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Heatherwick's Cape Town museum

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Riding the underground Mail Rail in London

Cairns Aquarium

A window into Australia's rainforest and reef

DAVID ATTENBOROUGH

at the American Museum of Natural History

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SCIENCE OF ATTRACTION DESIGN

Neuroscientists, user experience designers and anthropologists are being drawn to work in the attractions industry. Their expertise is opening up the potential for us to create a new generation of even more immersive experiences which are emotionally rewarding

This month we reported on work by Disney Research which has created a haptic system that enables people to 'feel' fireworks using computerised water jets sprayed on flexible screens.

The technology has been developed for use by blind and visually impaired people, but is part of an emerging interest in harnessing the senses to create a new generation of sensory experiences for use in visitor attractions.

In this issue, we examine a number of projects in which experts are turning to science and neuroscience to find new ways to connect with guests and create more powerful, immersive experiences.

On page 16, neuroscience researcher Tedi Asher from the Peabody Essex Museum in Salem, Massachusetts, talks to *Attractions Management* about using neuroscience to create the best experience for visitors – the aim being to display collections in a manner that complements the way the brain functions.

Asher's work has been made possible by a grant from the Barr Foundation, a Boston-based private institute that works to elevate the arts and creative expression.

Applying the latest neuroscientific research and neuroaesthetic theory to enhance visitor experiences across the museum's permanent collection, Asher will publish her findings so they can be shared with museums worldwide.

Elsewhere in this issue, the science behind sensory design and ways in which it can be harnessed to create compelling attractions is examined by our expert panel on page 80.

> Neuroscience is being used to create the best experience for museum visitors by displaying collections in a way that complements brain function

Composer Joel Beckerman, architect and writer Gordon Grice and researcher and anthropologist Scott A Lukas talk us through ways to understand the five senses and highlight how they can be used to create more resonant experiences.

They reveal fascinating sensory facts, for example: unlike most memories, sensory memories are not subject to 'retroactive interference' – ie, they can't be disturbed or altered by memories which are acquired later, so your grandma's cookies will always smell as good as they did on the day they were baked, when it comes to your memory of them.

When it comes to taste, experiments show people experience different flavours when drinking the same wine in different coloured environments – it tastes richer in a darker, room.

The main objective is to get all of the senses working together, combining aromatic elements with visual, auditory and tactile ones, to create a total experience which delivers 'environmental authenticity'.

Understanding visitor psychology and how guests use our attractions can also feed into the science of safety, and on page 84, Dr Kathryn Woodcock of Ryerson University explains the theory of 'human factors engineering', looking at how to best design attractions to ensure people use them safely by adjusting and anticipating their perceptions of risk and danger.

Welcoming scientists into our industry will enable the creation of a new generation of safer and more engaging experiences, which will in turn make the memories of tomorrow.

Liz Terry, editor. Twitter: @elizterry

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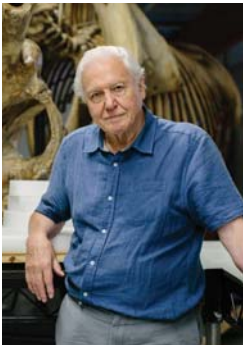

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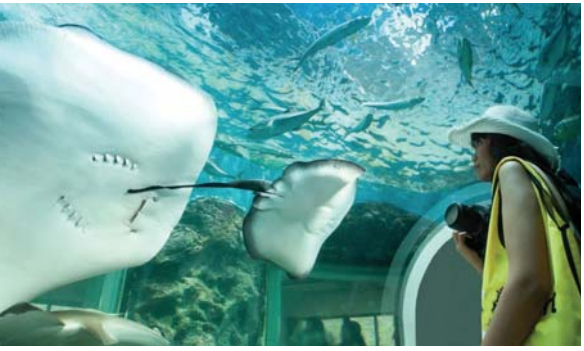

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- London's newest attraction, the Mail Rail and Postal Museum

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- Parques Reunidos linked to SeaWorld sale
- "This time I mean it" – Disney CEO Bob Iger to step down in 2019
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Attractions People

David Attenborough and Jumbo the elephant at the American Museum of Natural History

PHOTO: BBC PICTURES

‘Institutions like this are the very foundations of all zoological knowledge’

Sir David Attenborough broadcaster and naturalist

Sir David Attenborough, the veteran naturalist and broadcaster known for groundbreaking documentaries like *Life*, *Blue Planet*, *Frozen Planet* and *Planet Earth*, has been working with the American Museum of Natural History (AMNH) on a new film.

With the working title *Jumbo: The Life Of An Elephant Superstar*, Attenborough and a team of experts at the AMNH in New York, New York, created a 60-minute documentary that explores the story of the elephant who inspired Disney's *Dumbo*.

Jumbo's moving story began when he was brought to London Zoo in 1865. But the supersize animal was difficult to control and sold to PT Barnum's circus in the US. More than 20 million Americans came to see Jumbo and the troubled elephant became a star. Attenborough's upcoming programme investigates Jumbo's life and the mysterious circumstances of his death, looking too at elephants in the wild and examining changing attitudes to captivity.

"AMNH provided archive photographs and information, along with direct access to Jumbo's skeleton," Roberto Lebron, senior director of communications at the museum told *Attractions Management*. "The production was interested in doing a DNA analysis of the skeleton, which we facilitated – the results will be discussed in the film. The museum's provost of science Michael Novacek was also interviewed."

Lebron says the museum is looking into possible related programming for next year.

Attenborough has collaborated with attractions since the 1950s, when he worked on *Zoo Quest* alongside the BBC and ZSL London Zoo, establishing his talents in front of the camera.

While with the AMNH, Attenborough also filmed a short video about the importance of natural history museums in learning about and protecting the animal kingdom.

He says: "I've been fascinated by animals for as long as I can remember and if you're fascinated by animals, you want to know more about them. The great place to know about them is, of course, museums.

"Institutions like this are the very foundations of all zoological knowledge.

"The natural world is becoming poorer and more damaged. If we want to prevent it being damaged, we have to understand how it works and we have to understand what it is that we're doing that may have an effect. That is perhaps the most important thing that's facing humanity today. If we want to preserve the richness of the animal world, we have to know how it works. And these are the places that tell you."

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> ‘Something that is unexpected takes longer to detect – but it also makes a more lasting imprint’

Tedi Asher neuroscience researcher, Peabody Essex Museum

Tedi Asher will apply neuroscience research findings to enhance the visitor experience at the Peabody Essex Museum

When a visitor walks into an art gallery, they expect to see paintings hanging alongside one another on every wall, and the rooms categorised by era or movement or artist.

Sometimes, galleries adopt different methods – displaying a single artwork in a room on its own or making use of flexible design techniques that enable them to rearrange the layout of the space.

Experts now believe displaying many works side-by-side and top-to-tail on a gallery wall is not the best way for the visitor to appreciate the art. It makes sense – doesn’t it? – that seeing maybe one hundred works in a room altogether might overwhelm the visitor’s brain?

At Peabody Essex Museum (PEM), in Salem, Massachusetts, Dr Tedi Asher has joined the team to advise on exactly this conundrum – what is, neurologically speaking, the best gallery experience?

Asher takes the role of neuroscience researcher, part of a PEM neuroscience initiative made possible through $130,000 (£100,000, €110,000) funding from the Barr Foundation, a Boston-based private institute that works to “elevate the arts and creative expression”. PEM’s neuroscience initiative aims to find

 ©CYBERTREK 2017

In Rodin: Transforming Sculpture, dancers encourage visitors to think about art in new ways

PHOTOS: COURTESY OF PEABODY ESSEX MUSEUM

Peabody Essex Museum head Dan Monroe; (right) the Asia in Amsterdam exhibit uses jars filled with spices to elicit multi-sensory reactions in guests

strategies to display art in a way that complements the way the brain functions.

"PEM's cross-disciplinary approach is exciting and comes at a time when neuroscience findings are beginning to be more widely embraced outside of the scientific community," says Asher.

Applying the latest neuroscientific research and neuroaesthetic theory to enhance visitor experiences across the museum's permanent collection, Asher will document her work and work with PEM to write and publish her findings, which will be shared with art museums worldwide.

"We're all familiar with the idea that a satisfying experience has this delicate balance of meeting and violating our expectations," the Harvard-educated Asher, who has a special interest in neuroscience and psychology, told *Artsy* magazine. "In the context of exhibition design, how can we surprise people in a way that won't be jarring, but will help viewers make sense of what they have seen? Something that is unexpected takes longer to detect – but it also makes a more lasting imprint."

Museum head Dan Monroe has been introducing neuroscience to PEM over the past couple of years, experimenting with less cluttered exhibition spaces, more manageable and engaging descriptions for the art and some multi-sensory elements. The appointment of Asher will help him take this work to previously unexplored levels.

"We're excited to be the first art museum to employ a full-time neuroscientist to help develop new ways of designing experiences that are highly meaningful and relevant to visitors," says Monroe. "Dr Asher's unique perspective and deep insight will make the process of art exploration and discovery especially rewarding, stimulating and fun.

"We believe there are new ways to present and interpret art that will enliven and enrich the art and art museum experience. We also believe the collaboration may benefit the art museum community at large," Monroe says.

‘One day I woke up and realised we needed something really iconic’

Chester Osborn
chief winemaker and viticulturist, d’Arenberg

The d’Arenberg Cube visitor experience and restauramt opens in late November

 ©CYBERTREK 2017

In the McLaren Vale wine region, an unlikely structure has emerged – a contemporary, twisted glass box that glistens in the South Australia sunshine. The A$15m d'Arenberg Cube serves two purposes. It's a brand home for the award-winning wine producer, offering a multi-sensory, art-filled journey through the world of d'Arenberg and a range of blending and degustation masterclasses, and it's a world-class restaurant.

"When the guest enters the building, they walk through a mist that introduces their senses to the wine of the day," says chief winemaker and viticulturist Chester Osborn. "There's an art gallery of wine-related installations and an interactive gallery called Alternate Realities, because when two people have the same glass of wine, they'll have different realities of that wine."

Chester Osborn is chief winemaker at d'Arenberg

For Osborn, whose great grandfather, Joseph Osborn, founded the d'Arenberg wineries in 1912, it's been a long-held dream. As the owner of one of the busiest cellar doors in McLaren Vale, research by wine and tourism industries noted the need for more tourist drawcards and the Cube is his response. Osborn needed more space to cater more people.

"We have a successful restaurant called d'Arrys Verandah and a tasting room, which are always fully booked," he tells *Attractions Management*. "I thought about creating an 1800s, colonial-style restaurant, but then one day I woke up and realised we needed something really iconic that will make people really want to come and see us."

PUZZLE ME THIS

Wines from d'Arenberg are famously something of a riddle – for example, The Dead Arm Shiraz, The Hermit Crab Viognier, The Money Spider Roussanne – "and wine, too, is a puzzle to work out," says Osborn. That inspired the idea of a Rubik's cube-shaped structure, with the top two levels appearing to have been twisted. The mirrored design means it looks like a cube floating on top of a vine.

In the new fine dining restaurant, Michelin-starred chefs Brendan Wessels and Lindsay Durr will be serving a menu inspired by the theme of alternate realities and at "the top end of international cuisine – think Melbourne's Vue de Monde or El Celler de Can Roca in Spain," says Osborn. There are four big terraces where guests can admire the panoramic view and, on the top floor, the bar, tasting room and lounge area will be located, featuring glass art, lightboxes, video screens and projections.

"The bar is made up of 115 screens showing content of a person swimming along, as if they're trapped inside."

There are plenty more offbeat or zany installations and interactives inside the visitor experience, including a cow sculpture with a polygraph, a natural automated winemaker, a "flower and fruit" room, decorated with artificial flowers and fruits and filled with wine aromas the visitor can try, and a 360-multimedia immersion room that recreates the vineyard.

The d'Arenberg Cube – expected to open in late November – is built to accommodate 500,000 annually and Osborn says he will charge a flat A$10 ticket price for non-diners and non-members who just want to do the experiences. As wine tourism continues to blossom in McLaren Vale, where there are 120 wineries and 18 cellar doors, Osborn's iconic Cube is certain to attract attention.

"It's a very busy tourist destination, second to Barossa Valley in numbers, but not by much," he says. "It's on the way to Fleurieu peninsula and Kangaroo Island, which are popular destinations, so we have a lot of people heading there who don't stop, but maybe they will now. There are 40 restaurants in this region and its only 40 minutes drive from the centre of Adelaide, so it's popular for a day or overnight trip."

Obama advisor Dorgelo to lead ASTC

Barack Obama's former White House science and technology chief of staff, Cristin Dorgelo, has been named the new president and CEO of the Association of Science and Technology Centers (ASTC).

Dorgelo, who worked at the Office of Science and Technology Policy under the science advisor to then-president Barack Obama from 2014 to January 2017, takes the reins from current ASTC interim CEO Gillian Thomas. She will oversee the organisation, which has around 670 members in the science communication field.

Her career has focused on bringing science to a wider audience, especially on the Obama administration's Grand Challenges initiative, which invited parties to use science, technology, and innovation to solve major problems.

Cristin Dorgelo will lead the ASTC from January 2018

"At this critical time for science, I'm thrilled to lead ASTC in supporting the vital work of its global membership," she said. "These institutions provide welcoming, inclusive environments for millions of children and adults; helping them to experience wonder and curiosity and be inspired by the contribution that science and technology can make in solving tough societal challenges."

Details: http://lei.sr?a=H6s7s_T

Science North to develop Guangzhou centre

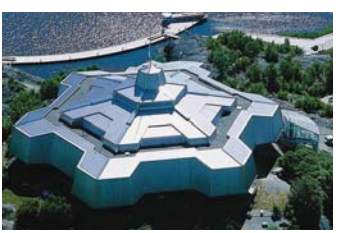
One of Canada's largest science centres has signed a deal with Chinese company Grandview Enterprise to establish a major new science centre in the city of Guangzhou.

Science North – an interactive science museum in Greater Sudbury, Ontario – opened in 1984 and is Northern Ontario's most popular tourist attraction.

The new relationship, marked by the signing of a Memorandum of Understanding (MoU), will leverage Science North's expertise in operations, science education, commerce, professional services and talent training to aid the facility's creation.

"The collaboration with Grandview Enterprises will benefit both our organisations as we share our knowledge and expertise in operating a science centre as well as in science communication to the public," said Science North CEO Guy Labine.

PHOTO: SCIENCE NORTH



Science North opened in 1984 in Northern Ontario

The science centre is not the only attraction development for Grandview. Last year, in collaboration with Wanda, it opened a theatre and IMAX cinema in the city. Plans are also underway for a nature museum, rainforest ecological museum and a Cantonese culture street, with each project aiming to "enrich people's spiritual and cultural life" in the city.

Details: http://lei.sr?a=g9m2v_T

INDUSTRY OPINION

Our refugee initiative reflects our mission – you would do the same

Thanassis Kontonikolaou

Since 2016, NOESIS science centre has run the Welcome Refugees initiative. In line with our mission to make science accessible to all, our foundation welcomes children from the refugee camps of Thessaloniki, Greece, offering them a scientific, cultural and social programme.

Children get to enjoy a planetarium film and guided tour in their native language. They experience in practice that technology is a dynamic field and that future technologies are built on past knowledge – an important point in Greece's history of innovation. As they learn Greek, we offer activities together with their local peers.

Including children in our activities and programming is a creative and effective way to make them feel welcome, show human solidarity and some hope for a better tomorrow.

Serving refugees in the ongoing crisis is a challenge for society as well as for cultural institutions. With their hand-on activities, learning programmes and collections, science centres can contribute to the long-term social need of meeting and getting to know the unknown "other". Welcoming refugee children into our community's cultural and scientific life is putting into practice the values of inclusion, diversity and active citizenship. Science – and society – should be without prejudice.

Our project was awarded a special mention for courageous leadership at the 2017 Mariano Gago Ecsite Awards. This award recognizes our effort to make a difference to these people's lives that changed so abruptly in an irreversible way. We are honoured – but really, we simply did what our human values commanded. You would have done the same. ●

Thanassis Kontonikolaou, director, NOESIS, Thessaloniki, Greece

 ©CYBERTREK 2017

BIG-designed Lego House captures brand's philosophy

Lego fans from around the world are descending on the small Danish town of Billund for a new museum and experience centre dubbed the 'House of the Brick'.

Bjarke Ingels Group (BIG) has created the 12,000sqm (129,000sq ft) Lego House as a three-dimensional village of interlocking buildings and spaces, with the structure designed to look like a giant stack of Lego blocks topped by a giant Lego keystone.

The centre, which opened on 28 September, features four colour-coded play zones: red for creative skills, blue for cognitive skills, green for social skills and yellow for emotional skills. There is also a Masterpiece Gallery showcasing fans' Lego creations and a basement museum celebrating the history of the Lego company, which was born in Billund.

While visitors must pay to enter these areas, everybody has free access to the site's 1,800sqm (20,000sq ft) indoor lobby, three restaurants, Lego store and the brightly coloured roof terraces.

About 250,000 people are expected to visit per year, boosting tourism for a town that is also home to the first Legoland theme park.

PHOTO: LEGO GROUP

Bjarke Ingels created Lego House as a village of interlocking buildings and spaces

Lego House manager Jesper Vilstrup said: "This building is a manifestation of the very essence of the Lego idea. This will be an amazing place where Lego fans, their families and friends can experience – or re-experience – the playfulness of the Lego universe.

"All activities are related to our philosophy that creative play promotes innovation. Lego House will enable us to offer both adult and young guests the chance of stimulating both creativity and learning."

Details: http://lei.sr?a=7N6M9_T

PHOTO: P.2 ENTERTAINMENT

The experience will open in 2021

Real Madrid plans football experience

Real Madrid football club has announced plans for an interactive experience centre as part of a major development in Zhuhai, China.

Utilising advanced technologies, entertainment elements and football, virtual and augmented reality will play a major role in the attraction, which will also include various challenges and entertainment experiences, as well as a museum chronicling the club history.

Details: http://lei.sr?a=R6X2J_T

Amanda Thompson to lead IAAPA in 2020

Amanda Thompson OBE will become only the third woman to chair IAAPA in its 100-year history, after the global attractions body announced the Blackpool Pleasure Beach managing director would take over in 2020.

Thompson was elected second vice chair of IAAPA at a meeting on 25 September, a position that she will hold through 2018, before becoming first vice chair in 2019 and then chair in 2020.

The Thompson family has been involved with Blackpool Pleasure Beach in the UK for more than a century, with the attraction first established by her great-grandfather, WG Bean, in 1896. Her grandfather, Leonard Thompson, assumed leadership in 1931, and her father Geoffrey oversaw the business from 1976 until 2004. Amanda has led the park as managing director since then.

Thompson received an OBE for services to tourism in 2012

In addition to becoming the third woman in a century to chair the global trade association, the appointment represents a series of firsts for IAAPA. British-born Thompson will become the first woman from Europe to chair IAAPA and it will be the first time a second member of the same family has chaired the association – following on from Geoffrey Thomspon who led IAAPA in 1996.

Details: http://lei.sr?a=N3t5B_T

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Disney breaks ground on Hong Kong theme park expansion

Disney has started work to transform its Hong Kong theme park – part of a six-year master plan to introduce a host of new experiences and characters to the destination.

The plan, worth HK$11bn ($1.4bn, €1.2bn, £1bn), aims to address problems for the struggling Disneyland Hong Kong, making the park profitable again.

Marvel's presence at the park is being significantly expanded, with a new experience featuring Ant-Man, The Wasp and Shield to be launched in Tomorrowland. The Marvel-themed area will add to the Iron Man Experience – the park's most popular attraction – which Disney hopes will make it "Asia's Marvel epicentre".

The company's smash hit *Moana* gets its first outing at a Disney park, with a new entertainment zone in Adventureland. Taking the form of a live stage show, guests will also get the opportunity to meet the character Moana.

An *Frozen*-themed area – to debut in 2020 – is a first for Disney parks, with a recreation of Arendelle featuring a lake, ice mountain, two rides, shops and restaurants. Guests will also be able to meet the film's stars, Elsa and Anna. The park's castle – currently Disney's smallest at 77 feet (23 metres) – will be "supersized" to match other parks. The transformation will also feature new day and night shows.

"We're creating first-of-a-kind experiences based on some of Disney's best brands," said Samuel Lau, executive vice president and managing director of Disneyland Hong Kong.

■ Details: http://lei.sr?a=Q4h8p_T

PHOTO: DISNEY

■ A *Frozen*-themed area is among the plans for the Hong Kong master plan by Disney

■ Mehrmann boosted Ocean Park visitation

Mehrmann to lead Universal Beijing

Former Ocean Park CEO Tom Mehrmann will play a lead role in the development of the CN¥50bn ($7.4bn, €6.65bn, £6bn) Universal Beijing, after being named president and general manager for the upcoming theme park and resort.

The new park will be the company's fourth Universal theme park in Asia, following destinations in Japan, Singapore and South Korea.

■ Details: http://lei.sr?a=a7A2x_T

Legoland gives 20,000 tickets to Irma kids

Merlin's Legoland resort in Florida is donating 20,000 tickets to children in the state affected by Hurricane Irma, representing the largest ticket giveaway in the park's history.

The donation, valued at $1.8m (€1.5m, £1.35m), has been made in conjunction with Merlin's Magic Wand – the global charity of Merlin Entertainments.

UNICEF's Kid Power Schools Programme, a teacher-led experience incorporating lessons and activities, will receive 18,000 tickets, with each student eligible for two tickets so they can visit with a parent or guardian. Additionally, the Citrus Center Boys and Girls Clubs – a charity organisation for young people offering access to a range of programmes promoting education, health, social character, service and leadership – will receive 2,000 tickets to distribute among its children.

Hurricane Irma caused an estimated $63bn (€53bn, £47bn) worth of damage as winds of up to 185mph (295kph) caused destruction across the Caribbean and US. It was responsible for 134 deaths and was the most intense Atlantic hurricane to strike the US since Katrina in 2005.

■ Details: http://lei.sr?a=e8G4P_T

PHOTO: LEGOLAND FLORIDA

■ The ticket donation from Merlin is valued at $1.8m

Launch nears for Omani waterpark

Oman's first waterpark development is on course for its December launch, authorities have confirmed.

Hawana Aqua Park is set to be a 35,000sqm (378,000sq ft), $7m (€6m, £5.4m) development by James Cubitt and Partners Abu Dhabi. It will feature a selection of water rides, including a lazy river, wave pool and a number of slides. A further 30,000sqm (376,000sq ft) of space will also be dedicated to a food court, shopping area and a large car park.

Following the opening, a second development phase included in the signing will see significant expansion to include six different types of watersports, as well as green areas.

The development is part of the largest tourist development in Oman, Hawana Salalah. Overseen by real-estate developer Muriya, the resort will house 900 rooms across seven hotels, three of which are already operational. The destination is also home to a 171 berth marina, freehold residences, retail, restaurants and cafés.

The development is by James Cubitt and Partners Abu Dhabi

"The ministry is working to elevate tourism in the Sultanate and has worked with the private sector to realise that ambition through the development of high-footfall tourism projects," said Ahmed bin Nasser Hamad Al Mahrizi, Oman minister for tourism.

Details: http://lei.sr?a=Y6N4n_T

Waterpark planned for Deira resort, Dubai

Developer Nakheel and Thai hotel group Centara Hotels and Resorts have unveiled plans to open a hotel, beach resort and waterpark on Dubai's Deira Islands.

The two companies have formed a joint venture agreement for the "family-centric lifestyle destination," which will be part of the newly-formed Deira Islands – a 15sq km (5.8sq mi) group of four reclaimed artificial islands currently under development.

Set to open in 2020, the 600-bedroom resort will be managed by Centara, which has a portfolio of 67 hotels across Asia, the Indian Ocean and the Middle East.

Covering 300,000sq ft (27,900sq m), a large beachfront waterpark is included in the plans, as well as multiple restaurants, a kids' club, spa, fitness centre and business facilities.

PHOTO: NAKHEEL

A large beachfront waterpark is included in the plans

The development is part of the Dubai government's Tourism Vision for 2020 – a strategic roadmap with the key objective of attracting 20 million visitors per year by 2020, doubling the number welcomed in 2012.

"This strategic joint venture underlines our commitment to bringing new hospitality concepts to Dubai, in line with the government's tourism vision," said Nakheel chair Ali Rashid Lootah.

Details: http://lei.sr?a=a7N3z_T

INDUSTRY OPINION

Going beyond what stakeholders expect is good advice in a crisis

Aleatha Ezra

Hundreds of waterpark professionals representing active leisure markets in 22 countries came together for the World Waterpark Association (WWA) Show, held from 16 to 19 October, 2017, in West Palm Beach, Florida.

The WWA Show is well known for its high-quality educational events and this year's programme continued to provide attendees with access to thought-provoking speakers sharing their ideas on guest safety, operational excellence, quality customer service, top-line employee training and more. Throughout the show, rooms were filled to capacity with attendees ready to ask questions and take home proven tactics to make their teams safer, smarter and more successful in 2018.

In addition to the wide variety of breakout sessions and workshops, this year's WWA Show offered a timely keynote address featuring Chris Nelson, the crisis management lead for leading PR firm FleishmanHillard. Nelson shared best practices on how waterpark operators can prepare for and recover from a crisis situation.

"Anyone could have a crisis, and organisational stakeholders know that. What they evaluate is how a company responds, which is why it's critical to surpass their expectations," said Nelson. "By going beyond what stakeholders expect, companies can go from being the villains in the story to being stewards of the resolution."

Considering 2017 had its share of challenges, many of them weather-related, Nelson's message about turning the page on a crisis in a way that improves the perception of your brand seemed to resonate with many who were in attendance. ●

Aleatha Ezra, director of park member development, WWA

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Jerusalem planetarium to become home for Einstein museum

An abandoned planetarium in Jerusalem will be converted into a museum dedicated to Albert Einstein as part of a $5m (€4.2m, £3.8m) project to showcase the scientist's personal archives.

Architecture firm Arad Simon is behind the plans, which will see a museum and visitor centre built on Hebrew University's Givat Ram campus in Jerusalem, Israel.

Arad Simon was selected from four local firms, with the university saying the winning proposal was "modest, not grandiose, and it spoke to us".

