SOMETIMES it takes two tries to get it right. Virtual Reality (VR) is one such example. The term first popped up in fiction long before it became fact... in a 1982 science fiction novel, The Judas Mandala by Australian writer Damien Broderick.

Ten years passed before the first VR systems were introduced in the early 1990s – complex room-sized projection systems, bulky head-mounted displays coupled with haptic (touch-sensitive) gloves. The starting prices were Rs 100,000 (Rs 70 lakh in today’s money). The systems were embraced by military agencies – as simulators that gave armed forces realistic training on costly weapon systems like missile launchers, or fighter aircraft. But they remained out of reach of the mass market.

In India, the National Informatics Centre of the Department of Electronics, then headed by the charismatic scientist-administrator, Dr. N. Seshagiri, realised the potential of VR and set up one of the world’s earliest VR labs in Delhi – the Virtual Environment Lab of NIC or VELNIC. It created simulation and training solutions for many strategic government departments.

Flash forward to 2014, and the Second Coming of VR was preceded by complementary technologies like 3-D visualization and Augmented Reality (AR).
Virtual Reality, also known as Immersive Multimedia or Computer Enhanced Reality, is an artificial environment created by computers and software that allows the user to interact with it and by harnessing senses like sight, touch and sound (and sometimes, smell!) creates the illusion that it is a real environment.

Interactive 3-D

In its simplest form, VR can be experienced by all of us with no special tools other than a PC or laptop with a mouse. Do a browser search for “Interactive 3-D” and you will find hundreds of images where you can zoom in and out and move 360 degrees around the object in the picture by manipulating the mouse. You will find sites that sell cars or apartments, increasingly offering such ‘walk-through’ imagery for potential customers. All leading online real estate marketers – CommonFloor.com, Housing.Com, IndiaProperty.com – have launched mobile apps that harness technologies like 3-D and VR to let you ‘look before you leap’: immerse yourself in virtual realizations of the fully constructed property, before leaping for your cheque book.

In fact, adding a third dimension to a flat image has long been the best way to give the illusion that ‘you are there’. In the 1950s, parents in India could buy small viewing plastic devices for their children called View-Master – with sets of circular cardboard-backed image disks. These were essentially Kodachrome transparencies shot with a stereoscopic camera and related to one theme – like wonders of the world, wild life, etc. Seen through the View-Master, the pair of images gave the illusion of 3-D. Larger desi versions of the stereoscopic viewer were a constant and popular feature of fairs and jathras all over India for decades.

The second, more people-centred, avatar of VR occurred in the last 3-4 years, on the back of a few other immersive technologies.

Google Street View

Between 2007 and 2010, Google took the 3-D experience of its Google Maps tool a notch higher with StreetView. This gave users a very real experience of actually navigating streets, panning and zooming to change one’s view point, glide along streets and diving into side streets and
lanes, much as one might do in a computer game – only this was the real thing.

To capture this imagery Google deployed special vehicles equipped with multiple stereo and 360 degree cameras. For India the company rolled out a bicycle version to navigate narrower streets. However StreetView remains a somewhat contentious technology in India, with some states banning the capture of such 3-D imagery, citing security – while the hospitality and tourism industry has embraced it to enhance travellers’ experience. Oberoi Hotels and Resorts was the first hotel group to have all of its properties in India photographed using Google’s Street View technology. Tourists can now take a ‘virtual’ walk-through all Oberoi hotels. Another good example is the Amarvilas Hotel in Agra whose 3-D walk-through can be experienced at: http://goo.gl/HHUzeo

Augmented Reality
A number of companies tried to deliver Augmented Reality, which unlike VR does not create a new and artificial world but adds additional digital information into the users’ real world.

A prime example is Google Glass, an optical head-mounted display, shaped like a pair of eyeglasses, which allows the wearer to access information in the Internet through voice commands, and displays such information in a corner of the glass. Regular spectacle users could incorporate their prescription into the Glass. The product had the ability to grab pictures or video of what the wearer was seeing – and this raised some privacy issues.

Google Glass became available globally around mid 2013 – but the stiff asking price of $ 1500 (Rs 1 lakh) limited its use to corporates, especially in the medical profession. Surgeons at the Nanavati Hospital in Mumbai performed open-heart surgery while wearing Google Glass, which allowed them to access additional help in real time. At the Sir H N Reliance Foundation Hospital and Research Centre, also in Mumbai, doctors wearing the Glass would get a feed of the patient’s entire medical history, prior to an examination. At Lifeline Hospital in Chennai, doctors performed a hernia repair while giving a running commentary to medical students through the Glass.

But Google has not pursued the commercial development of the Glass and it looks like this technology may never gain wide public acceptance.

Microsoft’s own AR offering was the Hololens – head-mounted smart glasses that worked with the Windows 10 operating system to offer what is known as ‘mixed reality’: a combo of real and virtual worlds that the user can command using voice and gesture. The potential applications are very similar to 3-D viewing systems – but as of now, Hololens is still available only to developers as a $ 3000 (Rs 2 lakhs) kit.
AR is not about to go away – but in 2016, it has been challenged by the galloping pace of full function Virtual Reality in a new consumer-friendly garb.

