

# Personal Architect and Personal Finance Management Application for House Building Expenses

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**Abstract:-** Augmented Reality (AR) turns the surroundings around you right into a virtual interface by means of setting digital objects in the actual world, in real-time. AR may be seen through a extensive style of studies together with gaming programs, AR browsers, and many others. AR provides automatic components to a stay view via making use of the digicam on a cellular telephone. In comparison to Virtual Reality (VR), AR would not make the complete artificial situations to supplant real with a virtual one. AR suggests up in direct attitude on an present situation and consists of sounds, recordings, and illustrations to it. A view of the physical certifiable situation with superimposed laptop created photographs, consequently converting the affect of the fact, is the AR. AR is currently used to assist visualize objects that aren't inside the room and to create immersive emblem stories that have interaction consumers on another level. In this survey we recommend a machine for conversion of 2D architectural floor plans to 3-D fashions the usage of Augmented Reality. This will provide the user an interactive and stronger to enjoy the virtual experience to understand the ground plan. Along with visualization we also recommend optimized expenditure distribution in the survey.

**Keywords—** *Augmented Reality (AR), Floor Plan, Indoor, 3D Interaction, Navigation, Mobile Device, Unity.*

## I. INTRODUCTION

AR is one of the most mainstream innovations that has been at present utilized in real estate. The field of AR has existed for more than a decade, however, the development and progress in the past years has been significant. In 1997, the principal creator conveyed a survey [3] (based on a 1995 SIGGRAPH course address) that described the field, had various issues, and summarized the upgrades up to that point.

Since then, the field has developed fast. In the late 1990s, a few gatherings spend significant time here were begun, remembering the International Workshop and Symposium for AR [29], the International Symposium on Mixed Reality [30], and the Designing AR Environments workshop. Some overall upheld interdisciplinary consortia were outlined that based on AR, remarkably the Mixed Reality Systems Laboratory [50] in Japan and Project ARVIKIT [61] in Germany. An openly accessible programming toolbox (AR TOOLKIT/UNITY) for quickly Building AR applications is currently accessible [2]. Due to this wealth of new developments, an updated study is expected to guide and encourage further research in this exciting area.

The review won't attempt to reference each new paper that has appeared since the first study; there is many various new papers. Or maybe, we reference agent instances of the new advances.

What is AR? The basic goal of an AR system is to redesign the customer's perspective on and association with this current reality through upgrading this current reality with 3D virtual articles that appear to match in a comparable space as this current reality. Various progressing papers extend the importance of AR past this vision, anyway in the soul of the first study, we describe.

AR frameworks to share the accompanying properties:

- 1) Blends veritable and virtual, in a genuine situation
- 2) Real-time intuitive
- 3) Registered in 3D

Registration implies the specific plan of certified and virtual articles. Without exact enrollment, the dream that the virtual articles exist in the certifiable condition is seriously undermined. Selection is an inconvenient issue and a subject of continuing to ask about. Making such an Augmented domain model requires a couple few pros and exceptionally programming, for example, SketchUp, 3ds Max, Blender, etc.

AR is the development that extends our physical world, including layers of advanced data onto it. Not at all like Virtual Reality (VR), AR doesn't make the whole fake conditions to override genuine with a virtual one. AR appears in a direct perspective on a current domain and incorporates sounds, recordings, and illustrations to it. A perspective on the physical certifiable condition with superimposed PC created pictures, along these lines changing the view of the truth, is the AR.

The term itself was established in 1990, and one of the essential business uses was in TV and military. With the ascent of the Internet and cell phones, AR revealed its subsequent wave, and these days are generally related to the instinctive idea. 3D models are truly anticipated onto physical things or utilized together progressively, different increased reality applications influence our propensities, public activity, and media outlets.

AR innovations enhance our perception and help us to see, hear, and feel our surroundings in new and enhanced ways. AR technologies are capable of applying different AR services. Many AR applications are developed by the visual markers which are some pictures of patterns instead of AR Tool Kit markers.

To accomplish this, a couple of programming and systems are required which are grown dedicatedly for AR improvement. These products are clarified to sum things up:-

Solidarity is a cross-stage game motor. It was created by Unity Technologies. This venture will utilize Unity as a significant improvement stage. With the assistance of Unity 3D motor, clients can build up their games. They can likewise make a virtual world for different applications, or change a genuine element in the virtual one. This task accentuates the changing of certifiable items, for example, the 3D redo of a loft.

Vuforia AR SDK is an increased reality programming improvement unit for cell phones that empowers the formation of enlarged reality applications. Vuforia AR SDK gives a structure to make markers that will help to recognize every marker that this undertaking will actualize.

Autodesk Maya, ordinarily abbreviated to just Maya, is a 3D PC illustrations application. Utilizing Maya clients can make 3D models. This task will utilize Maya to make the necessary 3D models of the engineering plans. All the current element will be delivered in this product, for example, dividers, seats, tables, beds, and so forth These parts will be consolidated into one android application that utilizes all the segments referenced previously. A complete target of broadened the fact of the matter is to make an accommodating and trademark immersion, so sense phones and tablets will get displaced, anyway it isn't clear what those replacements will be.

In this paper, we have proposed a framework to make a genuine application by delivering a 2D plan to 3D that gives a sensible inside design of the property by utilizing free and lightweight programming: 3D Model and Unity. The final product will be chiefly founded on picture preparation and increased reality advances. This Application will empower clients to handily audit the 3D model progressively through their cell phones. For any compositional designer, it is vital to have a demo level or building prepared. This demo level gives a plan to the client concerning what they would buy and how their level would feel like in appearance and the course of action of furniture is more diligently to envision. Subsequently, we plan to build up an AR framework that would empower the draftsmen or building designer to give a lot more extravagant experience. This spares the expense of setting up a demo level to satisfy the client. The portability and comfort of the versatile AR framework establish a decent first connection with the client.

