# Revolutionising social media With Maps and Augmented Reality

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*Abstract— In today's world of increased internet participation, as well as the need for additional facilities and developments, there is a desire for innovation; consequently, we seek to produce a Maps API driven cross-platform application that utilises the power of Augmented Reality (AR). This project's purpose is to provide services where users can conglomerate via their digital selves into a single map-based user interface where users may purchase, sell, and socialise on a metaverse-like platform.*

*Indexed Terms-- Entertainment, Health-care, Social-networking, Collaborative learning tools, learning via discovery, Navigation, Augmented Reality (AR), Map, Socialise, Cloud Anchor, Photogrammetry.*

## I. INTRODUCTION

People rely more and more on mobile apps to do their day-to-day errands - with it advertising and marketing are booming. Apps Like Instagram and Facebook generally tend to advertise in a one-dimensional way using either vertical scroll views or horizontal scroll views. Mappe is made on the idea of integrating the principle foundations of these traditional social media platforms with augmented reality with the help of blockchain and other fault tolerant systems (for high availability) into our daily lives regardless of platform. The idea of Mappe is not to create something that's already not present in the world but to change the way advertisements are done on existing social media platforms and the way people interact with each other in their social lives on these social media platforms. Combining the old-school one-dimensional scroll views with mapping libraries and augmented reality would create a new realm where people can immerse themselves into the metaverse a.k.a the "Reality-virtuality continuum". Using augmented reality,

blockchain and geolocation APIs for precise navigation in this virtual world environment would definitely open a lot of new experiences such as two dimensional feeds, shopping, AR powered virtual rooms, virtual advertisement and much more. The idea is very simple i.e., opening tons of possibilities per dimension in a "reality-virtuality continuum" Fig. 1.1
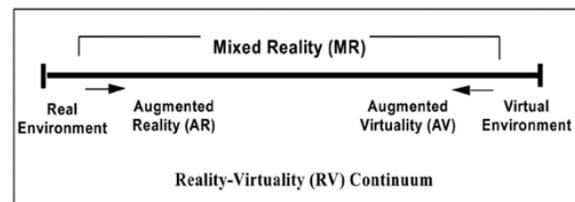


Figure 1.1 Reality-Virtuality Continuum [1]

AR resolves all the costs like fashion marketing involves a lot of expense. A virtual fashion shown by AR apps can cost less than a physical collection [2] or a marketing event. It will help increase web sales as it will attract the customers more than the recent activities taking place in shopping; the fun and the playful shopping experience through augmented reality will help increase the web scales.AR shopping will entirely transform the way of shopping in today's world. It will significantly impact the customers and the luxury brands and items in the fashion industry.

In Southeast Asia, more people are now shopping online than ever before. Over 80% of new digital users said they would continue using the service after the crisis. According to a study conducted by the research firm ComScore, 41% of consumers say that a product website makes them more likely to buy a product. This is because websites that are easy to navigate and feature specific product specifications make them more likely to buy. People in the study said they would prefer to save money and time when shopping online. However, they also cited the need for better prices and

faster delivery times as two of the most important factors for making an online purchase. Alibaba's Taobao Live is a live streaming channel that enables retailers to communicate with their customers. It's similar to how social interactions are conducted in shops and supermarkets. Consumers want to shop seamlessly and find what they're looking for.

This paper is organized as follows; In section II we are discussing the products in the same domain of Mappe such as OLX, Oyo, Dubizzle and comparing the revenue, user base and all the different aspects of these companies. In section III we discuss the proposed model and challenges followed by section IV. We are concluding our research with conclusion in section V and future work in section VI.

## II.      LITERATURE SURVEY

Augmented truth (AR) is a variant of digital environments (VE), or digital truth as it's far extra customarily called. VE technology immerses a person in internal artificial surroundings. While engaged, the person can't see the actual international world around him. In contrast, AR lets the person engage with the real world, with digital items superimposed upon or composited with the natural environment.

Existing outdoor navigation systems can guide us on streets [6] where to go and how to go, but no such handy Indoor Navigation System can guide us inside the buildings. If you are a driver who uses navigation software to get to a certain destination, you might consider using indoor navigation. This technology can help you navigate through the confusing streets and buildings in the area. A home navigation system user can find their current location on a map. They can then select the place or area that interests them, and the route they want to take will appear on the map. Because the area is calculated on the device, this is called a Client setting.

