

Mizyner: An AR based Smart Interior Designer

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Abstract: Being one of the hot technologies of the era Augmented reality is exponentially developing various day to day activities and home decor is one of them. Mizyner is an android application that overlays the virtual Interior in a physical environment. Markers are implanted on the mesh (floor or wall) for tracking to define the scale and coordinates of the room. The user selects virtual Interior on the screen and places it into the design space. Here the concept of AR is used to integrate that selected virtual Interior with an environment where the actual Interior is present. The user can also manipulate the location of the selected Interior and view it in various angles. All the operations are performed in real time. It is implemented for android devices where the mobile camera is an important component. Smartphones are very popular; it is hoped that the proposed system will allow a large range of users. Also, the most difficult challenge of decision making can be easily resolved when the user gets to choose the desired layout for a room. Thus, this saves time and efforts by avoiding the need to physically go to the store and select interiors.

Keywords: Augmented Reality, virtual interior, tracking, view in various angles, real time, less efforts.

I. INTRODUCTION

It is pretty difficult to anticipate how any piece of interior will look inside a room with lot of artefacts left to human imagination. The size, the color, and the way it integrates with the prevailing environment. Augmented reality, a technology that overlays infographics on the concrete world has its applications within the field of engineering and architecture and has been employed to tackle real world problems.

Mizyner is an android application that overlays the virtual Interior in a physical environment. Markers are implanted on the mesh (floor or wall) for tracking to define the scale and coordinates of the room. The user selects virtual Interior on the screen and places it into the design space. Here the concept of AR is used to integrate that selected virtual Interior with an environment where the actual Interior is present. The user can also manipulate the location of the selected Interior and view it in various angles. All the operations are performed in real time. It is implemented for android devices where the mobile camera is an important component. Also, the most difficult challenge of decision making can be easily resolved when the user gets to choose the desired layout for a room. Thus, this saves time and effort by avoiding the need to physically go to the store and select interiors.

Some similar systems have already been presented but the system proposed includes additional functions for the user interface and an improved implementation. For example, the user can interact with implicit interior using Palpable Augmented Reality in real time allowing complex and diverse designs to be explored and visualized, making AR technology for interior design accessible to both professionals and amateurs.

Goals or Objectives

- To provide virtual experience of Home Decor to a user.
- To Optimize the cost of Interior Designing.
- To provide virtual experience to users using augmented reality.
- To provide the user the estimation of the size, look and cost of the object.
- To provide satisfaction to the user by providing features that are not available.

II. LITERATURE SURVEY

“Interior Design using Augmented Reality Environment: (International Journal of Innovative Research in Science, Engineering and Technology)”- This paper presents an application of Augmented Reality technology for interior design. Nowadays, people are busy with their work thus limiting their time to go to various stores to buy furniture for their everyday use.[1] There is difficulty to fulfil the customers contentment of decorate their room without imaginary view of how the place would appear. A printed furniture catalogue is paper based containing textual information and images which does not provide any interaction for the user.[1] We intend to use marker-based AR for implementing a new design approach for interior design. This AR environment will allow the user to select from a range of furniture and then display the virtual furniture selected on the real environment.[1] The user can also modify the virtual furniture in real-time on the screen allowing the user to have an interactive experience with the furniture in a real-world environment.[1] This will provide a better view of the furniture placement and simplify the process of interior designing for users to save their time and effort [1].