According to the plans, the visitor centre will sit inside the dome of the 500sqm (5,381sq ft) building, while the archive and research space will sit in its rectangular area.

An entrance lobby – which will also host temporary exhibitions – will feature Einstein's historic library, which is designed as a semi-transparent wall of books separating the visitor centre from the archives and research wing. It will also include a retail store and administrative office.

Inside the dome, the building's floor will be partly excavated, designed as a bowl so visitors can lie down and look up at the planetarium's ceiling, which will show milestones from Einstein's life.

In the planetarium's upper dome, 12 wells of light will display the movement of the sun during the day, with the darker area reserved for displays of Einstein's studies.

The rectangular part of the building will also feature a meeting room, preservation and photography room and a conference hall.

No date has been set for the project, but a funding campaign is commencing soon.

■ Details: http://lei.sr?a=f5Z5U_T

PHOTO: ARAD SIMON ARCHITECTS

■ The planetarium conversion will become a part of the city's Museum Row

PHOTO: WHY IS MY ART MUSEUM

■ Architects wHY are behind the plans

Asian Art Museum to get $90m makeover

San Francisco's Asian Art Museum has unveiled a $90m (€77m, £67m) plan to transform the institution.

According to the designs, a new 13,000sq ft (1,200sqm) exhibition space – to be used for special exhibitions – will be topped by an art terrace, which will serve as a sculpture garden and events space covering 7,200sq ft (668sqm). The museum's galleries will also be modernised.

■ Details: http://lei.sr?a=B9K6w_T

David Geffen donates $150m to LACMA

DreamWorks founder David Geffen has donated $150m (€128m, £114m) towards the US$600m (€512m, £457m) campaign to create a new home for the Los Angeles County Museum of Art (LACMA) in California.

Geffen's donation is the largest single cash gift from an individual in the museum's history, with his philanthropic support also making him the largest individual donor to the Building LACMA campaign.

"This innovative addition to the LACMA campus will ensure ongoing and expanded access to their permanent collection," said Geffen.

"LACMA will be able to touch millions of lives and create an even healthier and more vibrant community for everyone. At a time when federal funding for the arts is threatened, it's important that we foster public-private partnerships, like this one, to support arts and cultural institutions. Together, we can and must make sure every person has access to the arts."

The newly renamed Geffen Galleries will replace four of the museum's seven current buildings, with construction expected to start in 2019. Work will be completed in 2023 to coincide with the opening of the adjacent New Metro Purple Line subway.

■ Details: http://lei.sr?a=z5A3Z_T

■ Geffen's donation is the largest in the museum's history

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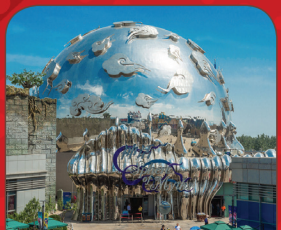

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Smit heads up new project as Jurassica and Memo join forces

The long-awaited Jurassica project is taking a new path towards realisation, joining forces with biodiversity project Memo to create a single visitor experience.

Sir Tim Smit is behind the reimagined venture, named The Journey, with the Eden Project creator coming on board to steer the development into this new phase.

The £80m ($106m, €89m) Jurassica – a subterranean geological park on the Isle of Portland, Dorset – was the brainchild of science writer Michael Hanlon, who died from a heart attack in February last year. Following his death, the project's board, which had backing from Smit and Sir David Attenborough, made a unanimous decision to press forward, promising to bring Hanlon's "thrilling vision" for the prehistoric attraction to life.

Memo – the Mass Extinction Memorial Observatory – was a proposed "living monument", designed to raise awareness of 17,000 global species under threat from extinction. The landmark, also in Dorset, would have been made of Portland stone blocks, each carved to depict the 850 species lost since 1662, when the last dodo died.

PHOTO: SUSTAINABLE EARTH

Jurassica will now join forces with Memo for a new biodiversity project

The Journey was originally envisaged as a £30m ($40m, €34m) project designed as a monument about species extinction.

However, it has been downsized and will now form a £16m ($21m, €18m) biodiversity scheme in the disused Albion Stone mines, which will feature an underground Jurassic rainforest.

"We want to create a world-class product to present biodiversity, evolution and the art of seeing the world anew," said Smit.

Details: http://lei.sr?a=g3b9h_T

Heritage theft is a problem in Mexico

Mexico police team to tackle looting

Mexico's police force has created a new federal division dedicated to protecting the country's cultural heritage, with the aim of tackling theft, the looting of historic artefacts and trafficking of such items.

Speaking to *El Universal*, Benjamin Grajeda Regalado, head of Mexico's gendarmerie, said the division would seek to "preserve and guarantee the security of Mexico's heritage."

Details: http://lei.sr?a=a5S7b_T

Unesco and Russia team up to protect heritage

Unesco and Russia's Hermitage Museum of St Petersburg have signed a Memorandum of Understanding (MoU) to protect cultural properties in areas of conflict.

Under the agreement, the museum will provide the world heritage body with support for the assessment of damage to cultural property and will help to devise operational plans for urgent safeguarding measures and restoration efforts worldwide – notably in the Middle East.

The museum will also offer technical supervision and restoration training in order to assist national authorities in affected regions.

"We are very grateful for this cooperation for all of what the Hermitage is bringing to us in terms of knowledge and expertise," said Unesco director general, Irina Bokova, speaking at the signing.

"This signature testifies to our shared responsibility towards preservation, history and future generations to protect heritage."

PHOTO: TASS/TASS/PA IMAGES

Inaccessible sites are being recovered from enemy forces

The partnership is part of Unesco's 2015 strategy to better protect global culture in the event of armed conflict, which Bokova said responds to a "real necessity" to do work in areas now accessible after spending long periods under the control of hostile forces.

Details: http://lei.sr?a=U6a5A_T

Cage-free zoo approved for Sydney

Plans to develop a second zoo in Sydney, Australia, have been given the go-ahead after local government officials granted planning permission to the AU$36m ($29m, €24m, £21m) "cage free" project in Bungarribee.

First touted in September 2015, the proposal for the Western Sydney Parklands – masterplanned by Australian design firm Misho + Associates (M+A) in conjunction with landscape architecture from Aspect Studios – will create natural-looking spaces developed to showcase animals from around the world over 165,000sq m (1.8 million sq ft).

According to M+A, who are handling building design for the project, the primary concept is for the structures to mimic the landscape and blend into their surroundings.

The zoo will feature 30 exhibits, including African safari animals and an Aboriginal and natural heritage programme focusing on Western Sydney's Darug people. The zoo is expected to draw around 745,000 visitors every year.

According to Australia's environment minister Mark Speakman, the zoo will boost Sydney's economy by AU$45m ($36m, €30m, £27m) annually when it opens in 2018.

■ Details: http://lei.sr?a=u8A3f_T

PHOTO: MISHO + ASSOCIATES

■ The zoo's design will offer a cage-free approach

Lausanne opens major freshwater aquarium

Aquatis, a groundbreaking new aquarium and vivarium that's home to some 100 reptile and 10,000 fish species, has opened.

The largest facility of its kind in Europe, Aquatis is located near Lake Geneva in Lausanne, Switzerland, and takes visitors on a journey through 20 different freshwater habitats.

Opening its doors on 21 October, the two-storey Aquatis holds 2 million litres of water and boasts 46 different aquariums, vivariums and terrariums. Across approximately 3,500sqm (37,673sq ft) of floor space, the exhibits are divided into five zones – one representing each the continents, with the ground floor dedicated to Europe and the upper floor to Africa, Asia, Oceania and America. At the centre of the building across the two storeys, a tropical greenhouse recreates the Amazon rainforest and river, complete with piranhas.

Designed by architectural studio Richter Dahl Rocha, the circular building is decorated with 100,000 aluminium discs that shimmer in the sunshine and sway in the breeze.

As well as the permanent and temporary exhibition spaces, Aquatis offers educational spaces, a conference centre and hotel, wellness centre, restaurants and gift shop.

■ Details: http://lei.sr?a=t2k8K_T

PHOTO: FERNANDO GUERRERA

■ Richter Dahl Rocha & Associates designed the aquarium

INDUSTRY OPINION

WAZA conference tackles marine litter, palm oil and more

Gavrielle Kirk-Cohen

WAZA (the World Association of Zoos and Aquariums) recently hosted its 72nd annual conference. More than 250 zoo and aquarium officials from 42 countries gathered in Berlin to discuss key issues such as conservation, animal welfare, marine litter, illegal wildlife trade and palm oil.

The conference examined the social, cultural and physical benefits of zoos and aquariums and emphasised the pivotal role zoos and aquariums play in the global fight to protect wildlife and wild spaces.

WAZA called on leaders from global conservation, environmental and development organisations to address the delegates. Keynote speakers, included Darrel Webber, CEO of the Roundtable on Sustainable Palm Oil (RSPO); John Scanlon, secretary-general of CITES; Jon Paul Rodriguez, chair of the IUCN Species Survival Commission; Erik Solheim, UN environment executive director; and many more leading experts.

During the conference, WAZA committed to sustainable palm oil by signing a five-year Memorandum of Understanding (MoU) with RSPO. WAZA and its members will aim to drive global consumer demand and make sustainable palm oil the norm.

WAZA also signed an MoU with the UN focusing on communicating and implementing behavioural change activities, focusing on marine plastic pollution, protecting coral reefs and reducing demand for wildlife products.

More than 700 million people visit zoos and aquariums every year. WAZA and its members can play an important role in affecting behaviour change and tackling issues such as conservation, the illegal wildlife trade, marine litter and palm oil. ●

Gavrielle Kirk-Cohen, communications coordinator, WAZA

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Snapchat snaps Jeff Koons for augmented reality art project

American artist Jeff Koons has teamed up with Snapchat to create virtual art installations using augmented reality.

The artist – famously known for reimagining everyday objects and turning them into art – has developed digital installations based on his works, which will be available in multiple locations worldwide.

Using the messaging application's filter system, Snapchat users can access 'lenses' within 300 metres (985 feet) of designated locations, which on their smart device will add the artworks to their photos and videos.

In New York's Central Park, for example, a three-storey-high AR version of Koons' *Balloon Dog*, will appear using the lens, while at the Sydney Opera House, there will be a giant AR version of his *Popeye* installation.

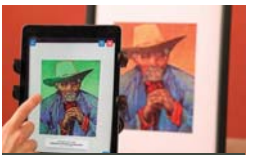
"The creative experience brings us together and brings about better communication," the contemporary artist said of the initiative. "When somebody views one of my works, I always hope that they have a sense of awe and wonder. It's so exciting to see the Snapchat lenses come to life and I can't wait to see the creativity that comes from this."

Jeff Koons' *Balloon Rabbit* will appear virtually at the Eiffel Tower in Paris, France

Available initially in nine cities – New York, Paris, London, Toronto, Sydney, Chicago, Rio de Janeiro, Washington, DC, and Venice (California) – lenses will be available at each location for two weeks, before moving to a new destination.

Snapchat users will be able to see where the artworks are being displayed via a dedicated microsite, which is also calling for new artists to develop further similar collaborations for the app.

Details: http://lei.sr?a=c3t2t_T



The tech is intended for musuems

Interactive colour editing from Disney

Disney's research and development arm has come up with a new way to interact with art – creating an augmented reality application that allows users to recolour paintings.

The technology was created with young visitors in mind, to help them to engage with art they might not otherwise be interested in. To interact, users select a colour and pick an alternative, which changes on screen.

Details: http://lei.sr?a=8t5u5_T

AMC strikes $20m deal with Dreamscape

Cinema chain AMC Entertainment has invested $20m (€17m, £15m) into virtual reality specialists Dreamscape Immersive, in a bid to bring VR to British and the US cinemas next year.

Founded in January, the Los Angeles-based Dreamscape is developing VR attractions utilising full-body tracking technology by Swiss motion capture specialists Artanim. A VR headset attached to a backpack computer offers up to six users untethered movement around large physical spaces, with the system supporting shared interactions such as high fives, handshakes or real-life object manipulation.

Dreamscape has an impressive team behind it, with film producers Walter Parkes and Kevin Wall acting as co-chairs, while its chief executive Bruce Vaughn spent 23 years at Disney, most recently as chief creative officer for Walt Disney Imagineering.

The investment – which comes in the form of a $10m (€8.5m, £7.6m) equity investment in the VR company, as well as a $10m investment in creating content – is the first step of a "wide-ranging strategic partnership" from the Wanda-owned AMC, which will rapidly scale up the development of Dreamscape in the coming months.

The LA-based Deamscape is developing full-body VR

Details: http://lei.sr?a=r7y5N_T

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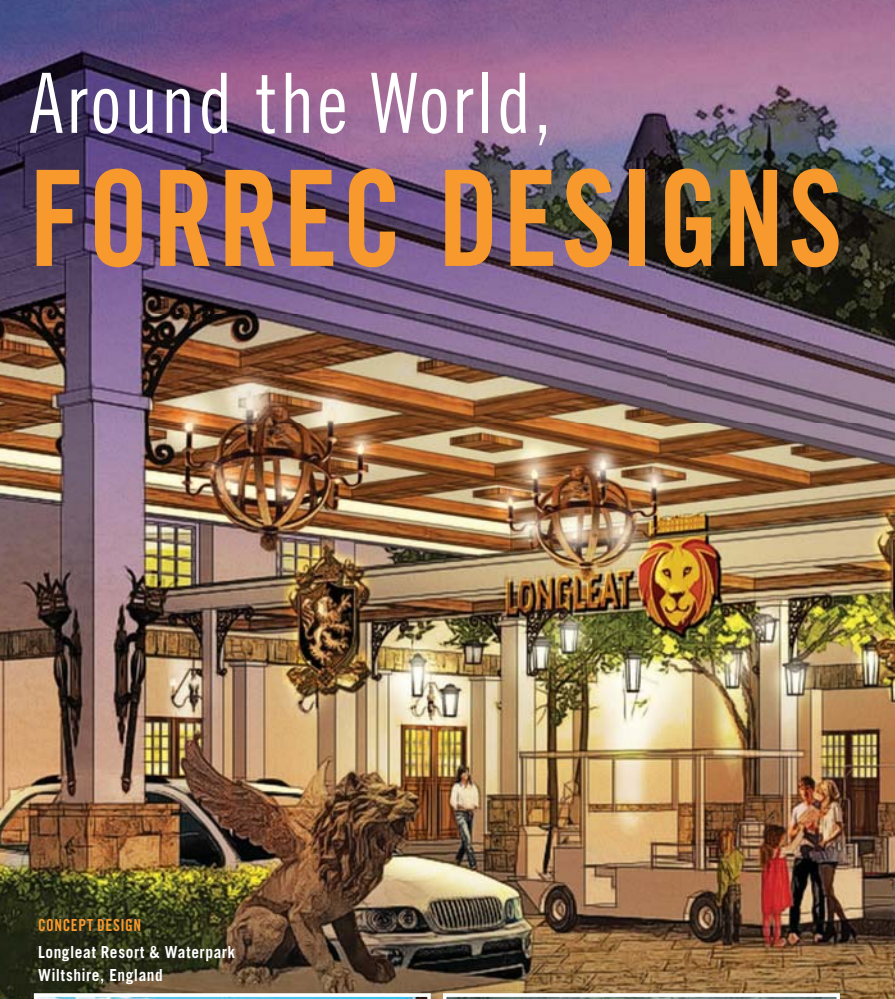

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JANE COOPER

Tom Anstey speaks to Herschend Family Entertainment president and COO, Jane Cooper, about the storied history of the company and its plans going forward

Tom Anstey, news editor, Attractions Management

The billion-dollar Herschend empire traces its roots back to a family holiday in 1950, when Hugo and Mary Herschend – along with their sons, Jack and Pete – took a story millions of years in the making and made it their own.

On a trip to Missouri's Ozark Mountains, the Herschends fell in love with the area and the natural setting it offered its visitors – so much so that Hugo bought an attraction near the city of Branson, with the aim of making a new life there.

A 16th-century discovery by the Osage Indians, Marvel Cave was the family's first acquisition when Hugo took a 99-year lease on the site in 1951. In 1955, Hugo suffered a heart attack and later died. Mary, along with Jack and Pete, continued to make improvements to the cave, installing electric lighting and cement walkways to improve the visitor experience. In 1958, a cable train was installed to return guests from the depths of the cave on the tour's conclusion. From there, Silver Dollar City was born. (The operation gave silver dollars as change, with the idea that guests would spend the rare coins, telling other people where they'd procured them.)

Jane Cooper spent 25 years with Paramount Parks, becoming CEO, before joining Herschend in 2006

Herschend acquired the then-failing Wild Adventures in Valdosta, Georgia, in 2007

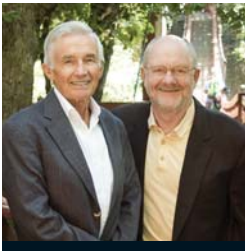
> I NEVER INTENDED TO STAY IN THIS INDUSTRY THAT LONG. I STARTED WORKING IN A THEME PARK WHEN I WAS IN COLLEGE, JUST LIKE EVERYBODY ELSE DOES

This marketing idea turned out to be a success, so much so that the site soon metamorphosed into a fully-fledged theme park attraction, with the family building a frontier town on the land surrounding the site of the cave. Through the years, the park has expanded its entertainment offering, adding attractions such as a stage coach ride, a steam engine train, interactive activities and various thrill rides.

Fast-forward to today, Herschend Family Entertainment – which, if you ask Jack or Pete, is in "the business of creating memories" – represents the largest privately held theme park company in the US, with 26 properties across six states. Its portfolio – which includes theme parks, waterparks, aquariums, camping grounds, a showboat, and even the Harlem Globetrotters basketball team – turns over some $400m (£305m, €344m) annually, with profits of around $150m.

In the present

Today, Jane Cooper is responsible for heading up the Herschend portfolio, with Jack and Pete, now 85 and 82 respectively, enjoying a well-earned semi-retirement. Age is just a number for the brothers, however, who maintain a hand in the business.



Jack and Pete Herschend still take an active interest in their businesses

"They created the company and built the culture, so I'd classify them as inspirational leaders," says Cooper. "They both visit the properties often, connecting with employees from the front-line level all the way to the top. They communicate with management on how they see things and we seek their guidance as we move forward."

Cooper is a veteran of the attractions sector. She started out in the industry in 1972 when she took a summer job at a Paramount theme park. She ending up spending more than 25 years with the company, climbing the corporate ladder to eventually become president and CEO of Paramount Parks (now part of Cedar Fair), a position she held for eight years.

Cooper moved to Herschend Family Entertainment in 2006 and was named president and COO in 2008, joining then-CEO Joel Manby. But despite her excellent track record, the attractions sector was never where Cooper envisaged herself spending her entire career.

"I never intended to stay in this industry that long," she says. "I started working in a theme park when I was in college, just like everybody else does. To this day, I consider myself a business person. I didn't consider myself a theme park executive, or attracted to what a theme park was. I was attracted to the concept of the business."

Family first

Throughout the company's history, the Herschends have always had a desire to keep the business within the family, but outsiders have been brought in to oversee the professional operation of the portfolio. The right person for the job had to be not only business-savvy, but they also had to hold similar values to the Christian family. ▶

Dollywood is undergoing a 10-year growth plan as it eyes an even greater share of the Great Smoky Mountains tourist market

"What we say about our values set is it's not about what somebody's belief is, it's about how we treat each other," says Cooper. "We teach the leaders within our company how to 'lead with love' and what that really means is we treat each other with respect. We use an eight-word mantra that we classify as part of that: Patient, Kind, Humble, Respectful, Trusting, Unselfish, Forgiving, Truthful and Dedicated. That's our expectation of how our leaders are going to behave."

While no member of the family is currently involved in the business from a management perspective, a group of more than 50 shareholders – all related to the Herschends – owns the operation. The Herschend Board of Directors reports directly to the family about ongoing ventures. "All of the shareholders are family members. We're also managed by a family office and they're very engaged as well," says Cooper, who adds that the mantra of the Herschends is for the company to be "family-held forever".

Dolly Parton has been in business with the Herschends since 1986

The Dollywood effect

In 1976, the Herschends purchased Goldrush Junction theme park in Pigeon Forge, Tennessee. The acquisition became a sister park to their Branson attraction, known as Silver Dollar City Tennessee. However, in 1986, the family partnered with country music star Dolly Parton and, from there, Dollywood was born.

The theme park was successful, expanding in 2001 with Dolly's Splash Country waterpark. Nowadays, the theme park attracts around 3 million visitors a year. In 2013, Herschend Family Entertainment revealed plans for a 10-year, $300m expansion of Dollywood, which included the new Dollywood's DreamMore Resort. Now nearing the halfway point, Cooper says the masterplan was designed to turn the attraction from a theme park to a complete destination.

"We wanted Dollywood to become a regional destination, hence building our first hotel and developing a real hospitality strategy," she says. "More than 10 million people visit the Great Smoky Mountains National Park each year. It's the most visited national park in the US. We felt like this expansion and what we were going to do was going to help us attract more of those 10 million people that are already within this market."

Beyond the 10-year plan, Herschend has further plans for Dollywood.

"We're probably about 90 per cent through the planning process," says Cooper. "It's mostly under wraps at this point, but our directive is to make Dollywood a regional resort destination. If you think of it in that context, you can start putting all of the different pieces of the puzzle together."

With the success of Dollywood, the biggest ticketed tourist attraction in Tennessee, there have been rumours of plans to expand the brand and launch a second Dollywood property.

"We're always on the lookout for new opportunities," says Cooper. "We've entertained some thoughts around that. It depends on the opportunity on the table, and the timing of that opportunity."

"And just as we have the growth plan for Dollywood, we are also in the process of doing a five or seven-year masterplan for every one of our properties."

Continuous investment and growth will include projects like the new Christmas light festival at Silver Dollar City, or the Missouri park's state of the art coaster, Time Traveler, which opens in 2018.

Globetrotting risk?

An acquisition that raised some eyebrows came in 2013, when Herschend bought the Harlem Globetrotters basketball franchise.

Founded in 1926, the exhibition basketball team combines athleticism, theatre and comedy. Since inception, the team has played more than 26,000 exhibition games in 122 countries and territories, and still prove to be a huge draw, with more than 450 live Globetrotters events worldwide each year.

"When we bought the Globetrotters, I think some people thought, 'Hm, why did they do that?'" says Cooper.

"Was there a risk because it was a business we'd never done before? Certainly. But you're buying the expertise

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TENNESSEE WILDFIRES

In November last year, the state of Tennessee was ravaged by a series of wildfires, which spread across the Gatlinburg area and forced an evacuation of Dollywood. Following the fires, the Dollywood Foundation, the charitable arm of Dolly Parton's business empire, pledged $1,000 a month for six months to 900 families who had lost their homes. The My People Fund proved so successful that on the final month each family was given $5,000, totalling $10,000 per family over the six-month period. In total, the fund raised more than $11m, with $9m distributed directly through the fund. Funds left over were donated to Mountain Tough, which is another wildfire relief organisation.

Something for everyone: every Herschend family attraction aims to appeal to an audience of all ages

of the management team, and you have to do the appropriate amount of due diligence to get comfortable with it.

Balance

The Herschend portfolio is vast and diverse, which according to Cooper is a positive thing for the company, ensuring revenue streams remain stable as different elements affect different businesses.

"If you think about our aquariums for example, when it rains they do really well," says Cooper. "It's not so great for our theme parks, but that kind of balance helps manage the risk of the portfolio.

"I think it also helps us look at things a little differently. We learn things from the aquariums that we've brought to Silver Dollar City and Dollywood. We've learned things from the theme park environment that helps us look at things a little differently in the aquariums. So, by and large, I think it's a real positive to manage such a varied set of operations."

Balance also comes through the different attractions' ability to offer "something for everyone". Following the Herschend Family Entertainment formula, each separate part of the portfolio is designed to appeal to everyone – "from aged two to aged 92".

"Another big key to our success is that we really work with every demographic, and we're very balanced in the products that we're giving all of them," says Cooper. "There's always something for everyone, so our reach is very broad."

"We're seeing more multi-generational families in the mix. We welcome lots of family reunions at Dollywood, who stay at the hotel and partake in the experiences. We're seeing, from a societal point of view, this need for families to find a place where they can connect in the right zone. That's why we have something for everyone to do."

Recipe for success

With Cooper achieving so much during her career, she says it boils down to just two pieces of advice, which if approached correctly, can offer anyone in the attractions sector the recipe for success.

"First off, you need to know your market, know your market and know your market. Or, better said, you really, really need to know who your customer is," she says.

"The second thing you need is to have the right people on your team. You want the right kind of people on your bus. If you look at something that hasn't worked, it usually goes back to one of those two things.

"When you're dealing with millions of people, of course there are challenges. We all have peaks and valleys, times that were great and times that weren't. But that's the challenge when you have so many moving parts. I mean, I think this business, it's not hard, but it's very complex. You need to turn multiple knobs in multiple directions all at the same time to get to the sweet spot." ●

WOMEN IN THE INDUSTRY

Alongside her career at Herschend Family Entertainment, Jane Cooper has played a very active role in the industry. She has been involved in IAAPA throughout the years, where she currently chairs the IAAPA Foundation, the international attractions body's charity enterprise. Cooper is one of only two women who has chaired the organisation in its 100-year history, holding the position in 2005.

"This industry is very time intensive," she says. "I was lucky that my husband stayed at home when my children were young, which allowed me to travel and make the commitments required to do this job. The millennial generation is very focused on balance and quality of life, much more so than we were in the 1970s, so I do think the industry needs to figure out how to create a work environment that's flexible and works for the individual as well as the company.

"When we talk about consumers, we always say that mom is the decision maker. How do we appeal to mom? When you look at some of these boardroom tables and there aren't many moms there, that's a little concerning. You want the people making the decisions to mirror who your guests are. We could always use more. But, I think we're making a little progress."

Outdoor adventure parks like BeWILDerwood have had success creating their own detailed story worlds

Creating Your Own **IP**

With global IPs opening rides and attractions at an increasing rate, is there still room for theme parks to develop and establish their own unique story worlds? We asked the experts

When done well, investing in an IP license partnership for an attraction can increase visitor numbers and boost revenues.

