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المجلس العالمي
WORLD MAJLIS

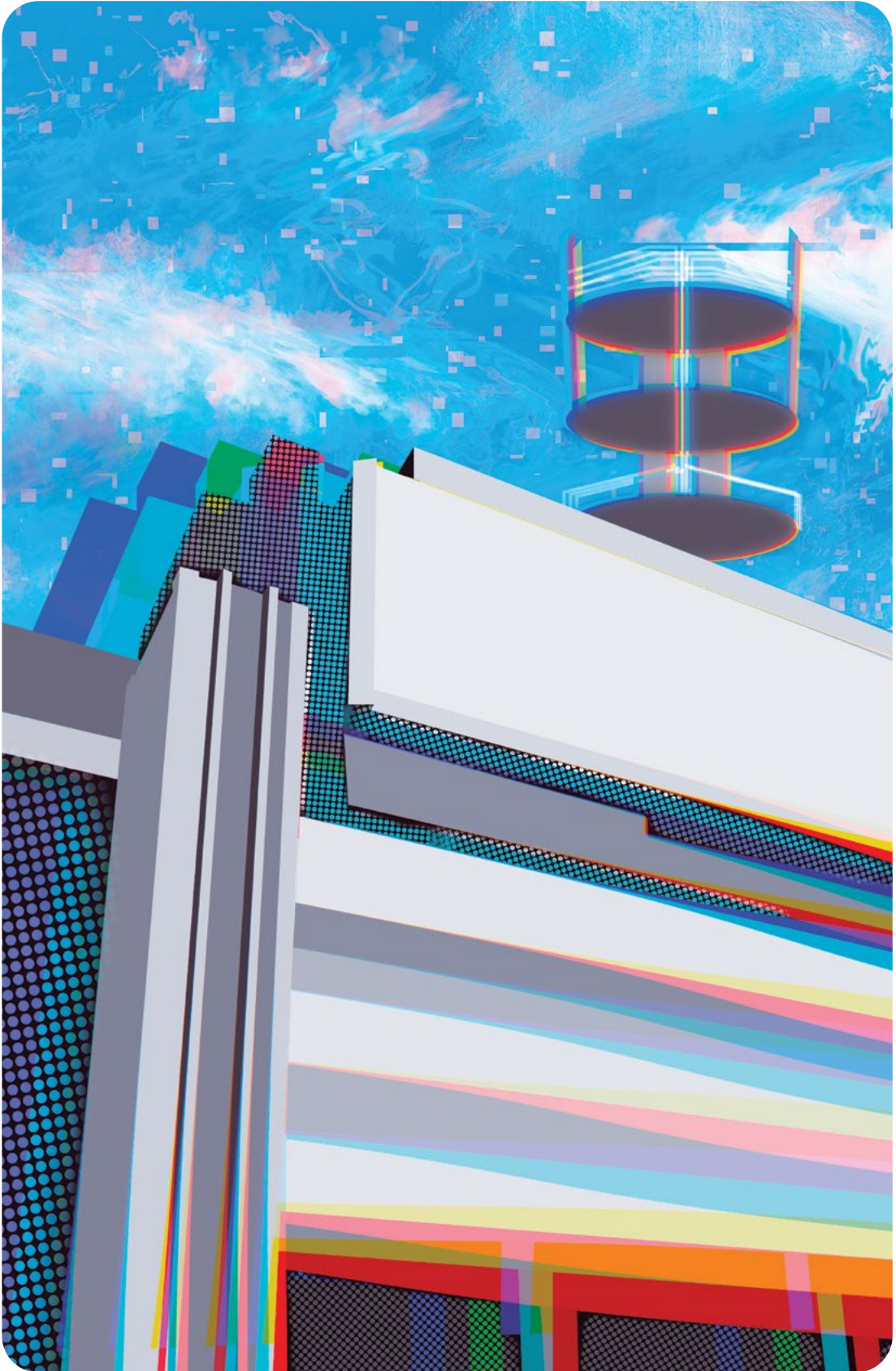
WORLD MAJLIS REPORT

INSIGHTS FROM

TRAVEL AND CONNECTIVITY

9th TO 15th JANUARY 2022

What if the perception of both
time and space changed?