“Augmented Reality Application for Architects and interior designers: Interno A cost effective solution (IEEE)”- Nowadays with excessive workload and busy life, many professional face problems that results in the loss of their clients or the certain overheads that spoil the process of satisfying the client.[2] The proposed software will be used by interior designers or architects. This proposed research most likely acts as an effective tool which can decrease the gap between industrial company and customer in addition to other applicable business communities.[2] It will help in visualizing architect plans and interior designs. A virtual model of real environment can be designed before its physical implementation, it will allow interior designers to implement their idea in the given workspace virtually and then view it in real environment, it will also allow architects to view their 3D visualizations on their 2D drawings.[2] Application is based on my findings of user's expectations of an augmented reality interior design service, a service which is a combination of various functionality of social media, augmented reality (AR) and 3-D modeling that encloses the concept of home design. This study distinctively bridges all users of relevant businesses to the user-intensive design of an augmented reality.[2] The paper provides you with the inner depth on how the augmented reality can be implemented to facilitate the architects and interior designers as well it discusses the algorithm used to achieve the functionalities.[2] The proposed application exhibits two types of Augmented reality, Marker less and marker based. The novelty of the project is that it does not require any sort of expensive gadgets.[2] It can easily be used via smartphones and tablets. It is also operable on any operating system.[2] This is a cost-effective solution that primarily reduces the overheads that interior designer and architects confronts on daily basis. The software exhibits all the features that might be required by interior designers and architects respectively [2].

“AR Furniture: Integrating Augmented Reality Technology to Enhance Interior Design using Marker and Marker less tracking”- Purchasing products for interior design always has a problem that the purchased products may not satisfy customers because they cannot put them in their own place before buying.[3] The purpose of this

research is to study and develop an android application called 'AR Furniture' with the use of Augmented Reality technology for design and decoration that will help customers visualize how furniture pieces will look and fit (to scale) in their homes and also can provide details of products to support customer decision.[3] This application is a prototype to find out factors affecting the design and tracking of AR applications [3].

III. PROPOSED WORK

The intent of our project is that the users should be able to take virtual experience of home decoration by using augmented reality and optimizing the cost and time required for interior decoration. Our product is an AR based application that is remarkably customer friendly and clientele oriented.

The philosophy of the application starts with examining images from the rear camera of a smartphone or tablet using marker tracking technique for displaying product's details and marker-less tracking technique for displaying 3D models, performing feature tracking, and calculating positions to display a 3D model over the real-world image.

A. Flow Chart

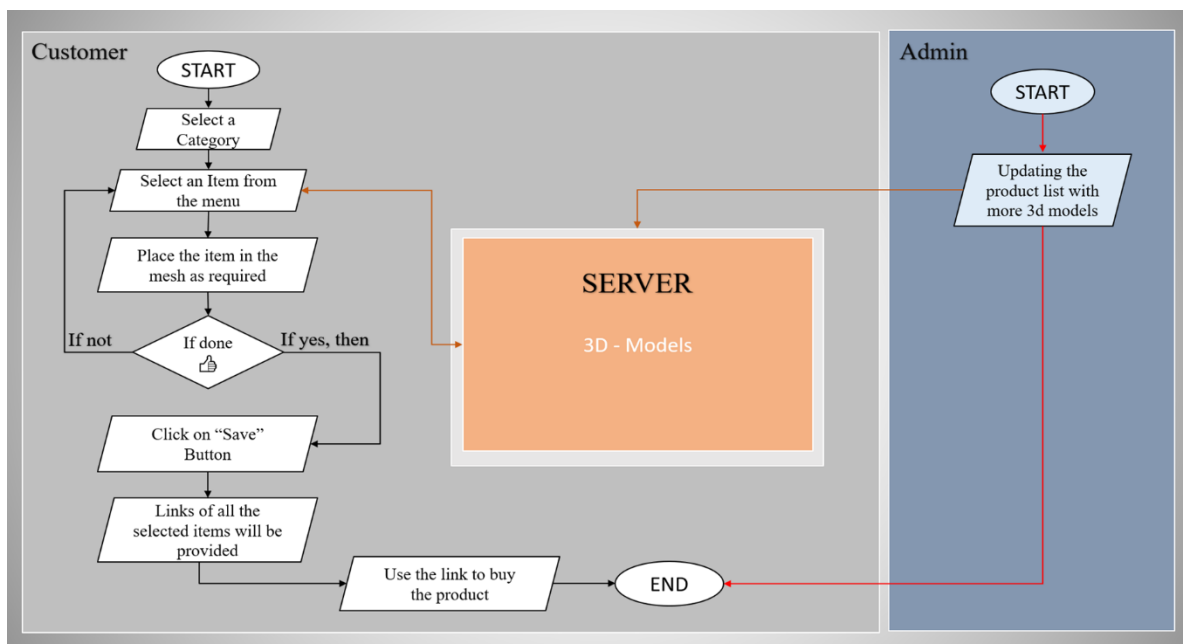


Fig.1. Flow Chart

B. Flow of the System:

- There is no login section as we are not taking any kind of information from our user.
- User has to select a category from the main menu and the application will redirect the user to the list of items for that particular category.

