

LET'S TAKE THIS TIME TO LOOK BACK AT OUR INDUSTRY'S RICH HISTORY AND FUTURE!

THE DEAL DIARIES SIXTH CHAPTER: VIRTUAL REALITY GETTING REAL

### **ARE YOU READY FOR THE EXPERIENCE?**

## HE ORIGIN:

The current VR technologies are built on ideas and concepts right from the 1800s, during the very beginning of practical photography. Way back in 1838, the first stereoscope was invented, using twin mirrors to project a single image. That eventually metamorphosised into the View-Master, patented in 1939, and is still produced today.

When you reminisce the Hollywood movies in the 1950s, there's a good chance that one of the first things that come to mind are the gimmicks. Modern widescreen. 3D stereoscopic movies, and even the ill-fated Smell-O-Vision arrived over the next decade.

Filmmaker Morton Heilig in 1957, invented a large booth-like machine called the Sensorama, which was intended to combine multiple technologies to give one



Sensorama booth in 1957

to four people the illusion of being in a fully 3D immersive world – complete with the smell, stereo sound, vibrations, and even atmospheric effects like the wind in the hair.

A few years later, in 1960, he honed a version of this idea into a patent for the world's first head-mounted display, promising stereoscopic 3D images, wide vision and true stereo sound. Neither technologies ever materialized in his lifetime, but they both helped lay the groundwork for the VR revolution to come.

At around the same time that Ivan Sutherland was working on his 'Sword of Damocles' project, a military engineer named Thomas Furness was busy developing an ambitious flight simulator project which eventually would grow into something called the 'Super Cockpit.' Furness continued working on the project through the 1980s, with the result being a training cockpit able to project computer-generated 3D maps, infrared and radar imagery, as well as avionics data into a real-time 3D space.

## **ROWTH PHASE OF THE VR INDUSTRY**

Developed by MIT in 1978, with a helping hand from DARPA, the Aspen Movie Map was basically a virtual reality take on Google Street View. Instead of the basic 3D graphics



Myron Krueger coined the term artificial reality in the 1970s

that could be created at the time, it utilised photographs that were taken from a car driving through Aspen, Colorado, giving the user an interactive first-person journey around the city.

Running it required several Laserdisc players, a computer, and a touch screen display. Nevertheless, the Aspen Movie Map's innovative use of first-person interactivity represented a smart examination of how VR could be used to transport people to other places. In the 1970s, computer artist Myron Krueger coined the term "artificial reality". The term VR, as it is popularly known now as, is attributed to computer scientist and artist Jaron Lanier who coined it in the 1980s.

Lanier, the founder of VPL Research, began to develop the gear, including goggles and gloves needed to experience what he called 'virtual reality.'

Jaron Lanier and Thomas Zimmerman founded VPL Research, Inc. This company is known as the first company to sell VR goggles and gloves. They developed a range of VR equipment such as the DataGlove, EyePhone HMD, and the Audio Sphere.



Computer scientist and artist Jaron Lanier in the 1980s mad the term VR famous

In 1979, McDonnell-Douglas Corporation integrated VR into its HMD, the VITAL helmet, for military use. A head tracker in the HMD followed the pilot's eye movements to match computer-generated images. Subsequently in the 1980s, StereoGraphics company created stereo vision glasses.



McDonnell-Douglas Corporation integrated VR into its HMD, the VITAL helmet, for military use

In 1989, Scott Foster founded Crystal River Engineering Inc after receiving a contract from NASA to develop the audio element of the Virtual Environment Workstation Project (VIEW) - a VR training simulator for astronauts. Through this company, real-time binaural 3D audio processing was developed.

As this industry evolved, Mattel, Inc. released the Power Glove, based on VPL's DataGlove. The Power Glove was a controller accessory for the Nintendo Entertainment System, but it never took off as it was deemed difficult to use.

In 1991, Antonio Medina, a NASA scientist designed a VR system to drive the Mars robot rovers from Earth in supposed real-time despite signal delays between the planets. This system called 'Computer is Simulated Teleoperation'.



VR training simulator for astronauts at NASA

# VR ENTERS GAMING INDUSTRY

Following that phase, the Virtuality Group launched Virtuality. These were VR arcade machines where gamers could play in a 3D gaming world. This was the first mass-produced VR entertainment system. A Virtuality Pod featured VR headsets and real-time immersive stereoscopic 3D images. Some of the machines could be networked together for multiplayer games. Eventually, some of the very popular



VR enters the gaming arena

arcade games, like Pac-Man. had their VR versions.

SEGA announced that they were working on the SEGA VR headset which would be available for the general public to purchase. This head-set was meant to be used for arcade games and the Mega Drive console.

It had a visor-like look due to the influence of popular films such as RoboCop. LCD displays were placed in the visor, as well as stereo headphones and sensors for tracking head movement.

However, it was never released even though four games were made for it. One of the explanations for the termination was SEGA's concern of people injuring themselves as the VR effect was too realistic. However, this possibility seems unlikely due to limited processing power. By 1994, SEGA released SEGA VR-1, a motion simulator arcade machine, and VictorMaxx released a VR headset called CyberMaxx.

