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The reality of … virtual reality

In this commentary piece, Allan Burns explores the prospect of virtual reality – and what it means for electricians.

Allan Burns is an electrical consultant with a special interest in energy management, the emerging smart grid and a passion for the environment and sustainability. This strong sense of direction stems from being well travelled, a Degree in Human Sciences from UCL and a period as a Charity Fundraising including Friends of the Earth. He is committed to educating customers and end users and his desire to test new technology was reflected by becoming a qualified Secondary Science Teacher. Teaching about renewables gave him the bug and he left teaching to create Ecoelectrical, an environmentally responsible electrical installation company, and Telemental, a design consultancy.

Introduction

Decades ago now, it arguably became the electrician's job to 'hang' the flat-screen TV … ok so far, got plugs, got screws, got back-brace …

Fast-forward to 2016, the invasion of integrated devices is possibly the most defining phenomena of the modern home; many such devices are for our entertainment.

Most modern homes have had an entertainment zone, ranging from a surface with a TV/radio on it that needs a socket-outlet, through time and up the slope of disposable income to that staple of the modern status-statement home, the Cinema Room.

I suspect that the Cinema Room is about to be outmoded. People are going to want to clear out some of those seats and tables to make space to move around.

Why?

Because the relationship with media that the traditional screen has monopolised for a century is about to be transcended by 'VR', aka Virtual Reality/Augmented Reality/Immersive Media. Call it what you want, it is coming. In this article I'm going to lump it all under the name VR.
So how will VR change our home and work spaces?

The first thing to realise is that VR is *immersive* 3D not pop-up 3D, where Jaws lunges at you and you spill your popcorn. With VR 3D you can get up, walk around Jaws and see if he is a she. That's just the start. The potential of what VR can do when you hit its version of the 'red'/'interactive' button is phenomenal. Imagination is the only limit; this article isn't about that, it's about how installers can plan an installation to allow for that.

To get a handle on these questions I went along to the University of Gloucestershire to get some ideas on best strategies for wiring for this future now.

Undergraduate with an enviably bright future Sam Pugh studies and works with VR. Sam is an avid gamer but is also alert to the wider potential of the medium. He's already completed commissions to create VR environments to facilitate work in other University of Gloucestershire Departments including Forensics and Psychology, and has therefore experienced the attraction of practical VR in other fields.

A few considerations installers need to think about

What are you selling?

Cultures and markets have to be ready. No one knows yet what VR is going to be. Who knew back in 1980 what the internet would become? Personally, I won't be talking people into dedicated 'holo-deck' rooms just yet … but maybe we can offer options on the traditional formats of more recognised spaces, like the cinema room, the telly room, maybe the living room. Probably best to keep it out of the dining room. And let's not even think about the toilet. For work premises, the training room would be a good place to start.

Network skills

Network skills are becoming increasingly important to the electrical contractor. More so for the VR suite specifier. Bear in mind that end-user expectation of some VR possibilities like gaming and Skyping are never going to flatten out. More resolution! More speed! These will always be desired. Don't skimp on your Ethernet or optical cabling. The boxes can be upgraded, people expect that; cables must be ripped out, they might not be expecting that.
Sam reckons a fast PC is currently preferable to a MAC in terms of meshing with what's out there but please don't shoot the messenger if you're an Apple nut!

Product knowledge

There is a fierce proprietary battle brewing for dominance all over this market. Do you want to be the person who advises them which technology to invest in? Every set will have its own stable of developers, its own set of possible subscriptions. Some of those might dwindle while others flourish. Electricians will need to decide how to create a finish to *their bit*, how to inform clients where to go to fill that space you designed for them. Don't set yourself up as a VR/AR experience guru unless you have the time and inclination to go the distance with that. It's going to move a lot faster than TV technology and that is tricky enough.

Design

Health and Safety

VR can be disorientating and even nauseating. Worth noting before you create a suite at the top of some stairs, near a balcony over a sitting area or near a door onto traffic – think the outcomes through. There are some dos and don'ts shared amongst the designers, which I won't list here, but suffice to say people will need time and space to adjust into and out of their VR experience.

Cable Topography

The best headsets are still wired to the PC. Batteries and wireless might takeover one day but for now assume that the player needs wires to their head. Plan for that, can you go overhead in order to reduce trip hazard? Sam Pugh at University of Gloucestershire would like to see some sort of sprung tether to keep the wires poised out of the way. Those aren't available on Amazon yet but perhaps they will be soon.

Can you put in ducts to likely outlets, for maximum future-proofing?

