

## Building Reality Experience Web Application

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### ABSTRACT

One of the biggest challenges of online shopping is that it doesn't lend itself well to a full sensory product experience. In a brick-and-mortar environment, you can try on clothes, touch fabrics, or see for yourself just how big a couch looks in a room.

While those things aren't technically possible in ecommerce, augmented reality (AR) applications offer a way to give customers deeper and more complete information about your products — right from their own home.

Retail presents a number of opportunities for AR, particularly when it comes to ecommerce. As much as people have gotten used to the idea of ecommerce, there are still some purchases for which we need a little bit more contextual information. That can be a barrier to selling certain product categories online.

AR allows ecommerce customers to preview products or experience services in their own environment and on their own time, before electing to make a purchase. Using AR, your customers can preview products and be more likely to pick the right product the first time.

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### I. INTRODUCTION

AR is used to integrate print and video marketing. Printed marketing material can be designed with certain "trigger" images that, when scanned by an AR-enabled device using image recognition, activate a video version of the promotional material. A major difference between augmented reality and straightforward image recognition is that one can overlay multiple media at the same time in the view screen, such as social media share buttons, the in-page video even audio and 3D objects. Traditional print-only publications are using augmented reality to connect different types of media.

AR can enhance product previews such as allowing a customer to view what's inside a product's packaging without opening it. AR can also be used as an aid in selecting products from a catalog or through a kiosk. Scanned images of products can activate views of additional content such as customization options and additional images of the product in its use.

#### A. VR is fully immersive, while AR simply augments the real world.

Augmented reality simply augments a world that already exists and that you will still perceive, to some extent. Virtual reality, on the other hand — like Facebook's Oculus Quest — is an immersive experience that lands you in a world completely of artificial creation. You typically cannot see and are not meant to experience the real world.

Think back to Pokémon Go, one of the most well-known applications of augmented reality. Users would be playing the game while walking down the street, looking at the real environment through their phone, which overlaid digital characters in specific places.

#### B. Augmented reality is more portable, while virtual reality requires equipment.

With virtual reality, you'll need to wear a headset and, potentially, hold controllers in your hands. You also have to make sure that your physical environment is safe from — well, you. (Don't be the person who punches their television while boxing in VR!)

AR, on the other hand, typically just needs a smartphone or, in some cases, AR glasses. Since you'll be fully aware of your environment, you won't need to clear the room to enjoy the experience.

#### C. More people have the capability to experience AR than VR.

Finally, because AR requires less equipment and fewer safety precautions, it's also more accessible. If you create a VR application, the number of people who have the equipment available to experience it are far fewer than the 3 billion smartphone users in the world today!

## **II. How Ecommerce Businesses Are Using Augmented Reality**

AR allows ecommerce customers to preview products or experience services in their own environment and on their own time, before electing to make a purchase. Using AR, your customers can preview products and be more likely to pick the right product the first time.

### **A. Virtual try-on solutions.**

The fear of that very outcome can reduce conversion rates. Shoppers want to really know what they're getting and take every precaution for it to be what they want. And if they do take the chance to buy and it doesn't work out, your return rates will go up.

AR helps online shoppers understand what they're buying and how the items will work for them. There are applications like this for clothing, makeup, accessories and even eyeglasses.

### **B. Preview placement.**

Preview placement gives customers a real-time glimpse of what a product will look like when placed in their own environment.

DTC furniture brand Burrow uses AR to help customers visualize how their couches will fit in their living rooms.

Their Burrow at Home app uses ARKit to place true-to-scale 3D models of Burrow's couches in photos taken on customers' iPhones and iPads.

### **C. Interactive user manuals.**

If you're selling a product that has a learning curve before it becomes easy for new customers to use, an interactive user manual might be a great AR application for you to help users better understand how your product works.

An interactive user manual responds to user actions, providing on-page contextual support when using a piece of software, website, or application. Many AR user manual apps scan the product and indicate the buttons in the real-life environment using graphical arrows and animations with text.

### **D. Social media filters.**

If you've used Instagram Stories or Snapchat lately, you may have used an AR filter. These filters were once used just for fun, but over the years there's been a rise in the number of brands jumping on the AR bandwagon through social media filters.

Here are some of the benefits:

- It's a great way to showcase a new product by enabling people to test out how it'll look on them.
- The novelty factor of AR filters can help boost audience engagement and encourage people to tag you in their content.
- The "wow" factor can help you stand out from the crowd of brands on social media and showcase what makes you special.

## **III. How to Bring Augmented Reality to Your Ecommerce Store**

### **A. Clarify your business objectives.**

Figure out your vision and goals before jumping into the technical aspects of your AR application. Once you know where you're going, it'll be easier to choose the techniques and technologies you need to get there.

### **B. Identify augmented reality tools you would like to use.**

Once you know what you want to create, you can start identifying the tools you need to use. Here are the aspects you need to think about:

- **License type:** If you have a limited budget, you may want to choose an AR platform that offers a free license. Many AR solutions provide both free and commercial licenses. However, remember that the free version won't be as robust as the full software.
- **Supported devices:** Whether you're planning to run your augmented reality app on mobile devices, laptops or AR glasses, make sure the tool you use can support the hardware for your app.
- **Supported operating systems:** If you're going to develop apps for several operating systems, make sure the platform you choose supports every operating system you want to run your app on.
- **Capabilities:** Carefully evaluate each platform to determine whether they have the exact features you need. For example, not all platforms support geo-location, so if you're planning to create a location-based AR app, those won't help you.