It can be a ride, like the popular Justice League: Battle for Metropolis rides that Six Flags has been introducing to its US parks (DC Comics/DC Entertainment/Warner Bros. Entertainment); or a zone inside a family leisure park, like Peppa Pig World at Paulton's in the UK (Astley Baker Davies/Entertainment One); or a whole facility licensing agreement, like Cartoon Network Amazone Waterpark in Thailand (Turner Broadcasting/Time Warner). There are many ways to work with established and often globally recognised IPs.

Yet investing in such a partnership comes with costs and risks; for example, the costs of licensing the product and building the attraction, and the risk that the IP may not do as well as expected, or may suffer a dip in popularity or go out of fashion. Cedar Fair may have just extended its license agreement with DHX Media for exclusive use of Charles M. Schulz's *Peanuts* characters – a relationship that dates back to 1983 – but not all IP partnerships are necessarily guaranteed the success and longevity of this one.

So, is it possible to develop your own attraction with a narrative world that has the same charm and pulling power of a big-name IP? How do you go about developing a fresh and exciting experience that is unique to your own operation? How would your customers react to and engage with something original? We asked the experts.

Cartoon Network provides the IPs for this waterpark

 ©CYBERTREK 2017

> Developing an internal IP has been particularly successful in regional outdoor attractions, such as adventure parks

LESLEY MORISETTI

Director
Morisetti Associates

The addition of IPs can bring many benefits to attractions, including creating a closer emotional connection with their visitors, supporting awareness building, attracting growth in new and existing audiences, helping shift perceptions of the attraction, building loyalty, and supporting income growth through higher ticket prices and incremental retail spend.

However, increasingly this is achieved by attractions using existing, external, IPs. The best results come when the attraction defines its key objectives and researches which external IPs would best support the achievement of those objectives and, crucially, allow the attraction to return a profit on the development (when any incremental development and operating costs and license fees are considered against incremental income potential).

Establishing a mutually successful relationship with an existing IP, which has a proven audience outside the attraction, allows the attraction to benefit from years of investment by the IP owner. By contrast, creating your own IP requires time and investment to establish it and, unless you have a production studio associated with your attraction (for example, Studio 100 and the Plopsa Group), the IP will only live within your sites. That's likely to limit its appeal to something that will add to guests' enjoyment during their visit, rather than motivating their visit in the first place.

Having said that, there are many examples of attractions successfully creating their own IPs, mainly park mascots and ride IPs. The latter have had some success in driving associated retail spend, but typically much lower spend than could be achieved by a well-chosen external IP, even when allowing for the associated license fees.

A sector where developing an internal IP has been particularly successful is local or regional outdoor attractions, such as adventure parks and farm parks. One of the best examples of this is BeWILDerwood, where establishing a backstory and carrying it through in the theming of the park has allowed the attraction to cost-effectively differentiate itself from similar attractions and build loyalty by strengthening its emotional connection with its visitors.

In conclusion, there is no single solution which works for all. Creating successful IP-led developments, using both internal and external IPs, depends on a clear understanding of your objectives and a sound assessment of the associated financial opportunities.

> Creating a character can cost a fortune. They don't often get beyond a basic stage

BENOIT CORNET

CEO and founder
Alterface

In today's highly mediatised world, media-based attractions are gaining traction. Visitors are craving more emotionally engaging moments and more experiences they can share. An interactive dark ride is a perfect way to answer this desire.

In the past, a cute, park-branded mascot was often used as a character in attractions. Some parks stretched it further by developing an entire family of characters with dedicated stories and branding. Nowadays, expectations are much higher, with technology allowing for more sophisticated and dynamic attractions with professional storytelling.

This brings with it new considerations. The character must have enough dimension to 'act' during the ride and connect with the players. On the other hand, it has to be simple enough to be animated at a reasonable cost.

Even with the plummeting costs of media production, creating a quality, enduring character and story can cost a fortune. As a result, characters and their vocabulary don't often get beyond a very basic stage.

As the development of a dedicated IP has quite a few limitations, it is tempting to use existing characters, maybe from the movie or gaming industries. Though this route works well for large parks that can spend a significant budget, it is less straightforward for smaller parks, who may often face demanding IP owners and extremely stringent rules for the IP deployment at their park.

Gaming IPs offer a great opportunity for the on-site entertainment industry, yet it has to be different enough from what is experienced at home and it should address the needs of the entire family. Even when all this is achieved, the challenge remains to meet the IP owner's profit expectations.

Popcorn Revenge is an original IP from Alterface

At Alterface, we have taken a different approach to the IP challenge by creating a series of proprietary characters that can be tailored to reflect the specific requirements of the client. We invested heavily in Popcorn Revenge, an evergreen story with universal appeal that offers parks the opportunity to customise the experience and add their own flavour.

IMAGE: © ALTERFACE 2017

Happy Family is an in-house IP that is now licensed to other parks

> Decision-making power is one of the most important advantages

MICHAEL MACK

CEO / Managing partner
MackMedia / Europa-Park

There are several reasons why creating our own IPs has become more of a priority in recent years. Full ownership is definitely one of the most important advantages, which leads to total decision-making power when creating content around your IP. As I grew up in a theme park, I was always dreaming of creating stories and evoking emotions that would stay with people beyond the boundaries of our park. They can't take a rollercoaster home, but they can take home a character as their new friend.

There is no better example of original content than Europa-Park. We create story worlds, around a ride for example, and extend the experience by adding multimedia aspects such as a mobile game or a film. We develop IPs and enable guests to take these experiences home with them.

We are a family business and we are all involved in the company. That means we are on-site on a daily basis, so when we want to create somthing new, we observe, speak to our guests and find out what they like. You have to be aware of industry trends as well. It's a combination of industry knowledge, a keen interest in your visitors and, in our case, the experience of 235 years being a family business.

Before we came up with our newest IP, Happy Family, a family-friendly spooky adventure, we realised that there was a lack of Halloween

content and characters that were suitable for family theme parks. We created a 4D movie, a VR experience and a character show for Europa-Park. As people liked the new content we had created, we were soon able to licence the IP to other parks around the world.

To further establish Happy Family as an IP, we have just released our first feature film. Having masterplanning and design competences in-house with our company division Mack Solutions, we have also developed a turnkey Happy Family Land concept, which can be scaled for the specific requests of parks and FECs.

Some content is not only relevant to theme parks, but also to cruise ships or other leisure facilities. We are always trying to see the whole market as an opportunity and identify different revenue streams.

At the start, investment is a lot higher when developing your own IP. Not everybody will be able to do it. For us, it was also a strategic decision to expand into the media industry. There are many things to learn when entering a new field, but in the long run, we definitely see the benefits of creating our own IPs.

> We've thought about the longevity of the IP and we have a stream of content and co-creation with children

ROSALIND JOHNSON

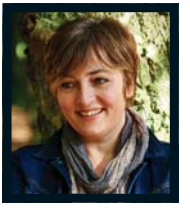
Guardian of wishes
Timbalaya

People ask us why we created an original IP, why we didn't buy the rights of something off the shelf. Arguably, that would be the easy route, but it was never something we seriously considered. We're a creative bunch and the allure of a blank sheet of paper and the promise of a magical land yet to be created was too much to resist.

The founders of Timbalaya – Nick Farmer, Sylvia Matiko, Simon Egan and me – have a great deal in common, not least a love of creating and operating wondrous attractions and companies. I think we have all, in our own way, sprinkled a little pixie dust across people's lives – and Timbalaya is made from pixie dust!

The appeal to operators is also the way we're set up. We've had the chance, right from the start, to think about the longevity of the IP. In practice, that means a creative engine room at the heart of the company that reacts to how children want to play. It means a stream of

Timbalaya is a story-driven outdoor play attraction IP



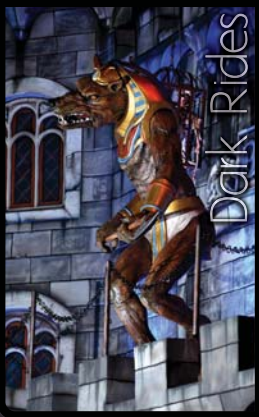
content and co-creation with children, helping keep Timbalaya relevant. We involve children to see what they do with the story and the characters, and that keeps us from wandering off into an adult's perception of the magical Timbalaya world.

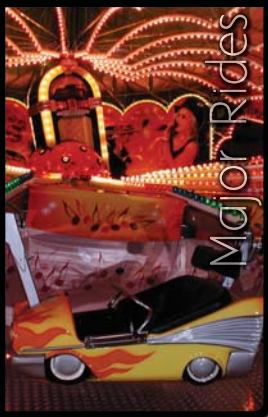
We're investing in ongoing market research to help keep the brand relevant and alert us to 'what's next'. For our franchisees, this is critical, as it enables them to see new opportunities for growth and determine where a refresh of the offer should be focused.

I'd say we've given as much attention to the franchise model as we have to the creative side of the IP and I think this will be both important and encouraging for operators. Matiko, Guardian of the Locket, was VP of franchise operations with Ripley Entertainment and so brings an incredible amount of franchise knowledge to Timbalaya. As a result, operators can expect a modern and imaginative approach to the support we offer. ●

BERTAZZON

The Carousel's Company





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SIMWORX FLYING HIGH

Simworx launches the Mini Flying Theatre, a smaller footprint, budget-friendly option using the latest cutting-edge ride technology

Dynamic simulation attractions specialist Simworx has added a new attraction to its product range – the Mini Flying Theatre.

Developed as a less expensive option to the larger Flying Theatre, also offered by Simworx in partnership with Dutch ride manufacturer Mondial, the Mini Flying Theatre brings this increasingly popular type of attraction into the reach of smaller operators, with both a more accessible price range and smaller overall footprint, but still utilising the latest, cutting-edge ride technology.

Featuring an immersive, large-format, quarter-dome screen concept, the Mini Flying Theatre offers 20 seats, which are accessed via entrance and exit routes on side gangways from a pre-show area, providing for an approximate hourly capacity of up to 250 guests. Riders are seated in a normal horizontal plane in four rows of five, two on each side of a central holding structure, one behind the other. As the attraction cycle begins, the seats are lifted into the air in a smooth transition to panorama mode in front of the dome screen, with the rear rows moving above those in front.

Unique movements

Riders experience unique movements fully synchronised to the movie being played on the screen, including programmable heave and tilt along with forward and backward motion, while the sensation of flying is enhanced by the riders' legs dangling freely.

TURNKEY SOLUTION

As with all its products, Simworx offers a full turnkey package for the Mini Flying Theatre which includes:

- **In-theatre effects**
- **3D projection system**
- **Surround sound**
- **Show control equipment**
- **Theming**
- **Pre-show/post-show**
- **Custom film productions**
- **3D glasses and glasses cleaning machines**

The Mini Flying Theatre has 20 seats, which are accessed from the entrance and exit routes on the side gangways

In-show effects such as water spray, wind, snow, bubbles, smoke and special-effects lighting provide operators with a truly sensational ride, which is sure to excite, surprise and entertain guests of all ages.

The Mini Flying Theatre is supplied with surround-sound audio and an HD2K or 4K 3D projection system. In addition to the motion synchronisation, the attraction is fully interfaced to projection and sound systems and uses custom show reels on a digital format AV solution. Retractable safety monitored seatbelts are also incorporated as a standard feature.

Competitive price point

"The Mini Flying Theatre is a great addition to our product range and provides operators of all kinds of venues with an opportunity to add such an attraction at a very competitive price point," says Terry Monkton, Simworx managing director.

"Flying Theatres are proving popular with the whole family – something we have seen with our larger, 60 seat models. But for those with smaller budgets, they have often not been a realistic option. This latest Simworx development makes the possibility of adding a Flying Theatre much more credible for many more operators and I'm delighted we've now added it to our ever-growing range of media-based attractions."

The first example of Simworx's newest product has already been sold and will make its debut in March 2019. ●

> FOR THOSE WITH SMALLER BUDGETS, FLYING THEATRES HAVE NOT BEEN A REALISTIC OPTION. THIS LATEST SIMWORX DEVELOPMENT MAKES THE POSSIBILITY MORE CREDIBLE

 ©CYBERTREK 2017

KEY FEATURES

- Large-format, quarter-dome screen
- Programmable heave
- Programmable tilt
- Load in normal horizontal plane
- Smooth transition to panorama mode
- Retractable safety monitored seatbelts
- Custom show reel
- Minimum rider height 1.1m

The Mini Flying Theatre has surround-sound audio, an HD2K/4K 3D projection system and a range of in-show effects

Specially commissioned street art marked the launch of Mail Rail and the Postal Museum

SIGNED, SEALED, DELIVERED

An underground postal transport system has reopened as the Mail Rail experience, with an accompanying Postal Museum. Alice Davis visited London's newest attraction

For 75 years, underneath the busy streets of London, a network of driverless electric trains transported millions of letters around the city. Though hidden from sight, the Mail Rail and its mail stations were alive with the loud rattle of the constant trains, the noise of the sorting machinery and the chatter of the people who worked there.

This fascinating feat of engineering is a part of an almost secret history, which has been preserved and transformed into a new attraction. First conceived in Victorian times, Mail Rail was the heart of the postal system and connected the UK to the rest of the world. Even through the World Wars, the post still had to be delivered, and the Mail Rail worked 22 hours a day, never resting, until the moment it ceased operation in the early hours of 31 May 2003.

Since then, the network has been regularly maintained and the site has now reopened as an attraction, with visitors able to ride a train through the original tunnels under Mount Pleasant. The Royal Mail also donated a disused building across the road from Mail Rail to the project, which is now the Postal Museum.

Located at Mount Pleasant Mail Centre – London's largest sorting office – the two-site attraction is a 15-minute walk or short bus journey from Kings Cross station. For most visitors, the main draw will be the Mail Rail; the chance to travel on a miniature train through abandoned underground tunnels promises a rare level of authenticity and has an inimitable appeal.

Because the capacity of the two trains is limited, rides on the Mail Rail run to a strict schedule and visitors need a timed ticket. The attraction is making a limited number of walk-up tickets available on weekdays, but due to the popularity of the attraction in its first few weeks of being open, it is much safer to book online and buy tickets in advance of a visit. ►

 ©CYBERTREK 2017

Specially designed trains (top) take visitors on a ride through the 2-metre-wide tunnels; the boarding zone in the former engineering depot

The high demand apparently took Mail Rail unawares. When I first tried to purchase a ticket, the attraction was completely sold out until January. Luckily, a new batch of tickets was made available, but I had to move quickly to get a ticket for a Thursday afternoon in October. The facility underestimated how many people would want to ride the Mail Rail, expecting to sell about 20 per cent of its tickets as advance bookings. It has, in fact, been selling 90 per cent online. On the other hand, there are plenty of tickets available for the Postal Museum without the train, showing almost everyone is opting for the Mail Rail and museum combination ticket.

Mail Rail

The Mail Rail stretched 6.5 miles (10.5km) from Whitechapel Eastern Delivery Office to Paddington Sorting Office, with Mount Pleasant in the middle. The carts, brimming with post, travelled at speeds of up to 40mph (64kph) and stopped at the station platforms for less than a minute, just enough time for the operators to unload the bags intended for them, and reload the carts with onward deliveries.

On the ground floor of the Mail Rail building – the network's former engineering depot – is a well staffed welcome desk and shop stocked with post-themed souvenirs. Heading downstairs into the large depot hall where the trains depart, minimal renovation has been done. The warehouse-like space looks much as it did when it was a working rail yard. While waiting to board, you can browse displays around the hall and watch a large-screen film that provides some background to the network.

The 20-minute experience takes you on a loop through the tunnels at Mount Pleasant station – though you do have a driver and you don't reach speeds of 40mph (it's more like 7mph). Boarding was a simple process, with staff scanning tickets to make sure visitors are booked for the next ride. The trains are cosy, but designed so that the roof and door both open up and make them easier to get in and out of, with the staff happy to help. Though it's small, the benches are well spaced out. If you're tall, you might find it a bit of a squeeze.

All aboard!

Once the driver ensures everyone is safely in, the train departs. The journey through the tunnels is interspersed with recorded narration from Ray Middlesworth, an engineer on London's underground postal network for 30 years. Middlesworth explains what it was like working on the underground platform at Mount Pleasant, sorting the mail, and as an engineer, making sure the rail carts were running and the tracks and trains were maintained.

When the train stops, the story of Mail Rail is told with large-scale multimedia displays and dynamic 3D mapping projected on the tunnel walls. It's a history lesson, showing the roles the service has played throughout the decades.

LOCATION

The Postal Museum and Mail Rail is located at 15-20 Phoenix Place, London. The nearest stations are King's Cross, Russell Square and Farringdon.

OPENING HOURS

The Postal Museum is open every day from 10.00 to 17.00.

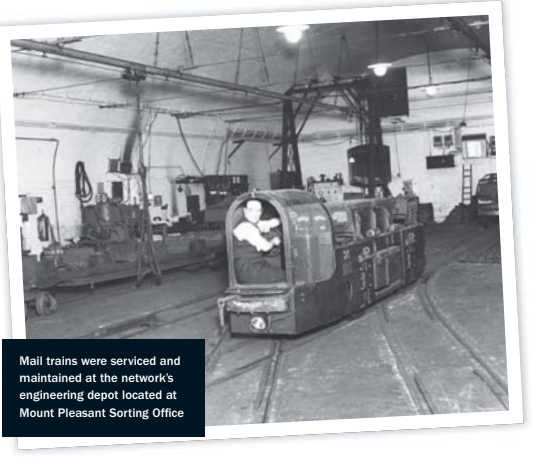
ADMISSION PRICES

General admission, including Mail Rail ride and exhibitions, costs £14.50 ($19, €16) for an adult and £7.25 for a child aged one to 15. Royal Mail staff go free. An exhibitions-only ticket costs £11 for an adult ($14.40, €12) and is free for children under 15. A 45-minute session in Sorted!, the postal-themed play area, is £5 ($6.50, €5.50) per child.

The entrance to the Postal Museum, with Mail Rail located across the road

SORTED! THE POSTAL PLAY SPACE

Sorted! is a KidZania-style play space on the ground floor of Mail Rail. In this miniature town, with trolleys, pulleys, slides and chutes, kids can dress up in post service uniforms, roleplay in the Post Office, sort mail and even drive a mail van and deliver post around town. Sessions are available in 45-minute slots.



Mail trains were serviced and maintained at the network's engineering depot located at Mount Pleasant Sorting Office

Following the train ride, visitors can learn about the history of Mail Rail and try the hands-on exhibits, like the wind-up pneumatic train race (left)

It makes for a one-of-a-kind immersive experience, being shown what it was like to work in those tunnels, which are brought to life before your eyes. There's a choreography to the storytelling, using a mix of archive photography, music and animation, that further emphasises what a vibrant place this once was. Though the work must have been backbreaking, the people who worked here were proud of what they did and part of something important.

After alighting the train, visitors enter the Mail Rail's permanent exhibition area inside the same depot building. There are interesting artefacts, such as the lockers, exactly as they were left when the staff clocked out at the end of their final shift.

There's an engineer's tool box and a deconstructed engine from one of the original trains. Many of these exhibits are accompanied by an oral history – pick up the receiver to hear the station controller tell his story. The exhibit signage – at both sites – is equally excellent, giving short but informative summaries, almost every time imparting a fact so fascinating you want to go and tell everybody. (This element of shareability continues throughout, with numerous spots perfect for sharing a snap on social media.)

In this zone, exhibition designers Haley Sharpe Design (hsd) invite visitors to get involved, and there's plenty of competition with some robust, man-size interactives. Challenge your companion to power their pneumatic train to the finish line before you, or step inside a rocking carriage and find out who can sort the letters inside more quickly. These interactives are big, bold, sturdy and fun, designed to challenge both grown-ups and kids, and almost impossible to resist. On my visit, I saw adult guests happily engaging with the gamified exhibits, which is something ▶

ACCESS ALL AREAS

The Postal Museum and Mail Rail has strived to create an accessible environment. All areas have step-free access, except for the ride. Any visitors who cannot travel on the train can experience the Accessible Mail Rail Show (with video and audio from the ride). There are folding seats for those unable to stand for long periods. Large print guides, magnifiers and Braille guides are available and AV exhibits are subtitled and fitted with induction loops. The attraction says described tours for blind visitors and regular BSL tours will be available soon.

you don't see in every museum. But then, we had all just been on a tiny train…

Postal Museum

Across the road is the Postal Museum, which you enter through an airy extension which holds the ticket desk, café and more retail space. The ground-floor museum, which is not large in size, is still jam-packed with content, and wayfinding is easy with the space divided into five sections, clearly demarcated through brightly coloured signposting.

The zones begin with the early history of the post – did you know it was founded by Henry VIII so he could more easily send orders around his kingdom? – and follow on to cover the Victorian era of invention, times of war, the Royal Mail's design culture, and communication and change.

And the museum does not just tell the story of post, but the telephone, telegrams, pneumatic systems – guests can even write and send their own pneumatic message across the exhibition space.

Like the Mail Rail exhibit, there are plenty of other opportunities for interaction. I loved the old dial telephones: refer to the "phone book" and choose whose oral history you want to hear. Then dial the number and listen; I suspect digital natives might be amused by this. There are stories with mystery boxes, authentic vehicles like a five-wheeled cycle and a horse-drawn mail coach, old post boxes and phone boxes, lantern slide displays, dress-up opportunities. The experience is completely engaging, made all the more meaningful because – aside from a couple of touchscreen games and challenges – it relies very little on digital technology.

If I had one tiny criticism about the Postal Museum, it's that the acoustics seemed compromised when lots of the louder exhibits were being used at the same time, which made it a little hard to focus on the exhibit in hand.

Another aspect that makes this new attraction so memorable is its focus on people, those who worked for the postal service throughout history, or for the Mail Rail itself. There are many stories, from prisoners of war who got a chance to write home, to the 1940s postwoman who demanded she be allowed to wear trousers instead of a skirt, to the first Sikh postman in 1960s Birmingham. It ended with a temporary exhibit called Writing Home, which told stories from around the world and rounded off the experience by presenting the postal system within a global context.

All in all, the Postal Museum and Mail Rail is a journey of discovery, exploring abandoned tunnels and absorbing untold stories. Leaving the museum, I check my phone and reply to a text message. I spare a thought for the 18th-century post boy, travelling on horseback to deliver people's letters, and London's engineers, who kept the Mail Rail running. Communication is at our fingertips today, but the story of how we got here will have even the most dedicated nomophobes putting their phones away. ●

Exhibits in the Postal Museum illustrate the design culture at the Post Office (top); the pentacycle was invented to help deliver parcels, but was almost impossible to ride

WHAT'S THE SCORE?

Staff	9/10
Cleanliness	8/10
Toilets	8/10
Experience	9/10
Value for money	8/10
Overall experience	**9/10**

RIGHT TO REPLY

Harry Huskisson, head of communications and marketing, the Postal Museum and Mail Rail

"We've seen incredible interest in the Postal Museum and Mail Rail since opening in September and we've had fantastic feedback from visitors. We're delighted the experience has been met with such enthusiasm and reaches the high standards we set ourselves. More tickets will be released soon, so we'd encourage everyone to sign up to our mailing list to be the first to hear when they go on sale and come see this unique part of hidden London for themselves."

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part eight

THE ATTRACTIONS BUSINESS
Benefits and impacts

In the final part of this series by industry consultant David Camp, we address the obstacles faced by developers and look at creative funding options and economic impacts

David Camp

SERIES ROADMAP

This eight-part series outlines the patterns and dynamics that define every attraction – from visitor behaviour and guest spending to operating costs and profitability

CONTENTS

1. An overview
2. How are you perceived?
3. Benchmarking
4. Planning a new attraction
5. Driving revenues
6. Controlling costs
7. Is it worth it?
8. Benefits and impacts

Many attractions that have been operating for a number of years have grown steadily over time, ploughing their operating profits back into the business to fund ongoing development and expansion. A prime example of this is the family-run Europa Park in Germany, which attracted 250,000 visitors in its first operating season in 1975. By the park's 40th anniversary, through reinvesting in the business, attendance had increased to 5.5 million and the resort had expanded to provide almost 1,000 hotel rooms.

Park operating groups such as Merlin Entertainments have grown through a combination of development and acquisitions, with attraction purchase values based on earnings multiples. As noted in the previous article, these are based on the operating business rather than the investment levels, and while the valuation may not equate to the total amount invested in the attraction, the impact of depreciation over the operating period of the attraction means that such deals are generally good for both parties.

Development challenges

New schemes face different challenges. There's an increasing aspiration among developers to create attractions that are bigger and better than those currently existing in a market, but this can often lead to a position where the level of investment required to create an attraction is not able to be supported by the business model.

In this case, scheme promoters can look at cutting the development budget, reducing operating costs, increasing admission prices or accepting a lower return on their investment. Yet these routes can have negative impacts on the quality of the offer, guest experience, and/or attendance levels.

To overcome these challenges and stop the scheme failing at the concept stage, a number of projects have been able to secure supporting funding via grants, donations, interest-free loans, cross-subsidies and other sources. Much of this funding is through public sector sources, charitable trusts, quangos and, at least in the UK, lottery-funded organisations.

Impact studies

Visitor attractions are among the highest profile recipients of this kind of funding support as they can have major benefits for a city or area. Funding decisions are generally supported by an assessment of the impact the attraction is likely to have on the image of an area or city, whether it will drive tourism, increase spending within an area, support overnight accommodation, create jobs or a combination of these.

Impacts like this are important in Abu Dhabi, where the massive investment in creating Ferrari World, Yas Waterworld, the

Ferrari World and nearby attractions in Abu Dhabi have received investment from the emirate

Yas Waterworld is important to Abu Dhabi's tourism strategy; the Eden Project boosted Cornwall's economy

Louvre and Warner Bros World Abu Dhabi has served to put the emirate on the international stage and increase tourism.

Other attraction developments that have benefited from significant subsidies and have had a major impact on the surrounding area include the Guggenheim Bilbao, the Eden Project and Titanic Belfast.

