

Virtual Reality in Real Estate Modelling

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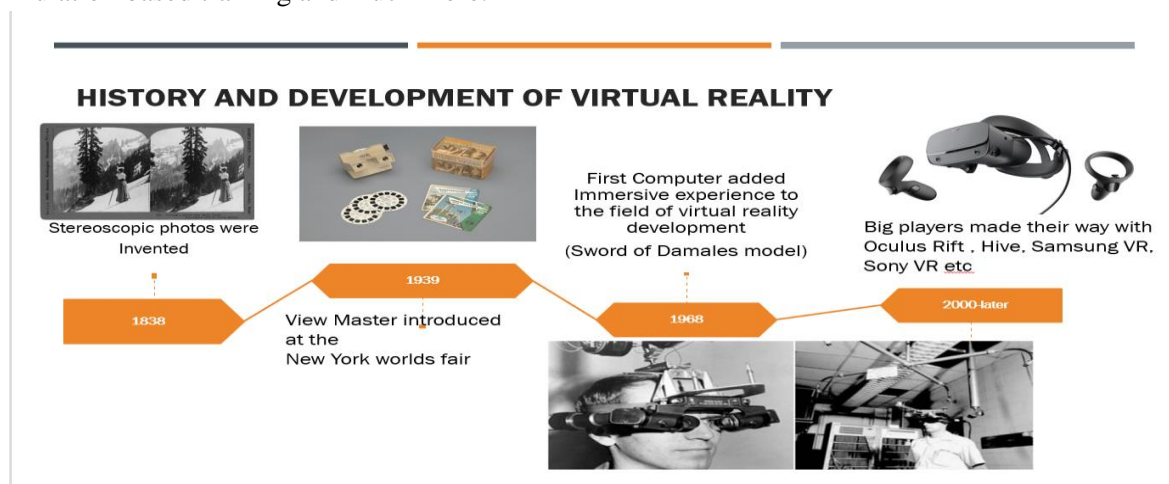
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Abstract: India a place where the hearts of millions of people beats with a dream of owning a dwelling place. The same dream is kept in mind as a construction firm to give its clients the best property, matching the same visionary transcripts as stated by the client. In order to model the vision of client in to reality architects and engineers join hands and start working on the project. But the most important question which arises is that, Whether the final product will be appreciated by client? As a client how can I be sure that the firm understood my requirements clearly? As a buyer why will I not hesitate to pay the token of total amount asked by the property developers? How can we model a perfect final property product experience for clients so that both the construction firms and the buyers are at ease in commencing the monetary transactions? In order to bridge this gap virtual reality technology can be used to solve this business problem. The solution would be to enlist the client requirements and model a complete multidimensional rich experience for clients or if the firm has a development idea beforehand, they can create a complete prototype of a complete finished architecture using virtual reality and let the potential buyers breathe in what could be their future living paradise.

Keywords: Virtual Reality, AFrame, Real Estate.

1. INTRODUCTION

Virtual reality a technology which is deeply connected with the embodiment of humans physiological and psychological aspects. A technology which has undergone various development from the time it was introduced and now is being used in entertainment industry, teaching industry, medical industry, simulation-based training and much more.



The potential of this technology is realised by many business tycoons and hence they are investing billions of dollars in the research and development for creating VR headsets, Language integration support development, Rendering and modelling software's, Development kits and much more. The very beauty of this piece of art is that it completely alters your mindset to believe in a simulated environment. Within fraction of seconds a world of complete different simulated scenarios emulsifies you in its created natural habitat. Soon you start interacting with objects around you by using your speech, eye moments and body gestures. The experience is utterly breath-taking. With constant efforts in research and development in virtual reality it is now possible for developers to use this technology in order to create and develop their ideas.