Download the report or watch the full World Majlis session at:
virtualexpodubai.com/about-history/detail/world-majlis

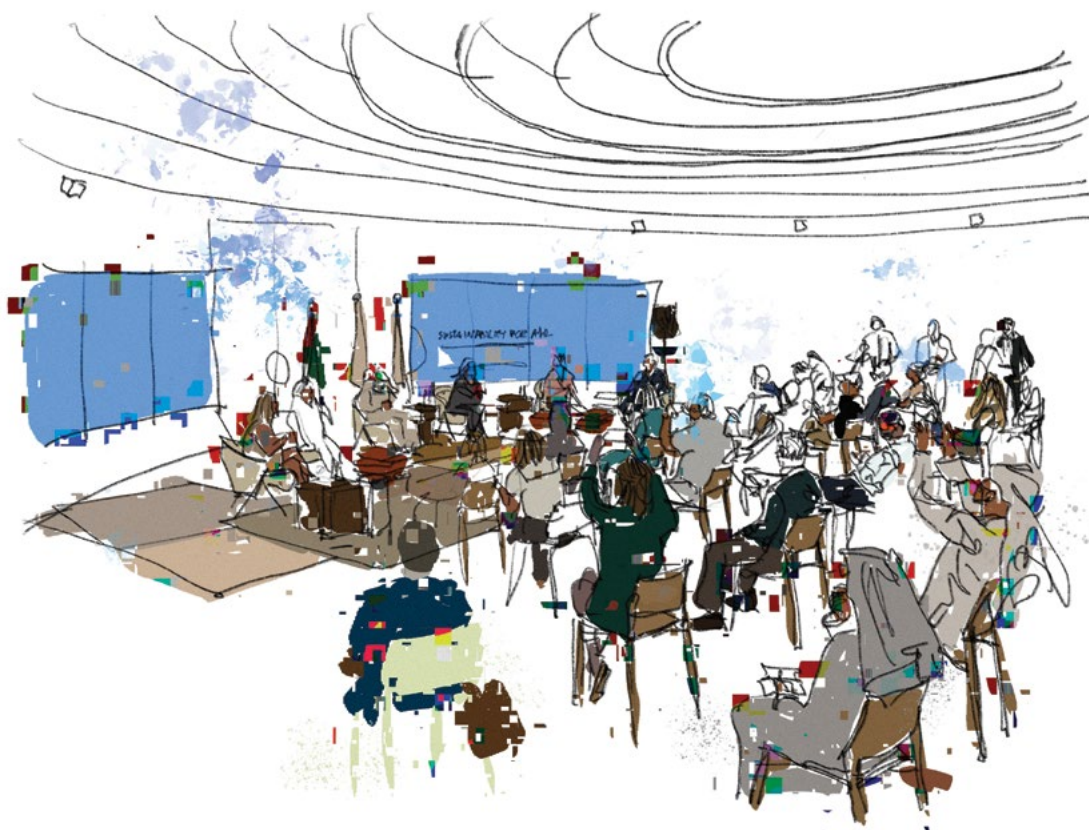
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Deeply rooted in the traditions of the UAE, the majlis is one of the cornerstones of Emirati society, a space that welcomes friends and strangers to share news and ideas.

The Expo 2020 Dubai World Majlis is an inclusive, open and informal conversation space, physical and digital; one that brings together diverse voices from all over the world to reflect on complex challenges for the wellbeing of people and planet.

WELCOME



Between 9th and 15th January 2022, Expo 2020 hosted three World Majlis to explore the theme of Travel and Connectivity through the lenses of digitisation, gender equality and sustainability.

1 All online? Not yet

Closing the Digital Gender Gap

Women's World Majlis- In collaboration with Etisalat

In the least developed countries, men are 52 percent more likely to have access to the internet than women. We are also facing a profound digital skills gap between men and women from the lowest to the highest levels.