**Oculus Rift & HTC Vive: PC-assisted VR**

Hedging its bet on Hololens, Microsoft in 2014, spent $2 billion to buy the most promising brand in VR – Oculus – whose VR headset, Oculus Rift finally went on sale in a few select global markets earlier this year. The Rift is a $599 (Rs 40,000) headset which is generally considered the most immersive product of its kind. But it has been challenged by the Taiwan-based HTC which launched its own offering, HTC Vive, at $799 (Rs 56000).

While Rift uses the XBox game pad as its controller (both are Microsoft products), Vive comes with its dedicated motion controllers which the user holds in his or her hands. A set of wireless “base stations” need to be installed in the room to mark its edges – they send messages and images to prevent you from bumping into walls. Gaming with the HTC Vive gives you a totally immersive experience.

You can roam around the room freely, turn through 360 degrees and also make gestures using the hand controllers.

Both Oculus Rift and HTC Vive are expected to be available in India in the second half of 2016. Both of them belong to a class of contemporary VR systems that are controlled by a PC with a powerful CPU and graphics card. If you add the cost of such a PC, they both end up costing upward of Rs 1 lakh... clearly not affordable by most of us.

By October 2016, Sony will also join this group with its own VR head set that needs a Playstation 4 console to work. Before that, the China-based Le Eco, which has launched a series of mobile phones in India, is likely to bring its own VR headset to this country. It previewed the device recently in India to allow the media to follow live its annual product showcase in Beijing.

**Indian Challenger**

Early in 2016, three undergraduates – Shubham Mishra, Vrushali Prasade, and Harikrishna Valiyath – dropped out of their course at BITS Pilani-Goa and decided to take on Oculus. Their Bengaluru-based startup -- Absentia -- created a VR headset called Tesseract
VR Movers and Shakers! Indian Content Creators

VR headsets are worth the asking price only if users have access to a large database of VR-friendly apps and edutainment resources. It’s okay for video gamers because every big console or browser-based game maker has come out with VR-friendly versions that take the player even deeper into the virtual world of the race track, the battlefield or cricket pitch. But what about those who seek a more rewarding experience?

Content shortage will be mitigated somewhat by YouTube’s recent announcement that it will now host near-VR content. You can find such videos if you search for ‘Immersive Videos With Spatial Audio’ on YouTube. But what about India-specific content? Indian software companies have seized the opportunity to fill the void.

Ingage, a Chennai-based startup founded by ex-Intel and AMD executive Vijay Karunakaran, morphs Virtual Reality and Augmented Reality. The company is tapping into what it calls digital customer engagement solutions for other enterprises. It has launched an Augmented Reality Mobile App called “InGage” on Apple iTunes and Android Google Play, designed for brands across a broad spectrum of industries to engage with their customers in an interactive manner. The company has partnered with educational publisher Ratna Sagar to enhance class 2 to class 8 lessons with 3-D augmented imagery.

The Indian talent-driven Blippar, the world’s biggest visual search tool, has joined Amar Chitra Katha to let readers interact with their favourite characters. The child needs to scan the Blippar logo that can be found on a printed page with a phone and the action moves to a virtual world on the phone screen. A recent edition of Tinkle Digest had a dartboard with Suppandi’s face on the cover. If you Blipp it, you can play darts.

The Mumbai-based Meraki led by IITians and film makers, Arvind Ghorwal, Sairam Saigiraju, Parth Choksi and Agam Garg, has established a robust business as a creator of 360-degree videos of sporting events, reality shows, adventure sport and annual events like IIT Bombay’s Mood Indigo festival. To get a flavour of how Meraki is competing with the best and brightest of the world’s 360 degree video makers, you need only go to YouTube and key in “A Mumbai Summer” for a three-minute tour of the city. Four directional arrows let you spin the camera in all directions, into a suburban electric train, around the Gateway of India, inside an Irani restaurant. Many 360-degree VR videos today are accompanied by a realistic audio track called Spatial Audio which has been created for the Android operating system and which lets you listen to audio from all directions just as in the real world. It works best when heard on headphones.

The Hyderabad-based Geosys Enterprises has created Hampi360.com, an exploration of the UNESCO heritage site of Hampi in Karnataka with 360-degree views of 25 different galleries and monuments.

The sector that is already embracing VR most zealously is tourism — and a web site like IndiaVRTours.com gives some idea of the limitless possibilities for enhancing visitor experience at all our major monuments.

A VR company incubated at the International Institute of Information Technology, Hyderabad and founded four years ago by Hemant Satyanarayana – ImagineAR – has launched many VR applications of which the best known is HeritageAR, an app at the Google Play Store where one can virtually tour the Quli Qutb Shahi Tombs in Hyderabad. Other VR apps include Dressy, a virtual online fitting room where from the comfort of your home you can try out a variety of dresses and sizes before ordering them online and ShootAR, a simulator for the Indian Army to train soldiers in marksmanship.

