

HOW CAN VR AND AR ADDRESS CHALLENGES IN HEALTH AND SAFETY TRAINING?

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WORLD LEADERS IN
AR, VR AND MR
FOR ENTERPRISE AND EDUCATION.



HOW CAN VR AND AR ADDRESS CHALLENGES IN HEALTH AND SAFETY TRAINING?

Virtual Reality and Augmented Reality as integrated course delivery, compliance and communication tools that create an immersive strategy to bolster H&S practice and engagement.

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CONTENTS

1. Introduction

2. The State of Health & Safety

The latest figures

3. Meeting new business challenges in H&S engagement

Why, and how

4. Immersive Strategy and Ideas For Your Strategy

Build in seamlessly with your H&S strategic initiatives

5. Our Platform: Connect Learning Across All Devices

On-site, Off-Site, On Mobile

6. Case Studies

Reducing the Risk with VR and AR

7. Conclusion



INTRODUCTION

Review, regulation and new strategy

The need for a cost-effective, strategic approach to improving workplace engagement smartly, and demonstrate value and learning outcomes in H&S is mission critical for businesses everywhere.

Overhauls legislation are expected to be ushered in, in keeping with the government's devolution of its health and safety priorities and programmes.

But the need for compliance is already clear: while well-established guidance information can exist, it is subject to change, new regulatory assessment and fines for non-compliance.

HSE report that there are 13,000 deaths every year linked to past exposures to hazardous substances at work alone.

Beyond 2018, there are ongoing additional

business challenges of being able to:

- Create, implement and update health and safety training easily
- Make training available on mobile phones, and for easy revision at any time to encourage best practice
- Evolve courses for newer generations who learn and retain knowledge differently
- Increase completion and active staff numbers
- Tackle how to communicate new methodologies in control measures as work environments evolve rapidly

From 2015-2016, the Health and Safety Executive estimated that there were 1.3 million people in work, suffering from an illness they understood was caused, or exacerbated, by work.

Across the three nations, this amounted to >>

THE COST OF INJURY – WORTH IT?

1.3 MILLION AFFECTED
BY WORK-RELATED ILLNESS

1.1
MILLION

Directly affected in England

98,000

Directly affected in Scotland

69,000

Directly affected in Wales

FINES INCURRED BY SECTOR, 2015-2016



£4M - paid by Construction



£7M - paid by Extractive & Utility Suppliers



£16 - paid by Manufacturing

In 2015/16 according to the HSE, the total financial cost of injury amounted to £5.3B - that's the equivalent of:

- £1.6 Million per fatal injury
- £8,200 per non-fatal injury
- Settlement and legal costs per company - vary widely



AT A GLANCE

THE STATE OF HEALTH & SAFETY



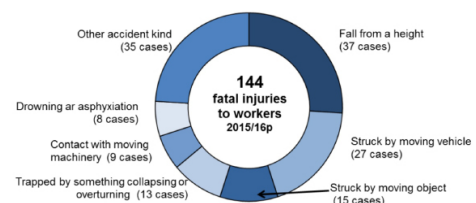
The number of businesses prosecuted by the Health and Safety Executive (HSE) rose by 6% during 2015 to 2016.

Yet, broadly speaking, there is an established precedent for Health and Safety prevention, protection and for the treatment of H&S to be a business priority.

Workplaces and learning styles evolve: so do the potential dangers and pitfalls to staff. Great Britain has an excellent track record in implementing H&S regulations, beginning with the Health and Safety at Work Act of 1974. Nevertheless, we face the same and sometimes increased business risk burdens, for work-related ill health.

Every day, thousands of businesses across the UK just like yours discover a new case of work-related illness, including those of long latency. According to incident reports made by employees in the recent Labour Force survey, there were:

Figure 1: Fatal injuries to workers by accident kind 2015/16⁴



Source: RIDDOR

Tragically, there were 144 deaths in the workplace between 2015 and 2016, and 621,000 non-fatal injuries according the survey.

As we have discovered at EON Reality, working with various global clients who require health and safety considerations for high and medium risk environments from across Energy, Manufacturing and Enterprise, we know innately that high risk and hazardous environments go part and parcel with having Health and Safety as a priority - and prevention is always better than cure.