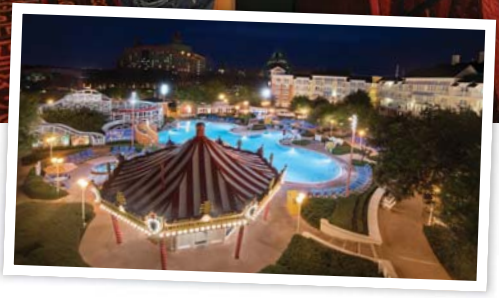
Securing such funding is not easy and in many cases economic impact studies are used to assess the benefits that these developments are likely to realise. There are three aspects to economic impacts:

- **Direct impacts**, resulting from direct expenditure by visitors to the attraction
- **Indirect impacts**, relating to the spending by the attraction to buying goods and services for the operation as well as the staff salaries and payroll
- **Induced impacts**, which are created when the attraction employees, and workers at suppliers of goods and services, spend their salaries on additional goods and services within the area

An assessment of these figures can show the impact of an attraction on an area's economy, jobs, salaries and taxes, and the impact figures are often much greater than the initial investment.

For example, the Eden Project in Cornwall opened in 2001 and the attraction has been supported by just over £100m ($132m, €112) in public-sector funding over the past 16 years. The company estimate that this investment has resulted in a total contribution of £1.7bn ($2.2bn, €1.9bn) to the regional economy over this ▸

An assessment can show the impact of an attraction on an area's economy, and it's often much greater than the initial investment



Operating on-site hotels and resorts, like Disney, increases visitor spend

period; a positive impact that's equivalent to the total investment each year.

A study on the impact of Titanic Belfast revealed that the £77m ($102m, €86m) development that opened in 2012 generated an additional £105m ($139, €117m) tourism spend within the Northern Ireland economy within the first three years, and supports almost 900 jobs within the local community. It has also been a catalyst for additional investment in other attractions and commercial real-estate development in the surrounding area.

Cross-funding opportunities

These external impacts can be substantial and are significantly enhanced when the attraction leads to people staying overnight in an area, rather than just visiting for a day trip. A study undertaken by Harrison "Buzz" Price for Walt Disney in the 1950s revealed that for every $1 spent by visitors to Disneyland in California, $2 was spent at the surrounding hotels, restaurants and shops. As these were not owned by Disney, it was clear that the honeypot that Walt had created was feeding lots of others.

As a result, Walt scoured the country and bought 12,000 hectares of land south of Orlando, where he could develop new parks, hotels, residential areas and shopping centres in order to capture as much visitor spend as possible.

Disney now owns almost 13,000 hotel rooms at their resorts around the world and caters to around 3 million overnight guests annually. While this is only a tiny proportion of the 139 million guests visiting their parks each year, these overnight guests spend around four times as much per person as day visitors do.

Additional revenue streams can allow for cross-funding opportunities where profits from accommodation, retail and other real estate elements are used to support the creation of an attraction.

This is a common route within retail and entertainment centres, where centre owners often invest in the creation of attractions to help the centre stand out and attract visitors. Ski Dubai within the Mall of the Emirates, and Dubai Aquarium at the Dubai Mall are examples of this. These attractions not only generate paying guests, they are an important visual feature of the malls. They draw high footfall to those areas of the mall and this helps to drive strong rents from nearby retail and F&B outlets, enhancing the overall business.

A final thought

While securing funds for the development of visitor attractions is not easy, looking beyond the core business at the potential for wider impacts can open up opportunities. This may require changes in location, scale, ownership structure and operating philosophy, and this may be too much for some project champions. But, if such changes can lead to a vision becoming reality rather than just remaining a dream, they may well be worth making. ●

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RAISING THE GAME

Polin Waterparks has launched a dedicated R&D centre, where 50 leading engineers are working on new projects, rides and first-of-a-kind gaming technologies

As one of the world's largest waterpark suppliers, Polin Waterparks is committed to investing in research and development (R&D), forging new paths in the industry and being responsive to clients' changing demands.

One area where the Polin team has been focusing is the integration of technology, interactivity and gaming into the waterpark experience and hence the company has launched Polin Game Technologies.

Polin Game Technologies

Polin Game Technologies division focuses on new concepts and technologies by strategically combining the experience of its highly skilled R&D engineers with those of other critical sectors — including some of the best known companies in their fields.

Combine that proficiency with 40 years of dependable, trustworthy expertise, and customers can now benefit from the development of some of today's most innovative gaming and interactive products. Furthermore, the wide variety of offerings in the Polin catalogue is specifically designed to make waterpark guests want to come back again and again.

Slide 'n Score

The future of adrenaline-soaring gaming is here! Guests collect a remote controller from a kiosk and log in before entering the ride, choosing one of five difficulty levels. Strapping the unit on their arm and slipping controllers over their fingers, players have access to multiple buttons that match LED-illuminated targets within the ride. As guests shoot through the waterslide – which can be either body slides or tube slides — they collect points by pushing the button that matches each target at precise points while sliding past. At the end of each sliding session, guests can observe their score on screens positioned in the landing area.

- Easy to play
- No complicated instructions necessary
- Guests not required to carry heavy boards or rafts
- Accurate positioning system without use of RFID tags
- Social media integration

Slide 'n Roll

This new offering combines all of Polin's exclusive technologies — unique sound, lighting and design, special effects — into one slide. The result is an experience that delivers a full range of sensory stimuli for guests.

- Combines exclusive sound, design and light effects
- Full sensory stimuli
- Special effects impact guests throughout entire slide experience
- Latest innovation technologies

The slide delivers sound and light effects, creating a sensory ride

- Ease of operation and maintenance
- Sound effects available
- Endless theming possibilities
- Fluorescent effect with special high-tech resin

SplashWare

Polin's multi-functional Splashware System, which launched last year, is the world's first and only Integrated Slide Information System. It offers an innovative modular solution and the system enhances slide safety, helps reduce operational risks and costs, improves the customer experience, boosts marketing efficiency, optimises capacity and can also significantly increase revenue by introducing new sources of income.

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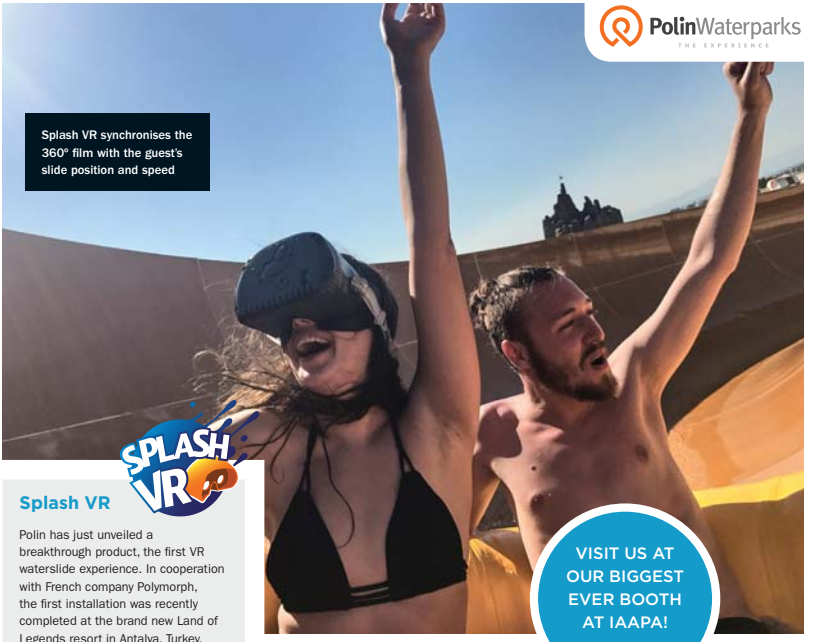
PolinWaterparks
THE EXPERIENCE



Splash VR synchronises the 360° film with the guest's slide position and speed

Splash VR

Polin has just unveiled a breakthrough product, the first VR waterslide experience. In cooperation with French company Polymorph, the first installation was recently completed at the brand new Land of Legends resort in Antalya, Turkey.

Splash VR is the first technology solution that allows an operator to deploy a VR experience in a waterpark, without changing the structure of the water slides. This ambitious project took more than eight months of research and development, structured around major innovations such as:

- The design of an indoor user-tracking solution that can be deployed on any slide without affecting its integrity. Using radio waves, the headset is able to triangulate exactly where it is located in the slide
- Design and production of the first waterproof VR headset. Drawn and printed in 3D, the headset is able to play 360° film, calculating in real-time its position in the slide. The headset is comfortable and ergonomic, but above all provides exceptional 360° immersion
- The development of a 360° media player with the ability to synchronise the speed of the film with both the speed of the visitor and their position in the slide

Polin developed a 3D-printed headset

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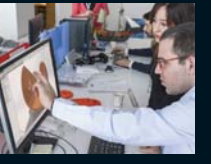
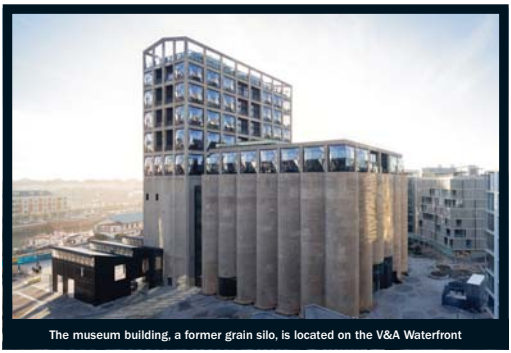
R&D AT POLIN

Polin Waterparks opened a dedictated research facility in Turkey

Polin Waterparks is proud to be recognised as one of the few research and development (R&D) centres in Turkey. Polin is a global leader in the design, engineering, manufacturing and installation of waterparks and the first firm to receive certification by the Turkish Ministry of Science, Industry and Technology as an official R&D centre in the its sector. Polin employs 46 R&D designers and engineers and is already recognised as a pioneer in the field of innovative advancement and application of closed-moulded manufacturing technology in waterslide development. Today, the firm continues to focus on high-quality design and innovation patents.





The museum building, a former grain silo, is located on the V&A Waterfront

Z IS FOR ZEITZ

An A to Z of Africa's brand new modern art museum

Alice Davis, managing editor, Attractions Management

The highly anticipated Zeitz Museum of Contemporary Art Africa (Zeitz MOCAA) opened in Cape Town, South Africa, in September – the largest museum of its kind in Africa and the first major museum on the continent dedicated to modern art from Africa and its diaspora.

Its founder, Jochen Zeitz, says: "I built my collection with a museum in Africa always in mind. The fact that these works will now be accessible to all is a very emotional thing for me personally and, ultimately, gives the art true purpose."

The museum is a stunning conversion from a historic grain silo complex structure, which has been reimagined by British architect Thomas Heatherwick.

Located on the city's Victoria & Albert Waterfront with Table Mountain as its backdrop, the 1920s silo building – for a while, the tallest in South Africa – had become an iconic structure. The design team were tasked with giving new life to the building, which had been out of use since 1990.

The galleries and the atrium space at the centre of the museum have been carved from the silos' dense cellular structure of forty-two tubes. There are 6,000sqm (64,500sq ft) of exhibition space over 100 gallery areas, a rooftop sculpture garden, storage and conservation areas, a bookshop, a restaurant, bar, and reading rooms.

The museum houses a costume institute and centres dedicated to photography, film, performative practice and art education.

"The idea of turning a giant disused concrete grain silo made from 116 vertical tubes into a new kind of public space was weird and compelling from the beginning," says Heatherwick, founder of Heatherick Studio. "We were excited by the opportunity to unlock this formerly dead structure and transform it into somewhere for people to see and enjoy the most incredible artworks from the continent of Africa."

A cross-section shows the layout of the museum complex

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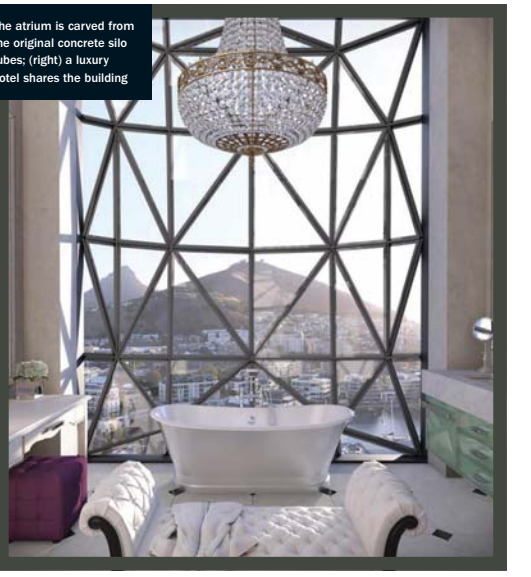


The atrium is carved from the original concrete silo tubes; (right) a luxury hotel shares the building

MUSEUM PHOTOS: IWAAN BAAN ARTWORK IMAGES: COURTESY OF ZEITZ MOCAA

A

atrium

Inside the grain house, where 42 cylindrical silos were packed together, Heatherwick Studio carved out an instantly iconic atrium. "We developed a concept to carve out an atrium, like a vaulted cathedral, to form the museum's heart. Scooped from the building's centre, it provides access to the gallery floors that are organised around the central atrium," the studio says. "The design preserves and celebrates the structure's industrial heritage. The original concrete tubes are carved away to create a spectacular atrium and house international and touring exhibitions."

B

beacon

Next to the silo building was the grading tower. Heatherwick imagined the tower as a beacon, its top half consisting of a repeated glass design. When night falls, the tower is lit up like a lantern for Cape Town.

Revelations V by Zimbabwean artist and activist Kudzani Chiurai

C

collection

Jochen Zeitz has been working with curator Mark Coetzee since 2008 to build a collection that reflected their vision for a museum dedicated to contemporary African art. Part of that aim has been to give the artworks a home in the region so that people from Africa can enjoy them and be inspired by them. Another motive has been to keep bodies of work by leading African artists together, so that they can be curated in a variety of ways and displayed together. The Zeitz Collection, which is on long-term loan to the museum as it finds its feet, will continue to grow as new acquisitions are made over the coming decade.

D

digital scan

During the first site visits, there were still remnants of grain around the building. The Heatherwick team found an ear of corn on the floor, which was digitally scanned and blown up to give them the design for the shape of the atrium. The design had to be hand-carved out of the concrete tubes.

E

El Loko

The late African artist El Loko created a specially commissioned etching for the glass roof of the atrium. The glass panels allow daylight into the atrium below and serve as a walkable surface for the sculpture garden. Each panel of laminated glass, measuring 6 metres (20 feet) across, carries his design, which is based on his *Cosmic Alphabet* works. El Loko's vision was to create a universal language that transcends racial and cultural barriers. The frit pattern is visible on nine glass panels consisting of 16 glass panes each. The artist died in November 2016, just after completing this work for Zeitz MOCAA.

F

free access

All under-18s access the museum for free. There is also free entry for South African and African citizens on Wednesday mornings and on regular Museum Nights.

G

garden

The rooftop sculpture garden, where visitors can walk on glass panels 33 metres above the atrium floor, connects the museum with the Silo hotel. ▶

Cyrus Kabiru's *Macho Nne 09 (Caribbean Peacock)* is in the permanent collection

ZEITZ MOCAA FOCUSES ON ART MADE SINCE THE MILLENNIUM UP TO THE PRESENT DAY. THE COLLECTION IS DEDICATED TO ART OF THE 21ST CENTURY

H

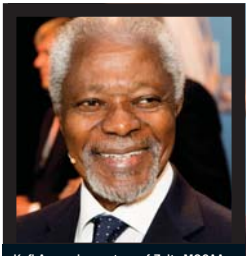
hotel

A luxury 26-room hotel, the Silo, has opened in the six storeys above the Zeitz MOCAA, in the grain elevator part of the complex.

I

international exhibitions

The Zeitz Collection collects art from Africa and its diaspora, but Zeitz MOCAA will also host international exhibitions.



Kofi Annan is a patron of Zeitz MOCAA

J

joint venture

The not-for-profit museum is the result of a joint venture between the V&A Waterfront and Jochen Zeitz. The V&A Waterfront provides use of the building for free and paid for the transformation. Zeitz is contributing to the running costs, as well as loaning the artworks.

K

Kofi Annan

Former UN secretary-general and Ghanaian diplomat Kofi Annan is a friend of Jochen Zeitz and a patron of Zeitz MOCAA. "By providing a platform for the incredibly talented and passionate artists across Africa and beyond, this museum fills a critical gap in the continent's art scene. I'm proud to be part of this journey," he says.

L

logo

A logo, font and branding was created pro bono for the museum by M&C Saatchi Abel advertising agency. The grid-style logo reflects the 42 silos and can be represented in a variety of colours, patterns and textures. An original font called Forty Two is used throughout the building.

M

millennium

Zeitz MOCAA focuses on art made since the millennium up to and including the present day. The Zeitz Collection is dedicated to art of the 21st century.

N

neighbours

Neighbouring attractions not far from Zeitz MOCAA include the Cape Town Diamond Museum, Ripley's Believe It or Not, the Springbok Experience Rugby Museum, the South African Maritime Museum, the Cape Wheel and the Two Oceans Aquarium.

O

Off-the-air

Tunisian artist Mouna Karray is the subject of an opening exhibition in the Roger Ballen Foundation Centre for Photography. Running through 15 January, OFF-THE-AIR presents the sparse landscapes and

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MUSEUM PHOTOS: IWAN BAAN ARTWORK IMAGES: COURTESY OF ZEITZ MOCAA

The Night of the Long Knives II by Athi-Patra Ruga; the atrium (right) at the heart of the museum

ZEITZ BY NUMBERS

- 116 vertical tubes
- 42 concrete silos
- 100 galleries
- 9,500sqm museum
- 6,000sqm exhibition space
- R500m budget ($40m, £30m, €34m)
- 40,000 tons of grain were stored there
- R180 adult ticket ($13, £10, €11)

abandoned environments of Karray's oeuvre. Works also look at how her homeland lost its economic significance.

P

photography

The museum's Centre for Photography was made possible thanks to major donations from the Roger Ballen Foundation and the Eiger Foundation. Famed American photographer Ballen, who has lived and worked in South Africa since the 1970s, is also donating numerous signed editions of his works. "It has been my great desire to contribute to the understanding of photography in South Africa, in the country that I call home," says Ballen. "By donating my archive and finance to Zeitz MOCAA, I wish to ensure that photography is guaranteed a place in the museum's activities."

Q

queues

Reports suggest people have been queuing for around 45 minutes to get into the museum, as visitor numbers have been far higher than first estimated – around 5,000 per day. Visitors are advised to buy tickets online to skip the entrance queue.

R

restaurant

The 200-cover Zeitz MOCAA Food opens on 1 December 2017 on level six, offering panoramic views of Cape Town and the sculpture garden. It's managed by luxury events specialists Aleit Group. Aleit is the exclusive event operator throughout the museum, including the multifunctional event space and the Atrium, which is available for private functions.

ZEITZ MOCAA

ZEITZ MUSEUM OF CONTEMPORARY ART AFRICA
ZEITZ MUSEUM VAN HEDENDAAGSE KUNST AFRIKA
ZEITZ UNDI WOSONO BUGUSIRA BASEMPANGA

WHO'S WHO

Jochen Zeitz, co-founder and co-chair of Zeitz MOCAA, is a German business entrepreneur, philanthropist and former CEO of Puma. Zeitz has also opened a nature retreat and luxury eco-safari resort in Kenya. "We wanted the museum to be as representative of Africa as possible. Most importantly, this is an institution for all of Africa," he says.

David Green, CEO of the V&A Waterfront and co-chair of Zeitz MOCAA, has overseen consistent growth and investment into the infrastructure of the popular waterfront district, including the new museum. Green is also chair of the neighbouring Two Oceans Aquarium and the director of Western Cape Development Board (WESGRO).

Mark Coetzee is executive director and chief curator at Zeitz MOCAA. Coetzee has published numerous articles on art and artist monographs. "Standing at the opening of the Zeitz MOCAA is somewhat surreal," he says. "It's been a long journey, but we're delighted we've been able to create a platform of such scale and influence for Africa."

Thomas Heatherwick is a British designer and architect who founded Heatherwick Studio in 1994. Based in London, Heatherwick Studio's 200-strong team is well known for creating projects such as the London Olympic torch, the UK Pavilion for 2010's Shanghai Expo, the Bombay Sapphire Distillery, London's Routemaster bus and upcoming projects for Google.

Isaac Julien's *Ten Thousand Waves*; and Nicholos Hlobo's lightning bird sculpture (right)

S

storage

Zeitz MOCAA is equipped with state of the art storage zones and conservation areas.

T

tubes

The 42 vertical tubes that made up the silo became central to the project, connecting the industrial history of the building to the atrium that represents Zeitz MOCAA's heart. The concrete tubes were only 170mm thick and after they were carefully carved into shape, they had to be lined with inner sleeves of reinforced concrete.

U

underground tunnels

Underground tunnels beneath the building were used to transport grain and are feats of architectural engineering in themselves. The tunnels have been preserved and adapted to support site-specific artworks.

V

V&A Waterfront

The Victoria & Albert Waterfront attracts 24 million visitors every year. The 123-hectare development, which opened within the busy port area in 1988, includes commercial, retail, cruise, leisure and entertainment activity. Until now, it lacked a cultural offer.

W

waves

The nine-screen projection film *Ten Thousand Waves* (2010), by Isaac Julien, is said to be one of the most visited contemporary artworks in the world and is now part of the Zeitz Collection.

X

Xhosa

A national Xhosa folk tale about a lightning bird is the inspiration for *Iimpundulu Zonke Ziyandilandela* (All the Lightning Birds Are After Me), the huge sculpture that marks the atrium's debut installation. It's by South African artist Nicholas Hlobo.

Y

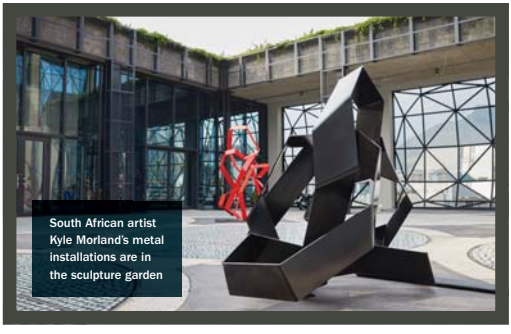
yellow

The silo was painted yellow in the 1980s. Layers of paint had to be scraped away to return the building to its original façade.

Z

Zeitz Foundation

The Zeitz Foundation is a charitable organisation founded by Zeitz in 2008. Led by its 4Cs philosophy (conservation, community, culture, commerce), it oversees the Long Run initiative, a members group of nature-based sustainable tourism businesses, and the Laikipia Programme, which runs social programmes in Kenya. ●



South African artist Kyle Morland's metal installations are in the sculpture garden

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TAKING TECHNOLOGY FURTHER

HUMANLY POSSIBLE

Professor and researcher Dr Kathryn Woodcock shares her thoughts on the role of guests in amusement ride safety and human factors in attractions design

Piloting a rocket! Riding a unicorn! Fighting giant bugs! Attractions present the guest with an opportunity to experience a fantasy. Guests are in on the pretence – and operators admit to it – but the fantasy narrative is the reason the guests want to play.

The narrative fantasy is quite obviously a part of major themed dark rides, but even a small umbrella ride at a carnival holds the promise of riding a "real motorcycle", if you are two years old.

However, every once in a while, the experience does not unfold as intended. Guests can feel motion sick, physically uncomfortable or sensitive to the attraction's media, special effects or props.

Less often, guests reposition in the ride vehicle in a way that compromises the restraint and containment devices and they fall out, or intentionally self-extract from the ride, exposing them to serious harm from moving machinery and structures not intended for pedestrian access.

Woodcock is an engineer and ergonomist with a special interest in theme parks and amusement rides

Situation awareness

The proportion of rider injuries traced to the rider's own characteristics or behaviours has typically been cited at 80 per cent or higher – though we should be aware that this causal attribution is affected by investigators' interpretations of the event. The common impression is that injured riders are risk-takers caught in a miscalculation.

Using the language of human factors, the errors are attributed to a lack or loss of "situation awareness". In response, remedies focus on correcting situation

PHOTO: SHUTTERSTOCK/FAMELD

Attractions and rides allow park visitors to take part in a fantasy, but they must know how to act safely within that illusory situation

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Intense rides like The Incredible Hulk are designed to look daunting, and many people self-exclude; guests may twist or lean out of their seats (left)

Warning guests of hazards may have little effect. People trust their own perceptions more than a contradictory description

awareness: reiterating hazards and promoting responsibility to avoid them.

Unfortunately, the concept of situation awareness comes from domains where the person is participating in a single situation.

There is no doubt that a machine operator should be aware that their machine is powered on and ready to move with the nudge of a lever. Situation awareness deficits can result from situation complexity that overloads and distracts: the machine operator may also need to be aware of whether the machine has a workpiece in position, the guard in place, space in the scrap bin, exhaust ventilation powered on, no co-workers in the path of moving equipment, and many other things.

However, situation awareness is not achieved solely by operator diligence. It is promoted by designing information to enhance the person's situation awareness. And, most importantly of all, there is one single objectively correct situation.

Consciousness contradicts

In contrast, the entire point of an attraction is to experience an illusory situation, either the abstraction of sensory "thrill" or a specific narrative that takes place within an objective world that they are supposed to ignore. People cannot simultaneously give themselves over to the illusory situation and also maintain accurate awareness of the real situation and all its physical properties that could give rise to hazards. The paradigm of situation awareness fails.

Consciousness of the real world situation compromises user experience. This compromise might be worthwhile if it was reliably effective. However, when guests are overwhelmed by the urge to escape intolerable physical or emotional discomfort, the instinctive reaction to reposition or self-extract is not a decision based on situation assessment.

While some guests might feel compelled to escape, other guests might find a ride's sensations not intense enough. Guests know the purpose of an attraction is "fun", whether "fun" is thrilling, pleasant or social in nature. When they find the attraction short of the expected level and type of fun, the guests may "complete the design" with adjustments like leaning out, twisting around or rising up in the seat. These actions seem to enhance fun, but unknown to them, may actually increase risk of ejection or another injury event.

Advising guests of situational hazards may have little effect in either case. People trust their own perception of a situation more than a contradictory description presented to them, even if they still ►

Actions or spaces that are dangerous should seem every bit as dangerous as they are, or just a little more dangerous

Selfie sticks (above) may not be perceived as a hazard by guests, but many parks have banned their use; new coasters, like ICON (right), target the most daring thrillseekers

remember it amidst the hyper-stimulation of the attraction. There is also some evidence that guests give little credit to warnings because they believe them to exaggerate actual hazards to avoid liability. If an action is physically possible, it is likely to occur eventually, if it appears to solve a problem, or if brought about by unconscious reaction.