To accomplish this, we have taken exact estimations of an institutional floor which will be moved onto the 3D displaying framework. The thought behind this is to give a precise model of the compositional arrangement. The client needn't bother with any mastery of design or structural designing area to utilize the application. Our inspiration here is to build time proficiency and improve the availability of different models of engineering plans and improve the goal of 3D models. This will improve the perceptual experience of the client making it more obvious the floor plan.

This paper underlines the application of AR for the change of 2D architectural floor plans to 3D models. This paper will be organized as Section I introduces the domain of AR and the system and programming needed for its usage. In Section II the current work has been summed up. Besides the foundation of AR has been talked about. Area III contains the proposed design of the AR application with its predefined targets. Likewise, the framework design with the progression of the cycle has been referenced. Section IV finishes up this review.

## II. RELATED WORK

### 1. Architecture in an Age of Augmented Reality: Opportunities and Obstacles for Mobile AR in Design, Construction, and Post-Completion.

By Rana Abboud ,NAWIC International Women's Day Scholarship Recipient 2013 March 2014

This paper investigated the Opportunities and Obstacles for Mobile Augmented Reality over the Plan, Construction, and Post-Completion periods of engineering practice. It recognizes significant level utilizes for Mobile AR (MAR) over these stages, and clarifies the difficulties at present forestalling Blemish's take-up by Australian design industry. Composed principally as a prologue to Mobile Expanded Reality for rehearsing modelers in Australia, the paper may likewise intrigue experts inside

the Architecture, Engineering, and Construction (AEC) enterprises all around, just as AR engineers creating applications for Architectural employments.

Advantages:

In Design, MAR may augment a real site with proposed virtual models at full scale, and overlay physical presentation media with 4D content

In Construction, MAR applications may geo-locate BIM data directly on the construction site to aid site set-out

Disadvantages:

The Obstacles preventing MAR uptake by architectural industry today encompass technological challenges, human factors, and financial constraints. Technological hurdles range from hardware limitations- such as MAR displays and tracking challenges- to difficulties in the preparation of virtual data.

## **2. Augmented Reality in Architecture and Design: Potentials and Challenges for Application Xiangyu Wang**

This paper showed the view of ongoing advances in PC interface and equipment power have cultivated Augmented Reality (AR) models for different engineering

what's more, structure applications. More natural representation stages are vital for proficient utilization of computerized data these days in the engineering and structure industries. As a promising perception stage to address this need, this paper presents the idea and related empowering advances of AR and furthermore presents an overview of its current applications in the territory of engineering and design. Another focal point of the paper was to examine how the distinguished key specialized issues could possibly be tended to with regards to architected engineering and structure applications.

Advantages:

The paper showed the use of AR in particular architectural key parts or software's like sketchands+:

One of the applications of AR in the early phases of a design is for sketch which is a rapid and fuzzy embodiment of the architectural discussion. The sketchand+ system as an experimental prototype to make a first attempt to use AR in the early architectural design stages, which could have significant impact on the quality of the entire design process. This AR prototype utilized a scribbling interface through the metaphor of a digitizer tablet and the virtual response is a 3D sketch.

Disadvantages:

In the design and implementation of Augmented Reality systems for industrial problems in architecture and design arenas, researchers and system developers face three major relevant challenges: extraction of industrial domain knowledge, preparation of reality model, and technological limitations. The following subsections discuss the details of each challenge and the suggested solutions.

## **3. A research agenda for augmented and virtual reality in architecture, engineering and construction**

**-Juan Manuel Davila Delgado, Lukumon Oyedelea, Peter Demianc, Thomas Beachb**

This paper presented an investigation on the utilization scene of (AR) and (VR) in the design, building and development segments, and proposes an exploration plan to address the current holes in required abilities. In view of the information gathered from the workshops, six AR and VR use-cases were characterized: partner commitment, structure uphold, plan audit, development backing, tasks and the board backing, and preparing. Two primary examination classes for a future exploration plan have been proposed, i.e.:

(I) designing evaluation gadgets, which incorporates research that empowers hearty gadgets that can be utilized practically speaking, for example the unpleasant and complex states of building destinations;

(ii) work process and information the board; to adequately oversee information and cycles required by AR and VR advancements; and

Advantages:

The visualisation and analysis of data are usually carried out on 2D computer displays without any spatial context or reference to the physical world from which was originated. However, many data analysis tasks can be significantly enriched by visualising data relevant to the task in its original context. AR and VR environments provide the basis to visualise data in a way that improves its value and facilitates its use and interpretation

Disadvantages:

AR and VR systems are still immature technologies, and various issues still need to be resolved including form factor, see-through quality, the field of view, image quality, handling occlusion, vision correction capabilities, etc

#### 4. Virtual and Augmented Reality in Architectural Design and Education

*Julie Milovanovic, Guillaume Moreau, Daniel Siret, Francis Miguet*

Computer generated Reality and Augmented Reality research in the engineering field show an assortment of potential employments of frameworks to go with planners, laymen and chiefs in their compositional plan measure. This article gave us a study of VR and AR gadgets among a corpus of papers chose from meetings and diaries on CAAD (Computer Aided Architectural Plan). A more intensive glance at some particular exploration ventures features their possibilities and cutoff points, which formalize achievements for future difficulties to address. Recognizing favorable circumstances and disadvantages of those gadgets gave us bits of knowledge to propose an elective sort of framework, CORAULIS, including both VR and SAR advances, so as to help collective structure to be actualized in an instructive situation.

