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مجلس الشرق الأوسط وشمال أفريقيا للترفيه والجذب السياحي
Middle East and North Africa Leisure & Attractions Council

LET'S TALK SAFETY - AUGUST 2021

ADVANCING THE USE OF TECHNOLOGY TO IMPROVE HSE

Driving Safety Standard,
Assurance and Culture
through Modern Technology



Introductions:

The use of technology has made everyone's life exciting and it is continuously growing because it can provide evolving enhancements to every part of our life.

The Leisure and Entertainment industry is not untouched by this as we see world-leading leisure parks across the globe which are equipped with complex machinery that attract, delight, and provide thrilling experiences.

As a prerequisite, our industry has a duty to continue to embrace and use modern technology in order to ensure the highest standards of safety so that our guests feel safe and secure when visiting our facilities.



In this article we will focus on the existing and emerging technologies being used, specifically focusing on:

1. Inherent safety controls on rides and attractions and to aid inspection and testing.
2. The use of software, apps, and handheld technology to improve assurance.
3. Engaging and effective learning and development tools.



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As a prerequisite, our industry has a duty to continue to embrace and use modern technology in order to ensure the highest standards of safety so that our guests feel safe and secure when visiting our facilities.

1. Inherent Safety Controls on Rides and Attractions



In the early days of our industry, safety was delivered through engineering controls combined with operator controls. Initially, these engineering controls were basic and focused on protecting users from basic hazards.

As technology developed over the years, the ability for technology to improve safety evolved quickly with the primary aim to make the safety controls more reliable, more sensitive, and crucially to reduce human error. In safety terms, providing extra layers of safeguards and redundancy on controls to reduce the human dependency on many

parameters where automatically decision is made on time by the automated equipment.

As technology has accelerated exponentially over the last 30 years, inherent safety controls have developed quickly and have been documented and delivered through the implementation within many technical standards. These improvements have seen:

- Basic guarding moving to automated guards with inter-locking sensors and shut off linking to advanced automated control systems.
- Enabling devices linked to actuators and start control systems
- Sensitive protective equipment (SPE) for detecting persons or parts of persons which generates an appropriate signal to the control.
- Active Optoelectronic Protective Devices (AOPD) devices whose sensing function is performed by optoelectronic emitting and receiving elements detecting the interruption of optical radiation detection zone linked to control systems



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- Limited Movement Control Devices and over or under-speed control device, a single actuation of which, together with the control system of the machine, permits only a limited amount of travel of a machine element.
- Pressure system controls
- Intrinsic electrical safety equipment

In recent years, all of the above devices have been integrated within complex automatic monitoring intended to ensure that these protective devices constantly measure in real time. Automatic monitoring either detects a fault immediately or carries out periodic checks so that a fault is detected before the next demand upon the safety function. In either case, the protective measures can be initiated immediately or delayed until a specific event occurs, such as programmed machine cycles.

Where next for technology?

In addition to ride manufacturers constantly working on the reliability and sensitivity of the safety device components above, our industry has seen further technological development in:

Virtual and Remote monitoring - sophisticated off-site monitoring of the safety parameters of rides and the whole parks/ premises providing real-time active monitoring of equipment allowing operators to take a full view of the ride performance, out-of-parameter flags and using the Internet Of Things (IoT) concept to provide remote control of systems.

Virtual and Remote Inspections – bringing the “expert critical eye” remotely to the asset via virtual remote inspection, including the use of drone technology to allow the technician or inspector to evaluate complicate and hard to reach areas without being physically there in person. Whilst this approach needs to be done with high caution and with the right checks and balances, this application is now used by many inspection bodies.

(Reference. Various BN:EN standards plus BS EN ISO 12100:2010)

Our industry has seen further technological development in Virtual and Remote monitoring and Virtual and Remote Inspections



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2. The use of software, apps, and handheld technology to improve assurance

Put simply, making sure things are checked and documented is fundamental to the assurance that rides and attractions are safe. Whilst we rely on technology to deliver many elements of this, it can not be replaced by the human intervention of making sure structure, equipment and programable cycles are working correct.