Fines Incurred by sector, 2015-2016



£16M paid by Manufacturing



£7M paid by Extractive & Utility Suppliers



£4M paid by Construction

It can be extremely challenging for businesses to cope with the parallel demands of:

- A high-change work environment with new generations
- Ensure risk management keeps pace with change
- Reducing incident, while discovering methods to help prevent specific occupational health and safety problems
- The need to upskill workers as quickly and effectively as possible - and encouraging revision behaviours from home
- Updating staff efficiently across a variety of skill levels
- Engage the workforce regularly in a way that can be easily captured and recorded digitally and physically
- Ensure business innovation is cost effective
- Ensure training is innately and natively updateable, without re-inventing the wheel for another solution every time regulation changes

Simulator scenarios remain a strong tradition in many sectors.

In VR, this is to increase recognition, beyond awareness, allow rehearsals of fast decisions, responses and 'muscle memory' which inform the workforce, and help prevent incidents.

The outcomes of these form the data which is occurring across 'Industry 4.0' and H&S is no different.

VR and AR both provide the opportunity to use performance data, and data integration, to enhance the learning process - remotely, centrally, and at lower cost.

These same advances in technology also provide opportunities to transform the delivery of health and safety training.

With a workforce of lower attention spans and higher demands of media experiences, the ability to deliver meaningful courses and programmes, that create high impact, are repeatable, updateable and are cost-effective. has never been more of the essence than it is today.

Most recently, Prof. Jeremy Bailenson from Stanford, discovered that learners retain **33% more information from VR, than standard video.**



SAFETY IS THE BUSINESS CASE.
DIGITAL TRANSFORMATION IS
THE ROI



MEETING NEW CHALLENGES IN ENGAGEMENT

So how do Virtual Reality and Augmented Reality measure up?

Virtual Reality provides a high-impact, visually appealing, multi-sensory and innovative platform.

Virtual reality replicates the vast majority of scenarios and their variables in real time, to scale and with photorealism, without the need for expensive actors, location hire and training live on-site without prior or proper acclimatisation where mistakes can be extremely costly.

Off site, within a classroom or training area – or any space in the world, virtual reality provides a repeatable, harmless setting in which typically dangerous tasks and high-risk actions and intricate models inside safe, low-cost photorealistic environments.

Some VR and AR solutions (yes, ours do!) also allow collaboration, so staff from lots of different sites and locations in the world can learn and update their Health and Safety training together, while still having their custom learning journeys recorded for lessons centred around safety-critical outcomes.

These outcomes can then be recorded to track improvement, learner journeys and results with an existing Learning Management System.

Augmented Reality applies layers into your real-world environment., responding to markers and adding actionable data, graphics and cues. With wearables like glasses and helmets, workers are increasingly being assisted on site by the integration of training, warnings and hardware.

The software which joins all this together allows workers to be tracked, located and be made aware of the hazards in their environment with visual, audio and haptic cues while in the field. Augmented Reality (and Mixed Reality) is already transforming operations in this way, not only in health and safety but across operations throughout the supply chain.

Where Virtual Reality allows your trainees to be surrounded 360 degrees by a virtual environment, augmented reality adds layers onto your real-world environment. This can be the ‘final driving lesson’ or provide timed or live data from human or AI sources, and on-site/in the field.

In terms of training and assessment, VR and AR apps can be plugged into a HR or existing LMS to track progress and compliance.

VR and AR provide “core and advanced health and safety training without borders, without walls”, sparking competence and completion behaviours quickly.

In various studies conducted by Stanford, VR can also hugely increase reaction times, resulting in better recognition and understanding of obstacles and performance.

Doing something for the sake of it doesn't qualify your training – it must add value.

Health and Safety messages are meaningful in and of themselves – but it can often be the delivery of those messages which fails in the first instance. In meeting compliance.

Immersive technology like virtual reality and augmented reality provides the opportunity to make training learner-centric, centrally controlled and more cost-effective than room hire, consultancy hire and makes refresher training instantly accessible anytime, anywhere.

An immersive strategy allows you to include existing platforms - like staff smartphones, tablets and PCs - along with the more exciting hardware in order to create simultaneously independent and collaborative, discursive learning experiences, and demonstrate better delivery, better memorisation and stronger learner satisfaction which e-learning alone does not provide.

This is useful not only for high risk and hazardous environments, but where low-frequency, high impact risks can be identified and the correct reaction can be engrained.

Undoubtedly, there are communication challenges when it comes to ensuring that training from across all levels - whether that's during onboarding for new staff, or scheduling refresher training.