Advantages:

As shown in the quantitative approach of the paper, collaboration and communication are one of the main qualities brought out from using AR applications for design activities.

Those features helped them in their design decision-making, thanks to the visualization of alternatives solution and dynamic simulations.

Disadvantages:

This experiment would run but will serve as a test-bed to investigate the potential of VR and SAR for design critique, the limits of its usage and suggest guidelines to enhance design pedagogy in the architectural studio.

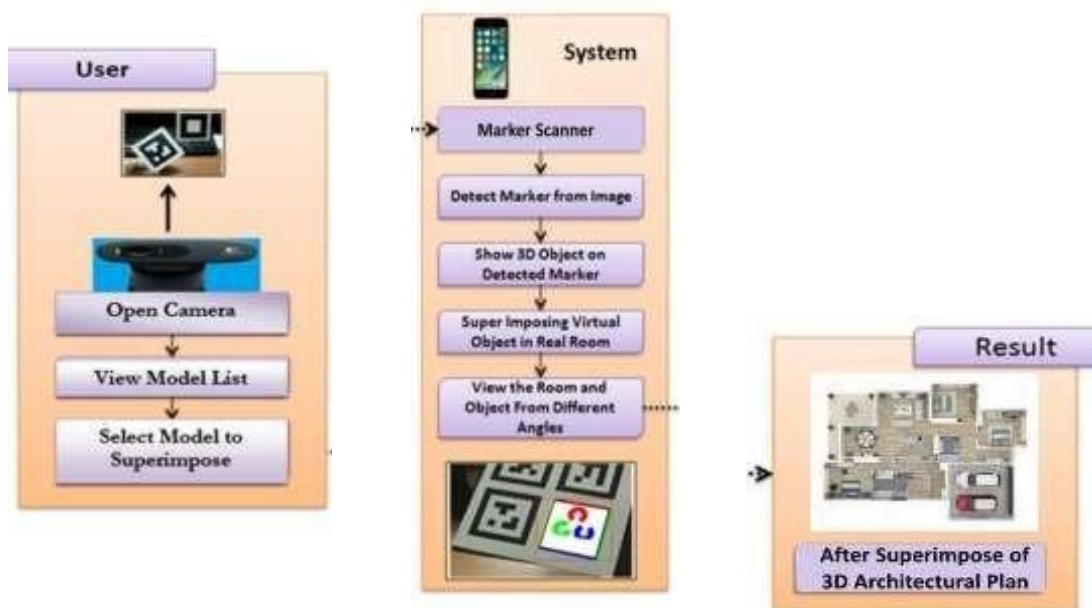
#### III. PROPOSED SYSTEM

##### System Architecture

The figure beneath shows the design of the proposed framework. According to the User's viewpoint, the User will open the created application on inbuilt camera device. Clients should open a camera through created application and the different model rundown will be interrupt up. From the Model dropdown, Users can choose any model to superimpose.

##### Working (Personal Architect):

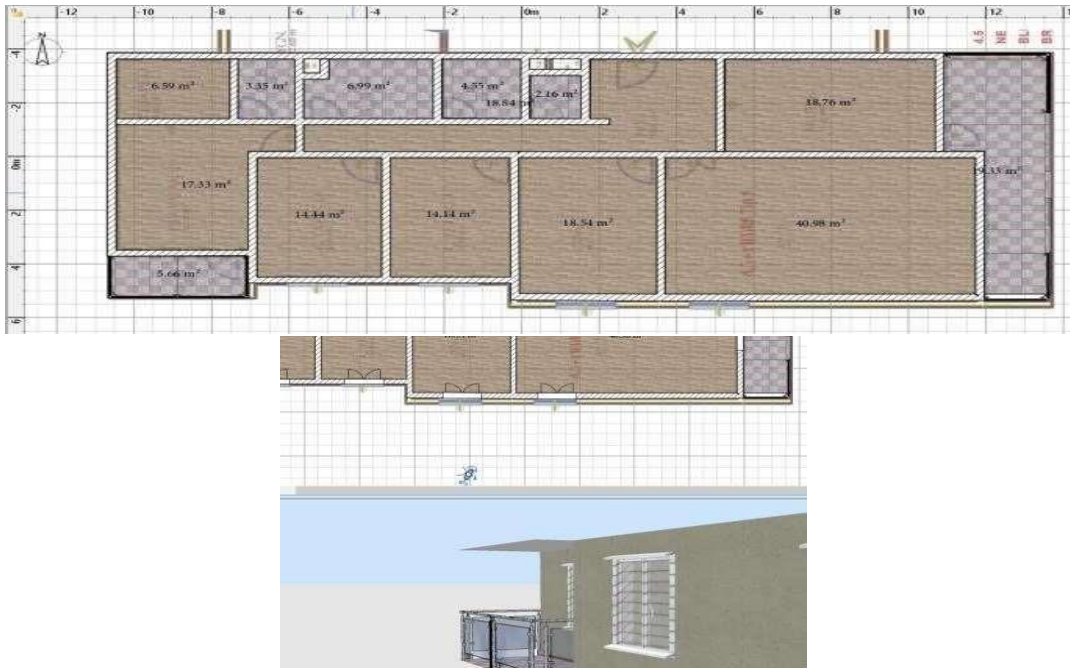
Utilizing the marker scanner in the created framework, it can recognize the markers set in the picture to show the 3D model. It speaks to the 3D model, on the recognized markers. Superimposing virtual items in genuine rooms. We can see the model from different points through a camera. Subsequent to examining the picture, the Superimposing of 3D structural arrangement is appeared to the client.