### C. Market your new tool.

Now that you've put all the hard work into creating your tool, you'll want to make sure the world knows about it. Here are a few ways you can get the word out:

- Create a demo video: Make promotional and instructional videos for your app that demonstrate how to use it.
- Display in-app instructions: Provide clear direction so people understand what they're supposed to do to get the most out of your app.
- Make your content shareable: Enable users to share their AR experience with friends and social media contacts.

## IV. How to Implement AR In HTML

You can experience efficient augmented reality for the web directly on your phone without installing any applications. But let's go further and see how to produce your own augmented reality experience. The shortest example of AR.js is only 10 lines of HTML thanks to the magic of a-frame.

### A. Including the Libraries

First, you include a-frame, an effort started by MozillaVR to build VR experiences. A-frame contains three.js. Then you simply include AR.js for a-frame. AR.js will make the 3d displayed in AR run very fast on your phone, even if it's a 2-3 year old phone!

```
https://aframe.io/releases/0.5.0/aframe.min.js"></script>
https://rawgit.com/jeromeetienne/ar.js/master/aframe/build/aframe-ar.js"></script>
x.ArToolkitContext.baseUrl = 'https://rawgit.com/jeromeetienne/ar.js/master/three.js/'</script>
```

#### 1. Defining the Body

In this step, it's all business as usual. You define the body, like you would in all HTML pages.

```
<body style='margin : 0px; overflow: hidden;'>
  <!-- ... -->
</body>
```

#### 2. Creating a 3D Scene

Next, we are going to create our a-frame scene. We also need to add the ARToolkit component. ARToolKit is an open-source library that we use to localize it through the phone camera.

```
<a-scene embedded artoolkit='sourceType: webcam;'>
  <!-- put your 3d content here -->
</a-scene>
```

#### 3. Adding Simple Content

Once we have created the 3d scene, we can start adding objects to it. In this line, we add a simple box. We then modify its material to make it transparent. We also change its position so it displays on top of the AR marker.

```
<a-box position='0 0.5 0' material='opacity: 0.5;'></a-box>
```

#### 4. Adding AR Camera

```
<a-marker-camera preset='hiro'></a-marker-camera>
```

Finally, we make it move as if it were your phone.

## V. RESULTS

- List of items available for shopping.
- Every product has square icon , which enable us to view the product in real world, for better understanding.



*Simply on clicking AR icon your phone shows you item.*



Fig 1. Lamp looks good in room with AR.

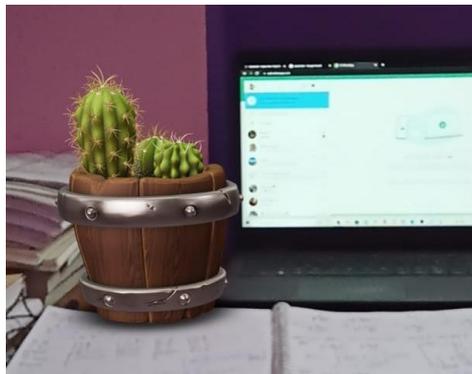


Fig 2. cacti pot is shown in real world.

## VI. Augmented Reality in Ecommerce Statistics

Augmented reality technology is really starting to take off, and advertisers — in retail or otherwise — are taking notice. Let's look at some of the numbers to prove it:

- In 2018, Apple announced USDZ AR file support for iPhones and iPads with iOS12. Apple has created an AR Quick Look Gallery that allows masses to experience augmented reality on their own Apple device.
- In 2018, Shopify, the Canadian e-commerce company, announced ARkit2 integration. Their merchants are able to use the tools to upload 3D models of their products. Users will be able to tap on the goods inside Safari to view in their real-world environments.
- In 2018, Twinkl released a free AR classroom application. Pupils can see how York looked over 1,900 years ago.<sup>[142]</sup> Twinkl launched the first ever multi-player AR game, *Little Red*<sup>[143]</sup> and has over 100 free AR educational models.
- Global AR advertising revenue, which topped out at half a billion dollars in 2019, grew to \$1.41 billion in 2020.
- One AR research firm projects that advertising revenue could top \$8 billion by the end of 2024.
- eMarketer estimated that more than 43 million people in the U.S. would use social network AR at least once a month in 2020. That's almost 21% of social network users.
- Overall, more than 83 million people in the U.S. will use AR on some kind of device at least once per month, and eMarketer expects this number to rise to 95.1 million by 2022.
- As of June 2020, 35% of U.S. respondents said they'd used AR to visualize furniture or vehicle customizations.
- A June 2020 survey of U.S. retailers showed that 20% expected to invest in AR or VR for their company's online store, up from just 8% six months prior.

5G availability is expected to increase retailer interest in AR and VR experimentation because of the improvement in bandwidth.

## VII. CONCLUSION

Some product categories can be a tough sell on ecommerce sites because it's so difficult to interpret how the products will look in real life versus a computer or mobile screen. That's why augmented reality applications — particularly since the onset of social distancing — are on the rise.

Now that you know the different types of augmented reality, associated use cases, and the benefits of using it, you can evaluate whether or not it's the right choice for your business.

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