In 1995, Nintendo launched the Virtual Boy console which played 3D monochrome video games. It was the first portable console to display 3D graphics. However, it was a commercial failure due to the lack of colour graphics, lack of software support, and uncomfortable to use. One year later, the console was discontinued. In 1997, Georgia Tech and Emory University researchers used VR to create war zone scenarios for veterans receiving exposure therapy for Post-traumatic stress disorder. This was known-as Virtual Vietnam.



**Figure 1 Helicopter Environment** 



**Figure 2 Open Field Environment** 

#### MMERSIVE VR HEADSETS GAINS PROMINENCE



Palmer Luckey with his team

In 2010, 18-year-old entrepreneur Palmer Luckey created the first prototype of the Oculus Rift. Boasting a 90-degree field of view that hadn't been seen previously in a consumer device, it raised \$2.4 million on Kickstarter a couple of years later, before the company was purchased by Facebook for \$2 billion in 2014. Luckey's decision to sell the company before shipping any prototypes to Kickstarter backers stirred up controversy from early supporters.

In 2014, Facebook bought the Oculus VR company for \$2 billion. This was a defining moment in VR's history because VR gained momentum rapidly after this. Sony too announced that they were working on Project Morpheus, a VR headset for the PlayStation 4 (PS4). Google released the Cardboard - a low-cost and do-it-yourself stereoscopic viewer for smartphones. Samsung announced the Samsung Gear VR, a headset that uses a Samsung Galaxy smartphone as a viewer.

More people started exploring the possibilities of VR, including adding accessories. example, innovative For independent Cratesmith, an developer, recreated a hoverboard scene from Back to the Future by pairing the Oculus Rift with a Wii's balance board.

> By 2015, VR possibilities started becoming widely available to the general public. The Wall Street Journal launched a VR roller coaster that followed the ups and downs of the Nasdaq Stock Market. The BBC created a 360-degree video where users view a Syrian migrant camp and Washington Post released a VR experience of the Oval Office at the White House Correspondents' Association Dinner.

Oculus Rift: Step Into the Game



Oculus raised US\$2.4 million on Kickstarter

By 2016 hundreds of companies were developing VR products. Most of the headsets had dynamic binaural audio. Haptic interfaces were underdeveloped. Haptic interfaces are systems that allow humans to interact with a computer using their touch and movements - like the Gloveone gloves that were being developed. This



meant that handsets were typically button operated. HTC released its HTC VIVE SteamVR headset. This was the first commercial release of headset with sensor-based а tracking which allowed users to move freely in a given space.

By 2017, several companies were

developing their own VR headsets, including HTC, Google, Apple, Amazon, Microsoft, Sony and Samsung. In 2018, at Facebook F8,

Oculus demonstrated a new headset prototype, the Half Dome. This is a varifocal headset with a 140 degrees field of vision.

Virtual reality has significantly progressed and is now being used in a variety of ways, from providing immersive gaming experiences to helping treat psychological disorders, to teaching new skills, and even taking terminally ill people on virtual journeys. VR has many applications, and with the rise in smartphone technology, VR will be even more accessible. With large numbers of companies competing, novel controllers being explored, and lots of uses for VR, this field is only set to further evolve.

One of the first companies to attempt to launch a VR headset was Sega, which planned Sega VR as an accessory for the Genesis. With development starting in 1991 and continuing for a couple of years after, Sega VR was an attempt to squeeze more life out of the company's 16-bit games console.

## HOW DOES VIRTUAL REALITY CONCEPT 'TRICK' YOUR BRAIN

Virtual reality (VR) technologies play with our senses to transport us to any world within our imagination. How do VR environments convince your brain to take you to these different places? How does your brain, in turn, react as you explore a virtual world?

Your brain builds on your past experiences to develop "rules" by which to interpret the world. For example, the sky tells you which way is up.



Shadows tell you where light is coming from. The relative size of things tells you which one is farther away. These rules help your brain operate more efficiently.

VR developers take these rules and try to provide the same information for your brain in the virtual world. In an effective virtual environment, moving objects should follow your expectations of the laws of physics. Shading and texture should allow you to determine depth and distance. Sometimes, when the virtual cues don't quite match your brain's expectations, you can feel disoriented or nauseated. Because the human brain is much more complex than even the most sophisticated computer, scientists are still trying to understand which cues are most important to prioritize in VR.

## () NE OF THE WORLD'S LARGEST VR PARK IN DUBAI MALL



Emaar Entertainment, the leisure, and entertainment subsidiary of Emaar Properties launched the region's first VR Park few years ago, a brand new virtual and augmented reality attraction in The Dubai Mall. The futuristic VR Park offers a wide range of VR and AR games, rides and experiential attractions, as well as a roller coaster experience.

A 'first-of-its-kind-attraction in the Middle East'. Emaar's latest retailtainment

destination is home to a mix of immersive rides, interactive games and, educational journeys. The new VR park is spread across two

levels of the mall. Many of the attractions offer a multi-player experience, enabling visitors to interact and enjoy the experience with family and friends. The attractions at this VR park represent a broad range of genres, including adrenalin-fuelled experiences, horror, fantasy, and more. Tourists from around the world visit this unique and immersive VR Park in Dubai, which succeeds in leaving lasting memories of their engaging virtual experiences.

There are several VR specialists who have been participating at the DEAL show each year and every year they come to the show with concepts that keep the audience mesmerised.