(Figure 1)

### Creating 3D models using 2D interface : We have used Google SketchUp design software

This free programming with its straightforward split screen 2D/3D sees one can attract dividers and room 2D window, and all the while picture them in 3D see (Figure 1). It likewise lets unexperienced first-time clients tap on the 3D object to handily change the surface, shading or material so it coordinates client's plan. Furthermore, the client can pick and drop objects onto the 2D plan. What's more, not just that, they can drag the items to wanted spot in the plan.



(Figure2)

### Creating Interactive and Realistic 3D Environment: Done using Unity Application:

1. Scaling the model that made with SketchUp 3D and bringing in it to unity 3D.
2. Applying High Definition surfaces onto the interior models so they can have a sensible view.
3. Using straightforward concealing application for making diffuse, typical and ambient guides to make reasonable 3D surfaces.
4. Creating Vuforia represent target (Floor Plan) planning for 3D model.
5. Implementing exact framework so client can move their gadgets from one room (same arrangement) to another room (same arrangement) effectively with no disturbance.
6. Setting bundle conditions for android.
7. Finally, export .apk file from unity and install on your mobile device.

### Working (Personal Finance Management Application for House Building expenses)

The bank statement analyzer takes in the persons excel/csv as the input which is preprocessed to reach a common format irrespective of the bank so that the data can be easily connected to DASH for the visualizations and analysis .

The main challenge for the preprocessing is gathering data from the raw excel file . A typical bank statement looks like one shown in Figure 3.1 and 3.2.



Figure 3.1:

Value Date	Post Date	Remitter Branch	Description	Cheque No.	Debit Amount	Credit Amount	Balance
01/01/2020	01/01/2020	ATM SERVICE BRANCH	BALANCE B/F				31732.91CR
01/01/2020	01/01/2020	ATM SERVICE BRANCH	WITHDRAWAL TRANSFER UPI TR		20000.00		11732.91CR
01/01/2020	01/01/2020	ATM SERVICE BRANCH	WITHDRAWAL TRANSFER UPI TR		111.00		11621.91CR
02/01/2020	02/01/2020	ATM SERVICE BRANCH	WITHDRAWAL TRANSFER UPI TR		300.00		11321.91CR
02/01/2020	02/01/2020	ATM SERVICE BRANCH	WITHDRAWAL TRANSFER UPI TR		234.00		11087.91CR
02/01/2020	02/01/2020	ATM SERVICE BRANCH	BY TRANSFER IMPSP2A000217			15000.00	26087.91CR
02/01/2020	02/01/2020	ATM SERVICE BRANCH	WITHDRAWAL TRANSFER UPI TR		125.00		25962.91CR
03/01/2020	03/01/2020	ATM SERVICE BRANCH	WITHDRAWAL TRANSFER UPI TR		6000.00		19962.91CR
03/01/2020	03/01/2020	ATM SERVICE BRANCH	WITHDRAWAL TRANSFER UPI TR		149.00		19813.91CR
04/01/2020	04/01/2020	ATM SERVICE BRANCH	WITHDRAWAL TRANSFER UPI TR		535.00		19278.91CR
04/01/2020	04/01/2020	ATM SERVICE BRANCH	BY TRANSFER UPI TRANSFER000			250.00	19528.91CR
05/01/2020	05/01/2020	ATM SERVICE BRANCH	WITHDRAWAL TRANSFER UPI TR		349.00		19179.91CR
05/01/2020	05/01/2020	ATM SERVICE BRANCH	WITHDRAWAL TRANSFER UPI TR		5500.00		13679.91CR
05/01/2020	05/01/2020	ATM SERVICE BRANCH	BY TRANSFER UPI TRANSFER000			8000.00	21679.91CR
05/01/2020	05/01/2020	ATM SERVICE BRANCH	WITHDRAWAL TRANSFER UPI TR		209.00		21470.91CR
06/01/2020	06/01/2020	ATM SERVICE BRANCH	WITHDRAWAL TRANSFER UPI TR		180.00		21290.91CR
06/01/2020	06/01/2020	ATM SERVICE BRANCH	BY TRANSFER UPI TRANSFER000			50.00	21340.91CR
06/01/2020	06/01/2020	ATM SERVICE BRANCH	WITHDRAWAL TRANSFER UPI TR		5500.00		15840.91CR
06/01/2020	06/01/2020	ATM SERVICE BRANCH	WITHDRAWAL TRANSFER UPI TR		149.00		15691.91CR

Figure 3.2:

Value Date	Post Date	Remitter Branch	Description	Cheque No.	Debit Amount	Credit Amount	Balance
01/01/2020	01/01/2020	ATM SERVICE BRANCH	BALANCE B/F				31732.91CR
01/01/2020	01/01/2020	ATM SERVICE BRANCH	WITHDRAWAL TRANSFER UPI TR		20000.00		11732.91CR
01/01/2020	01/01/2020	ATM SERVICE BRANCH	WITHDRAWAL TRANSFER UPI TR		111.00		11621.91CR
02/01/2020	02/01/2020	ATM SERVICE BRANCH	WITHDRAWAL TRANSFER UPI TR		300.00		11321.91CR
02/01/2020	02/01/2020	ATM SERVICE BRANCH	WITHDRAWAL TRANSFER UPI TR		234.00		11087.91CR
02/01/2020	02/01/2020	ATM SERVICE BRANCH	BY TRANSFER IMPSP2A000217			15000.00	26087.91CR
02/01/2020	02/01/2020	ATM SERVICE BRANCH	WITHDRAWAL TRANSFER UPI TR		125.00		25962.91CR
03/01/2020	03/01/2020	ATM SERVICE BRANCH	WITHDRAWAL TRANSFER UPI TR		6000.00		19962.91CR
03/01/2020	03/01/2020	ATM SERVICE BRANCH	WITHDRAWAL TRANSFER UPI TR		149.00		19813.91CR
04/01/2020	04/01/2020	ATM SERVICE BRANCH	WITHDRAWAL TRANSFER UPI TR		535.00		19278.91CR
04/01/2020	04/01/2020	ATM SERVICE BRANCH	BY TRANSFER UPI TRANSFER000			250.00	19528.91CR
05/01/2020	05/01/2020	ATM SERVICE BRANCH	WITHDRAWAL TRANSFER UPI TR		349.00		19179.91CR
05/01/2020	05/01/2020	ATM SERVICE BRANCH	WITHDRAWAL TRANSFER UPI TR		5500.00		13679.91CR
05/01/2020	05/01/2020	ATM SERVICE BRANCH	BY TRANSFER UPI TRANSFER000			8000.00	21679.91CR
05/01/2020	05/01/2020	ATM SERVICE BRANCH	WITHDRAWAL TRANSFER UPI TR		209.00		21470.91CR
06/01/2020	06/01/2020	ATM SERVICE BRANCH	WITHDRAWAL TRANSFER UPI TR		180.00		21290.91CR
06/01/2020	06/01/2020	ATM SERVICE BRANCH	BY TRANSFER UPI TRANSFER000			50.00	21340.91CR
06/01/2020	06/01/2020	ATM SERVICE BRANCH	WITHDRAWAL TRANSFER UPI TR		5500.00		15840.91CR
06/01/2020	06/01/2020	ATM SERVICE BRANCH	WITHDRAWAL TRANSFER UPI TR		149.00		15691.91CR

The bank statement has initially some basic information about the holder and the Bank Branch. This is followed by the actual information about the account holders' statements. The target is to extract only the data which shows the transactions. For this, we try to detect the 'Balance Column' in the excel file. The balance column is the most reliable column to find out as no Bank can omit the balance column in the statement file.

To find the Balance column, we perform a linear search through the dataframe's values and we apply a regex match on each value (lowercased) to find anything which matches something like `.* balance .*`.

To make the result reliable, when we find any entry matching the balance regex, we do a vertical scan from that entry point and check whether at least 5 entries below it match a regex representing decimal numbers. Before matching this regex, we clear any leading or trailing alphabetic characters in the entry (these usually appear to represent the currency). If we find that 5 or more entries are in numerical form, we declare that row as the 'Header Row' indicating the row where we have all the columns names used by the bank to store the information. If the data frame has less than 5 rows, we only check for the immediate down value.

Figure 4 shows an example how the Header Row is concluded from the Balance Column.

Once we get the 'Header Row', our aim is to trim the foot of the data frame which stores the information given by some banks relating to the account. An example is shown in Figure 5.

Figure 4

Value Date	Post Date	Remitter Branch	Description	Cheque No.	Debit Amount	Credit Amount	Balance
01/01/2020	01/01/2020	ATM SERVICE BRANCH	BALANCE B/F				31732.91CR
01/01/2020	01/01/2020	ATM SERVICE BRANCH	WITHDRAWAL TRANSFER UPI TR		20000.00		11732.91CR
01/01/2020	01/01/2020	ATM SERVICE BRANCH	WITHDRAWAL TRANSFER UPI TR		111.00		11621.91CR
02/01/2020	02/01/2020	ATM SERVICE BRANCH	WITHDRAWAL TRANSFER UPI TR		300.00		11321.91CR
02/01/2020	02/01/2020	ATM SERVICE BRANCH	WITHDRAWAL TRANSFER UPI TR		234.00		11087.91CR
02/01/2020	02/01/2020	ATM SERVICE BRANCH	BY TRANSFER IMPSP2A000217			15000.00	26087.91CR
02/01/2020	02/01/2020	ATM SERVICE BRANCH	WITHDRAWAL TRANSFER UPI TR		125.00		25962.91CR
03/01/2020	03/01/2020	ATM SERVICE BRANCH	WITHDRAWAL TRANSFER UPI TR		6000.00		19962.91CR
03/01/2020	03/01/2020	ATM SERVICE BRANCH	WITHDRAWAL TRANSFER UPI TR		149.00		19813.91CR
04/01/2020	04/01/2020	ATM SERVICE BRANCH	WITHDRAWAL TRANSFER UPI TR		535.00		19278.91CR
04/01/2020	04/01/2020	ATM SERVICE BRANCH	BY TRANSFER UPI TRANSFER000			250.00	19528.91CR
05/01/2020	05/01/2020	ATM SERVICE BRANCH	WITHDRAWAL TRANSFER UPI TR		349.00		19179.91CR
05/01/2020	05/01/2020	ATM SERVICE BRANCH	WITHDRAWAL TRANSFER UPI TR		5500.00		13679.91CR
05/01/2020	05/01/2020	ATM SERVICE BRANCH	BY TRANSFER UPI TRANSFER000			8000.00	21679.91CR
05/01/2020	05/01/2020	ATM SERVICE BRANCH	WITHDRAWAL TRANSFER UPI TR		209.00		21470.91CR
06/01/2020	06/01/2020	ATM SERVICE BRANCH	WITHDRAWAL TRANSFER UPI TR		180.00		21290.91CR
06/01/2020	06/01/2020	ATM SERVICE BRANCH	BY TRANSFER UPI TRANSFER000			50.00	21340.91CR
06/01/2020	06/01/2020	ATM SERVICE BRANCH	WITHDRAWAL TRANSFER UPI TR		5500.00		15840.91CR
06/01/2020	06/01/2020	ATM SERVICE BRANCH	WITHDRAWAL TRANSFER UPI TR		149.00		15691.91CR