Augmented reality also helps with navigation like locating elevators, stores and more if you find yourself lost in a mall or airport. Instead, augmented reality will feature arrows on the screen Fig. 3.1 showing you where to go, much like how the site operates now on city streets.

Another example of an app that provides several services that offer home installation, maintenance and repair services (Urban Company). It takes your exact location and provides the best service you want at that particular time. In addition, it provides you with a history of your work which you posted. This app uses an advanced search filter.  In the last financial year, its home repair and beauty & wellness services contributed 45% to its total revenue. By March 2020, Urban Company had a network of around 25,000 professionals and was servicing over 22 locations globally.

OLX is a marketplace where consumers can buy and sell various goods and services. In 2014, it had more than 200 million active users and more than 8 million monthly transactions.

Dubizzle.com is a great platform that enables users to buy and sell anything in their community.

OYO is a leading hotel company that connects people with great hotels across various cities. It generates around a million job openings in India and South Asia each year.

OYO Rooms, OYO Hotels & Homes has a multi-brand approach which includes:-
- SilverKey was launched in April 2018, and it aims to meet the needs of the corporate visitors.
- OYO LIFE is targeted at millennials and young specialists in search of fully maintained homes on long-term rentals at affordable prices.
- Palette allows a well-curated staycation for those seeking an intuitive experience at aggressive prices, an upper-end recreation resorts category.
- The main goal of Mappe aims to provide everything you need in one map, buy and sell all things by categories, receive or deliver services like Babysitter, Tutoring, Elder Care, Beauty care, Dogwalker, Cleaning, find Entertainment, compete in sports and games tournaments, get a cheap ride, find a place to stay, meet new friends and socialise (that too in mixed reality). Pay with points or money. Realise all your passions, discover the possibilities in every neighborhood, learn new things enjoy the natural world, not on "just" a social network.
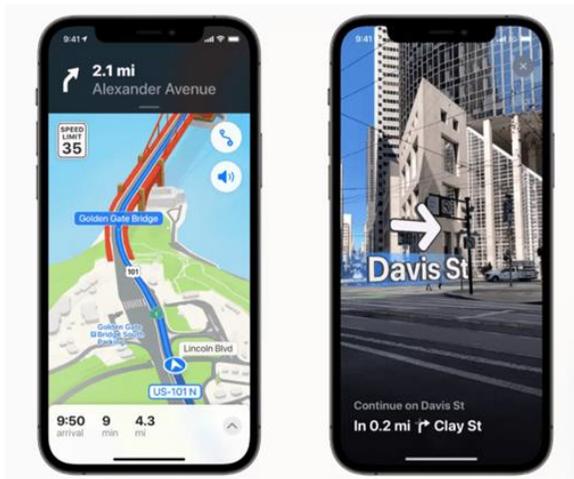
Figure 2.1 Augmented Arrows [20]

## A. Digital Marketing

Social media marketing is a strategy used to promote products and services through Facebook and other online platforms. It uses various advertising techniques to encourage users to purchase.



Figure 2.1.1 Digital Shopping [19]

## B. Revolutionizing Social Media

XR technology is usually limited to a subset of video games and niche business applications. However, as the games grow into social media platforms, the possibilities are increasing that their features - the visible and continuous worlds, open [10] and creative media, and pop culture channels - can be used and will be used in other contexts.



Figure 2.2.1 Digital Space [19]

### III.    PROPOSED MODEL

Because of the regions mentioned above, people demand more ease while using a digital application; to provide more comfort, virtual reality/augmented reality would be a perfect solution for this. We are going to discuss them one by one in this section.