In utilising immersive technology, there is a huge opportunity now to adopt early and immediately excite and engage new staff from the outset.

This has the knock-on effect of increasing the probability that staff complete H&S modules, as the "intrigue factor" around virtual reality exists strongly enough to help Health and Safety manager to create an 'event' around this.

EON Reality's AVR PLATFORM has been designed with local and global collaboration in mind.

Collaborative working and learning is empowered within our simulation and visualisation platform, with lessons enabled online and offline, and tracked.

Adding communicative and repeat-at-home training value with immersive, endlessly practicable environments and interactive models gives H&S leaders extra opportunities to ensure compliance, attention and better learning results.



IMMERSIVE STRATEGY
WITHIN YOUR H&S
STRATEGY

Staff take VR and AR lessons home on their phones



VR/AR STRATEGY: FUTUREPROOFING

Develop sophisticated awareness and appetite to re-engage



Increase numbers across your learning management system



Play, pause, stop, rewind: identify potential new risks and behaviours



Improve organisation-wide safety awareness culture





Remove the challenge of encouraging participation and reflection on good practice

IMPROVE YOUR HEALTH & SAFETY TRAINING



Enhanced reputation and brand equity for H&S innovation within the supply chain



Independent lesson creation from specific risks



Investigate mistakes live from and to anywhere in the world



Assess and control simulated risks and hazards with accuracy

THE AVR PLATFORM

TRAIN: Users can train and fine tune their learning immersively with Virtual Trainer whether in the office, in the training centre or any connected room in the world.

LEARN: Progress the same learning journey for every trainee on smartphone or tablet, empowering them to train on the go, outside, or whenever they are travelling.



PERFORM: Leverage the power of wearables, smartphones, tablets - or all three at the same time.



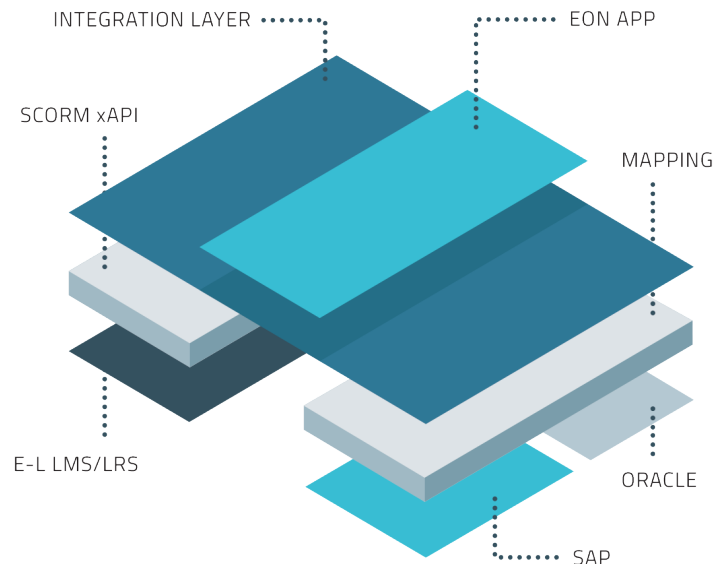
Administer training on site, in the field and in dangerous locations with ease - progress and track each learner journey, for every individual user.

Discover a fully integrated, immersive training suite providing a unique, virtual training environment which is accessible anytime, anywhere.

Save money. Stay compliant. Engage every trainee.

Provide consistent, captured learning outcomes.

INTEGRATE VR & AR



COMPLEX SITE DELIVERY: MADE PHOTOREALISTIC, MADE EASY

Deliver dangerous tasks and intricate models inside safe, photorealistic environments – with every learning outcome tracked and made actionable.

REDUCE TRAVEL COSTS

Learning programmes are absorbed faster by trainees, updated for them in real time, wherever they are in the world. With training costs skyrocketing per person per year, the race is on for organisations to deliver courses and programmes cost-effectively.

CENTRALISE AND COLLABORATE

Communicate and upskill with your global team: virtual and remote guidance helps you fully exploit your company's collective expertise from anywhere in the world. Collaborate through our powerful, yet simple dashboard which puts the trainers back in control, with multiple viewpoints within your training environments.

NEW BUSINESS OPPORTUNITIES

Explore and innovate your business model, opening new sales channels and potentially, brand new markets.