Figure 5

Value Date	Post Date	Remitter Branch	Description	Cheque No.	Debit Amount	Credit Amount	Balance
2020	27/02/2020	VIT BRANCH(VELLORE)	E COM PUR ECOM TX SEQ NO 00		10.00		1515.00CR
2020	27/02/2020	VIT BRANCH(VELLORE)	E COM PUR ECOM TX SEQ NO 00		123.00		1402.00CR
2020	28/02/2020	VIT BRANCH(VELLORE)	E COM PUR ECOM TX SEQ NO 00		25.00		1467.00CR
2020	28/02/2020	ATM SERVICE BRANCH	WITHDRAWAL TRANSFER UPI TR		210.00		1257.00CR
2020	28/02/2020	ATM SERVICE BRANCH	WITHDRAWAL TRANSFER UPI TR		25.00		1232.00CR
2020	28/02/2020	ATM SERVICE BRANCH	WITHDRAWAL TRANSFER UPI TR		10.00		1222.00CR
2020	28/02/2020	ATM SERVICE BRANCH	WITHDRAWAL TRANSFER UPI TR		21.00		1201.00CR
2020	28/02/2020	ATM SERVICE BRANCH	BY TRANSFER IMPSP2A000018			17000.00	18201.00CR
2020	01/03/2020	ATM SERVICE BRANCH	WITHDRAWAL TRANSFER UPI TR		1967.00		16234.00CR
2020	01/03/2020	ATM SERVICE BRANCH	WITHDRAWAL TRANSFER UPI TR		60.00		15774.00CR
2020	01/03/2020	ATM SERVICE BRANCH	WITHDRAWAL TRANSFER UPI TR		20.00		15754.00CR
2020	01/03/2020	ATM SERVICE BRANCH	BY TRANSFER UPI TRANSFER000			60.00	15814.00CR
2020	02/03/2020	ATM SERVICE BRANCH	WITHDRAWAL TRANSFER UPI TR		350.00		15464.00CR
2020	03/03/2020	ATM SERVICE BRANCH	WITHDRAWAL TRANSFER UPI TR		346.00		15118.00CR
2020	04/03/2020	ATM SERVICE BRANCH	WITHDRAWAL TRANSFER UPI TR		1000.00		14118.00CR
2020	04/03/2020	ATM SERVICE BRANCH	WITHDRAWAL TRANSFER UPI TR		4500.00		10018.00CR
2020	04/03/2020	ATM SERVICE BRANCH	BY TRANSFER UPI TRANSFER000			1500.00	11518.00CR
2020	06/03/2020	ATM SERVICE BRANCH	WITHDRAWAL TRANSFER UPI TR		3000.00		8518.00CR
2020	06/03/2020	ATM SERVICE BRANCH	CREDIT UPI RET 0061079466 04			1000.00	9518.00CR
2020	07/03/2020	ATM SERVICE BRANCH	WITHDRAWAL TRANSFER UPI TR		32.00		9486.00CR
2020	08/03/2020	ATM SERVICE BRANCH	WITHDRAWAL TRANSFER UPI TR		20.00		9466.00CR
Total					91,508.83	69,242.00	

These unwanted values can be removed by limiting the data frame up to the row where the 'Balance Column' of the data frame is not null. If the balance columns gets null, we can easily assume that there is some unwanted information below this in the dataframe.

Once we limit our dataframe, our aim is to identify the main columns from the data frame. We now have a list of all the column names but we still don't have the classification of these columns.

The next column which can be easily targeted most of the time is the 'Date Column' of the sheet. The Date is usually of the format xx/xx/xxxx or xx-xx-xxxx. For both the cases, we can run a regex match on all the columns to detect such a pattern in the columns values. If we are able to match such a pattern for 'all' the columns values, we ask the user himself for the column which represents the transaction date from a drop down having all the dataframe column names. The main aim is to reduce human effort to give all details to the software, hence if we find a column matching the pattern for all the values, we automatically set the 'Date column' to that column name and display it to the user and provide a 'Automatically Detected' tag alongside the column name.

The next column which can be detected most reliably is the 'Description Columns' of a bank statement. This column is the longest running column in terms of the length of each entry inside the column. Hence, for this, we calculate the average length of all the remaining columns and only for those columns which don't have 'only numerical data'.

The final columns required for the analysis are the columns which provide the information of whether a transaction is a debit or credit and also the amount credited or debited in a single transaction. This is quite difficult to detect as there are several formats in which different banks like to represent this information. An example of a total different structure is shown in figures 6 and 7.