The proposed model is divided into the given sub-sections (Fig 3.1):

- Buying, selling and socializing
- Indoor Navigation
- Augmented Reality with cloud anchors
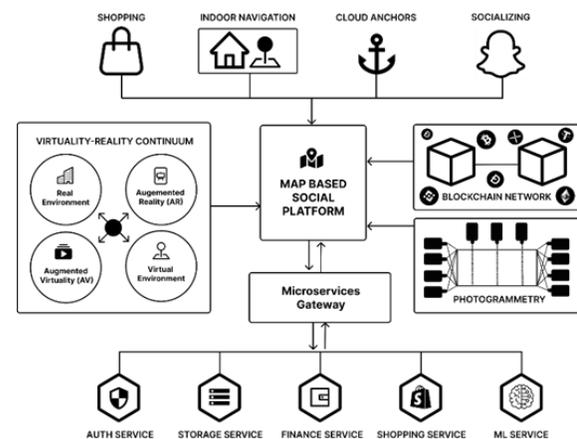- Blockchain (NFT and Decentralized services)
- Photogrammetry



Figure 3.1
Proposed Model

## A. Buying and Selling

Ecommerce is being used by almost everyone in today's world for their daily needs such as household items, gadgets, clothes etc., Mappe also has a buying and selling feature, allowing users to buy and sell a particular thing. If someone is going to a mall, they might want to get details of a particular shop or browse

through its inventory. Mappe will help them find these details by augmenting them outside the store to get insight into that product without even visiting inside the store. A seller can upload an AR object and anchor it to the cloud anchor by which the buyer can view it and sync with that seller. A user uploads their review in that place. Next, a local anchor is attached to the study. Then during hosting, ARCore uploads data for the ARCore Cloud Anchor service, which yields a unique ID for that anchor. Then the app assigns the unique ID to other users.

### B. Indoor Navigation

Indoor Navigation involves flexible [3] guidance in confusing, unfamiliar houses and building complexes. The user's position is always updated by the change in the position of the building.

### C. Augmented Reality

The app implements augmented reality by integrating it with the core features of Mappe using AR core. Users can navigate a mall or airport using guided arrows. Now, just go to a mall or shopping complex and navigate to the shop nearest to you. For example, suppose you are a shopkeeper and want to promote your business by displaying the bestseller items. With the help of Mappe, you can attract a crowd to your store.

Shopkeepers can use AR to allow consumers to try products before they buy them, which can help users to know about the product more and experience it. Augmented reality is the latest trend in sales and digital marketing. It allows shopkeepers to give unique experiences to customers by tapping into their mobile devices. AR resolves all the problems where fashion marketing involves a lot of expertise. For example, a virtual fashion show on AR apps can cost less than a physical collection or marketing event. It will help increase the web sales as it will attract the customers more than the recent [5] activities taking place in shopping. A playful shopping experience through augmented reality will help increase the web scales.

AR shopping will entirely transform the way of shopping in today's world. It will significantly impact the customers and the luxury brands and items in the fashion industry.

### D. Cloud Anchors

We use Cloud Anchors to enable multiple users to place virtual content in the exact world location. Users can add virtual objects to an AR scene. Cloud Anchors are hosted on the ARCore Cloud Anchor Service, allowing users to interact with the same virtual thing from anywhere through an AR application. Mappe can also be used for digital marketing and brand recognition as well as collaborative learning tools.

### E. Interactive Playgrounds powered by AR

In-built AR playgrounds/virtual labs for medical students (and general students) to interact with Augmented reality objects like human anatomy and chemical components. Ability to create custom AR playgrounds with 3D objects and discover all the things that are impossible to visualise with traditional learning techniques, which are possible with education games in augmented reality.

### F. NFT (Non-Fungible Tokens)

NFT is an acronym for non-fungible tokens [9]. Simply put, a digital token is available in a blockchain to record proof of the holder's identity. Each token is entirely different because it has unique metadata that cannot be duplicated or replaced by another.

While regular NFTs are just an illustration of pieces of art or timelines (such as photos or videos), AR NFTs include AR features and indicators, such as the ability to visualise digital objects in your area or face/body. In addition, 3D NFTs are digital objects that can be detected using AR or other technologies. That means AR NFTs and 3D NFTs are deep objects that AR-enabled websites or applications can share.

The great advantage of AR NFTs and 3D NFTs is that they can generate new sources of revenue for artists (visual artists, digital artists, artists, video makers, etc.), auctioneers, and retailers. Artistic NFTs also reduce the need for mediators by allowing artists to engage with their audience directly. And, unlike analogue objects, digital collections are software, which means that the original creator can make a profit every time an NFT gets resold.