In order eliminate the old-fashioned handwritten checklist and in order to to make this more efficient , reliable, and undertaken in a timely manner, companies are investing in on and off-line assurance platforms. Such systems have the benefit of:

- Standardising this due diligence approach across multiple regions, with data held securely and off site.
- Inspections, audit, and checklists conducted in the field, on handheld devices that time-date the activity and allow real time upload of pictures and videos to aid fault finding.
- Incident management with at-the-scene data capture with automatic escalation parameters to key stakeholders.
- Action management and tracking being efficient with action-owners, urgency, and close-out monitoring.
- Accountabilities and responsibilities made clear and tasks assigned to colleagues at every level of the organisation.
- Reporting and management data providing trend analysis and promoting root cause evaluation and benchmarking.
- Historical data held over extended periods to allow data retrieval and due diligence in the event of issues or incidents.





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Where next for technology and the use of assurance platforms?

Such software platforms continue to grow and develop and have the potential through AI to assist fact-based management decisions, predictive fault and trend analysis, predictive maintenance and risk management.

Software providers continue to evolve the ease of use, user-experience, hardware technology to aid data capture at source so that it promotes the use of such systems in the most efficient way.

Assurance platforms continue to grow and develop and have the potential through AI to assist fact-based management decisions, predictive fault and trend analysis, predictive maintenance and risk management.

3. Engaging and Effective Learning and Development Tools



Similar to the development of the safety controls outlined in the first section, training and development has embraced technology massively and has been at the centre of the technological revolution with the development of technology and the desire of the learner for more engaging content.

Classroom and face to face training will always be needed, particularly where practical training is needed or where the training needs to happen at the point of use, such as in ride operator training. However, the advent of e-learning has accelerated in recent decades and has some key benefits:

- **Accessibility** - when learning is made available at the exact moment of need from countless devices, it makes learning, training, and career development possible for employees allowing learners to acquire knowledge at their own pace.
- **Engagement** - using multi-media content to provide blended text, audio, and visual learning methods with the ability to add knowledge-checking and testing at regular intervals.



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- **Personalized** - traditional learning might be considered a one-size-fits-all solution, whereas e-learning can suit an individual's needs in terms of picking from a library of topics that fit the skill-gap being addressed. Furthermore, its content can be accessed, consumed, discussed, and shared as each individual learner sees fit to their own benefit.
- **Agility** - According to some research, around 75% of companies who regularly used e-learning backed the statement that learning technologies, such as eLearning and mobile learning, assisted their business greatly in adapting more quickly to change. In addition, it accelerated the reach of learning to more people, in a shorter period of time compared with conventional face to face training,

What next for technology and learners?

There is a growing trend to the science of app-based, micro learning. That is short bite-sized training and knowledge sharing – short bursts of training in 3-5minutes, delivered on a more frequent basis. The rationale for this is that research indicates that the human brain is not built to remember a mass of data delivered at the same time. In fact, it is estimated that employees who attend a 1-day training lose around 70% of the information they learn by the second day - this is called the forgetting curve. Forgetting the important information around safety protocols brings real-world consequences

It is likely that the younger demographic of workers within our industry will be more likely to want to consume learning using this type of technology which has the benefit of being focused, bite-sized bursts of information proven by science to make learning memorable and impactful. It has the benefits of being:

- Fast and fits the flow of work
- Personalized with training targeted to what each person knows and doesn't know as well what behaviours are exhibited in the workplace.
- AI Learning – systems that provide content intuitively and automatically based on how the learner interacts with the system and learning content.
- Built-in games, points, rewards, and leader boards to add to the engagement.

The advent of e-learning has accelerated in recent decades and has some key benefits of accessibility, engagement, personalized learning and agility

(Reference. <https://elearningindustry.com> plus www.axonify.com)



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In summary, history has demonstrated that the majority of technological advancements in recent years has had huge positive impact on improving health and safety standards. This will continue to be the case. That said, it is critical that new and emerging technology must be fully evaluated in order to ensure reliability, appropriateness and to safeguard against un-intended consequences.

Author Credits:

This article is contributed by Mr. Peter Stubbs, Director of HSE, Majid Al Futtaim Leisure, Entertainment and Cinemas and Mr. Pankaj Sharma, Health & Safety Manager, Landmark Leisure, Dubai.

Disclaimer:

The advice shared above is based on a high-level view of best practices when adopting technology to improve HSE within an organization. It is however important that you speak with and follow the recommendations of the local authorities and regulations in the countries that you operate. Their guidelines will help you to create your own best practices when adopting technology to improve HSE within an organization. to ensure your Rules and Responsibilities outlined meet the requirements of your individual country, the regulations and recommendations of your local authorities.