There’s nothing virtual about “Make in India”, when it comes to content that will fuel VR world-wide. It’s all too real!
The real excitement today is about a disruptor; they harness the power of the cell phone. This class of headset is essentially a cushioned optical system with two adjustable lenses and a receptacle in which you must plug in the smartphone. The runaway success in this category has been the Samsung Gear VR.

which offers 360 degree military-grade head tracking and the ability to watch any game or movie in 3-D. It works with all current games and movies. The Tesseract is currently offered for pre-booking at Rs 20,000.

Look Ma, No PC!
The real excitement today is about a disruptor that has appeared on the scene: VR headsets that don’t need to be connected to a computer. Instead, they harness the power of the cell phone. This class of headset is essentially a cushioned optical system with two adjustable lenses and a receptacle in which you must plug in the smartphone. The runaway success in this category has been the Samsung Gear VR, but it can only work with a limited number of Samsung smart phones. For gaming and navigation it comes with a sensor pad.

Compared to PC-linked VR headsets, the Gear VR offers an advantage of untethered movement for 360 degree videos. There is a zoom control on the top of the set. The Gear VR is basically meant for watching 3-D videos and playing games with compatible Samsung smart phones. And at Rs 8200 it is considerably more affordable than the PC-reliant options, possibly sacrificing some realism in the process.

Indian VR Headsets
But how low can you go when creating this type of smart-phone-based VR headset? Indian players have shown the way with a canny mix of jugaad and clever component sourcing. The Indian handset maker Karbonn has launched two phones in 2016, costing between Rs 7500 and Rs 8800, with built-in VR software – and the headset is thrown in for free.

Recognizing that people may already own a handset, two other Indian companies have launched VR headsets which work with any make of phone. The Chennai-based Zebronics has launched the Zeb VR at Rs 1600. It can work with any make of smart phone up to a screen size of 6 inches and comes with a thick foam padding and pair of focus-adjusting lenses. The problem with all VR sets is what do you do with it: there is so little 3-D and VR content out there. Zebronics has solved the problem by making its headset compatible with Google Cardboard apps which straight away opens the door to a large library of free 3-D and VR friendly apps.

More recently, Indian mobile and tech accessories e-tailer LatestOne.com has launched another affordable virtual reality (VR) headset PTTron that works with all phone makes and costs Rs 1499.

By crashing the cost of a headset to below Rs 2000 and letting buyers use their existing phones, these players have suddenly made India the world’s first and biggest testing ground for consumer-facing VR.
In fact, adding a third dimension to a flat image has long been the best way to give the illusion that ‘you are there’. In the 1950s, parents in India could buy small viewing plastic devices for their children called View-Master – with sets of circular cardboard-backed image disks.

**Blippar Offers Real-world Approach to Learning**

Wouldn’t it be wonderful if our mobile phones offered a real-world approach to learning and recognized the world as we do? What if a student’s imagination could come to life and become interactive on their mobile phone? Well, it’s going to be true!

Taking a leaf from Prime Minister Narendra Modi’s vision of Digital India, Blippar, an augmented-reality and visual discovery platform has come together with Avanti Learning Centres to make the periodic table in all Avanti books Blippable.

With the use of augmented reality technology, Blippar has tried to make understanding, learning and interacting with the chemical elements in the periodic table a fun and quirky activity. The periodic table has been made interactive by adding games, a quiz and presenting fun and interesting content in an animated format.

Students simply have to hover their phone over the periodic table, Blipp it and bring to life the fascinating world of chemical elements! Students can learn the history of each element, play interactive games and quick quizzes designed to help them learn more comprehensively and retain the specifics about the elements they interact with.

“The interactive periodic table will engage the students with the content in a way that sparks curiosity, experimentation, and creativity,” says Mr. Arnab Ghosh, MD Blippar India. “We believe that going forward technology is going to change the way education industry functions today. Visual Discovery will play a very important role in adding fun to the content and enhancing the learning experience.”

Meanwhile, Google which made the mistake of pricing Google Glass too high to touch the consumer market, has swung to the other extreme with Cardboard – a very basic do-it-yourself headset which is just what its name suggests: a cardboard box with a couple of lenses stuck in and with rubber bands to hold the phone. You can buy a kit online for about Rs 500 or follow instructions to do it yourself. The bill of materials is affordable enough for companies to give away Cardboard-like kits free to promote their products through a VR video. The phone maker OnePlus used this route for its global handset launch in India and elsewhere.

Indeed, a Cardboard clone easily folds flat and can be given away with your morning newspaper – which is what Tata Motors did earlier this year in four Indian metros, to launch a new compact car.

VR and AR are here to stay. Globally the market is estimated to be worth $ 150 billion by 2020, with AR accounting for the bulk of the business at $ 120 billion (Source: Digi-Capital 2015).

This early, one can only guess at the India end of the market, but makers of VR headsets expect to sell at least 2 million headsets here this year and think the number will grow ten-fold in 3-5 years. This is not unrealistic, when you consider that Indian mobile phone subscriptions crossed one billion in 2015.

As you read this, thousands of ordinary Indians are taking their first steps into the future, buying or making a VR attachment to their phone which will deliver a heightened sensual experience in a seamless combo of the real and the virtual. Maya Bazaar is alive and here.

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