2. PROPOSED APPROACH

Problems Faced:

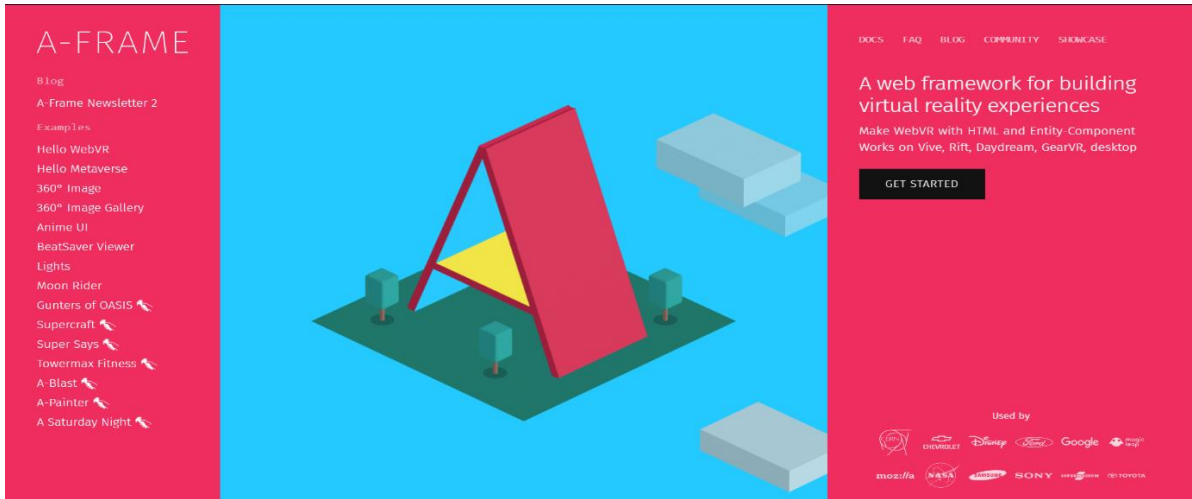
For a software developer it may be really difficult to learn graphic modelling as he would need to learn artistic skills, unity or unreal software environment, more new tools and rendering methods. To constantly test the progress of the system he needs to have a virtual reality headset. The price of virtual reality headset may be another issue as it tends to be very high. Another problem that may arise is, what if the designed experience needs to be created and shown to a wide range of audience. The problem now is availability of virtual reality headset. Another problem that may arise is familiarity with the technology. Virtual reality headsets may not be accepted by a vast majority of people as the major audience is familiar with websites and android apps and introducing a new player may be cumbersome. So, what can be the possible solution?

The answer to the question would be:

- 1) Using a tool which is simple to understand. Creating or using a framework which is easy to understand by a majority of developers. A framework which is not a complete shift of development environment for the creators so that they find it easy.
- 2) Creating an experience which can be implemented in websites so as to target large audience. As discussed above the familiarity of technology is widely accepted by the people. Also, the problem of availability of VR headsets can be solved as the complete prototype can be viewed in the website with or without the virtual reality headset. The experience will obviously be fruitful with the availability of a virtual headset, but even without it, a product can be shown to the client. Another advantage would be if the prototype experience would be deployed in a website, the application can be made global and now the market for your potential buyers increased at a global rate.
- 3) Simple to learn by just use of simple languages like HTML, CSS and JavaScript coupling with the predefined presets. The most peculiar aspect about these three musketeers is that the technology is easy to learn, easy to code and develop. Similarly, the community of support for these technologies is also huge. Moreover, the familiarity of these technologies is also at a global scale.
- 4) Easy to deploy and something which can be tested quickly even without the availability of a virtual reality headset. The most important aspect of developing a complete functional product is testing. If the experience can be merged in a website, the job of maintainability and