This bias to improvisation is far from perverse. Throughout our lives, we acquire new skills and experiences of all kinds through the process of trial and error. People are also conditioned to interact actively with attractions: many experiences at the same park may involve, and even reward, their active participation and interaction.

No room for error

In addition, because attractions have so few serious accidents, and the environment is deliberately reassuring, they feel safe. The "error" part of trial and error is feedback that teaches us not to repeat a particular action. Unfortunately, in a fast-paced activity, the results of some actions can be unforgiving.

Because awareness of real-world boundaries spoils the illusion of the attraction, and because persuasion is an unreliable means to achieve it, it is most promising to provide boundaries within the illusion that will shape intuitive reactions and improvisation.

Some boundaries can be created by physical barriers, such as ride restraints, sidewalls and doors. Ensuring the ride's restraint and containment system prevents successful repositioning is a strategy that does not require controlling the guest's state of mind. A disadvantage is that barriers may not fully eliminate all undesirable positions for people with exceptional size, body shape or agility.

Forcing functions are another physical strategy to limit actions. Adding a step to performing an action can allow time for the person's conscious second thought to intercept the action or distract them from one action by engaging them in another. If a person cannot rise up in the seat without unbuckling a seat belt, the act of unbuckling the seat belt will slow down the action and force consciousness of the disabling of a safety measure. The forcing function can also make the unsafe action detectable by automation and more visible to operators, providing other options for interception.

A seat belt can help prevent unsafe actions

Prompts and cues

Barriers and forcing functions can obstruct or deter actions, but what we often want to know is how to discourage guests from even forming the idea for a particular action.

Actions or spaces that are dangerous

Early design cues help visitors decide if they will be able to tolerate an experience; proper positioning can be elicited by steering or target shooting

should seem every bit as dangerous as they are, or just a little more dangerous. Sensory illusions that accentuate speed, acceleration and elevation can prompt authentically conservative behaviour, and could use cues authentic to the narrative.

There should be payoff in the narrative for safe actions that exclude unsafe actions. Access to vehicle steering or target shooting is a more compelling reward for proper hand position than an admonishment to keep hands inside and hold on.

Foreshadow through design

Design can interfere with the inspiration to escape through disorientation and concealment of escape routes. Design may also provide options to self-manage anxiety and discomfort. Sometimes the action we need to shape is the action of choosing an attraction. Attractions offer something for everybody, but every experience isn't for everyone. It is preferable for everyone that a guest chooses self-exclusion rather than having an employee reject them.

Susceptible guests are not always obvious by their appearance or behaviour. Guests may perceive a posted description of an attraction as an exaggeration or overestimate their ability to tolerate specific discomfort in order to go on an attraction that "everyone" is talking about or share an experience with their companions.

Descriptions cannot always convey what the experience will feel like to a guest, and avoiding "spoilers" in general advisories can result in vague information. Guests should receive the information they ask for to anticipate their tolerance for a ride, even if the information includes a spoiler.

In case guests do not ask, design of the pre-attraction experience could foreshadow specific features including known phobia triggers and demanding physical sensations. An attraction that features darkness, for instance, could foreshadow the dark atmosphere with enough dark elements in the preshow and queue spaces that a person with discomfort in the dark would be more likely to choose to abstain from the attraction. A dark queue would not give the right implicit warning for an attraction where the main challenges are speed, motion or simulator induced nausea, or creepy crawlies. Designers would be challenged to craft specific foreshadowing into the pre-attraction experience, which would likely further enhance the immersion of the attraction.

Guest behaviour and guest restriction is often seen as a risk-increasing dilemma, but of all the risks in themed entertainment, guests are a necessary risk. With no guests, there would be no injuries – but, there would also be no attractions.

The most creative designers produce attractions that enlighten, engage and amaze ladies, gentlemen and children of all ages with thrilling, terrifying and fantastic experiences. The same powerful design that tells compelling stories may also hold the key to shaping safer guest participation. ●

ABOUT THE AUTHOR

Dr Kathryn Woodcock, CCPE, ICAE, PEng, is a professor at Ryerson University in Toronto, Canada, and director of the THRILL lab where she studies and develops applications of human factors engineering with a particular interest in amusement rides and attractions.

PURE ENERGY

Having worked on and visited many world expos, Christian Lachel found this year's event in Kazakhstan had a special energy all of its own. He filed this report

PHOTO: DIVSENKOVALERIA

Expo 2017 in Astana, Kazakhstan, said goodbye to the last of its 4 million guests on 10 September. So was it successful? In my role as producer and creative director for the USA Pavilion, I spent plenty of time in Astana. I want to share with you the highlights of my journey, and some takeaways for Expo 2020 Dubai.

GOOD DESIGN, GOOD EXPO

Kazakhstan moved its capital from Almaty to Astana in 1998, embarking on a fiendishly difficult task that has defeated many city planners: to build a visionary city that incorporates a number of styles and functions as a cohesive, awe-inspiring whole. The same kind of visionary thinking went into the design of the Expo site. The Expo plan fit snugly in the context of greater Astana: elegant and modern, guided by a design intention to present a "future that works for everyone".

The brevity of the Expo, at just three months, and the modest ambitions of the Expo planners – drawing 4 million visitors in contrast to Shanghai's 73 million in 2010 – contributed to its success. Expo participants embraced the challenge of creating entertaining, charismatic pavilions on short schedules with limited budgets. Almost every participant created a solution that contributed to the liveliness and pure fun of this Expo.

PHOTO: SHUTTERSTOCK

The futuristic city of Astana, the capital of Kazakhstan, played host to the 2017 Expo

THE BEST OF THE BEST

I visited every Expo pavilion experience. Here are some of my favourites:

▼ NUR ALEM PAVILION (THE SPHERE)

Wow. The Expo hosts got this one just right. First, the Nur Alem Pavilion was a brilliant icon for this Expo. This dramatic sphere anchored the site and drew people toward it. It shimmered in the sun during the day, and was illuminated with coloured lights during the striking Kazakh sunsets. At night, it came alive with LED lighting, featuring signature media. The presentations inside the pavilion were flawless, covering the mythic history of Kazakhstan and the kinds of energy that will power the 21st century.

PHOTO: XINHUA NEWS AGENCY / IN IMAGES

PHOTO: ALEX KRAMER / ARTWORK COMPANY

Inside Nur Alem Sphere (left); visitors enjoy the fun environment that Austria created (above); the German pavilion looked at new energies

PHOTO: MARZHAN

■ SHELL PAVILION

This place, one of the few standalone corporate pavilions, made a tactical decision to win the hearts of children – and the parents trying to entertain them. Shell invited kids to come inside, engage in fun, interactive activities and "build your own future world". There were lots of smiling faces emerging from this pavilion.

▶ GERMAN PAVILION

This pavilion combined an elegant, efficient design aesthetic with a clever interactivity strategy to please guests. We were given a "smart stick" geared to our language preference. This stick allowed us to collect information, solutions and ideas on our journey. We were then invited to discover various kinds of emerging energy and a variety of energy products. In the final immersive media space, the energy stick triggered a show that affirmed the case for diverse solutions if the world is to meet its energy needs. Great hospitality complemented this programme of guest engagement.

■ MONACO PAVILION

Great pavilions don't have to be large and complex. Monaco produced a mesmerising experience that featured undulating mirrored blades reflecting footage that told the story of Monaco's relationship with its marine environment. The effect – enhanced with a lush soundscape and aromas – was hypnotic. And Monaco also served the best cup of coffee at the Expo as part of its outstanding hospitality programme.

◀ SWITZERLAND PAVILION

Switzerland had a standout pavilion in Milan, and their expression of Flower Power in Astana was another winner. Here we entered a world illuminated by a kinetic light sculpture featuring poles with spinning LED lights projecting flowers. Then we were invited to enter three narrative "houses": energy self-sufficiency, food production and clean water. All this, plus a flexible space to showcase new ideas and hold creative workshops.

The Swiss pavilion offered Expo attendees a place to brainstorm creative ideas

▲ AUSTRIA PAVILION

Austria's pavilion delivered on an oft-ignored commandment of Expo design: Expos are supposed to be *fun*. As I entered, I found myself inside a wild and whimsical Power Machine with all the energy supplied by guests. I joined my fellow visitors pedalling a stationary bike and pulling on ropes to power a Willy Wonka-style factory of pop art kinetic sculptures. This pavilion put every guest at the centre of the experience.

■ NETHERLANDS PAVILION

This exercise in pure fun asked what the Dutch painter Piet Mondrian would have designed to show the world how, for centuries, the Dutch have used boldness and ingenuity to adapt to a hostile environment and climate change. Mondrian's simple, bright and playful ▶

Simple, elegant, striking. We discovered a living, computer-generated "universal landscape" that cycled through a virtual night and day

graphic design put across the theme Low Land, High Energy with simplicity and style. The highlight was a 3D holographic theatre. This was a multi-layered visual feast that engaged the Expo theme in a way that was effortless, seamless and memorable.

▲ UK PAVILION

Simple, elegant, striking. As we entered, we discovered a living, computer-generated "universal landscape" that cycled through a virtual night and day. At the centre of this landscape was stylised, yurt-inspired structure composed of transparent spokes that illuminated when touched. Then came a gallery of energy innovations in the UK, and a special display on "graphene" – a wonder material that's the strongest, thinnest and most permeable material known to man.

▼ USA PAVILION

The USA Pavilion was all about hospitality and engagement. After a greeting by a friendly ambassador, guests were asked, "What is the source of infinite energy?" An immersive multimedia presentation delivered the answer with a blast of exhilarating music, acrobatic dancing and a cascade of kinetic images. The source of infinite energy is, of course, us – people! Harnessing our ingenuity and innovation can solve the challenges we face in creating an abundant, sustainable world. This show was followed by an exhibit that included an interactive energy model, video walls and supporting photo opps.

The USA Pavilion presented a vibrant experience involving dance and music

■ UAE PAVILION

This pavilion was the perfect precursor to the UAE hosting the next world expo in Dubai. The country will provide a gracious, hospitable welcome. The signature experience was an energetic presentation about how the UAE is building on its past traditions to provide future generations with sustainable and stable sources of energy.

■ ISRAEL PAVILION

A powerful experience can be short and straightforward. The Israel Pavilion featured two simple, well-executed, five-minute show experiences that delighted guests. The first room, Energy Country, was an infinity room that plunged us into all aspects of Israeli culture, powered by alternative forms of energy. The second room, Energy of Creation, presented a live dancer supported by 360° video projections on all four scrim walls and an LED sphere hovering above the stage. This was a dynamic fusion of art, dance, science and technology.

■ SINGAPORE PAVILION

Small City, Big Ideas. The Singapore Pavilion invited us to step into a giant terrarium, a metaphor for Singapore as the Garden City. Here we could linger in this refreshing, entertaining environment

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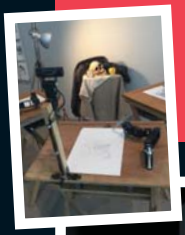
■ ARTISTS AND ROBOTS

In the Upper Exhibit area of the Arts Pavilion, I enjoyed a fascinating exhibit about how artists and robots were working together to create unique expressions of art. There were entire immersive rooms of art created by robots programmed by artists. Another part of this exhibit featured three robots sketching and drawing an object in real time, using their eye sensor. Each robot saw and drew something different depending on its point of view.



Robot-generated works include the Origin of the World by Miguel Chevalier (top) and Astana Columns by Michael Hansmeyer (left)

and discover exhibits on the specific ways that the city state is responding to the need to create a sustainable energy future. This pavilion demonstrated that a non-narrative, environmental storytelling approach can be successful with a sufficiently bold design commitment.

▶ JAPAN PAVILION

Once again, Japan delivered an extraordinary experience with great narrative power. Zone 1 of the pavilion presented the challenges Japan – and the world – faces in the 21st century and beyond. Zone 2 presented a super-widescreen immersive show experience that reassured us that a bountiful future of clean energy can be realised by the wise use of emerging technologies. Zone 3 invited guests to discover and interact with these technologies. I was happy to see Morzio and Kiccoio, the mascots from Expo 2005 in Aichi, cavorting here.

Visitors sample a VR experience in Japan's pavilion at the Astana Expo

■ MALAYSIA PAVILION

This simple pavilion, done on a budget, proved to be very popular with guests. Everyone called it the "Butterfly Pavilion". The centrepiece was a floor-to-ceiling rainforest room. Here we found ourselves twirling amidst thousands of butterflies … and the occasional tiger emerging from the foliage. The Malaysians were very clever about using social media to build the buzz; it was in the top 10 most popular pavilions.

■ RUSSIA PAVILION

This pavilion was well-executed and quite impressive. Russia chose to focus its narrative firepower on the story of icebreakers finding energy under the Arctic. Russia showcased its technology and expertise in finding energy in treacherous environments to power the near future. Guests found themselves under the ice and in an ice cave. They were even invited to touch a giant chunk of Arctic ice. ▶

MY TOP TWO PAVILIONS

▲ SOUTH KOREA PAVILION

What do I want in an Expo pavilion? Beauty, engagement, the opportunity to learn through enchantment and meaningful interaction. The South Korea Pavilion had all that, and one thing more: love.

This pavilion had a beautiful exterior with lots of activation: very appealing. The first room was a white-on-white animation theatre featuring an artist who drew vignettes from the history of energy in South Korea. These vignettes then came to life and formed a huge portrait of the nation as a forward-looking energy powerhouse. The second room was the love story. This ingenious theatre featured projection on slits of cloth, facilitating the entrances and exits of live actors. Here Astan found his true love, Ara, as they both discovered how to transform a barren landscape into something living and fertile. In the third room, every guest was given a Samsung mini tablet and invited to create a "future world of energy". We roamed a forest filled with "trees of light" as we did this. Magical from beginning to end.

▼ THAILAND PAVILION

Who knew that an ear of corn could make such an engaging host? Pa-Lang was the corn mascot of the Thailand Pavilion. The creators of this pavilion knew the best and only effective way to educate an audience is through light-hearted entertainment. We moved from a traditional introductory gallery featuring Pa-Lang to a 3D animation theatre highlighting the role that agriculture plays in the development of sustainable, renewable bioenergy. The final hall was an Energy Creation Lab, where we found multimedia presentations, videos and interactives that invited us to explore biomass energy solutions. It also got the social media element right, with one of the more active outreach and engagement strategies.

PHOTOS: EVENTPIC

Magical from beginning to end: the South Korea Pavilion offered education, enchantment and love

EXPO SUCCESS?

Let's return to my original question: was this Expo successful? My answer is an unqualified yes. Why? Because people loved this Expo. I saw happy, enthusiastic visitors enjoying themselves, and the people who came to share their expertise and learn from others also helped make it a success. The global community came together in a programme of symposiums, engaging in lively discussions about how to create a sustainable energy future.

Light-hearted entertainment was key to the Thai pavilion's success

This was a big stage for Central Asia and Kazakhstan used it to its advantage: making friends, influencing guests and winning hearts. The friendly ambassadors enhanced the experience with never-ending smiles (and tons of selfies).

Many pavilion producers were fellow members of what I call "the class of Expo 2005". This is the group that produced some of the most memorable pavilions for the Aichi Japan Expo in 2005. Many of us met again in Shanghai, producing pavilions for Expo 2010, and again in 2015 in Milan.

I hope we meet again in Dubai in 2020, because expos offer people like us a unique opportunity to make the world a better place. They are defiant beacons of optimism and courage that exist in a magic space beyond the walls and borders countries erect to fight off the rest of the world. In three years, we'll have another opportunity to "connect minds, create the future" – the theme of the Dubai Expo – with transcendent experiences representing a new, better tomorrow for humanity. ●

ABOUT THE AUTHOR

Christian Lachel is vice president and executive creative director, BRC Imagination Arts. He has planned, directed and produced award-winning pavilions at Expo 2010 Shanghai and Expo Milan 2015. Astana was his sixth Expo in a creative director/producer role.

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SUBWAY

Alterface's proprietary world of Popcorn Revenge can fit a wide range of movie-inspired themes

ERRATIC FANTASTIC

Alterface launches Erratic® Ride, the first non-linear, mixed-media, interactive ride on the market, with the first set to open at Walibi in Belgium

Alterface Projects, the media-based attractions manufacturer and technologies specialist, has launched a groundbreaking and unmatched interactive experience: Erratic® Ride.

It's the first non-linear, mixed-media ride with dynamic scene changing, where players can determine the sequence of events depending on their ranking and preferences. The ride fully immerses and engages guests with every facet of the story. And furthermore, it can be installed on a relatively small space to achieve a high throughput.

The first installation of Erratic Ride is set for the Compagnie des Alpes-owned Walibi, one of the largest parks in Belgium. Erratic Ride at Walibi will feature Popcorn Revenge, a brand new IP from Alterface, and trackless Multi Mover vehicles by ETF.

ETF's Multi Mover trackless vehicles complete the ride

Gamechanging concept

"After 16 years of interactive dark ride success, including Mausau-Chocolat type rides, we felt we had to come with a new and truly gamechanging concept," says Benoit Cornet, CEO and founder of Alterface. "The storytelling capabilities of our show control technologies, combined with the unique features of ETF Multi Mover vehicles, are key ingredients for this exciting ride formula. The collective know-how acquired over no fewer than 30 successful installations has allowed the team at Alterface to define this winning concept."

The compact Erratic Ride is the first member of a new family of visitor-centric experiences. It's aimed at space-conscious venues and represents a total solution for anyone who wants a true dark ride experience on a limited footprint.

Benoit Cornet, CEO and founder of Alterface

"The user experience was the starting point and the technical details followed. We made sure that transitions from one scene to another are smooth and the limited footprint has an enhancing rather than a limiting impact," says Cornet.

The ride concept is versatile and the speed, route, rotations and reverse movements of the six-person trackless Multi Mover can be specified in the design phase and altered at any time.

Popcorn Revenge

Popcorn Revenge® brings a flurry of projection techniques, video-mapping and special effects, as already demonstrated in Alterface signature rides around the world.

Combined with a unique touch of "choreography" usually only found in much

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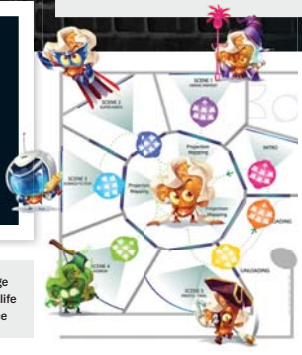
"Alterface's new ride generation is refreshing and innovative. Erratic Ride will, without any doubt, be a great addition to our park. Based on Alterface's track record and the quality of our relationship, we trust them to deliver our visitors an experience that will be immediate, simple, playful and extremely effective"

– Jean-Christophe Parent, CEO, Walibi Belgium

KEY POINTS

- dynamic scene changing
- fully immersive
- small footprint
- high throughput
- six-person vehicles
- true dark-ride experience
- affordable price point
- supports any IP, including Alterface's Popcorn Revenge



Projection mapping and cutting-edge special effects bring each scene to life in Alterface's Erratic Ride experience

larger projects, it's an ideal IP for parks of any size and visitors of any age. Alterface has designed a series of characters that can fit each movie theme. From pirate to space themes, from horror to magic to superhero themes, there are endless possibilities.

"Erratic Ride is the perfect example of a next-generation attraction that offers a more dynamic and coherent media experience. Needing a relatively small footprint, it can be easily installed at any park or indoor location," says Cornet. "Popcorn Revenge's theme is universal and suitable for guests both young and old, but we can implement any other IP or character of choice.

"With this world-class yet affordable ride, Alterface demonstrates once again its commitment to developing innovative concepts to offer clients the best possible rides at their venue." ●

ABOUT ALTERFACE

Founded in 2001 and headquartered in Belgium, Alterface Projects operates globally with offices in the US and China. Together with a worldwide network of partners, the Alterface team develops turnkey interactive attractions for dark rides, including spinning and duelling theatres and walkthroughs. Alterface champions the market with advanced technologies, including their patented interactive show control system Salto, multi-user and device-free pointing solutions, as well as creative mixed-media ride concepts.

Alterface clients include Phantasialand, Six Flags, Legoland Discovery Centres, Carowinds, Ferrari World, IMG, Lotte World, Yumiyuriland, Hub Zero, Comics Station Antwerp and many more.

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GOOD REEF!

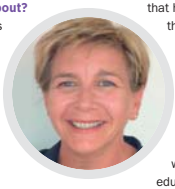
The all-new Cairns Aquarium marks the first marine attraction to open in Australia in 18 years. The team behind the project share their stories

After a number of construction setbacks, the A$54m ($42m, $32m, €37m) Cairns Aquarium finally opened its doors in September, in Cairns, Australia.

The three-storey, 10,000sqm (107,600sq ft) development mainly houses animals endemic to the local region. As a world-class tourist attraction and reef research centre, and Australia's first new public aquarium in 18 years, it is the only facility in the world devoted to exclusively showcasing marine and plant life of the adjoining Great Barrier Reef and Wet Tropics Rainforest UNESCO World Heritage protected areas.

Visitors to the new Cairns Aquarium can get up close with many of the region's rare, unusual, and sometimes deadly marine creatures

JULIE CULLEN
General manager
Cairns Aquarium



How did the project come about?
The privately-funded project is the vision of the company directors, Daniel Leipnik and Andrew Preston, who visited the region on holiday and saw people who went to the reef yet didn't enter the water because they couldn't swim, were frightened of stingers or were out of their comfort zone.

The entrepreneurs saw an opportunity to bring the Great Barrier Reef to them. Their love of animals and desire to contribute to the conservation of regional wildlife was the impetus to undertake this project.

What are the aims of the new aquarium?
We aim to foster a culture of sustainability that supports the conservation goals of the organisation and the greater public, while building a legacy of environmental stewardship for the Wet Tropics and ecosystems worldwide. Cairns Aquarium is also committed to development and implementation of policies, partnerships and other programmes that integrate environmentally conscious practices into our daily operations and convey a fundamental message of conservation.

If we're to protect these amazing ecosystems and their wildlife for future generations, we must first understand them. The aquarium has dedicated research and development programmes that help us learn more about the extraordinary diversity of animals and plants, how they interact and the impacts of the many changes and pressures currently experienced by these natural systems. The outcomes of the research will play a significant role in educating the community about their natural environment and how to conserve, appreciate and enjoy it.

Who do you expect to visit?
The target audience includes local and domestic visitors, as well as international visitors who are predominantly Chinese, Japanese and American. Visitation is forecast at 720,000 people per annum.

How big is the attraction?
The building itself is over 11.5 metres in height, 90 metres in length and 40 metres in width. Over 15,000 animals, fish, plants and other organisms will be housed in a two-level journey that will take visitors through all the habitats of the Wet Tropics.

Visitors follow the path of a drop of rain from the mountains to the creeks to the billabongs and mangroves and to the Great Barrier Reef

How many staff are you employing?
We'll employ 130 when fully operational.

Can you describe the visitor experience?
The magic truly begins as visitors follow the path of a drop of rain as it travels from the rainforest-clad mountain range, joining creeks and streams that flow through the tropical rainforest, across the flooded plains and billabongs into the mangroves and the Great Barrier Reef before entering its final destination, the Coral Sea.

Ten North Queensland ecosystems and 71 habitats have been meticulously researched and replicated throughout the aquarium to ensure that visitors will enjoy an immersive journey where they'll see some of the most elusive animals on earth.

What is the length of stay?
It's about two and a half hours.

The aquarium features different Wet Tropics zones that tackle reefs, rainforests, rivers and mangroves

Which exhibits do visitors see?
One of the most mesmerising attractions is the 300,000-litre Deep Reef exhibit, the first of its kind in Australia and one of only three in the world. This 10x8.5-metre exhibit replicates the reef dropoff, providing a view of this beautiful ecosystem and the diverse marine creatures that call it home – a view normally only seen by highly experienced scuba divers far offshore.

Our 1.5-million-litre Oceanarium is home to scalloped hammerhead sharks and large predators. The River Monsters exhibit houses the highly endangered sawfish and other weird freshwater creatures. The Tropical Rainforest features snakes, lizards, frogs, spiders and some of the biggest and meanest rainforest giants.

Life in the Mangroves hosts fish that live out of water, fighting crabs, baby crocodiles, sharks and rays, while Dangers of the Reef features species that can be fatal, such as stone fish, sea snakes, lionfish and jellyfish.

Touch and Talk exhibits offer visitors of all ages the ability to touch creatures such as blue sea stars, sea cucumbers and lizards supervised by a trained aquarist.

The Deep Reef exhibit replicates the reef dropoff, a view normally only seen by scuba divers far offshore

Regular daily talks by our passionate and knowledgeable staff outline the behaviours of the creatures and inspire the desire to conserve these natural assets.

Will you be WAZA accredited?
Yes.

What are the food and retail offers?
Aqualuna, a 220-seat contemporary Italian restaurant, has a 70,000-litre shark exhibit inside the restaurant. Tropical Treasures Gift Store stocks a variety of local goods.

What learning opportunities are there?
Education programmes tailored to the Australian curriculum will be available.

Our research arm will conduct vital R&D in species preservation and repopulation, aquaculture reproductive biotechnology development, and collaborations with industry partners to explore clean energy technologies in marine environments.

Will you offer any special programming?
Back-of-house tours allow visitors to see how we take care of the animals. Choices include a Turtle Rehabilitation Tour or a Behind the Scenes Tour of the aquarium operations. For the ultimate experience, there's an access-all-areas tour with a personal guide and seven-course dinner.

Shark Sleepovers offer the chance to spend the night in the Oceanarium.

BRADLEY DOHNT

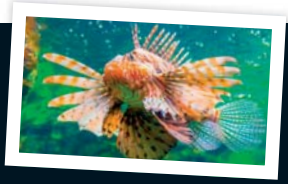
Assistant curator
Cairns Aquarium

How many tanks are there and what size are they?
There are 71 tanks and they vary in size from 1,000 litres to 1.5 million litres.

What variety of marine life will be on display?
The marine life is representative of the freshwater and marine environments of Tropical North Queensland, including species found in the streams and rivers, flooded billabongs and waterways, mangroves, intertidal reef zones, the Great Barrier Reef and the Coral Sea. There are also terrestrial species on display, such as rainforest reptiles, amphibians and insects.