### G. Digital Art Lenses

Live filters allow users to display unique digital art pieces. With a lens, you can interact with NFT art by

placing it in your space, be it your living room, office, or art gallery, via AR.

Pascal Boyart from Paris was one of the first street artists to attach Bitcoin QR codes to his work. In 2019, his painting depicting the Yellow Vest protests was immediately painted by French authorities. But the artwork in the picture continued with NFTs - a move that greatly benefited Boyart. Remarkably, Boyart often refreshes his murals with sound, movement, and additional facts.

Sotheby's auction house, which had previously worked with Poplar Studio to create an Instagram filter that allows users to see what "Bottomic Roundel's" Image Boy "will look like in their homes, is about to enter the AR NFT. market.

### H. NFT Face Filtering
Artists are also increasingly combining their art and technology to create NFT face filters. Marc-O-Matic from Melbourne is a good example - his artwork incorporates traditional graphic art, 3D animation, and augmented reality.

### I. 3D Product NFT
Art NFTs are not limited to works of art and face filters. 3D models of unique products are also growing. NFT fashion sounds like a dress you can wear on your body, done by an AR filter.

The collaboration between the crypto brand RTFKT Studios and Atari has created a line of digital sneakers that consumers will be able to show off at all multiplayer blockchain games, including the upcoming Atari Metaverse. Interestingly, users can try these sneakers at home before using Snapchat or the MetaverseMe app.

### J. Photogrammetry
Photogrammetry is the science, art and technology of collecting reliable information about physical objects and the environment by measuring, recording and interpreting photographic patterns and pictures of recorded radiant electromagnetic energy and other phenomena.[14].

Relief displacement can be described as the change in an object's image position caused by its elevation above

a particular datum (set of values). A vertical object (such as a tree or a pole) will appear to be lying along a line radial to the image nadir point (direction pointing directly below a particular location). This deformation is called relief displacement.
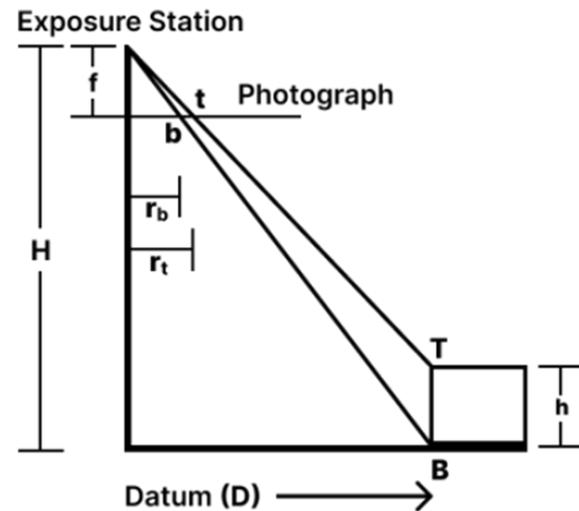


Figure 3.10.1
Relief Displacement

Eq 1

$$\frac{f}{h} = \frac{r_b}{D} \quad \rightarrow \quad D = \frac{r_b h}{f}$$

Eq 2

$$\frac{f}{H - h} = \frac{r_t}{D} \quad \rightarrow \quad D = \frac{r_t (H - h)}{f}$$

From Eq (1) and Eq (2)

$$\frac{r_b H}{f} = \frac{r_t (H - h)}{f}$$

$$r_b H = r_t H - r_t h \quad => \quad r_t H = H(r_t - r_b)$$

$$h = \frac{H(r_t - r_b)}{r_t} \quad => \quad \frac{H \Delta r}{r_t}$$

### K. Going Native (iOS)
The addition of LiDAR yields more accurate depth information so that the iPhone can understand the