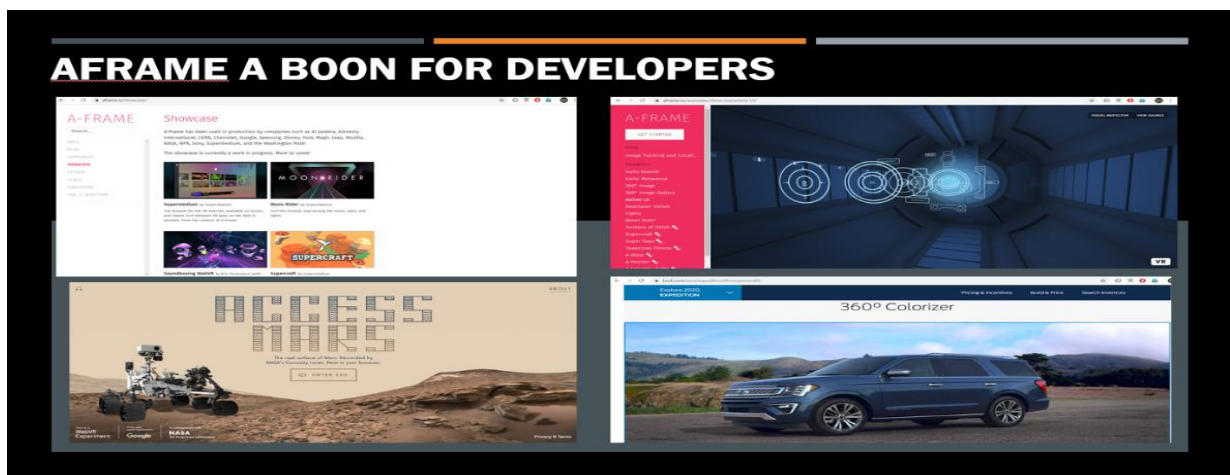
code testing becomes easy as the testing can be done in any ide or the browser provided support to test the code.

3. MODERN SOLUTION FOR THE PROBLEM



(source: @aframe.io)

Keeping all these aspects the best tool to use to create a virtual reality experience would be “Aframe”. Aframe is really a boon for all the software developers, as creation of virtual reality experience becomes quite easy. You can work with your favorite development ide, all that you need is to import the AFrame library. This technology is being successfully used by NASA, Ford, Disney, Netflix to create immersive virtual reality experiences and market their product to a greater audience.

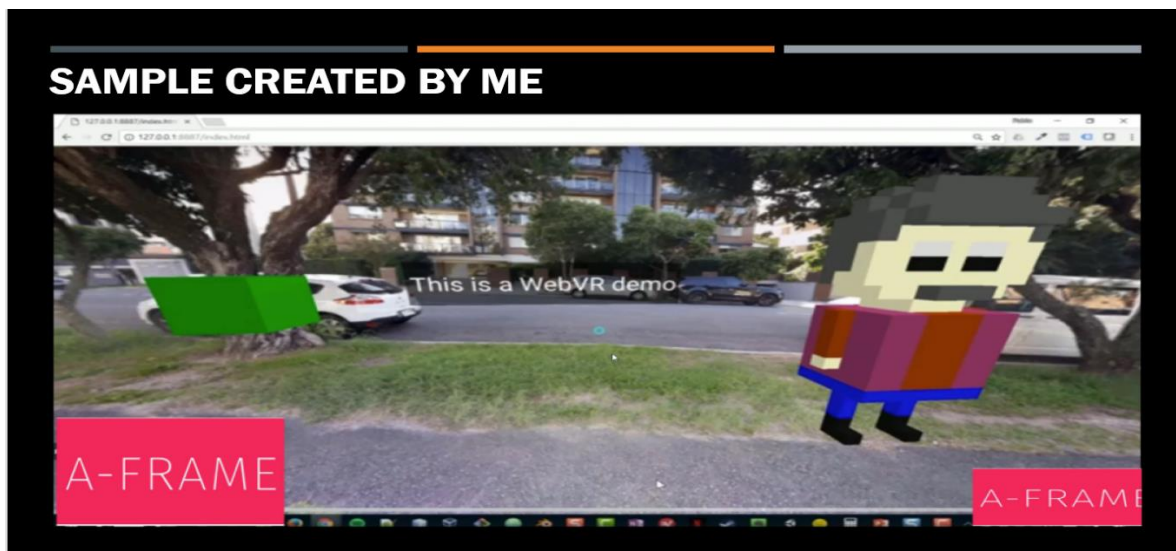


(source: @aframe.io)

A-Frame is a web framework for building virtual reality (VR) experiences. A-Frame is based on top of HTML, making it simple to get started. But A-Frame is not just a 3D scene graph or a mark-up language; the core is a powerful entity-component framework that provides a declarative, extensible, and composable structure to three.js.


Originally conceived within Mozilla and now maintained by the co-creators of A-Frame within Super Medium. A-Frame was developed to be an easy yet powerful way to develop VR content as an independent open source project. A-Frame has grown to be one of the largest VR communities.