Inspired by true global collaboration, you can pioneer new business with our solutions to help explore world markets, track remote locations live, or those which could be subject to political instability and are more difficult to visit in groups. Test your operations before deployment; transform points of sale; track and trace logistics in a smarter way... the possibilities are truly endless.

BETTER SERVICE – ENHANCED IN REAL TIME

Speed, accuracy and efficiency in upskilling the workforce is mission-critical to any business. Virtual Trainer gives you easy assimilation with existing learner records, xAPI and LMS solutions, with statements provided on an analytics dashboard. Make learning outcomes and virtual comms traceable, smart and actionable.

BOOST EMPLOYER BRAND

Enhance, upskill and excite your teams with augmented, virtual and mixed reality applications and solutions from EON Reality. By making their work more efficient, deliverable from anywhere in the world and at any time, you can help balance the lives of your employees and take away the travel and time strain through an augmented virtual workplace.

CASE STUDIES

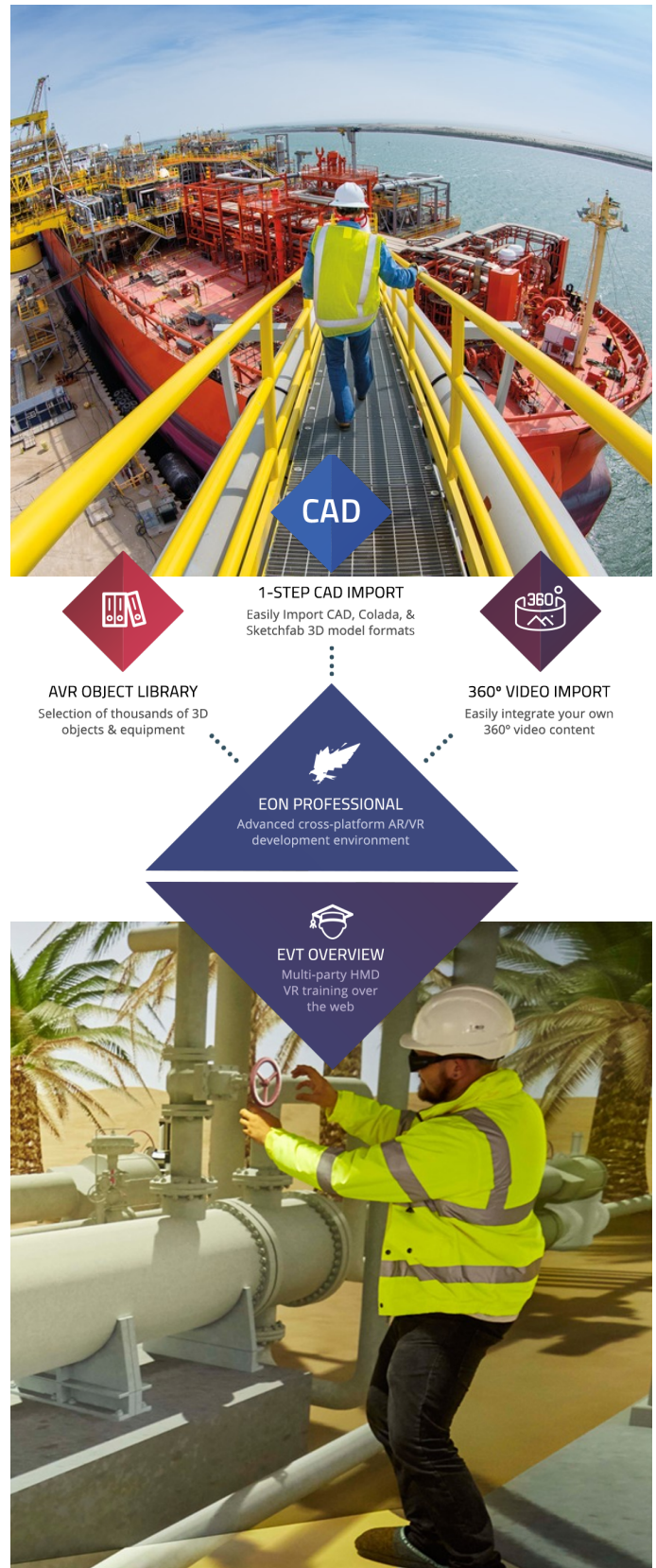
ExxonMobil

ExxonMobil wanted holistic training solutions that combined effective field training, using 3D immersive environments with panel operations, using advanced dynamic process simulators (DPS). The 3D immersive environment enabled a field trainee to navigate and interact with these environments.

