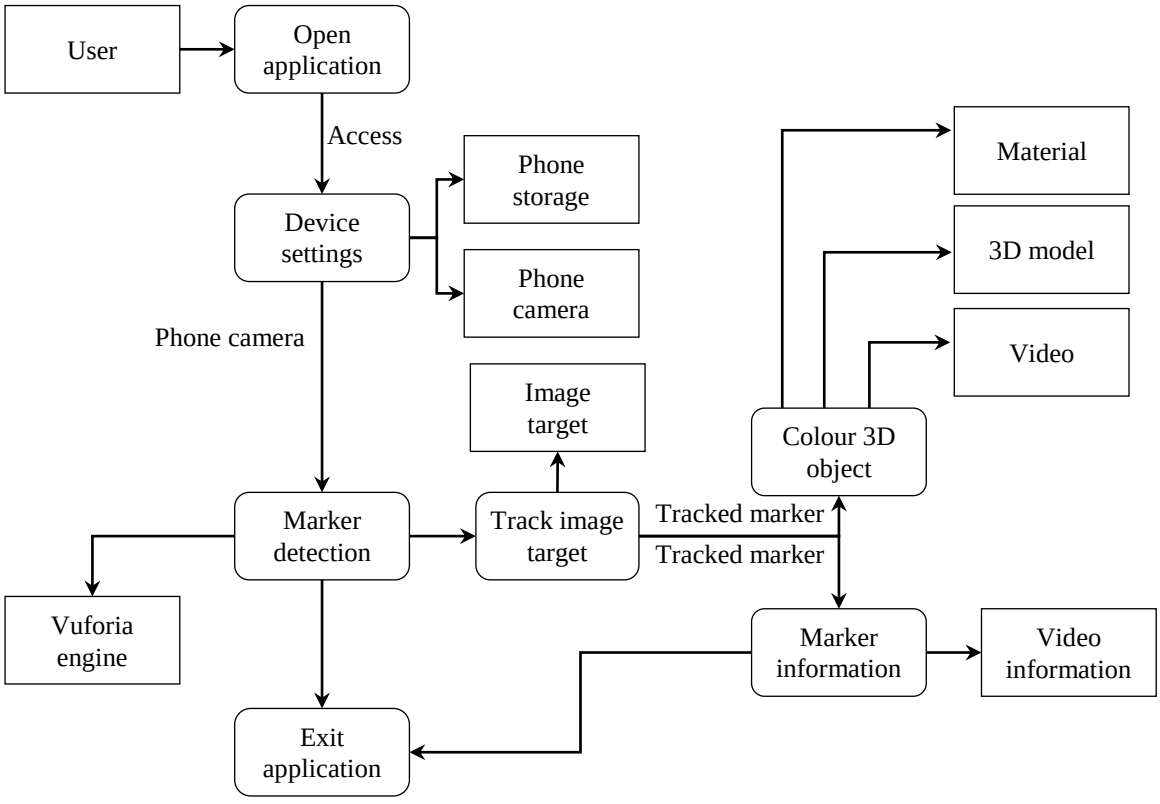

Figure 7. Working Diagram of Application.

In our application, the device's back camera searches for a scene, and when it recognises the scene using Vuforia Image Tracking, by scanning a newspaper image, the relevant video is played on the newspaper. All this video assets for newspaper will be rendered in Unity and image tracking and recognition will be done using Vuforia. We will be using latest feature of Vuforia to turn our newspaper into a magical newspaper that play the content that is relevant to the image that is being detected (Figure 7).

RESULT

Below is a digital app (Figure 8) that displays the traditional newspaper in a more convenient video format (Figures 9 and 10), complete with caption and voice.

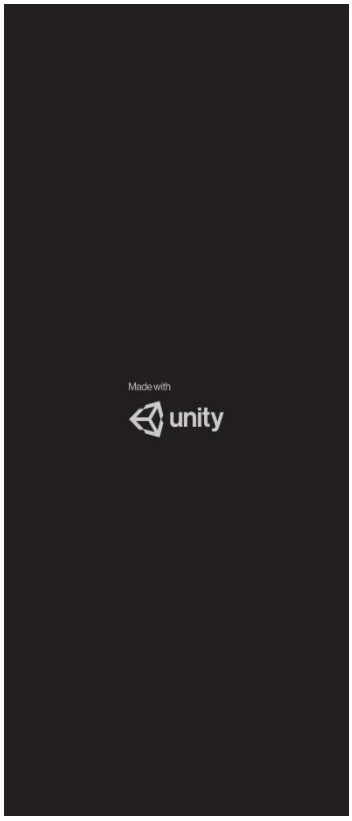

Figure 8. App Startup.

Figure 9. Video related to news played on newspaper with captions and voice.

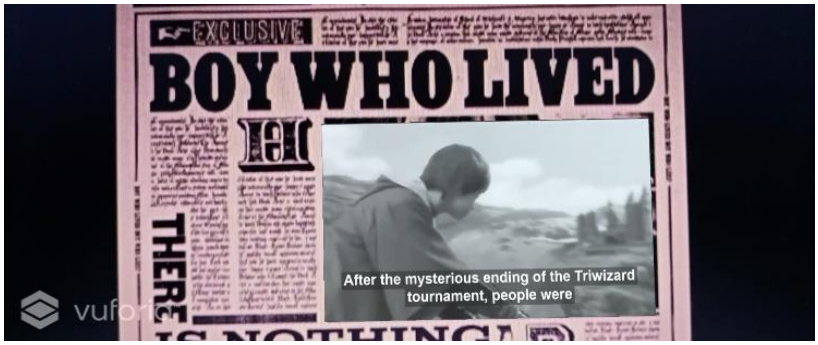

Figure 10. App in Landscape mode with video playing on a newspaper

CONCLUSION

By the support of AR Smart Newspaper, we can create a successful way of human interaction with the newspaper. By taking advantage of the digital boom in print media, we can strike a balance between AR technology and Newspaper. It can be improved in the future by developing this system for large newspapers or magazines. Smart newspapers, which can utilise the benefits of augmented reality technology, will create a more realistic integration world for us humans in the future. As people can use AR to interact with the system in a additional ordinary technique than traditional human-computer interaction.

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