Figure 6

Date	Description	Debit Amount	Credit Amount	Balance
01/01/2020	ATM SERVICE BRANCH	20000.00		1732.81 INR
01/01/2020	ATM SERVICE BRANCH	111.00		1721.81 INR
02/01/2020	ATM SERVICE BRANCH	300.00		1421.81 INR
02/01/2020	ATM SERVICE BRANCH	294.00		1127.81 INR
02/01/2020	ATM SERVICE BRANCH	125.00	15000.00	20097.81 INR
02/01/2020	ATM SERVICE BRANCH	6000.00		20962.81 INR
02/01/2020	ATM SERVICE BRANCH	140.00		19813.81 INR
04/01/2020	ATM SERVICE BRANCH	535.00		19278.81 INR
04/01/2020	ATM SERVICE BRANCH	340.00	250.00	19628.81 INR
05/01/2020	ATM SERVICE BRANCH	5500.00		14128.81 INR
05/01/2020	ATM SERVICE BRANCH	250.00	8000.00	21778.81 INR
05/01/2020	ATM SERVICE BRANCH	180.00		21598.81 INR
06/01/2020	ATM SERVICE BRANCH	50.00		21548.81 INR
06/01/2020	ATM SERVICE BRANCH	5500.00		16048.81 INR

Figure 7

Sr	Date	Value Date	Description	Cheque No.	CRDR	CCY	Amount (INR)	Balance (INR)
1	24/08/2019	24/08/2019	UPI0227464019POORNA CHANDRA PANT BO		CR	INR	1.00	178.0
2	24/08/2019	24/08/2019	UPI02241434017ABANWAL JAL SAN2704IN		CR	INR	1,458.00	177.0
3	24/08/2019	24/08/2019	UPI022417970504Paytm		CR	INR	1,500.00	1,636.0
4	19/08/2020	19/08/2020	UPI02215615304DOVETAL WOODCRAFTERS PVT		CR	INR	3,240.00	135.0
5	19/08/2020	19/08/2020	UPI0227240802PhonePe		CR	INR	75.00	3,375.0
6	19/08/2020	19/08/2020	UPI02211981624SUNDH CONFECTIONERY		CR	INR	830.00	3,460.0
7	19/08/2020	19/08/2020	UPI02219020050New Ridge		CR	INR	65.00	4,260.0
8	19/08/2020	19/08/2020	UPI02215240520PhonePe		CR	INR	20.00	4,340.0
9	19/08/2020	19/08/2020	UPI02300611244Google Pay		CR	INR	129.00	4,365.0
10	15/08/2020	15/08/2020	UPI02288700313Whole sale accessories		CR	INR	80.00	4,484.0
11	15/08/2020	15/08/2020	UPI02288700313Whole sale accessories		CR	INR	1.00	4,474.0
12	14/08/2020	14/08/2020	UPI02274000050ROHIT SHARMA		CR	INR	10,000.00	4,375.0
13	13/08/2020	13/08/2020	UPI02288717722PhonePe		CR	INR	4,168.00	14,075.0
14	13/08/2020	13/08/2020	UPI02284405050MANGAL SALES		CR	INR	11,000.00	18,763.0
15	13/08/2020	13/08/2020	UPI02284405050MANGAL SALES		CR	INR	19,000.00	29,763.0
16	13/08/2020	13/08/2020	UPI02284405050MANGAL SALES		CR	INR	20,000.00	48,763.0
17	13/08/2020	13/08/2020	UPI02281056074M NISHANT PANDEY		CR	INR	20,000.00	68,763.0
18	13/08/2020	13/08/2020	UPI02281056074M NISHANT PANDEY		CR	INR	20,000.00	88,763.0
19	13/08/2020	13/08/2020	UPI02281056074M NISHANT PANDEY		CR	INR	20,000.00	108,763.0

Figure 6 shows a bank where the information about the credit/debit and the amount is represented in 2 columns. Figure 7 shows a bank where the debit/credit and the amount are shown in 2 columns where one column shows the amount of the transaction and the other shows whether it is a credit or a debit as a string. To resolve such ambiguities, we ask the user with a series of drop downs the names of the columns which represent the Credit, Debit and the amount of the transaction (if present). This is the only time when the user has to tell the software something about the data represent inside the excel file. Once we get all the required information about the dataset columns, we now convert the dataframe into a general format. The general format includes – The date of transaction, The amount of the transaction, A columns to identify if the transaction was credit or debit, The description of the transaction, The balance remaining in the account after the transaction. All data frames which have missing any of these columns are restructured using pandas to get the above format.

Once we get the data frame in the required structure, we fix the data types of all the columns as the data frame is always read in as a string/object data type because of the noise inserted by the banks before and after the actual data. Once the data frame is ready, it can easily be connected through dash to get a dashboard for the user.

## IV.CONCLUSION

It is hard to visualize and believe the layout of college, house, and many others. By just examining the blueprint of floor plan every day for human beings. The most important motive of this gadget is to increase a utility, that presents floor or architectural plans in reality without the usage of the actual method that are noticeably exhaustive and time-consuming sports. Moreover, an Interior Management Augmented along with finance management for optimized expenditure over house expenses. Augmented Reality App which can overlay virtual content i.e., snap shots onto bodily items or locations, and it typically works by means of the use of digicam module of an electronic tool consisting of a smartphone or a tablet. Proposed AR App work on excessive price of version mapping and accuracy using Unity and Vuforia SDK. This device gives a 3-d view of the 2D architectural floor plan with the assist of augmented reality. The gadget will create 3-d fashions in real-time, presenting an interactive way to enjoy for the customers. It aids the method of conversion of 2D plans to 3-D plans with no human assistance to make the procedure rapid and green