Can you create storage nodes in likely places, for example, over the VR zone (probably where HDMI comes in) to allow for bits and bobs to be added if needed? All intra-connectivity may go wireless one day – who knows; so don't break the bank doing this.

Interior Design

Position, position, position! Whatever it's being used for, the participant's position in the VR zone is important and needs to be tracked.

VR headsets use a sort of GPS; they come with sensor-boxes that act like the satellites your SATNAV uses, except that they can't work off solar PV – so make sure you put sockets where they need to be. Best guess is currently to put them in opposite corners. If there are no corners, make your own virtual corners ☺ They mostly use a line-of-sight to the headset – make sure that is understood, before your clients put the aquarium in!

Having transcended the humble screen, we're no longer all sitting facing the same way – what should we do now? Sam reckons the best layout for a VR zone is a triangle consisting of: decent screen, decent sofa and decent *roam-zone*. The dynamic will tend to be a VRaggle (VR gaggle – I just made up a word) of watchers who might want a sofa while they watch the player lunge and gurn about the roam-zone. They'll want to swap, hydrate and ventilate. It will be your job to help them understand and design that space. Will it need a socket-outlet for a wine fridge? Provision for AirCon?

Advise clients where boxes (PC etc.) are likely to stack up, so they can plan to hide them if they want to.

Don't assume everyone will want to shoot space pirates in front of their mates. Remember some people might just want it for Skype, or immersing themselves in images, or training: literally anything. They may not know yet but it's your job to ask the question so good decisions can be made.

What's around the corner

Keep in mind you don't know what is coming. Omid Nikroo at LOXONE UK is a smarthome consultant who did his thesis on VR back in the day, in particular, how to create the physical environment for VR. He believes untethered battery powered VR rigs are round the corner so was keen on setting VR up in wide spaces, great if you have space! If you don't have a spare gymnasium, one option he envisaged was a travelling floor that allowed VR users to get some running in while they were playing. Sci-Fi fantasy, I had a flash of Omid at a Red Dwarf Convention when he said that … when I asked Sam at University of Gloucestershire about this he matter-of-factly showed me the Virtuix Omni Virtual Reality Treadmill http://www.virtuix.com/. Basically: Omid's vision modularised, half running machine,

half toddler trolley – on Kickstarter right now. It won't be cheap but one major benefit is that it will stop people throwing up and you can't put a price on that. Details thin on the ground but I reckon it will need a 13A socket-outlet and maybe run in Ethernet while you're at it, come to think of it make sure you put in some charging points for Omid's battery packs. Get the idea?

Provision for sound

Immersion is the name of the game so headphones are *en vogue* for the ultimate player experience but provision for your VRaggle is needed. Omid reckons Dolby Atmos surround sound is helpful; another reason to put VR in with the entertainment – you can piggy back off its Audio system.

Summary

It's tempting under the billion-dollar onslaught of WiFi and Internet of Things to throw up your hands and let the router and maybe some of those nifty USB plug things stand in place of any considered system design. Let google or Apple work it out …

But should we give up? We have a role and a responsibility to keep thinking and keep advising clients on how to future-proof technology.

New-builders and developers now have opportunity to design for very exciting possibilities, not all of which can be or should be accommodated by a dongle or a *smart*-plug. VR is a prime example, another example is energy management. Devices are multiplying all the time.
The IoT has a lot to offer for the energy-frugal and connection-hungry home-owner but it's never going to be to able crack all the problems; you're still going to need a thick cable if you want to charge your electric car. You're still going to need decent data cables if you want to transmit data fast and privately.

The 'Big Players' would have us all pare down our lives into something they can sell a dongle for. Electrical designers and contractors have arguably already transformed more and further than any of the other players in construction. If we keep thinking and planning ahead, we can enable people to get what they want, not what the Big Players want them to want.
Perhaps someone will write a VR simulation that will allow Joe Bloggs to understand how the energy companies calculate their bills - maybe that's not a bad idea? Dream the impossible, install the future.

Virtual reality – the money behind the vision

Melissa Fremeijer, from International Data Corporation (IDC), tells us that VR hardware spending (i.e. screenless viewers, standalone HMD, and tethered HMD) for consumer use virtually boosted over 2016 reaching a total of US$ 1.17 billion in Western Europe. IDC expects VR hardware spending in the consumer market to grow at a 166% CAGR towards 2020 whilst VR hardware spending for commercial use will grow at a CAGR of 122% reaching US$ 347.3 million in 2020. VR hardware spending for both consumer and commercial usage is expected to reach a total of US$2.47 billion in 2020.