Why did you choose endemic animals?
There are very few locations in the world where a zoo or aquarium could develop a world- class aquarium using only species endemic to their region. Cairns Aquarium is located in one of the most biodiverse regions in the world, and given our commitment to conserving these amazing species we have chosen to exclusively showcase the fish, animals, plants and habitats of the only two adjoining World Heritage protected areas: the Great Barrier Reef and the Wet Tropics Rainforest.

Are the exhibits themed in a special way?
The exhibits are designed to look as close to the natural environment as possible.



There are over 70 different habitats represented at Cairns Aquarium

What do you want visitors to learn?
To understand how unique this region is in terms of species diversity, how our activities are impacting them, and why it's important to protect them for the future.

What are the conservation messages?
The primary messages are linked to the protection of the diversity of species and their habitats in the region. These are delivered via interpretive signage and during daily presentations and education programmes conducted by trained staff.

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NICK LAWSON

Associate director

Arterial Design

How did you approach this project?

Initial research on all key creatures and their habitats is paramount in ensuring a design response that is bespoke to a site. From this research, behavioural and physical attributes of animals can be translated into interpretation points, ensuring all theming clearly displays natural elements specific to the zone we wish to replicate in the aquarium. For Cairns Aquarium, research focused on the far north habitats, including the reef, and key creatures such as the sawfish and sharks.

What did you want to achieve?

The key objective was to hero the animals within their natural environment. The architecture reflects this, with large viewing windows into each exhibit. Exhibit and theming design works with the architecture to ensure each animal is the main focus but is displayed in an ultra-realistic environment. The visitor experience plays on scale and detail, revealing elements within the natural environment that they may not physically experience in the wild.

Can you describe the look and feel?

Visitors enter a highly immersive, realistic depiction of the Far North Queensland natural environment. Wide corridors and tall ceilings provide a sense of open space not normally available in an indoor attraction while focused light directs attention to key theming and tanks.

What interactives are used?

The concept behind Cairns Aquarium was to be relatively low tech, with a focus on real tactile and visual experiences. Interactive learning is driven through person-to-person education and talks. Touch tanks and educational open-top tanks drive this hands-on approach.

What theming is used?

Sculpted trees, rock and artificial foliage feature throughout the attraction, interspersed with feature lighting, graphic interpretation and large-scale photography. Natural elements such as timber and plants were used where possible.

The key objective was to hero the animals within their natural environment

What wayfinding is used?

There are 280 educational, interpretive, and interactive signs. These are a mix of species identification signs, zonal specific educational signs and wayfinding signage.

What's the highlight of the experience?

The highlight of the experience is the 10-metre-high Deep Reef exhibit, which is designed to showcase the aquatic biodiversity that lives over the reef dropoff.

Another enjoyable highlight is the Oceanarium with multiple viewing windows on all sides and underwater tunnels where ocean predators are visible.

For children, two stand-out experiences are the turtle tunnel viewing experience and the coastal zone marine touch tank.

What do you want visitors to take away?

We hope that visitors come away having enjoyed themselves in an immersive aquatic wonderland adventure. We hope they learn about the species, habitats and ecosystems found within the Great Barrier Reef and the adjacent rainforests of Tropical North Queensland. Through this interaction, we hope that people will develop a sense of care and respect for the environment and the amazing biodiversity found within the region.

The concept for the façade is a series of tectonic plates reflecting the movement in the Earth's crust

Peddle Thorp designed the new aquarium

ESAD DAUTOVIC

Project leader
Peddle Thorp Architects

Please describe your design.
Our primary vision was to provide a modern facility for aquarium exhibits with an educative journey and global environmental message. We followed the best sustainable design practices, such as using controlled natural light, carefully selected building materials, and efficient use and re-use of water.

A simple material palette of steel, coloured glass, white polished concrete façade cladding and natural decorative and structural timbers allows the exhibits to be the main focus of what we would call a "natural history" experience in Cairns.

What was the inspiration?
Our design approach does not reference international building typologies, but rather envisages a contemporary Australian architecture. We chose to differentiate our design from the surrounding building stock of generally hotel and motel typologies.

The building's external fabric is partially transparent, allowing passersby a glimpse inside. The concept for the façade is a series of tectonic plates reflecting the movement in the Earth's crust. Fissures between the plates offer a glimpse into the land, vegetation and water exhibits within.

On entry, visitors are immediately immersed into a major exhibit, the Rainforest, with sights and sound. The journey spaces are broken up into a number of sections starting at one end of the building and weaving through the various exhibits before arriving at the final showstopper exhibit, the main Oceanarium.

What were the challenges?
Cairns is known for short, heavy bursts of rainfall so the roof needed super-sized gutters, downpipes and water collection points. This was challenge during construction as the pipes had to be navigated through the building, over, through and around exhibits.

The acrylic viewing panels were manufactured in Rome, Italy, and shipped out to Australia in full-size pieces, some of which were up to 9 metres in height and weighing tonnes. We needed to get the panels into the building once they arrived on site, so we kept vertical penetrations, like specific drop zones, at various points of the structure to lower the panels in to position. The challenge with this, as the main acrylic panels weren't arriving towards the final stages of completing the structure, was to keep construction going around the open penetrations. We couldn't seal the building structure until all the panels arrived and were dropped in to position.

Tall, wide viewing panels help create a deeper sense of immersion

Safety is obviously a huge element. How do you incorporate this into the design?
A building of this type has an avalanche of back-of-house areas that contain life support services, equipment, water storage, filtration, etc, that maintains water quality for the animals. A lot of these spaces are confined yet need access so we had to incorporate access points, ladders, safety harness points, handrails and balustrades so that the aquarists are able to safely and adequately access where needed.

You've designed aquariums before. What approach do you take to this form?
The approach always begins with the space you are given to work with, the client brief in terms of which specific exhibits are required and then the journey through for the visitor. Having the knowledge of allocating spaces for back-of-house services/spaces required for an aquarium is also a benefit during conceptual work.

In addition, Cairns Aquarium is located at the doorstep of the world's largest Coral Reef so the experience here needed to complement this amazing natural wonder.

What do you like most about the building?
We measure the success of our aquarium projects in the smile of a child; the first time they look a shark in the eye or watch the majesty of a stingray glide overhead. We expect the experience to highlight the exhibits and we intentionally made the spaces dark so as to not compete with the displays. The building externally, particularly the front elevation, provides a sneak peak of what may be inside, but has been designed to not give too much away. ●

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MAKING SENSE

Experience designers need to appeal to all of the audience's senses. Three industry experts – Joel Beckerman, Gordon Grice and Scott A Lukas – share their thoughts on effective multi-sensory design

Joel Beckerman is a composer, producer, and founder of Man Made Music, a sonic branding studio, and author of *The Sonic Boom: How Sound Transforms the Way We Think, Feel and Buy.*

Gordon Grice is an architect, writer, editor, illustrator, and creative director at FORREC, based in Toronto, Canada.

Scott A Lukas is a researcher, anthropologist, YouTube documentarian, former theme park trainer, and author, who specialises in immersive worlds, theming and cultural remaking.

Most of us are happy to be just looking and listening. You might be reading this article on a train, with your earbuds in, or on the beach, comforted by the sound of waves, or in a café with soft music playing in the background. But in every case, important sensory information has not been accounted for. What about the bump-bump-bump and abrupt swaying of the carriage, the feeling of warm sun on your back, the aroma and taste of strong coffee? It takes all of these sensations to make up a complete experience.

This is why, as designers, we spend time tasting, smelling, touching, listening, looking – and observing. We want the environments we create to be *complete* environments.

Follow the nose

We have probably all had Marcel Proust moments, when we encounter an unexpectedly familiar aroma that suddenly transports us back to another time and place. Pretty soon, associated visual and aural memories also appear, creating an experience that can be strongly emotional. When we design entertainment environments, we are really trying to accomplish the same thing: to provide a memorable emotional experience by removing visitors from the here and now and transporting them to another time and place, with the aid of sensory design elements.

Given how efficient it is, why isn't olfactory stimulus used all the time? The main reason is that stimuli don't affect everybody in the same way. Smell memory is personal, as well as regional and cultural; an aroma that appeals to some people might easily disgust other people. It's easy to miscalculate.

When we use smells as a design tool, we're not trying to create everyone's favourite aroma; we're trying to complete or reinforce a sensory experience. The main objective is to get all of the senses working together in the same direction. By providing an aromatic element, we are adding an emotional connection and an element of memorability, reinforcing the visual, the auditory and the tactile, to create a total experience and to enhance what some have called "environmental authenticity". ▶

Bombay Sapphire Distillery has a botanical dry room where guests uncover various aromas and flavours

Punch Drunk's *Sleep No More*, playing in Shanghai, China, offers a masterclass in multisensory audience immersion

PHOTO: IVAN STUDIO

Five things to remember about **SMELL**

1. Human beings have a much more discerning sense of smell than was previously believed. According to recent research, we are able to distinguish millions of different scents.
2. Smell memory is most strongly associated with early childhood, since it peaks at around the age of five. As a result, many of these memories recall warm and pleasant experiences.
3. Unlike most memories, smell memories are not subject to retroactive interference – being disturbed or altered by memories acquired later.
4. Since smell memories are personal, designers should use aromas carefully and appropriately to reinforce other sensory stimuli. Note that not all smell memories are positive ones.
5. Smell memories are directly connected to the limbic system, the part of the brain that generates emotions.

Stay in touch

The other sense with a large emotional component is the sense of touch – more accurately, the somatosensory system. We sometimes say we are "touched" by something, when it stirs our emotions.

There are several reasons for this tactile-emotional connection. First, our other senses deal with discrete, measurable things, such as sound and light waves and airborne molecules, but our sense of touch connects us directly to our environment and involves the whole body. A second emotional connection occurs because our brain has two pathways for processing touch information: a sensory pathway that gives us the facts of the encounter – texture, temperature, pressure – and a social-emotional neural pathway that draws on our sense memory to tell us how we should "feel" about what we feel. A third reason, of special importance to entertainment designers, is that our sense of touch doesn't only connect us to the outside world, it also monitors what is going on inside our bodies. This inner sense of touch is called proprioception. It's the mechanism that sets off alarms when we lose equilibrium or orientation, for example, when we reach the top of a coaster lift and start to hurtle downwards.

When reaching the top of a coaster, proprioception kicks in, which is like an inner sense of touch

Five things to remember about TOUCH

1. How we feel can affect what we feel. Certain kinds of touch, such as temperature, moisture or human contact, might be soothing in a comfortable environment, but may be upsetting for people in an uncomfortable environment.
2. When we can't see, our first recourse is to touch. Moving through a dimly lit or darkened space, we often rely on our hands and feet to guide us.
3. Touch is internal as well as external. Discomfort in our internal sensory perception (proprioception) is a powerful tool in the hands of entertainment designers.
4. Textures should be felt, not just seen. Don't forget, that can involve the feet, the hands, and the skin.
5. Temperature (thermoreception) and moisture add to the tactile experience. Temperature gradients, mists and sprays can be used to create richer experiences.

Touch is used to unnerve passengers on Derren Brown's Ghost Train at Thorpe Park

PHOTO: DANIEL LEWIS

Looks are everything

The visual sense is often the first of the senses that a guest experiences when entering a space. Amusement parks, since the days of Coney Island and Luna Park, have relied on dramatic visual stimuli to establish the foundations of a space.

The "look" of a space – whether approached through sightlines, colour, texture, depth, montage, juxtaposition, etc – allows the guest to associate what is distinctive about the space with the brand, contexts or services that it provides.

In some ways, we could say that visual stimuli may overwhelm a guest in terms of the senses. As a designer, imagine if your guests focus primarily on visual cues that you have created, thus minimising all of the other sensory designs that you have offered. Perhaps for this reason, we have witnessed an increased popularity of "dark restaurants", venues where guests eat in total darkness, requiring them to rely on the senses of taste, smell and touch. ▶

Five things to remember about VISION

1. Visual perception of a space – for better or for worse – may be the first thing that a guest notices in the space, so you may wish to enhance this perception through effective use of the other senses.
2. Visual clues can lead to other sensory experiences (textures are often visible, aromas should have an identifiable source, etc).
3. Static space may be boring for a guest, so consider the use of movement, change and fluctuation as part of a more immersive sensory setting.
4. Mood boards – quick visual representations of the moods associated with a space – may be an effective way to approach the visual design of a space. Note that creative written descriptions can help weave together the visual, auditory, haptic and olfactory.
5. Vision is a "cold" sense, as in "look but don't touch," thus it is incumbent on the designer to enhance vision with other sensory cues.

Guests exit the dining room after experiencing a meal in pitch darkness at Dans Le Noir? (inset); Singapore's Gardens by the Bay is rich in visual stimuli

PHOTO: EDWARD TIAN

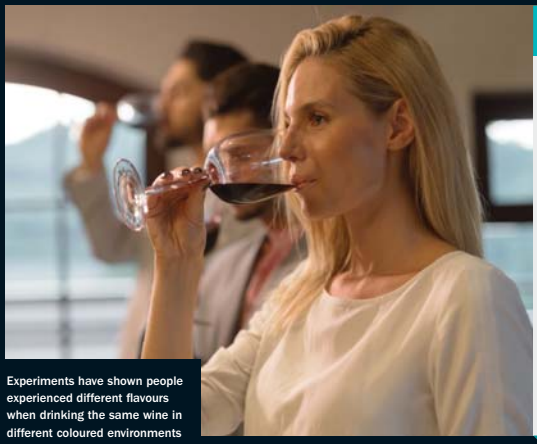
Matters of taste

There are five basic tastes that we recognise: sweet, sour, salt, bitter and umami (a savoury or meaty taste). Taste is closely connected to flavour, which draws heavily on the sense of smell.

Scientists who study taste often focus on the chemical issues of foods and other substances that we ingest, but for architects and designers, the concern, typically, is how taste may be used to create memorable and immersive experiences in combination with the other senses.

A clear challenge of such design relates to the subjective nature of the human sense of taste. One guest may really enjoy sweet foods, while another will have a different preference. Contemporary culinary spaces, like the three-Michelin star molecular gastronomy restaurant Alinea in Chicago, Illinois, combine taste "tricks" with other sensory experiences for guests. British chef and restaurateur Heston Blumenthal is similarly celebrated for a highly experimental approach – for example, creating a sense of theatre by cooking with liquid nitrogen at the table.

Taste is a challenging sense to deploy as it often relies on an immediate, localised experience. We can hear sounds from a distance, but the same is not true for taste.



Experiments have shown people experienced different flavours when drinking the same wine in different coloured environments

Five things to remember about TASTE

1. Taste is a subjective sense, so it is important to consider design elements that will balance unpleasant with pleasant taste.
2. As with the other senses, it is valuable to play off of other sensory capabilities, such as smell, so the experience can be heightened.
3. Taste is impacted by atmosphere – foods may taste better in the designed space. It's more common that the environmental experience enhances the gustatory experience, rather than the other way around.
4. Memory and nostalgia may impact the guest 's experiences with taste.
5. Culture, lifestyle backgrounds, and expectations impact perceptions about taste, so it is good to consider these as you design a space.

PHOTO: SHUTTERSTOCK

Hear, hear!

Sound, too, is a frequently overlooked and underleveraged sense. All too often sound and music aren't considered at the onset of an experience, but are brought into the fold too late in the process, tacked on so as merely to check a box.

But this is an unfortunate misstep. Of the five senses, our brains react to sound the fastest, making it the defacto organiser. With the emergence of new forms of immersive entertainment, both in physical spaces and hybrid experiences inclusive of VR, AR and beyond, integrated 3D positional soundscapes can be a powerful tool to complete an illusion and transport audiences in an instant. With these new technologies, sound can be key to driving narrative attention and giving visitors the illusion of an infinite decision tree of options.

Our brains are wired to discern a situation based on the sound we hear. No matter how compelling visual or tactile experiences may be, if something doesn't sound right, especially in the spatial dimension, the brain won't truly be fooled.

An upcoming ABBA exhibition will use musical soundscapes

Five things to remember about SOUND

1. You must consider the higher role of sound during the concept stage, or opportunities are lost.
2. It's not about the sound, it's about the cohesive multisensory experience we are creating.
3. Silence is our design "white space" and makes the experience stronger.
4. Sound is the organiser of the senses – it's the key to a first impression.
5. Cacophony breeds confusion. Sound is the hidden driver of narrative focus.

PHOTO: TORBJORN CALVERO @PREMUMROCKSHOT

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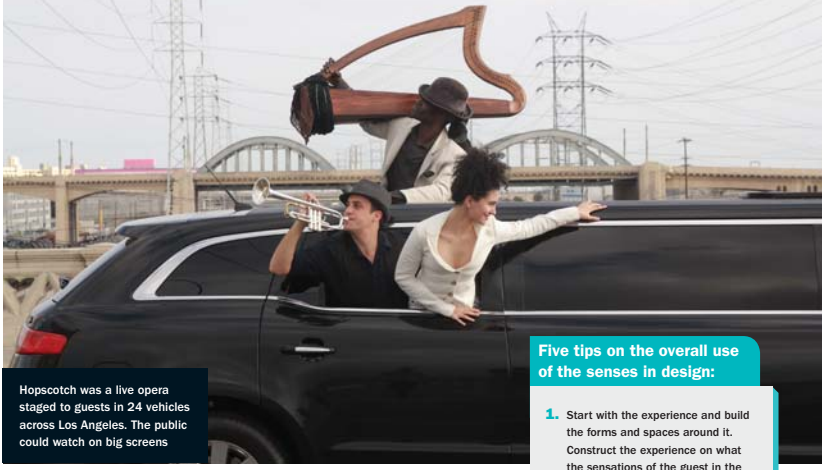


Hopscotch was a live opera staged to guests in 24 vehicles across Los Angeles. The public could watch on big screens

Combining the Senses

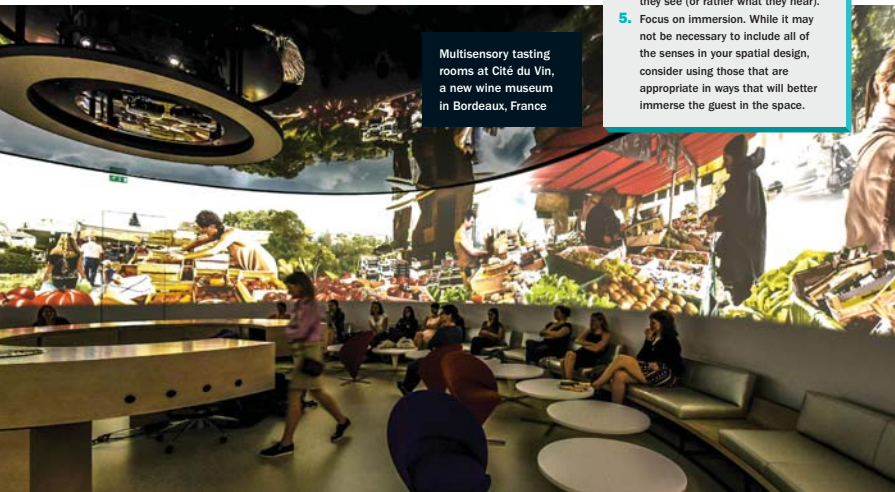
We should note that the senses should never be considered in isolation. Designers and psychologists alike are aware of synesthesia, or the idea of one sense impacting and causing an effect in another of the senses. As we think about effective sensory design, we should try to leverage the power of one sense to impact another, with the overall effect being the greater immersion of the guest in the space.

People do not differentiate each of the sensory elements that they experience in a space. This is the challenge in terms of creating a holistic, immersive space in which each of the senses is integrated seamlessly for the guest.

There are architects who will argue that any intentional sensory stimulation, other than visual, is a betrayal of architectural principles. The visual sense is by far the most important and it is this sense that has guided architectural design and experience since its very beginnings. But an increasing number of architects, not all of them involved in entertainment design, feel that the neglect of sensory design is the neglect of the complete (user) experience.

Five tips on the overall use of the senses in design:

1. Start with the experience and build the forms and spaces around it. Construct the experience on what the sensations of the guest in the space will be like.
2. Think multisensory. Use a mix of the senses and synesthetic potentials to enhance the experience of a space.
3. Present experientially when you're recording and pitching your ideas. Make sure you stress the importance of non-visual (ie, absent from your drawings and models) sensory components.
4. Consider distinctiveness. Sound can be a true differentiator between a fun experience and a truly immersive environment. Audiences aren't easily fooled, but sound is the most economical way to guarantee that their brains will believe what they see (or rather what they hear).
5. Focus on immersion. While it may not be necessary to include all of the senses in your spatial design, consider using those that are appropriate in ways that will better immerse the guest in the space.



Multisensory tasting rooms at Cité du Vin, a new wine museum in Bordeaux, France

FAIRYTALE ENDING

IDEATTACK announces an exclusive deal with Chinese developer Evergrande Group to bring its gamechanging Fairytale Theme Parks to cities across the mainland

IDEATTACK, a global leader in tourism and leisure destinations, has partnered with Evergrande Tourism Group as its exclusive designer, planner, attraction producer and general contractor.

The location-based entertainment design expert has been working with Evergrande, one of China's biggest developers, on a park design envisioned as a one-of-a-kind destination that celebrates the diverse variety of fairy stories, myths and legends from across the world.

The newly announced deal comprises the development of a new theme park brand, Evergrande Fairytale Theme Park, and the construction of up to six parks located at different locations in China.

Evergrande Fairytale Theme Park is envisioned as a top-quality entertainment destination featuring more than cutting-edge attractions, including immersive multimedia rides and theatres, across six specially themed zones: Splendid China, Magical Europe, Mysterious Kingdom, Adventure South America, Surfing Sea and Space Travel.

Each zone and every ride has its own unique story to make it truly outstanding.

With its highly-themed architecture, ride and show experiences and dining and retail offering, Evergrande Fairytale Theme Park is on track to be a gamechanger in China's theme park industry in several key ways:

PROJECT DETAIL

Name: The Fairytale Experience Park
Locations: Various sites in China
Size: 60 hectares
Client: Evergrande Group
IDEATTACK role: Exclusive design, planning and production partner

Evergrande representatives and IDEATTACK's Dan Thomas announce their theme park plans at a ceremony

 ©CYBERTREK 2017

Fairytale Theme Park includes the Brilliant China zone (opposite) and themes from around the world

- By breaking the quality gap between domestic Chinese theme parks and established overseas brands; Evergrande Fairytale Theme Park is set to meet or exceed world's top theme park brands
- By breaking the trend of developing high-quality leisure projects of this type only in a few major cities; Evergrande Fairytale Theme Park is bringing the high-end experience to the whole of China
- By employing Chinese themes, stories, myths and legends in over one-third of attractions and high-tech experiential rides and shows; Evergrande Fairytale Theme Park's largest themed zone will be Brilliant China Zone, featuring exclusively Chinese stories, characters and atmosphere
- By providing local residents a true escape form everyday life to a one-of-a-kind leisure paradise: Evergrande Fairytale Theme Park will feature ultimate fantasy environments, with elaborate, original buildings and façades, unseen elsewhere, to create a completely immersive experience for visitors and their families

The stories told in the attractions will correspond to the narrative of each themed land and will be created by chosen industry professionals already proven in the creation of the world's top attractions.

ABOUT IDEATTACK

IDEATTACK brings architecture and entertainment design together to create large-scale, mixed-use leisure tourism projects with the wow factor. Founded in 2004 by Natasha Varnica and Dan Thomas, the Los Angeles-based firm creates original, profitable, high-quality attractions on a realistic budget. The holistic service includes all stages of project development, from masterplanning to concept and brand design to construction supervision.

IDEATTACK CEO Natasha Varnica and president Dan Thomas

> "Each zone and ride has its own unique story to make it truly outstanding"

From an operational point of view, the theme parks are set to be fully open year-round, regardless of season, climate or weather. This is possible as visitors will have the choice of circulating both outdoors –through lush themed landscape environments – or staying entirely indoors, moving through the interconnecting corridors, which are dotted with speciality retail and exciting dining options.

Upon completion of Evergrande Fairytale Theme Parks, China will at last have its own formidable theme park brand that will offer its citizens an original domestic leisure experience product. We hope that Evergrande Fairytale Theme Park projects will inspire the theme park industry in China and set the a higher bar for the level of expectation and quality for future tourism and entertainment projects. ●

Museum MACAN is located inside a multipurpose building which incluces offices, apartments, a hotel and shops. Some of the revenues from the development will go towards operating the gallery

MACAN IMPRESSION

Jakarta's first contemporary art museum promotes Indonesian and Southeast Asian artists and engages with the global art community. Museum MACAN director Aaron Seeto told Alice Davis about the project

A major modern art museum opens its doors in Jakarta, Indonesia, on 4 November, to engage the city and promote its burgeoning art sector.

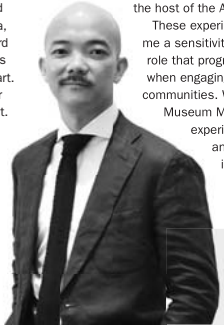
The passion project of Indonesian business tycoon, philanthropist and collector Haryanto Adikoesoemo, the multi-million-dollar Museum MACAN – which stands for Modern and Contemporary Art in Nusantara, and is also the Indonesian word for tiger – will house 800 works of modern and contemporary art.

We asked museum director Aaron Seeto about the project.

How is your previous career experience helping you in your role at the new museum?

There are two major roles that I held before coming to MACAN last year which have informed my experience: director of 4A Centre for Contemporary Art in Sydney, Australia, and curatorial manager of Asian and Pacific Art at QAGOMA (Queensland Art Gallery & Gallery of Modern Art) in Brisbane. I mention the two to illustrate a versatility. One was a small nonprofit that directly connected with artists and communities; the other was a large state collection with one of the most significant collections of contemporary Asian and Pacific art and the host of the Asia Pacific Triennial.

These experiences have given me a sensitivity to the important role that programming plays when engaging with different communities. What I bring to Museum MACAN from these experiences is a broad and global view of how important Indonesia and this region is to the world art scene.