Using their caves and software, ExxonMobil simulates a variety of plant scenarios such as routine operations, emergency response, abnormal ops, upset scenarios, integrity critical procedures, and low-probability/high-consequence events, all in safe, controlled areas. These simulated situations can then be repeated until the correct response becomes second nature.

“The Immersive 3D Operator Training Simulator provides a realistic 3D virtual environment that is a very close replica of an operating plant. These simulators are highly effective in training workers on how to prevent incidents, while teaching them to respond quickly and appropriately should any occur. This technology, developed in cooperation with EON Reality, is another example of how ExxonMobil continues to support research and safety, health and environmental protection across its global operations.”

Sara Ortwein, President of ExxonMobil Upstream Research Company



Construction Client

A global contractor wanted a virtual and interactive HSSE simulator to be used as a precursor to working onsite. The client wanted the solution to use current training materials, to be easy to update for compliance, and be tracked to support better learning outcomes.

Virtual Trainer needed to help the client succeed in reaching their internal objectives around training and communication in a more meaningful way. This meant ensuring that delegates and colleagues were doing more than watching videos and ticking boxes inside a legacy e-learning system which did not demand user attention. **The interactive and immersive environment allowed staff to explore a live site, make mistakes safely, optimise behaviours with all dangers and risks outlined, leading to an increase in compliance and risk recognition.** The risks covered and trained against in the virtual program covered:

- Working at height
- Rigging & Lifting
- Trench collapse and Tunnel Work
- Pedestrians
- Falls, Slips & Trips

Their bespoke Virtual Trainer program continues to form obligatory pre-site safety training delivery in the UK, and helps form a template for the company's global health and safety strategy.



*“Virtual Reality and Augmented Reality are the ideal technologies to base **integrated communication, engagement and course delivery** tools that create and complete an immersive training channel for Health and Safety, with longer lasting learning results.”*

- Head of Training, Construction Client (anonymised for privacy)

CONCLUSION

VR and AR already provide of businesses with new opportunities for compliance, digital transformation and HRIS or LMS integration enjoying the benefits of active pilots, projects, and R&D partnerships.

What we have discovered over the last 19 years at EON Reality is that visual, immersive, simulated, interactive environments continue to form proven training measures. Most recently, Prof. Jeremy Bailenson from Stanford, discovered that learners retain 33% more information from VR, than standard video.

The difference today is that there are many more tools than there used to be which encourage real, evidenced learning outcomes – and it's the integration of advanced analytics and immersive technologies that is revolutionising knowledge transfer. Health and Safety remains a major business challenge that is ongoing, evolving and applicable to all industries where the prevention of harm, and the promotion of health and business productivity are not only interlinked, but completely key to enterprise and operational success.

While plenty of technology providers are quick to lecture, EON Reality is incredibly sensitive to these issues, simply (but also compellingly) because virtual reality and augmented reality development works in tandem and intimately with HSSE in mind, from project design and scope, through to finalisation and workplace integration.

In Virtual Training environments, health and safety learning programmes are

absorbed faster by trainees, allows collaboration and inherently hosts multi-user training from across several sites wherever it's needed, and is updated for your employees in real time, wherever they are in the world, or on the move.

With both virtual and augmented reality, you can easily deliver dangerous tasks and intricate, interactive models inside safe, low-cost photorealistic environments – with every learning outcome tracked within a set of analytics / results. This recorded evidence of completion surpasses the expectations of most certification demands, while also allowing you to look at behaviours and performance more closely, and to align it with your HR and Operations functions as they too, undergo digital transformation.

We have found the following to be key outcomes from digital transforming towards an immersive strategy for Health and Safety:

- Top management commitment to innovation
- Management of risks
- Uncover further priorities and quick wins from the style of training VR and AR provides
- Build innovation and centrally controlled training with your H&S strategic initiatives
- Collaborate with Learning and Development subject matter experts to achieve the best objectives, ROI and outcomes

Deliver dangerous tasks and intricate models inside safe, photorealistic environments – with every learning outcome tracked and made actionable. Support faster learning by forming knowledge from experience, which is as good as being on the job.

WE'RE HERE TO HELP. CONTACT US TODAY

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