2 Digital Twins

Living and thriving with new realities

In collaboration with the UK Pavilion

A new generation of artists and technologists are creating mirror worlds that transcend our natural barriers and time. What opportunities do these technologies bring in city planning, culture and education?

3 Off The Beaten Path

Travel in the 21st Century

In collaboration with India and Portugal Pavilions

How can we use tourism to protect, rather than damage, the planet's natural and cultural heritage? Does tourism need limits?



PARTICIPANTS

All Online? Not Yet

Women's World Majlis:
Closing the Mobility and Digital Gender Gap



Women's Pavilion

Monday, 10th January 2022

Cristina Falcone

Vice President of Public Affairs,
UPS® Europe, Belgium

Asma Shabab

Senior Manager, Innovation
Strategy, Accenture, UAE

Hind Alowais (Moderator)

Senior Vice President of
International Participants for
International Organizations
and Non-Official Participants,
Expo 2020 Dubai, UAE



Digital Twins

Living and thriving with new realities

In collaboration with the UK Pavilion



UK Pavilion

Tuesday, 11th January 2022

Greg Cross
Chief Business Officer,
Soul Machines, New Zealand

Dr Don Mclean
CEO and Founder, Integrated
Environmental Solutions (IES), UK

Dr Urška Starc-Peceny
Chief Innovation Officer, Arctur Ltd.,
Slovenia

Dr Amy Hochadel
Minister of Education,
Panama

Brendan McGetrick
Creative Director of the Museum
of the Future, UAE

Eithne Treanor (Moderator)
Founder & CEO of ETreanor Media

Kurt Maldovan
Digital Delivery Global Solution
Director, Jacobs

Prof Yacine Rezgui
Cardiff University, UK



Off The Beaten Path

Travel in the 21st Century

In collaboration with India and Portugal Pavilions



India Pavilion

Thursday, 13th January 2022

Luís Araújo

President, Turismo de Portugal
(Portuguese National Tourism
Authority), Portugal

Prof Anne Hardy

Associate Professor Cultural
and Heritage Tourism, University
of Tasmania, Australia

Arvind Singh

Indian Administrative Services
Secretary, Ministry of Tourism,
Government of India