## V. RESULTS

Figure:8.1



Figure:8.2



Figure:8.3



Figure:9.1

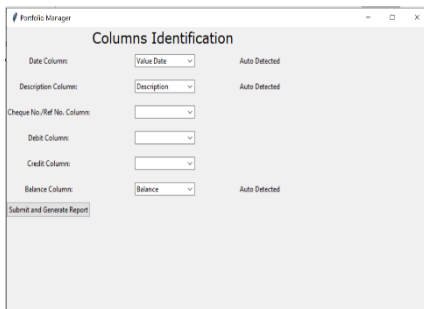


Figure:8.4



Figure:9.2

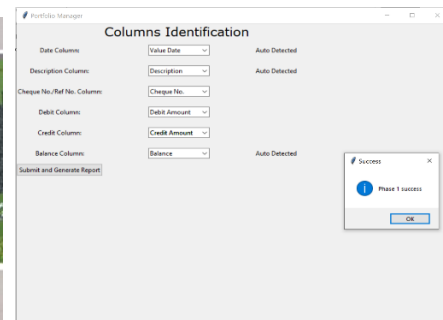


Figure:9.3

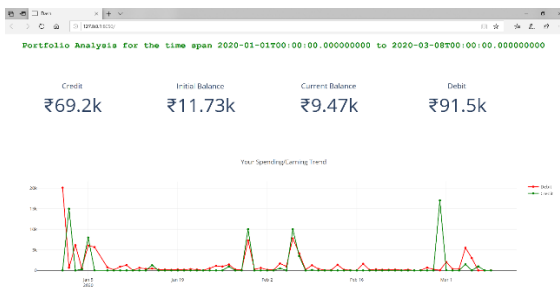


Figure:9.4



## VI. REFERENCES

- [1] Bogdan-Alexandru Deaky, Luminita Parv, 2017, Virtual Reality for Real Estate, Experiment@ International Conference, 2017, University of Algarve, Faro, Portugal, June 6- 8.
- [2] Xiao Yu, 2011, Research and Practice on Application of Virtual Reality Technology in Virtual Estate Exhibition, Procedia Engineering, 15, pp.1245-1250.
- [3] Sanni Siltanen and Virpi Oksman, 2013, User-Centered Design of Augmented Reality Interior Design Service, International Journal of Arts & Sciences, 6(1), pp.547-563, ISSN: 1944- 6934.
- [4] Shaoliang Qi, Virtual Interior Design Based On VRML AND JAVA, 2012, International Conference on Medical Physics and Biomedical Engineering, Physics Procedia, (33), pp.1614- 1620.
- [5] Spyros Vosinakis, Philip Azariadis, Nickolas Sapidis, Sofia Kyrtzi, 2007, A Virtual Reality Environment Supporting the Design and Evaluation of Interior Spaces, 4th Intuition Conference on Virtual Reality and Virtual Environments, Athens.
- [6] Petar Pejić, Sonja Krasić, Milica Veljković, Srđan Sakan, Taško Rizov, 2017, Augmented and Virtual Reality Application in Traditional Architectural Project Presentation - Case Study of "MH Petra" House, FME Transactions, (45)2, pp. 229.
- [7] R. Azuma, "A Survey of Augmented Reality," Presence: Teleoperators and Virtual Environments vol. 6, no. 4, Aug. 1997, pp. 355-385
- [8] Shaoliang Qi, Virtual Interior Design Based On VRML AND JAVA, 2012, International Conference on Medical Physics and Biomedical Engineering, Physics Procedia, (33), pp.1614- 1620.
- [9] Prabhakar Mudliyar, Yuvraj Ingale, Sanket Bhalerao, Onkar Jagtap, 2014, Virtual Reality for Interior Design, International Journal of Research in Advent Technology, (2)3, E-ISSN: 2321-9637.
- [10] AR Toolkit [http://www.hitl.washington.edu/research/shared\\_space/](http://www.hitl.washington.edu/research/shared_space/)
- [11] International Symposium on Augmented Reality. <http://www.Augmented-Reality.org/isar>
- [12] AR Toolkit [http://www.hitl.washington.edu/research/shared\\_space](http://www.hitl.washington.edu/research/shared_space)
- [13] The development of Augmented Reality as a tool in Architectural and Urban design ,Søren S. Sørensen
- [14] Application of Virtual and Augmented Reality in Automotive Measurement Processes: [https://www.researchgate.net/publication/316087927\\_Application\\_of\\_Virtual\\_and\\_Augmented\\_Reality\\_in\\_Automotive\\_Measurement\\_Processes](https://www.researchgate.net/publication/316087927_Application_of_Virtual_and_Augmented_Reality_in_Automotive_Measurement_Processes)
- [15] Interior Design with Augmented Reality, Ananda Poudel and Omar Al-Azzam
- [16] Kai-Yi Chin; Chun-Xin Hou ; Ching-Sheng Wang ; Ko-Fong Lee, " Using Augmented Reality Technology for the development of Historic Building : A Mackay Culture Course", IEEE [2017].
- [17] Dwi Ely Kurniawan, Afdhol Dziki, Muhammad Suriya , Yeny Rokhayati, Asep Najmurokhman, "Object Visualization Using Maps Marker Based On Augmented Reality" ,IEEE [2018].
- [18] Ralph Schoenfelder ET. AL, "Augmented Reality for Industrial Building Acceptance", IEEE National Natural Science Foundation. [2008].
- [19] R.G. N. Ruwanthika 1 , P. A. D. B. M. Amarasekera 2 , R. U. I. B. Chandrasiri 3 , D. M. A. I. Rangana 4 ,Nugaliyadde 5 , Y. Mallawarachchi , "Dynamic 3D Model Construction using Architectural House Plans" , IEEE [2017].
- [20] Kosin Kalarat, "Applying Relief Mapping on Augmented Reality", IEEE [2015].
- [21] International Symposium on Mixed Reality. <http://www.mr-system.co.jp/ismr>