Aaron Seeto champions art from Indonesia and Asia Pacific

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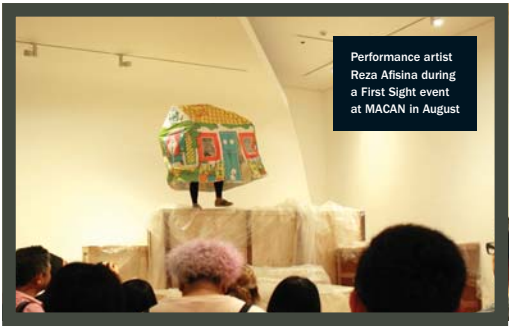
Why is the role important to you?
The museum's mission to provide an international platform for the art of our region, its commitment to education and to creating public accessible art really resonates with me. I couldn't pass up the opportunity to be a part of it.

Can you describe the location?
The Kebon Jeruk neighbourhood in West Jakarta is up and coming, with many interesting new restaurants, cafés and other community spaces, but most importantly, it is the area of Jakarta with the highest concentration of schools. Our location grants students access to the educational resources of a museum, which is an integral part of MACAN's overall commitment to education and accessibility.



Performance artist Reza Afisina during a First Sight event at MACAN in August

ALL PHOTOS COURTESY MUSEUM MACAN AND THE ARTISTS

What can MACAN bring to the area?
As mentioned, one of the museum's core missions is education and our location is close to many schools. MACAN hosts school visits with dedicated tours for children, as well as boasting a Children's Art Space. Its first site-specific commission is with the leading Indonesian artist Entang Wiharso.

The museum aims to provide public access to a significant collection of modern and contemporary art and currently houses over 800 artworks. Besides temporary exhibitions, the museum also holds regular art events to further encourage interaction between the art and the public.

Part of Entang Wiharso's plexiglass installation for the Children's Art Space

What else comprises MACAN's mission?
There is an increased curatorial attention on Indonesia and Southeast Asia from our colleagues around the world. We hope the museum will help to facilitate knowledge and interest in the region with opportunities for reciprocal cultural exchange.

What different areas are in the gallery?
The new building offers approximately 4,000 square metres (43,000 square feet) of space. The museum features about 2,000 square metres (21,528 square feet) of exhibition galleries, which include two areas specially reinforced for large-scale commissions of new work. Besides, there is the Children's Art Space, featuring interactive and educative commissions designed specifically for children. The museum also has a 500-square-metre ▶

Staging a three-hour art performance, Indonesian artist Reza Afisina is one of the artists partcipating in the First Sight series

WE HAVE TRAINED VISITOR SERVICES STAFF TO GUIDE FIRST-TIME VISITORS IN THE MUSEUM, AND PROVIDE A PLATFORM TO ENCOURAGE QUESTIONS AND EXPERIENCES FOR THOSE NEW TO ART

(5,382 square foot) indoor sculpture garden, a designated education zone, AV room, café/restaurant and retail store.

How does the design by MET Studio represent Museum MACAN?
MET Studio has over 30 years of experience in planning, designing and delivering museums and other projects across 50 countries, with a focus on creating environments that connect directly to their audience. Their vision for Museum MACAN responds to the cultural landscape of Jakarta and Indonesia and reflects our mission to create an engaging and open educational experience with art for visitors.

What is the visitor journey like?
The museum has been designed to present exhibitions, but also to encourage social interaction with a café, shop and other public spaces. We hope that our visitors see the museum as a place to experience new ideas told through the history of art. We have trained visitor services staff to guide first-time visitors in the museum, and provide a platform to encourage questions and experiences for those new to art. Both one-time admission tickets and membership programs will be available, with details on the website.

In our inaugural exhibition – Art Turns. World Turns. Exploring the Collection of Museum MACAN – approximately 90 century-defining works are on display. The spacious exhibition rooms encourage visitors to take time to reflect on the works.

What is on display and what type of works make up the permanent collection?
Art Turns. World Turns. is a snapshot of 90 artworks from our growing permanent collection. This selection, which sees Indonesia as its foundation, branches off into conversations that draw in artists from around the world. As curators Charles Esche and Agung Hujatnika remark, the strategy has been to explore the resonances between national discourses as they emerge in Indonesia and global connectedness as it has been experienced since the late 20th century.

Almost half of the collection is devoted to modern and contemporary work by Indonesian artists, including Raden Saleh, S. Sudjojono, Affandi, Lee Man Fong, Heri Dono, FX Harsono, Agus Suwage, Christine Ay Tjoe and Handiwirman Saputra.

In addition to a focus on Indonesia, the collection includes modern and contemporary work from across the greater Asian region, and around the world. This includes key regional artists Fernando Cueto Amorsolo, Sanyu, Yang Maolin and Wu Guanzhong; and renowned international artists such as Robert Rauschenberg, Anish Kapoor, Gerhard Richter, Banksy, Andy Warhol, Jean Michel Basquiat, Jeff Koons, Ed Ruscha, Keith Haring, David Hockney, Frank Stella, Antoni Tapies, to name a few.

How have the works been acquired?
The collection has been developed by our founder, Haryanto Adikoesoemo, since the 1990s and is continuously growing through acquisitions and commissions. We believe it's important to show formative works that are crucial to Indonesian societal history.

How many visitors do you expect?
We can't precisely gauge our annual visitation, but we've been very happy with the constant media coverage and buzz throughout the months before the opening, especially after the two First Sight preview events held in August and September. And to cater to both local and international visitors, all our guides are presented in both Bahasa Indonesia and English.

How are you using technology?
While education is a defining mission of the museum, we are focusing on human interactions to guide visitors when visiting

A series of events is being held ahead of the official opening to kickstart the conversation between artists and the public

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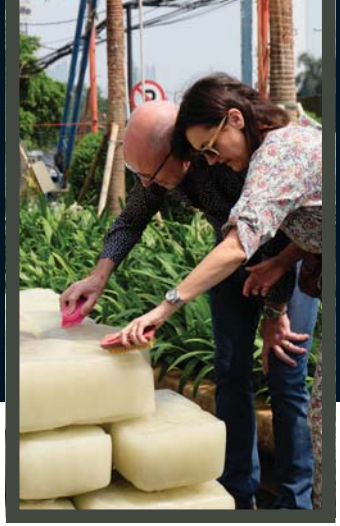


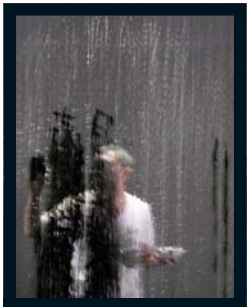
Tisna Sanjaya at work; Visitors take part in Yin Xiuzhen's outdoor installation (right)

▶ the exhibitions and events. We have a comprehensive range of guides, including one dedicated for children, to help put the exhibitions and events into context.

What was the budget of the museum?
We're not currently sharing details about the budget for the new museum. The design and construction of our new museum building has been fully funded. The museum will be seeking additional support for MACAN's operations, programming and endowment to ensure the museum's stability and growth into the future.

What is the status of Indonesia's contemporary art scene?
When we look at the history of art in Indonesia, the relationship between artist studio, critical discourse and marketplace have been intertwined. What our inaugural exhibition – Art Turns. World Turns. – illustrates is the important role that artistic discourse has had alongside the political, especially during the struggles for independence in the mid-20th century, which establishes so much of the subsequent art history dialogue. Now, however, the current external observation of the Indonesian scene is probably skewed towards the marketplace – Indonesia has gone through an impressive boom. Artists and collectors are highly visible.

Having said all this, even though Indonesia has great artists and collectors and a strong scene, it has lacked infrastructure and this is where we see Museum MACAN playing an important role.



MACAN will display art by FX Harsono, one of Indonesia's leading visual artists,

THE MUSEUM WANTS TO ENCOURAGE ARTISTS' CONCEPTUAL DEVELOPMENT FROM WHEN THEY ARE YOUNG TO WHEN THEY ARE ESTABLISHED

How will MACAN champion the country's artists?
Museum MACAN is an international museum, which has its base in Indonesia, representing the best of global and national artists. We are keen to support Indonesian artists through collecting their work, creating exhibitions, and also through providing discussions and context for them to see their activities within broader international conversations.

The museum will also publish, commission and share information through our international networks. This is an important responsibility that the museum wants to take up, with the support of the greater art ecosystem here, to further encourage artists' conceptual development from when they are young to when they are established, and to assist in expanding artists' peer networks through connections with other artists around the globe.

Why was it important to include international artists?
The importance is reflected in Art Turns. World Turns. The exhibition explores 178 years of dialogue between Indonesia and the rest of the world. As co-curator Charles Esche says: "Audiences can discover both common interests and individual ideas by artists who have made a strong and lasting impact on the history of art and culture over the decades."

We also live in a world where our conversations and interactions are global – including international artists as a reflection of our international outlook.

How do you imagine developing the museum going into the future?
With our main programmes to promote art education and foster long-term exchanges with the international art world, we hope to develop appreciation for art in Indonesia, provide a platform for Indonesian art in the international level, as well as growing a professional environment and human resources for art in Indonesia. ●

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TEN OUT OF TEN

A historic planetarium in Canada is set to become the first to offer visitors a super-high 10K resolution experience. We found out more

Alice Davis, managing editor, Attractions Management

Edmonton's Telus World of Science in Alberta, Canada, is about to enter the next phase of its Aurora Project – the year-long construction of a new planetarium theatre with higher screen resolution than any other planetarium in the world.

The renamed Zeidler Dome Theatre – formerly the Margaret Zeidler Star Theatre – includes a projector and screens capable of 10K resolution, more than double that currently offered by IMAX cinemas and more than the ultra-HD standard of 8K.

"With this new 10K resolution video projection system, the stars that we can project, the images will be incredibly sharp, highly detailed, and it will make you feel like you're right there," says Frank Florian, director of planetarium and space sciences at Telus World of Science.

We asked Florian to tell us more about the exciting project.

Can you describe what the new planetarium will be like?

It will be a re-visioning of the planetarium, taking it into the 21st century. While the old star projector was a cool projector and created nice-looking star fields, this new planetarium will showcase a state-of-the-art digital dome planetarium. It's got a Star Trek holodeck feel.

The audience will be transported through the use of high-resolution immersive visuals and a surround soundscape to any place possible. We can showcase the aurora borealis as it would have appeared the night before, or take the audience to deepest parts of the ocean or to the very distant places in our universe. It's the next best thing to being there and seeing it firsthand.

The heart of the projection system is Sky-Skan software, DigitalSky and Dark Matter, which drives the visuals on the hemispherical screen. The software is capable of displaying all astronomical objects to a high degree of realism, all in real time, so we can fly visitors over the surface of our Earth, through our solar system, into our Milky Way galaxy and beyond.

In addition to the astronomical tools, the software is capable of showing full-dome videos, like the current Canada 150 show *Horizon*, or pre-rendered shows by global producers.

Frank Florian is the director of planetarium and space sciences

How much is it costing?

It's around the CA$4m mark. The planetarium component – equipment, new dome, infrastructure work, etc – comes to about that much out of the CA$7m allocated for the planetarium and space gallery renewal.

Is it a brand new or upgrade facility?

It will be a completely refurbished and upgraded theatre. The theatre will undergo a complete facelift from the look and feel of the current planetarium. It will have a new projection screen – Astro-Tec Manufacturing's Ulteria, one of the best on the market – as well as new chairs, carpets, a new entrance and interactive experience, new audio system, new 10K video projection system, new theatre lighting, new software from Sky-Skan, called Dark Matter, and a new central stage. The space will look completely different.

How many seats will it have?

Around 220 to 250.

What size is the dome and who is providing the screens?

Astro-Tec Manufacturing is providing the new screen for their existing dome structure. It will remain a 23-metre-diameter dome, but the panels will be the new Ulteria dome ▶

The illustration provides an overview of the planetarium and science centre

 ©CYBERTREK 2017

The planetarium is being renamed the Zeidler Dome Theatre and the screen resolution will be 10K, a first for theatres

The stairs to the Starlight Room, a private event space (above); and renderings showing further plans for the Telus Aurora Project

► panels that are placed flush to each other, providing a superior projection surface.

Who is supplying the media software/hardware?

Sky-Skan is providing the audio and video equipment. We'll be using 12 Sony 4K VPL-GTZ270 laser phosphor projectors to give us an overall resolution on the dome of 4K. Sky-Skan's Digital Sky and Dark Matter software will run all the visuals on the dome using very high-end computers to run the imagery. Their software is capable of displaying up to 12K resolution.

What makes it different from other planetariums?

Every planetarium in the world is a little different from each other. Some theatres have unidirectional raked seating with a tilted dome while others are omnidirectional, circular seating, with a flat dome like ours. In Canada, our theatre will remain the largest flat dome theatre with a 10K projected image. Other planetariums in Canada are primarily 4K resolution across the dome, in either tilted or flat dome configuration. The high-resolution imagery is one of the major differences that we'll have over other planetariums – but that has the potential to change rather quickly.

It's a first for 10K resolution in a planetarium – what are the challenges involved with that?

There's a lot to consider. The Sky-Skan software is capable of displaying up to 12K resolution at its highest. With our 10K projector configuration, this will give us very nice star fields for the live astronomy shows, as we are not purchasing an expensive optical-mechanical star projector to illustrate the night sky. So this will give us the best digital star field available at this time. The highest resolution for a pre-recorded planetarium show is 8K and the production of an 8K show or a future 10K show requires a lot of computer rendering time from the developers of the show. So the 8K or higher resolution shows are more expensive and time consuming to produce, but the end result is spectacular.

As for playback, all 12 projectors have to be edge blended together to give a seamless image on the dome. This is a bit tricky and is something that Sky-Skan will put in extra effort to do properly, especially with a 10K projection system. With a multiple projection system like this, there is always the chance that a projector could fail on us, so it will be important to have a spare on hand to replace a faulty projector. We don't want to lose any shows due to a projector or computer failure.

How many visitors will the planetarium have each year?

It's anticipated that our numbers will increase for this new experience. As our theatre will be part of our general admission, we anticipate the new theatre

The old Space Place will be replaced by S.P.A.C.E (Stars, Planets, Astronauts, Comets, Etc.), a new astronomy gallery exploring our solar system

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WE'RE PLANNING LIVE MUSIC PERFORMANCES USING THE FULL-DOME VIDEO PROJECTION AND LASER LIGHT SHOW SYSTEMS. AND WEDDINGS AND SLEEPOVERS CAN TAKE PLACE UNDER THE DOME, WITH VISUALS OF ANY KIND

FURTHER PLANS

TELUS WORLD OF SCIENCE

Unveiled in February last year, the wider CA$40m redevelopment of the Telus World of Science (TWOSE) – dubbed the Aurora Project – was conceptualised by Canadian architects Dialog Design, with US-based firm Jeff Kennedy Associates handling exhibition design.

PORTAL TO THE ARCTIC

The expansion includes a 10,000sq ft (9,300sqm) gallery based on Canada's Arctic and polar regions, allowing TWOSE to help lead the conversation about Arctic science. Interactive exhibits and activities will engage guests with the latest arctic research and educate them about climate challenges.

NORTH WING SCIENCE GALLERIES

A new health-science gallery will highlight the health science, wellness and medical research being carried out in Edmonton. Additionally, the lobby will gain a retail store and will double in size, with an exterior garden space and entrance way leading to it.

NATURE EXCHANGE GALLERY

The Nature Exchange gallery promotes the wildlife found in Alberta's backyard and teaches visitors to observe live animals and their environment.

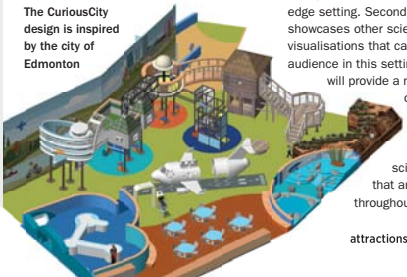
CURIOUSCITY

An early learning zone, CuriousCity will encourage exploration and independence among the attraction's youngest visitors.

will lead to greater visitation to our entire facility with almost all visitors attending at least one planetarium show. So our planetarium could see upwards of 400,000 people see a show in a year.

What special programming will you offer?

In addition to the star/night sky shows and pre-recorded full-dome shows, we're looking at some special programming. This would include special lectures on science topics using the projection technology to show the audience the latest scientific data on a particular topic. We're planning live music performances in the theatre using the full-dome video projection system and laser light show system to add a backdrop of stunning visuals. There will be live theatre performances, again using the full-dome video projection system to create the sets for the performance and doing theatre in the round. Weddings can take place under the dome, with visuals of any kind transporting the audience to the surface of the moon or the inside of a cathedral. We're planning sleepover programmes, where participants sleep under the stars in the theatre, and laser light shows, which will be performed to old classics or today's new music.



The CuriousCity design is inspired by the city of Edmonton

What is the function of the SPACE gallery and how does it relate to the planetarium?

The SPACE gallery offers a way for visitors to explore astronomy and the related space sciences using a more hands-on approach than is possible inside the planetarium. It will offer actual artefacts like meteorites, a moon rock, spacecraft components, telescopes and a terrella to tell the story of the human quest to understand our place in the Universe. As such, the gallery plays a complementary role to the programming in the planetarium and our public observatory.

How does the planetarium experience relate/connect to the wider aims of the science centre?

The planetarium was an integral part to the Edmonton Space Sciences Centre when it opened in 1984 and a successor to Canada's first planetarium, the Queen Elizabeth Planetarium, which opened here in Coronation Park in 1960.

The Zeidler Dome Theatre planetarium foremost continues the role of offering the citizens of Edmonton and Canada – and visitors to Edmonton and Canada – the opportunity to explore astronomy and the space sciences in a unique, cutting-edge setting. Secondly, it tackles and showcases other sciences using science visualisations that can immerse an audience in this setting. This planetarium will provide a new way of presenting developments in the sciences and will complement the many other areas of science and technology that are explored throughout our facility. ●

LIGHTS, CAMERA, INTERACTION!

Visitors are demanding evermore participatory attractions. In response, museums are evolving from passive experiences to immersive, interactive adventures

Yuri Sunahara and Debra Everett-Lane, ESI Design

After debating the pros and cons of new legislation that would restrict immigration to the US, a 17-year-old stands at a podium in front of 99 fellow students to defend her position. Then they cast their votes on the proposed law.

This kind of scene unfolds daily at the Edward M Kennedy Institute for the United States Senate, where visitors don't just learn about senators, they *are* senators. One hundred visitors at a time can roleplay a senator for a day in a live-action simulation called the Senate Immersion Module (SIM). It's a perfect illustration of how museums and institutions are evolving from passive exhibits to immersive, interactive adventures.

The museum world has undergone dramatic shifts in recent years, reflecting larger societal changes in how we interact with one another, driven in part by new technologies. For centuries, curators would gather artefacts and artworks to present in museums with a single-voiced authoritative narrative. Visitors simply walked through the exhibits, learning passively. But now audiences want participation, personal relevance and social interaction, and museums have been reinventing themselves to meet these new expectations.

First-person narratives

ESI Design founder Edwin Schlossberg was hired 40 years ago to reimagine the Brooklyn Children's Museum as a collection of participatory experiences, where kids could discover the relationship between themselves and the natural world.

The number of interactive museum exhibits has increased exponentially since then. Thanks to ever-improving technology and a wave of forward-thinking designers within the attractions industry, museums are now creating more robust content that's not only participatory, but also tells stories from different perspectives.

An example of such multi-voiced storytelling is Louisiana's Whitney Plantation, a museum where slavery is the central focus, which lets guests choose from a dozen walking tours presented from the dramatically different perspectives of the plantation's enslaved people. Similarly, we designed exhibits for The Peopling of America Center at the Ellis Island National Museum of Immigration, which allow visitors to choose from a variety of videos of real immigrants sharing their first-hand

Students roleplay political debates in a live simulation experience at Edward M Kennedy Institute for the US Senate

PHOTO: ESI DESIGN

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Dream Cube at Shanghai Expo (above) displayed 80,000 visitor photos; Whitney Plantation's muli-voiced walking tours present multiple stories

PHOTOS: ISTOCK

Participation once amounted to visitors performing an activity dictated by the museum, but now visitors can often contribute to an exhibit's actual content

accounts of arriving and living in the US, reminding visitors that people come to this country for many different reasons and face many different challenges.

Such first-person narratives offer an added benefit: putting visitors in other people's shoes sparks empathy, helping them gain an intimate understanding of experiences much different from their own. This is something that more and more museums are making part of their mission.

As they continue to push the boundaries of participation, museums are taking advantage of social media and other digital platforms to invite visitors not only to interact with their exhibits, but also to collaborate on them, contributing their own perspectives to the stories being presented. Whereas participation once amounted only to visitors playing a game or performing an activity according to specific instructions dictated by the institution, visitors can now often contribute to an exhibit's actual content.

Crowd-sourced content

Sometimes visitors are invited to contribute – through an online photo competition, for example – helping to create a genuinely community-driven experience. There are many ways exhibits can invite contribution during or after a visit to better engage the audience and keep the content fresh, giving visitors deeper involvement and a sense of ownership. The SIM at Edward M Kennedy Institute has an open software developer kit (SDK), which allows local schools and colleges to create new topics or modules for the Senate chamber to debate.

Another example of this kind of co-created experience is the Museum of Broken Relationships, an entirely crowd-sourced collection of first-person narratives recounting, yes, broken relationships. While anyone can share their story online, the museum also has two physical locations – one in Croatia and the other in Los Angeles, California – where contributors can send material mementos of lost loves, family members, homelands or any other person or group from which they've been severed.

Even more conventional institutions are discovering the rewards of crowd-sourcing. The Smithsonian's new National Museum of African American History amassed its collection by inviting the public to contribute family heirlooms and artefacts. Along with enhancing audience ▶

PHOTO: ALAN KARCHMER

PHOTO: ANDREW KELLY / INSIDER IMAGES

The National Museum of African American History asked the public to contribute artefacts; the Maker Space (right) at New York Hall of Science

engagement by involving the public in the museum's creation, the immediacy of the personal stories of the objects on display powerfully reinforces empathy for visitors.

Institutions that solicit public contributions need to be strategic, ensuring that crowd-sourced content is appropriate as well as factually accurate. A few tips for museums: provide explicit instructions and criteria on what you are seeking; partner with specific organisations whose networks are likely to have appropriate contributions rather than wide-open calls for submissions; and set up a system for monitoring content as it comes by using a combination of technology and moderators.

Multi-layered experiences

Another growing trend is multi-layered experiences. It's a given that every museum visitor arrives with their own interests and expectations: they might be explorers who want to sample every exhibit, or experts who want to dig down into one subject; some are spiritual wanderers looking to soak up the vibe, while others seek a social experience to share with family and friends.

To accommodate them, museums are designing exhibits that allow the same content to be experienced in different ways – an effective, low-cost method of appealing to a broad spectrum of interests while also offering a richer experience for each individual. A novel approach to this is Museum Hack, which has helped museums throughout the US reactivate existing exhibits without renovating them, by inventing playful, quirky tours or scavenger hunts as a new way to explore them.

The American Museum of Natural History has used short, easy games to enliven its dinosaur exhibit, broadening its appeal to kids. Examples include Dinoccupation, where players learn about a particular dinosaur's behaviour and diet and then imagine which modern occupation it might be best suited for, and Photo Tag, in which players snap photos of different dinosaur parts to learn about comparative anatomy.

All of these new directions contribute to one final trend we see transforming museums. Many institutions are recognising that they can expand their audiences by positioning themselves as community hubs that offer much more than just exhibits. Today's museums are reinforcing ties with the public through workshops, performing arts events, sleepovers, and other activities that establish them as social spaces. At the New York Hall of Science, Maker Space workshops invite families to tinker, design and create together, while many museums, such as the Brooklyn Museum of Art, now host regular dance parties, musical concerts and lunchtime conversations.

Appropriate strategies

Of course, all of these innovations, while effective at bringing in patrons, come with challenges. It's important not to try doing too much, especially when it comes to technology. VR can enhance an exhibit if it works with the existing narrative. Large, immersive digital displays can make some spaces more dynamic. But

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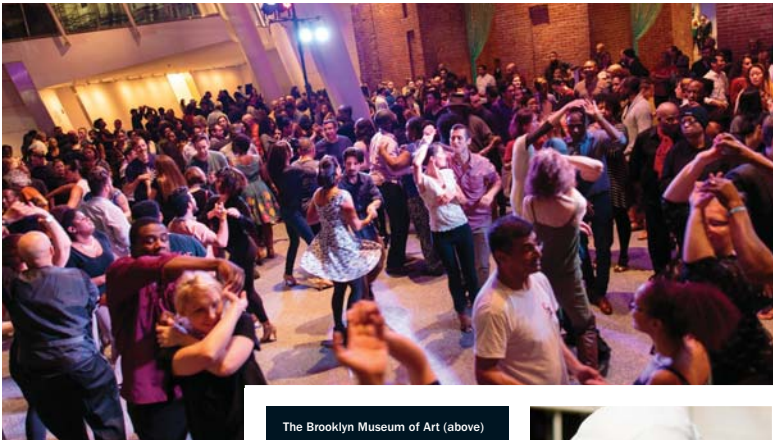

PHOTO: KOU MINGZE

The Brooklyn Museum of Art (above) hosts social events like this salsa party; Museum Hack puts visitor engagement at the centre of its tours

PHOTO: WINSTON STRUNE

Many institutions are recognising that they can expand their audiences by positioning themselves as community hubs that offer much more than just exhibits

making considered decisions about what technology to use is crucial to strategy.

Understanding how the audience experiences the physical space will help to determine the scale and nature of the content to be displayed. Technology also comes with risks: external data feeds can go down, hardware can fail and equipment can become obsolete. Strategise and prepare for various circumstances and use cases. Ask yourself if you have the resources to handle the extra effort required to operate and maintain new tech-centred experiences and exhibits.

It can seem daunting to keep up with all these changes, and even harder to gauge which ones will best serve any given institution. While most museums now strive to be more interactive and participatory, it's important to understand what methods are most appropriate to the context. Crowd-sourcing works better with an American history exhibit than a display of Renaissance art. Games that involve deeper focus and time might be better for teens and adults, while shorter games may be better for families with young children.