relationships between objects, draw spatial bitmaps [7] through algorithms, and crop images.
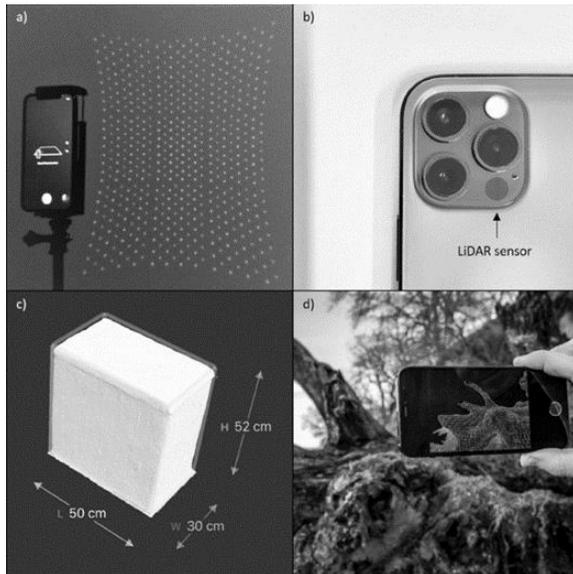


Figure 3.11.1

Apple iPhone 12 pro mounted on a selfie stick with the LiDAR sensor emitting an array of 8x8 points diffracted into 3x3 grids making a total of 576 points.

The iPhone dissects the image into sections based on a depth-of-field information map within a few nanoseconds. The farther the layer, the higher the degree of blur, creating a fake portrait with a shallow depth of field.

*L.  Going Native (Android)*
The ARCore Depth API is a tool that allows developers to create depth maps with a single camera. It does so by mapping the world around the device to the nearest object.

A depth map gets generated with high-resolution images from several angles and matches them as you move your phone around.

*M. Photogrammetry with AR*
Using the Depth API and LiDAR from both Android and iOS photogrammetry is possible (building 3D models by taking pictures from all angles). We can create 3D objects from the data captured by the phone.

ArKit by Apple Provides Object Capturing API for the same. While ARCore has Depth API for easing the

process. This would help in Mappe by Sending the Object Data to Cloud and the created model will be received by the user via cloud anchors.

TABLE 1. COMPARING TRADITIONAL SOCIAL MEDIA WITH METAVERSE

| Type | Advantages | Disadvantages |
|---|---|---|
| Traditional social media | 1.Help in building relationship with your customers through social media. | 1. It can be used ineffectively i.e., May damage your reputation. |
| | 2. Social content can boost traffic to your website. This can lead to increased online conversions such as sales and leads. | 2. It can be hard to measure and place a monetary value on the brand awareness and reputation that social media can bring. |
| Metaverse | 1. It helps in bringing people together and offer the mysterious aura of alien worlds. | 1. Separate you from the real nature and the real world overstimulates your senses. |
| | 2. Make everything more enjoyable and more interesting improve work at home and homeschooling. | 2. Generate addiction and make you lose track of time. |

IV.    CHALLENGES

The major pitfall of this project are as follows:

- Scaling-
Social Apps like these need a good amount of advertising and reviews (preferably word of mouth) which encourages other people to download and use the application.

- Regional Content –
As the app grows, it might tend to lean towards a particular topic which might be beneficial for people

with that taste but might not be good in future. Keeping a balanced user base is crucial.

• Social Stigma-

Some people discourage the concept of metaverse because of the misinformation spreading around the web. While there are pros and cons for everything building a Metaverse has several benefits in contrast to their anomalies.

## V.    CONCLUSION

As more and more technology enters our lives, it is complicated to segregate human life from technology. Everyone is looking for solutions on their hands and in the quest to provide the answers for ease of life, the students are demanding that AR could be the new technology because of its advantages. So keeping this in mind, we have proposed a model where sub technologies like Cloud Anchors, Google maps API, Flutter, React JavaScript, AR , Photogrammetry, NFTs (blockchain), LiDAR, spatial mapping Depth API, poisson reconstruction will be combined to provide the services like integrating all of the varied contents and features onto the same map-based user interface where users can purchase, sell and socialize in a metaverse-like platform therefore heavily impacting the lifestyle of the coming generation and common people.

## VI.    FUTURE WORK

Integrating AR advertising at scale with Lenses and incremental changes by launching features such as the marker templates and AR try-on Using AR enabled glasses like Oculus Quest 2 and Snap Spectacles 3.

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