CARE POINT USING AUGMENTED REALITY

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***Abstract* — Augmented Reality (AR) is an interactive experience that uses computer-generated perceptual data to improve the real world. The majority of today's mobile devices come equipped with a camera. It is a kind of hardware that provides data to your AR app for interpreting the real world. It offers a progressed and dynamic technique for medications. According to the proposed project, the completely unknown, elderly, or uneducated person can get information of the tablets such as warnings, age restrictions, and their usage just by scanning the pill cover. The proposed system is a mobile application that uses a native camera and objects recognition to extract the image of the pill cover. Then the information on the scanned pill will be displayed in the designed UI format which includes the medicine name, age restrictions, and its usage with the help of Unity and Vuforia. Unity helps for developing APK files and UI designs. Vuforia helps for storing the datasets.**

Keywords — Augmented reality, Unity, Vuforia, Android APK.

I. INTRODUCTION

Generally, AR has turned into a hugely examined topic and an excellent field for new sorts of applications in the medical area. In addition, augmented reality has opened up opportunities in the field of healthcare. The upcoming chapter explains the concepts of augmented reality usage in real time application. In our daily lives, many medicines are used in hospitals and primary health care centres, in which information of medicine are difficult to identify by the illiterate people. Medicines are one of the most essential health care technologies for improving health and quality of life for the generations. To identify the details about the medicine easily, a "Care Point" application was developed. According to this, the user just needs to scan the tablet wrapper. If the recognized object matches the medicine image in the dataset, then the application will return the output by displaying the entire description about the medicine such as name of the tablet, for what purpose we need to take that tablet in 3D view with the help of augmented reality. The main concept for developing this project is to solve the difficulties which are faced by the generalpublic, especially the elderly, to recognize medicine simply by scanning it. The proposed method is a mobile application that uses a native camera and object recognition to display the details about the medicines. When a user scans the medicine wrapper using a native camera which is used to identify the information of medicine wrapper.

If the recognized object matches the medicine image in the dataset then the application will return the output by rendering the corresponding 3D Model. The rendering can be done by comparing the scanned image with the predefined dataset (object recognition). This Augmented Reality application is used for general and medical customer service. In care point along with animation the medicine usage, additional information also displayed in the designed UI format.

II. LITERATURE REVIEW

Augmented reality (AR) is a technology that incorporates digital information into the user's real- world environment. It deals with new approach for treatments and education in medicine.AR aids in surgery planning and patient treatment and helps explain difficult medical situations to patients and their relatives. This work discusses the applicability and upcoming development of augmented- and mixed-reality technologies such as wearable computers and AR devices. It offers a summary of modern technology and a base for researchers involved in developing AR apps in tablets. The field of AR is well explored, and there is a optimistic trend in its application, but its use is still in the early stages in the field of medicine and it is not widely accepted in clinical practice. Medical studies proving the efficiency of applied AR technologies are still lacking [1].

The proliferation of mobile devices and the constant improvement of their processing capabilities has helped the improvement of other technologies, such as AR (Augmented Reality). On the other hand, there are currently more organizations that make their information available to society, such as the pharmaceutical industry, this helps the growth of the LODD (Linked Open Drug Data). Therefore, in this document we present ARLOD (Augmented Reality in Linked Open Data cloud) an application for mobile devices that integrates AR information obtained from the LODD datasets, with the intention that between the two technologies they complement each other to help solve the limitations that each of them presents and with the intention

that ARLOD becomes a support tool for people involved in the field of health care. Likewise, a proposed architecture for the integration of these technologies is presented, demonstrating its usefulness through the development of ARLOD. [2].

Many real world applications for Microsoft HoloLens*-based applications suffer the problem of reliably recognizing and identifying movable objects within an environment. While the HoloLens is perfectly able to discern already known rooms, it still has troubles with reflecting surfaces or identically shaped objects. Using dedicated recognition libraries for each task poses the issue of shared resource access in the rather controlled HoloLens environment-In this poster we present a solution for scenario with hard to track objects and similarly shaped objects for an electrical cabinet assembly task, where the reflective cabinet is tagged with a marker and the prefabricated cables are differentiated by text- based labels. [3].

Automatically detecting mentions of pharmaceutical drugs and chemical substances is key for the subsequent extraction of relations of chemicals with other biomedical entities such as genes, proteins, diseases, adverse reactions or symptoms. The identification of drug mentions is also a prior step for complex event types such as drug dosage recognition, duration of medical treatments or drug repurposing. Formally, this task is known as named entity recognition (NER), meaning automatically identifying mentions of predefined entities of interest in running text. In the domain of medical texts, for chemical entity recognition (CER), techniques based on hand-crafted rules and graph-based models can provide adequate performance Competitive resources for drug name recognition in English medical texts are already available and heavily used, while for other languages such as Spanish these tools, although clearly needed were missing. In this work, we adapt an existing neural NER system, NeuroNER, to the particular domain of Spanish clinical case texts, and extend the neural network to be able to take into account additional features apart from the plain text. [4].