One basic tenet holds true for all innovations. Your first consideration should always be the story you're telling. Before incorporating any new trend, think about what you want visitors to take away from it. Remember that museums are storytellers whose goal is to enlighten and entertain. The best exhibits make visitors excited to learn something new and inspire them to continue their journey of discovery. ●

Yuri Sunahara, director of creative technology, and Debra Everett-Lane, director of content and activity design, are colleagues at ESI Design, a New York City-based design firm which specialises in transforming places into experiences that engage audiences, solve complex challenges, and deliver lasting results. ESI Design has worked on Brooklyn Children's Museum, the Statue of Liberty-Ellis Island Foundation and the Edward M Kennedy Institute for the US Senate.

California Institute of the Arts in Valencia, California, hosted the gathering of themed entertainment professionals

BEYOND THE SCREEN

This year's SATE conference in Los Angeles looked at how the attractions industry is harnessing film and gaming techniques and technologies to create evermore immersive experiences. Christine Kerr filed this report

Beyond the screen: the future of immersive realities was the theme of the Themed Entertainment Association's (TEA) SATE 2017 conference, which was held in early October at the California Institute for the Arts in Valencia, California. It focused on storytelling devices originally developed for film, television and gaming and on the impact they are having on experiences across many categories, from theme parks to traditional theatre to museum exhibits and more.

As expected, there was much discussion about media, lighting, audio, AR and VR – all of them part of the toolkit available to creators of immersive experiences. The basics weren't forgotten, however. There was a real exploration of the importance of immersion based on people interacting with people, that this interaction is fundamental to creating emotional connections, and the increasing importance of such connections. There was also an emphasis on the pure art of themed entertainment and the attention to detail in built environments that is required and appreciated by today's increasingly sophisticated audiences.

The SATE co-chairs – Chris Conte (Electrosonic), Dina Benadon (Super 78) and Christian Kubsch (Walt Disney Imagineering) – along with Storytelling chair Paul Osterhout (Universal Creative), Architecture chair Louis Allen (Adirondack Scenic) and Technology chair Cory Rosen (Tippett Studio) all brought a variety of perspectives to the conference theme and this was reflected in the wide-ranging presentations.

A conference attendee takes a picture at SATE (Storytelling + Architecture + Technology = Experience)

Create our own story

Danny Byerly of On Track Themes started things off with a challenge for attendees: do they consider theme park design an art form that should be taken as seriously as theatre, painting or the movies? He went on to say that true immersion is far more than projection mapping, wraparound monitors and 4D theatres. Immersion is storytelling in every detail possible. It is multi-layered and physical. It's how guests move through the space emotionally and physically. Storytelling is also the driving force in design, story, budget, schedule and production and he reminded the attendees that they must be a steward for the design when pragmatic decisions are made.

Byerly returned to the idea of immersion as a catalyst for transformation, and suggested that while theming says "here I am, listen to my story", true immersion says "here you are, create your own story". Immersive environments transform the stories we tell ourselves and the stories we tell ourselves transform our lives.

He reminded the audience that we have a shared responsibility to touch the lives of every guest that walks into our story. This was a great start to a trend in the conference that took attendees away from any preconceived notion that true immersion requires high-tech solutions.

Immersive theatre

This trend continued with the Future of Immersive Realities presented by David Ruzicka, a writer and director of themed entertainment projects who also works

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Technology chair Cory Rosen (Tippett Studio)

Storytelling chair Paul Osterhout (Universal Creative) and his fellow segment chairs hosted the event

in immersive theatre. Ruzicka took the attendees on a journey that very effectively defined this form of theatre and opened their eyes to the possibilities of its potential for themed entertainment projects.

Immersive theatre brings together an audience and actors in a specific location for a non-traditional theatre experience where often the actors stay in one place and the audience moves – they are immersed in a realistic world where they can lose themselves. Successful immersive theatre projects that appear spontaneous are actually based on clear expectations and rules for the actors and audience, providing a foundation from which creativity and interaction can grow.

This requires performers who can stand alone but also act as stage manager and director at the same time; with this remarkable capacity and range, they can work in groups or have intimate, one-on-one encounters. The audience embraces this type of theatre because it feeds their desire to lose control (but not too much…).

Ruzicka points out that the storytelling approach for immersive theatre projects needs to follow the KISS (Keep it simple, stupid) principle because the audience doesn't know the story and characters very well. So, it is important to rely on pure scenario with not too much backstory, leaving room to respond to the audience.

These types of immersive experiences are epic and intimate at the same time, something that most storytellers strive to create and often fail to deliver. Ultimately, the most critical factor for immersive theatre is that people remember people.

Data-hacked creative

Amy Blackman from Contend Immersive looked at immersion from a different point of view – using analytics about your audience to drive creative, an approach she calls "data-hacked creative". It goes beyond listening to your audience – as with traditional focus groups – to collecting data from their online behaviour and social chatter. This approach allows for precision creative and ultimately involves humans because the data must be interpreted and developed into human experiences.

Blackman insists that the tools available don't undermine the end result: they provide creative teams with extremely focused and efficient ideas, ultimately augmenting the creative development process. This also makes it much

CONFERENCE PHOTOS: MARTIN PALICKA / TEA

From top to bottom: John Zaller from Imagine Exhibitions; Genevieve Angio-Morneau from GSM; Jason McManus from Thinkwell; Michael Jung from Walt Disney Imagineering Live Entertainment; Amy Blackman from Contend Immersive; Danny Byerly from On Track Themes

Below: SATE co-chairs Chris Conte (Electrosonic), Dina Benadon (Super 78) and Christian Kubsch (Walt Disney Imagineering) oversaw proceedings

Many industries are presenting "snackable content" for dwindling attention spans, but that is not the way millennials want to take in content at all

more impactful because it is based on intelligence insights for the core audience. This kind of insight takes creators from the "for who" to the "why" very quickly.

Blackman also talked about the opportunity for erasing the lines between the real and the virtual to create lasting impact that is relevant for today. It's a creative approach that extends the in-person experience back to the online audience with a quantifiable result and a way to actually quantify ROE (Return On Experience). To further explain the approach, Blackman used an example of a project they were given: to establish the basis for a new Netflix show's brand, including visuals, aesthetics and the start of a campaign. This major opportunity was based on a vague brief from the client for a new show that was simply described as a sci-fi thriller set in the 1980s.

Given that they had such minimal information, they decided to consider the audience first, learning from online behaviour and social chatter to gather data on what they knew. This new way of researching the audience transformed their approach to starting the creative process: the final art and imagery was done by humans (designers) but AI (online research) provided the starting point. The show was the hit Netflix series *Stranger Things*.

Deeper understanding

Travis Preston, dean of the CalArts Theater School, hosted this year's "Conversation with". Michael Jung, creative executive of theatrical development for Walt Disney Imagineering Live Entertainment was the participant. Jung is also an alumnus of and currently on faculty at Cal Arts.

The conversation began with a discussion of the fundamental principles in transforming content from the screen to live experiences. Jung used the incredibly successful production of *The Lion King* on Broadway as an example of how to be faithful to a much-loved animated film by relying on extremely different tools to create an immersive theatrical experience that is embraced by the fans of the original. The Broadway production understood the heart of the film but dug deeper into the African heritage and the art of puppetry, introducing additional layers of indigenous music over the well-known score and exploring the duality of the performers with their puppets.

The Lion King on Broadway dived deeper into African heritage and music

For Jung, this really speaks to the importance of exploring, researching and learning the backstory. He suggests that Shanghai Disneyland is an excellent example of this, where Disney embedded Chinese artists and theatrical traditions into the shows. The *Tarzan* show demonstrates this very successfully – a re-telling of the story using Chinese acrobats and their acrobatic traditions.

Finally, Preston and Jung explored the idea of true immersion: an experience where you lose yourself, a world where guests or audiences can choose their own level of immersion and their own way of being involved in the story.

Sharing generation

As a millennial himself, Jason McManus of Thinkwell knows a lot about how millennials tell stories. (And reaching this demographic is always of interest for experience creators.) McManus talked about how the speed and way in which we generate and consume media has changed.

The early response to this from many industries was to present "snackable content", small bits of information for

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dwindling attention spans. But it turns out that is not the way millennials want to take in content at all. They are more interested in long-form stories. Evidence of this comes from a variety of sources: binge-watching on Netflix, the fact that millennials love documentaries and games like Minecraft where they connect with a community of players around the world.

Millennials are the "sharing generation", says McManus. They want to talk about it and they appreciate that humans are natural storytellers, passing information from generation to generation in the form of stories. McManus pointed out that the attraction experience is shared with family and friends, including the social tree that comes with each person on their phone. The fact that they are not all there in person does not matter to this generation. Millennials want control of the story and this represents genuine immersion. His advice is to continue to tell a good story. Millennials will embrace this approach because they value memories and experiences and they will share these with the world.

Screen to exhibition

Both Genevieve Angio-Morneau (GSM Project) and John Zaller (Imagine Exhibitions) explored immersion in museums, taking blockbuster movie and television IPs and presenting a familiar story supported by layers of scientific, historical or archeological context. The resulting exhibits are large-scale, truly immersive and boundary-breaking for the right institution. They include layers of technology and media but also integrate giant dinosaurs (Jurassic World: The Exhibition) or authentic props and costumes and sets (Downton Abbey: The Exhibition, Star Wars Identities, Indiana Jones and the Adventure of Archeology) as context for educational content. The authenticity of the experiences is truly immersive.

PHOTOS: HOME BOX OFFICE

A panel discussed whether we are on the road to theme park experiences similar to HBO's *Westworld* series

Super 78's Robert Coker (left) and Brent Young explore the premise of *Westworld*

Waiting for Westworld

One of the final sessions of the conference was moderated by Brent Young and Robert Coker of Super 78 and explored the premise of *Westworld* (both the original film and the current HBO series). They asked the question: "Are we on the path to a *Westworld*?"

Bringing together a panel of industry leaders, each played an expert in one of the various disciplines required to create and manage an amusement park intended for rich vacationers, who are looked after by robot hosts and allowed to live out their fantasies through artificial consciousness. After a fascinating exploration of the technological, storytelling and control requirements to achieve what is portrayed in both versions of *Westworld*, the conclusion was unanimous – we are moving in this direction. But don't be fooled by Siri and Alexa; perhaps thankfully, we are still decades away and need to invent a lot more before we get there.

Conference attendees were polled over the two days, asked to identify their favourite immersive experience. The result was a tie: Diagon Alley (Wizarding World of Harry Potter, Universal Studios Florida) and *Sleep No More* (Punchdrunk, McKittrick Hotel, New York). What do they have in common? They effectively take guests somewhere else, transport them mentally, emotionally and physically to a place outside the usual, normal or everyday.

Diagon Alley is a beautiful physical space where guests can explore details and discover surprises whether they are familiar with the Harry Potter stories or not. They can visit multiple times and find something new. *Sleep No More* tells Shakespeare's classic tragedy *Macbeth* through a darkly cinematic lens, where audiences move freely through the epic story, creating their own journeys in a film noir world. It is a different theatrical experience every time. They are both immersive, authentic, human experiences and they both truly reflect the art of themed entertainment. ●

ABOUT THE AUTHOR

Christine Kerr is vice president at BaAM Productions and a former president of the TEA.

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IAAPA ATTRACTIONS EXPO

The 2017 IAAPA Attractions Expo kicks off on 13 November. Here's what to expect from the show - plus, news from a selection of visitors

The 2017 edition of the IAAPA Attractions Expo, the biggest event of its kind, is promising to be better than ever, with the global organisation set to celebrate its 100th year in 2018.

The expo is the world's largest conference and trade show for the $39bn attractions industry. Alongside its vast show floor, IAAPA offers a programme of more than 100 educational sessions and presentations by leading operators on industry trends, new technology, marketing and communications, entertainment, government relations, safety and security, food and beverage, games and merchandise, facility operations, human resources, and more.

This year's keynote speaker is Merlin Entertainments CEO Nick Varney, who will talk at the GM and Owners' Breakfast on 15 November. The conference takes place from 13 to 17 November and the trade show from 14 to 17 November at the Orange County Convention Center in Orlando, Florida. Buyers and decision-makers from the world of theme parks, waterparks, FECs, zoos and aquariums, and museums attend the show.

IAAPA 2017 expects to welcome 32,000 attendees and 1,100 exhibitors across the 560,000sq ft of trade show floor.

NEED TO KNOW

What: IAAPA Attractions Expo 2017

When: 13-17 November 2017

Where: Orange County Convention Center, Orlando, Florida

How much: $50 - student; $209 - IAAPA member; $395 - non-member

Register: www.iaapa.org/expos

EXHIBITOR NEWS

ANVIO

Booth #3381

Anvio VR is demoing a new multi-player, free-roam, body-tracking virtual reality midway attraction system. Anvio opened its first attraction with its launch game, the multi-player zombie shooter *City Z*, in Moscow, Russia, this April. At IAAPA, Anvio is presenting its systems, *City Z* and footage of its upcoming game release. The company is looking for partners to roll out the product in new locations.

Learn about Anvio's zombie shooter VR game at IAAPA

SALLY

Booth #2267

Sally Corp, which is celebrating its 40th birthday at IAAPA this year, will be on hand to discuss turnkey dark ride attractions with parks and entertainment facilities. Sally has new dark rides based on two of today's most popular franchises, The Walking Dead and Five Nights At Freddy's. In addition to IP-centred products, Sally's dark ride selection includes rides of all sizes and themes, including Power Blast, Challenge of Tutankhamon, Ghost Blasters, Scream in the Dark, Forbidden Island and Zombie Apocalypse.

IPLAYCO

Booth #4837

International Play Company (IPlayCo) is sharing the news that it has acquired the intellectual property rights to the Play Mart brand in Europe. This gives the company the ability to increase its market by adding Play Mart's complementary designs to its offer and allows the company's operations to function on a regional basis, with the North American, Asia-Pacific and EMEA teams supplying customers across continents.

GARNER HOLT

Booth #771

Animatronics technology has always been about making dimensional mechanical creations look like living beings. Garner Holt Productions has been pursuing the art of animatronics for 40 years,

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and has recently premiered its Living Faces of History series of expressive human characters. The animatronics feature faces with 40-plus individual motions capable of hundreds of unique combinations, making them truly expressive. See them in action at the Garner Holt booth.

OPENAIRE

Booth #1844

Visit the OpenAire booth to find out about the company's wide range of retractable enclosures, including the record-breaking indoor waterpark project at Epic Waters in Grand Prairie, Texas. Epic Waters covers 80,000sq ft and includes a 62,000sq ft retractable roof enclosure. The enclosure was unveiled to the public at a recent event where the Mayor of Grand Prairie opened the roof's 40 operable panels for the first time with the flip of a switch.

NICEBERG

Booth #1873

At IAAPA, find out about Niceberg Studios' latest film, *Moonthunder 5D*, which is now available for the US market and can be found on Triotech, Simex-Iwerks and Doron Precision platforms. And, from the makers of the popular ride film *Wall of China*, comes *Great Wall VR 360°*. *Great Wall VR 360°* is partnered with leading VR ride manufacturers including DOF Robotics, Fulldome Pro, and Innosimulation. There is also a new five-minute ride version of *Space Panda 4D*.

ADG

Booth #2646

Aquatic Development Group (ADG) is exhibiting at IAAPA 2017 and sharing the news of its recent Leading Edge Award. The World Waterpark Association (WWA) recognised ADG for its innovative take on the traditional wave pool, Twin Tides. Twin Tides is a dual-entry wave pool that employs a wave system configuration that creates continuous wave action across the pool, doubling capacity. ADG has installed several Twin Tides experiences across the US. To find out more, visit ADG's booth.

PICSOLVE

Booth #4850

Picsolve International is evolving. The attraction photography specialist's new, industry-leading, digital content platform is being unveiled exclusively at IAPPA 2017. Be sure to visit the Picsolve booth to discover how this game-changing approach to creating, collating and sharing photo and video moments can transform your consumer experience.

POLIN

Booth #1378

Polin Waterparks and its game technologies division is presenting a range of new experiences at its biggest ever IAAPA booth. Attendees can learn about Slide n Score, a game controller that allows waterpark guests to take on a target-shooting challenge on their way down a slide. They can also learn about the first VR waterslide, Splash VR. The first installation is at Land of Legends in Turkey, and allows an operator to deploy a VR experience on an existing slide. Polin is also showcasing the different functions of its Splashware System that launched last year and an all-new slide concept called Mantis.

Picsolve is unveiling a new digital content platform

Polin Waterparks is presenting a new water experience, Splash VR

TAA

Booth #2065

Theming and Animatronics Industries (TAA) is going comics. At the planned Warner Bros World park in Abu Dhabi, TAA is working with Bugs Bunny and the rest of the bunch to bring fun to the kids. TAA also recently reached for the stars and beyond – at Movie Park, Germany, with the new Star Trek attraction. At Disneyland Paris, TAA oversaw the retheming of the Star Wars attraction. Visit the booth to learn more.

BROGENT

Booth #5815

Brogent Technologies is launching Q-Ride, set to simulate an ocean journey and instil "surprise, exhilaration, and wonder" in park guests. Brogent Q-Ride takes guests on an ultra-realistic ocean VR adventure, taking a flight out over the water to be suddenly lowered into the sea, immersed underwater. Fish, dolphins, manta rays and whales appear all around as the ride takes guests through kelp forest and underwater caves. Q-Ride is a visual and emotional experience, travelling amongst marine spectacles offering tantalising thrills and surprises.

Attendees can watch 4D theatre film *Son of Bigfoot* at nWave's booth

NWAVE

Booth #1066

At IAAPA, nWave is presenting *Son of Bigfoot 4D*. Follow Adam Harrison on his wild adventure to find his father, Bigfoot. In *Return to the Lost World*, watch out for ferocious dinosaurs as an expedition returns to a familiar island. Show attendees are invited to stop by the booth for an exclusive preview of these exciting attraction films.

BRUNSWICK

Booth #2206

Brunswick Bowling is promoting Epicenter, a way to bring authentic bowling to spaces with a smaller footprint. It is an all-in-one solution that appeals to all demographics, making it popular with restaurants, hotels, cinemas, FECs and other venues that might not have room for traditional bowling. Epicenter increases revenues by keeping guests on the property longer and encouraging them to return. ▶

IAAPA Attractions Expo

EXHIBITOR NEWS

Simex-Iwerks is launching a submarine mystery film

GATEWAY

Booth #4854

Gateway Ticketing Systems is showcasing its customer relationship management solution, CRM Plus Powered by Galaxy. CRM Plus combines all the ticket, food and beverage, retail purchasing and usage information from the Galaxy Product Suite with marketing touchpoints to provide a 360° view of guest behaviour. Gateway says CRM Plus empowers customers to deliver "the right experience, at the right time, in the right way to the right people".

SIMEX-IWERKS

Booth #2249

Simex-Iwerks Entertainment has teamed up with Technicolor Animation to co-produce a new 4D theatrical experience, *The Deep: Mystery of the Ancient Amulet*. The film is based on the underwater adventure cartoon series *The Deep*, which is published by Gestalt Comics. Simex-Iwerks has created a 12-minute fully immersive 3D viewing experience, featuring exclusive 3D CG animation, an original storyline and stunning special effects, vibrating seats, water sprays and bubbles.

WATERPLAY

Booth #3675

Waterplay Solutions is debuting Shoreline, an interactive aquatic play experience bursting with seaside discoveries and water effects. Designed for splash pads and aquatic play spaces and inspired by ocean tides, the Shoreline collection includes 19 innovative products and acts as a playful extension of Waterplay's nature-inspired Grasslands collection. A dynamic range of water effects is designed to engage users of all ages and abilities.

LAGOTRONICS

Booth #2043

Having successfully introduced GameChanger and the Farm Fair edition of this interactive rotating dark ride at EAS, Lagotronics Projects is showing these experiences to its US audience in Orlando. Farm Fair is a brand new IP and game designed in a farm theme.

Holovis is unveiling a working model of R3ex

Bermuda Blitz is a recently completed coster by Vekoma

UNLIMITED LEISURE

Booth #1360 / 1560

Unlimited Leisure Group provides unique solutions for leisure developments. Its companies will be represented at IAAPA. The Ticket Experience solves the number one guest complaint by providing a queue-free theme park experience. TapeMyDay automatically films, edits and uploads an irresistible photo and video compilation of the guest's entire stay. Unlimited Snow is the one-stop-shop for all snow and ice leisure experiences. And visit the booth to find out more about HollandWorld, a second gate with attractions, hotels, casino, retail and F&B.

VEKOMA

Booth #5133

Vekoma Rides invites attendees to visit its booth and learn about the newest and latest thrill coaster designs as well as the Family Boomerang Rebound and Suspended Family Coaster. Vekoma's Bermuda Blitz has debuted at Legendia Poland. The coaster is 908 metres in length and stands 40 metres high, combining a variety of ride elements in a compact design. Space Warp at Energylandia is the first of a whole new generation of Vekoma's sitdown thrill coasters. It is the first thrill coaster to be designed using Vekoma's latest track design tools and built using its new track production method with the new MK1101 trains. In 2018, Vekoma will be opening the new Firestorm launch coaster in Vietnam and in China, and three Looping Coasters and four Family Boomerang Rebound in China.

HOLOVIS

Booth #1046

Holovis continues to build on the popularity and success of its new R3ex range of attractions by presenting a full-scale, augmented reality application-based demo of its R3ex Arena Solution. The real-time working model will show four of the R3ex systems in a duelling arena formation. Within this model, 16 riders (four on each R3ex arm) interact with and duel against each other in the virtual world, seeing the real-time cause and effect of their actions. The attraction layout sees the queueline cleverly designed so queuing guests can interact in real-time with the people on the ride.

IDEATTACK

Booth #2843

IDEATTACK, a global leader in the tourism and leisure design industry, has been announced as the exclusive designer, planner, attraction producer and general contractor for Chinese developer Evergrande Group. IDEATTACK will work on up to six Evergrande theme park projects, creating a new theme park brand that is envisioned as a top-quality entertainment destination featuring 33 cutting-edge attractions, from immersive multimedia rides to high-tech theatres. ●

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The British Music Experience has relocated to Liverpool – and received a complete technological update in the process

Josh Miller of DJ Willrich talks tech overhaul at Liverpool's BME

Integration firm DJ Willrich has installed Digital Projection's HIGHlite Laser II projector at the British Music Experience (BME) in Liverpool, UK.

The BME chronicles British music history from 1945 to the present day. It consists of eight zones recounting different eras in British music, using costumes, instruments, performance and memorabilia.

The museum reopened earlier this year after relocating from its previous home in the O2 Arena in London to the historic Cunard Building in Liverpool.

DJ Willrich was enlisted to carry out a complete overhaul of all the content and technology, which had become outdated since its original installation in 2009.

For the main stage show, a stunning life sized projection of Boy George, giving a five-minute custom-produced performance, DJ Willrich selected the HIGHlite Laser II, a specially designed long-life projection solution.

Josh Miller, director of DJ Willrich, says: "The projection technology used for the London BME had become dated. We needed the projected video of Boy George to be bright and punchy – visitors get really close to the display so it had to be stunning from all angles and distances. Digital Projection's HIGHlite Laser II was the best choice to help us achieve this."

The projector is powered by the 7thSense Delta Nano-SDI media server, and is capable of producing over 20,000 hours of illumination. It is designed to deliver a solid-state laser of up to 13,000 lumens and also features edge-blending technology and multi-projector tiling, as well as control management software that allows multiple projectors to be operated through a single system.

Two Digital Projection E-Vision 8500 laser projectors and eight E-Vision Laser 6500 projectors were also installed.

Josh Miller, DJ Willrich

ATTRACTIONS-KIT KEYWORD
DIGITAL PROJECTION

 ©CYBERTREK 2017

Lauren Heath-Jones, products editor, Attractions Management

Visitors feel history with Videofabrika VR experience, says Mikhail Antykov

Russia's Hermitage Museum has partnered with Russian video production company Videofabrika to create a brand new VR experience for visitors.

The VR experience touches on 300 years of Russian history

The Hermitage VR Experience is based on key events in the museum's history, spanning back to the 1700s. It takes place inside a purpose-built cinema, where 20 guests can view the film through Samsung Gear VR head-mounted devices.

Videofabrika collaborated with Russian film studio Super 8 to create the 19-minute film, which stars acclaimed Russian actor Konstantin Khabensky as a mystical time-travelling guide. The guide takes guests on a spectacular journey through centuries of Russian history in the halls of St Petersburg's Hermitage Museum, giving them unrestricted access to areas of the museum, including the roof, that are usually closed to the public.

Mikhail Antykov, interactive creative director at Videofabrika, says: "We're using VR to create a new kind of history lesson which teaches people in an interesting way. We let people feel and be in the history."

Professional film studio Super 8 helped created the footage

Mikhail Antykov, Videofabrika

Antykov adds: "We see a trend that all the museums and attractions are starting to incorporate VR into their programme and we expect this to grow. This is the first step for our re-imagining of the high-end museum experience."

ATTRACTIONS-KIT KEYWORD

VIDEOFABRIKA

Terry Monkton on Simworx' new Mini Flying Theatre

Simworx has expanded its range of media-based dynamic attractions with the launch of the Mini Flying Theatre, an innovative turnkey solution, based on the 360 Flying Theatre.

The Mini Flying Theatre (Mini FT), which makes its official debut at IAAPA in November, features a smaller footprint, with the in-show area measuring approximately 13x13x9 metres (43x43x30 feet) and the ride able to accommodate 20 passengers per cycle.

Designed to simulate the sensation of flying, the Mini FT moves guests backwards and forwards throughout. The ride's movements are synchronised to coincide with the movie playing on the dome screen, while riders' legs are suspended in mid-air to elevate the experience.

It also incorporates a range of in-theatre effects including wind, smoke, water spray and special effects lighting, and is equipped with a HD2K/4K 3D projection system and surround sound audio. Other features include a quarter dome screen, programmable heave and tilt and a custom showreel.

Simworx managing director Terry Monkton says: "The Mini Flying Theatre is an innovative and accessible product that requires far less space than some of our larger attractions."

Monkton adds: "The team has been working non-stop to develop a range of new, cutting-edge experiences and innovative products, including the Mini FT, that we're really excited to bring to market."

The Mini Flying Theatre is suited to operators with a smaller footprint

Terry Monkton, Simworx

Other recent launches from Simworx include the AGV Darkride, the Immersive Adventure Simulator and Paradrop VR, which debuted at EAS in partnership with Frontgrid.

ATTRACTIONS-KIT KEYWORD

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