A-Frame supports most VR headsets such as Vive, Rift, Windows Mixed Reality, Daydream, GearVR, Cardboard, Oculus Go, and can even be used for augmented reality. Although A-Frame supports the whole spectrum, A-Frame aims to define fully immersive interactive VR experiences that go beyond basic 360° content, making full use of positional tracking and controllers





(This sample consist of 360degree image experience, creating 3d characters, adding interaction and specifying instructions to respond to user's eye moments, all this is simply coded in JavaScript, html and CSS and embedded in to a website).


AFrame Features:

 **VR Made Simple:** Just drop in a `<script>` tag and `<a-scene>`. A-Frame will handle 3D boilerplate, VR setup, and default controls. Nothing to install, no build steps.

 **Declarative HTML:** HTML is easy to read, understand, and copy-and-paste. Being based on top of HTML, A-Frame is accessible to everyone: web developers, VR enthusiasts, artists, designers, educators, makers, kids.

 **Entity-Component Architecture:** A-Frame is a powerful [three.js](#) framework, providing a declarative, composable, reusable entity-component structure. HTML is just the tip of the iceberg; developers have unlimited access to JavaScript, DOM APIs, three.js, WebVR, and WebGL.

 **Cross-Platform VR:** Build VR applications for Vive, Rift, Windows Mixed Reality, Daydream, GearVR, and Cardboard with support for all respective controllers. Don't have a headset or controllers? No problem! A-Frame still works on standard desktop and smartphones.

 **Performance:** A-Frame is optimized from the ground up for WebVR. While A-Frame uses the DOM, its elements don't touch the browser layout engine. 3D object updates are all done in memory with little garbage and overhead. The most interactive and large scale WebVR applications have been done in A-Frame running smoothly at 90fps.

- 🔍 **Visual Inspector:** A-Frame provides a handy built-in visual 3d inspector. Open up *any* A-Frame scene,
hit `<ctrl> + <alt> + i`, and fly around to peek under the hood!
- 🏃 **Components:** Hit the ground running with A-Frame's core components such as geometries, materials, lights, animations, models, ray casters, shadows, positional audio, text, and controls for most major headsets. Get even further from the hundreds of community components including environment, state, particle systems, physics, multiuser, oceans, teleportation, super hands, and augmented reality.
- 🌐 **Proven and Scalable:** A-Frame has been used by companies such as Google, Disney, Samsung, Toyota, Ford, Chevrolet, Amnesty International, CERN, NPR, Al Jazeera, The Washington Post, NASA. Companies such as Google, Microsoft, Oculus, and Samsung have made contributions to A-Frame.

4. RESULTS

Coming back to our business problem. The solution can be easily modelled using AFrame. A 360degree experience, combined with the accurate area dimensions, creating dummy objects as stated by the client or architects, adding textual data for reference, capturing user movements, allowing user to walk around and much more. The final finished product will be a marvellous new approach towards approaching clients and ensuring their trust by providing them a complete futuristic approach. Moreover the experience will be of valid facts and figures. Using AFrame will ease the development process as well. Moreover the product becomes easily accessible as it will be embedded in a website and more potential buyers gets connected to your firm and product in an instant.



(@source: Aframe.io)

5. FUTURE ENHANCEMENTS

Once the basic structure will be ready the possibility can be endless. We can add more simulation experience for example adding more smaller details to property's environment.

1. For example on toggling the switches, lights should turn off or on in simulation environment.
2. Showers of the bathroom can also be toggled and music tone of flowing water can be added for the same.
3. Movements of user can be smoother if each object in a frame is coded to change its behaviour accordingly.
4. Multiple members of a family can be a part of same simulation experience so that the experience becomes more real.

6. CONCLUSIONS

To sum up the possibilities of Virtual reality are endless. If this idea gets implemented ,all the people in the commencement of transactions for the new estate will be benefitted .A client will have the complete picture in his mind as to, how the complete place will look on possession and if he is satisfied ,he will be more than happy to invest his money. Similarly, construction team is also benefitted as even they have a clear picture as to what product has to be made. Therefore, making the procurement of transactions smoother. Using AFrame all the discussed problems for development can be easily solved. Furthermore, future development happening in AFrame can help us add more features to the developed environment.

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