- User needs to create a mesh before they can place an object.
- To create mesh, user needs to just move the smartphone around an empty space and mesh will be created and shown by pixels on the screen.
- Henceforth user just needs to select a product from the list of items and place them virtually.
- After successful creation of virtual environment, user will have an option to download the 3d model file for the created environment.
- At last links for all the items will be provided by the application to the user to buy those products.

C. Modules:

Module 1: - Creating 3D Models using Autodesk 3Ds Max

- I. Creating objects for Home Decoration.
- II. Creating objects for Office Decoration
- III. Creating objects for Celebration Hall.

Module 2: - Developing the application using Unity3D, Android Studio and Sceneform Augmented Reality SDK as an engine for image analysis, image processing and 3D model rendering.

IV. IMPLEMENTED WORK

A. Module 1:

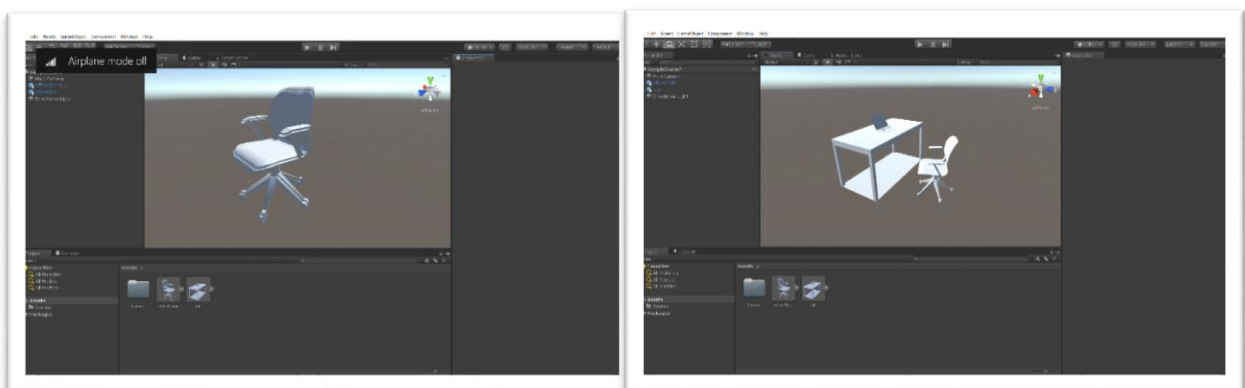


Fig.2. Creation of 3D Objects

Module 2:

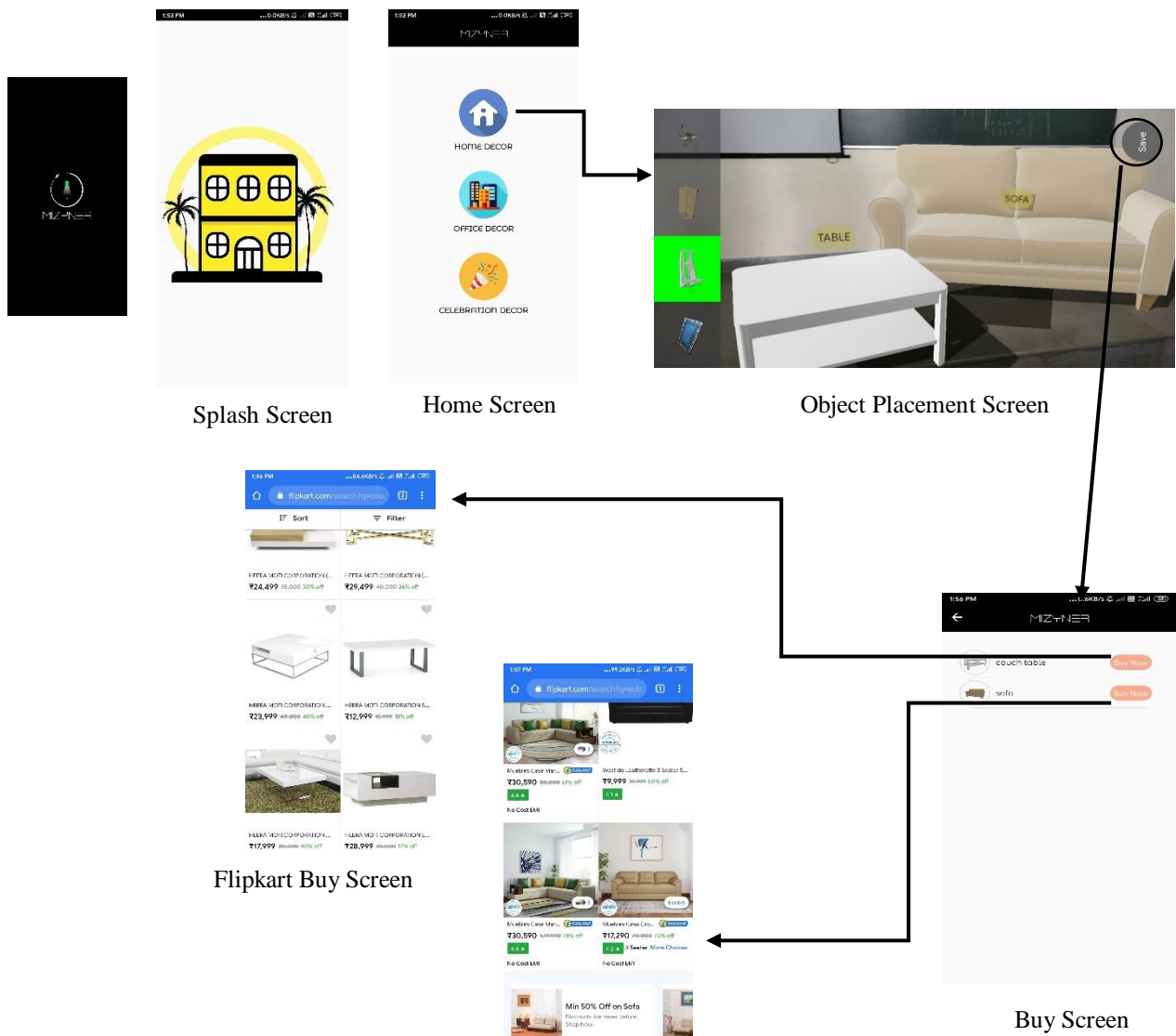


Fig.3. Working of Application

V. APPLICATIONS & ADVANTAGES

A. Applications:

- Celebration Halls can be decorated as per the customer requirements and the customer can also see the result before even investing too much.
- This will be a one stop solution for most of the décor job such as ‘Home Decor’, ‘Office Decor’, ‘Celebration’ and many more.
- Builders can provide a virtual tour to their long distant consumers by sharing the 3d model, any

updates by consumers can be done in few clicks.

B. Advantages:

- Use of AR Core helps us in making the product position static in the environment.
- Most of the similar apps uses 'Vuforia' as the major implementation this led to a 2D implementation of the work, but as we are using AR-Core we will be dealing with 3D objects.
- All the other apps only deal in furniture as the only product whereas we are providing most of the other décor options.

VI. CONCLUSION

We have developed an application, which amends the mode of current Décor system by providing an Augmented Reality based décor solution. This application can also be custom built according to the customer requirements by providing some 3D models. We have applied engineering knowledge to analyze the societal problem of interior designing of home, office and celebration halls and other places and provide a modern engineering solution. Henceforth, we have designed the application in two modules. We will investigate the trends in application development to find out the new solutions and updates. We have used modern tools viz. Unity 3D and AR-Core for the implementation of the app. During this project tenure we applied professional ethics and understood the importance of teamwork and communication while presenting project at various competitions and conferences for project management, which led us to engage ourselves in lifelong learning.

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