III. Existing System

An Augmented Reality in the medical field is developed with the feature to scan only the preferred prescription of the medicine. On the developed model it provides only the name of the medicine or the name that is processed from the image which will not be able to find by thepeople for what purpose we use it but in Care Point it provides us with the name of the medicine as well as the information about that scanned medicine. To make it a more efficient and easier way to convey to people, it is provided with the common language(English) to understand the information completely.

IV. Proposed System

In Care Point, it provides much and more information about the medicine which we are looking for. Medicines are one of the most important health care technologies for improving health and quality of life for generations. Care Point provides information such as Medicine name, Animation about cause of human's health problems, Warnings, Side effects, Age restriction and also the usage of the medicine. Care Point makes it easier, efficient and user friendly for all peoples such as educated, elderly, illiterate people. Our proposed system explains detailed information about the tablet which is more convenient for the users. Just by scanning the tablet cover they can able to get the information with their common language (English).

V. Methodology

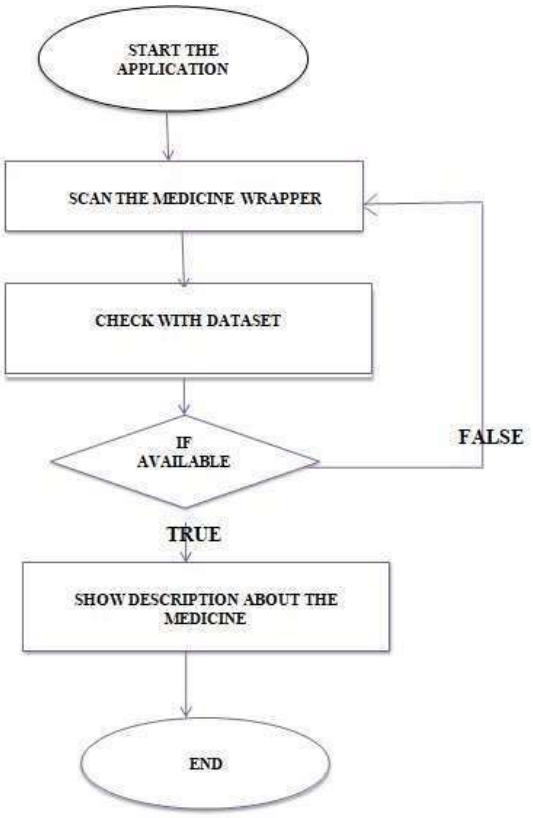

Fig.1 Process for Care Point Using AR

A) Hardware and Software Requirements:

This application is based on idea of detecting the medicine usage which required following additives:

1) Unity: For developing APK and designing UI
2) Vuforia: For storing the datasets
3) Android version: Above 5
4) RAM: Above 4GB
5) Operating System: Windows 10 64 bit

B) Working:

Care Point mainly focuses on comparing the input image which will be obtained while scanning the tablet wrapper by the user with the existing dataset and finds the

similarity from it and it provides the information about the tablet from the dataset. Object recognized by comparing the scanning image with the existing dataset. Care point provides the information such as Medicine name, Animation about cause of human's health problems, Age restriction, Warnings, Side effects and also the usage of the medicine. Care Point makes it easier, efficient and user friendly for all peoples such as educated, elderly, illiterate people.

Care Point makes it easier, efficient and user friendly for all peoples such as educated, elderly, illiterate people along with the brief description about the medicine it shows the 3D animated image of the disease with the help of the 3D view of image user who are illiterate can also find the usage of image just by scanning the medicine strips.

C) Design and Implementation:

Setting up Vuforia: A license key works as an ID to create an application in Unity using Vuforia. License key is created on the developer page with the help of a "License Manager" in Vuforia's Developer Portal. Images are added to the newly, made database. Target Database is used to add Image Targets in Unity. Download a target database and import it into unity.

Integrating with Unity: In Unity, there are about two modules that need to be imported for building an APK. Initially, after starting the application we need to build an APK file with the help of unity application. To build an APK, there are some packages that need to be imported for generating. The packages are imported from a module named Asset. Asset contains the features where we develop the UI template for the respected project. The developed asset is then imported. The second folder that is feed through APK is the image folder. There is an image folder where all the images are collected and kept on the image folder. The collected images are then accessed through the image folder and load through the APK. After accessing with the two modules of Asset and image folder an APK is build. After generating the APK file, the generated file is stored at a local machine. Once stored on a local machine it is transferred to the Android devices. The transferred APK file is then installed on the respected device for detecting. After install is completed, a native camera is opened on a Android device.

Object Recognition: The "Care point Using Augmented Reality" explains detailed information about the tablet which is more convenient for the users. Just by scanning the tablet cover they can able to get the information in their convenient language(English).Scanning of the medication includes opening up a native camera after installing with APK into their android device. Object recognition, once after scanning it searches for the match of the same image in the database.

Visualize the drug information: This phase mainly focuses on comparing the input image which will get from the user while scanning the tablet cover with the existing dataset and finding the similarity from it and providing the information about the tablet. Care point provides information such as the Medicine name, Warnings, Side effects, Age restriction and dosage of the medicine, and also the usage of the medicine. Care Point is also provided with animations indicating the symptoms of the effect of the particular medicine.

D) Software:

Unity engine can be used to create three-dimensional 3D and two-dimensional 2D games, as well as interactive simulations and other experiences. Unity gives users the ability to create games and experiences in both 2D and 3D, and the engine offers a primary scripting API in C# using Mono, for the Unity editor in the form of plugins, and games themselves, as well as drags and drop functionality. Prior to C# being the primary programming language used for the engine, it previously supported Boo, which was removed with the release of Unity 5, and a Boo-based implementation of JavaScript called Unity Script, after the release of Unity 2017.1, in favour of C#. Within 2D games, Unity allows importation of sprites and an advanced 2D world renderer. For 3D games, Unity allows specification of texture compression, mipmaps, and resolution settings for each platform that the game engine supports, and provides support for bump mapping, reflection mapping, parallax mapping, screen space ambient occlusion (SSAO), dynamic shadows using shadow maps, render-to-texture and full-screen post-processing effects. In the proposed system, unity is used to create the application as it is a good platform to create both AR and VR platforms.

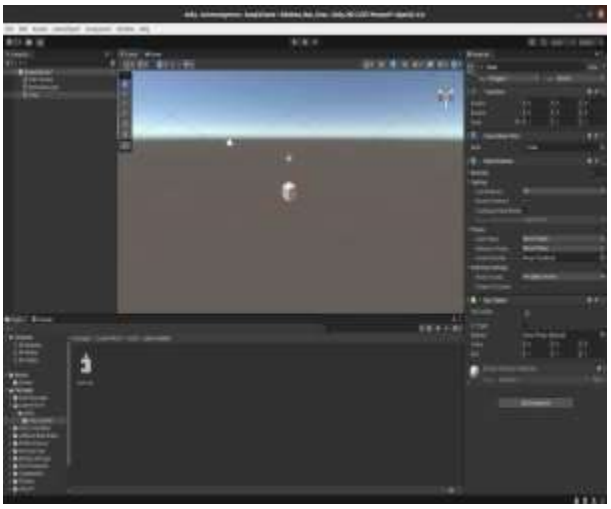

Fig.2 Unity Interface

E) Advantages:

- Cost effective.
- It is economical.
- Physical human force requirement is less.
- Time taking process is lower for detecting the medicine usage.
- This application reduces the manpower.
- Immediate results can be shown on the UI.
- The advantage of Care Point is to get all the information at a single site like the Medicine name, Uses, Warnings, Side effects, and some more additional information regarding the scanned tablet wrapper.
- Even if a person is illiterate they could find what the particular tablet is used by seeing through the animations.

VI. Experimental Result

A) Test case 1:

The mobile application was tested by scanning a medicine sheet called Diphenhydramine tablet which is generally used for relieve red, irritated, itchy, watery eyes which is generally used for common eye problems. The Android application scans a particular medicine sheet, it detects the medicine name present on the medicine sheet and gives the reactions as per the given UI design. The application can be utilized to identify some other medicines based on the availability of medicines in the predefined medicine name.

Fig.3 Test case 1

B) Test case 2:

The proposed mobile application was tested by scanning a medical sheet called Crocin tablet which is generally used for pain relief, treatment of fever and headache which is generally used for common pain reliefs. The proposed Android application scans a particular medicine sheet or cover, it detects the medicine name present on the medical descriptions and gives the reactions as per the given UI design along with that it displays the warning and additional information about the medicine.

Fig.4 Test case 2

C) Test case 3:

The proposed mobile application was tested by scanning a medical sheet called Paracetamol tablet which is generally used for pain relief, treatment of fever and headache which is generally used for common pain reliefs. The proposed Android application scans a particular medicine sheet, it detects the medicine name present on the medical descriptions here the medical sheet was not scanned properly so it delays to show the details of the medicine.

Fig.5 Test case 3

D) Test case 4:

The proposed mobile application was tested by scanning a medical sheet called Tylenol tablet which is generally used for pain relief, treatment of fever and headache which is generally used for common pain reliefs. The proposed Android application scans a particular medical sheet, it detects the medicine name present on the medical descriptions here the medical sheet was not scanned properly and with low lighting our system needs proper lighting to show the medicine details.

Fig.6 Test case 4

VII. CONCLUSION

The Care Point was created by considering the issues looked at by many people for knowing the details about the medicine information. The main concerns raised by the people were they may or may not be able to find the medicine usage. So, the proposed system would be an easy and comforting way to show the use of medicines visually just by scanning the medicine sheet. The care point work helps out the people who cannot understand the use of the different kinds of medicines and helps in a visually and lively way by using Augmented Reality, because of which the users will feel happy and easy with the provided information. The Care point can process scanned object and provide the information in English languages. A pictorial representation to show the usage of medicines is considered best for every single irrespective of whether they are educated or not. The intention for developing this system is to know the medicine details such as Medicine name, Animation about cause of human's health problems, Age restriction, Warnings, Side effects and also the usage of the medicine just by scanning the tablet strips.

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