Dipak Deva

Managing Director of Travel
Corporation of India Ltd., India

John Pagano

Chief Executive Officer, The Red
Sea Development Company
and AMAALA, KSA

Rogers Valencia

Former Minister of Foreign Trade
and Tourism, Peru

Conchita M. Espino, PhD

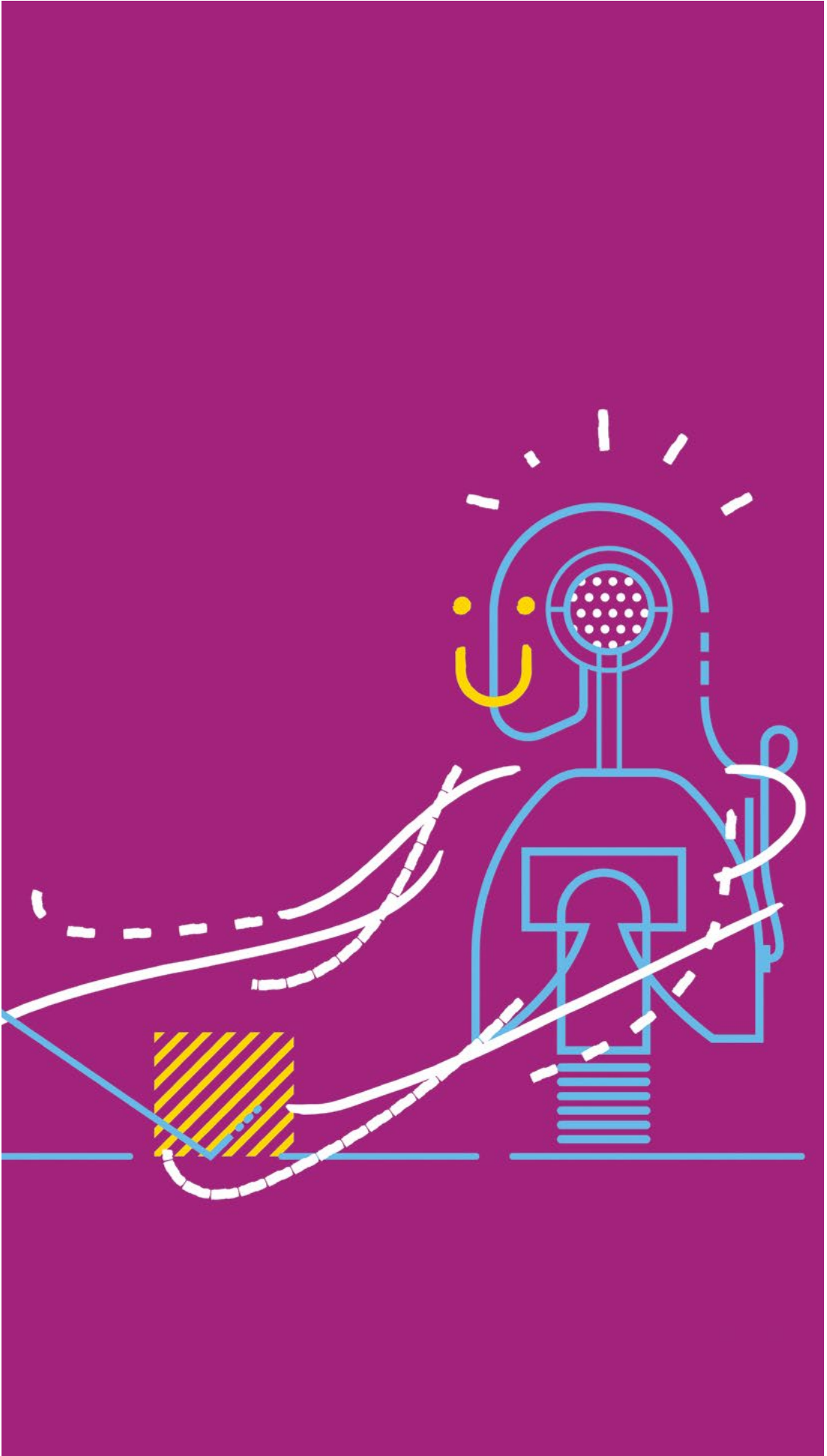
Executive Director, Asociación
Mar a Mar, Costa Rica

Ana Paula Pais

Head of Education, Turismo de
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Saeed Al Saeed (Moderator)

Science and Technology Advisor,
Ministry of Foreign Affairs and
International Cooperation, UAE



PARTICIPANTS

SUGGESTED ACTIONS AND INITIATIVES

For Government

CUSTOMISED SYSTEMS FOR BETTER LOCAL GOVERNANCE

Invest in customised digital platforms that better understand the movement of people and development of the environment in regions, cities and communities. These should use the data most relevant to that context [21, 22]

Pilot the use of digital simulations as part of regional decision-making, focusing how the process is divided responsibly between human and computer roles [31]

Support the same kind of customised work in regions without the skills or capital to kick it off themselves [24, 25]

SUSTAINABLE TOURISM DRIVEN BY LOCAL ENGAGEMENT

Learn from the best tourism education programmes, by understanding the skills and skill gaps in a region, and developing education schemes that respond directly to those [36, 39]

Invest in ongoing monitoring of local agendas and finding ways to match them with tourists with those interests [36, 40]

For Businesses

CUSTOMISED EXPERIENCES FOR ALL

Provide the same smart, customised experiences developed for the corporate directly to the individual and the community [21, 23]

Provide different products for how different people prefer to share their data [31]

DIVERSE PERSPECTIVES IN THE DEVELOPMENT OF TECHNOLOGY

Actively reach out to communities often ignored in the development of a product in order to include them and their needs [24, 25]

USE CONSUMER
CHOICE TO
ENCOURAGE THE
PRODUCTS THAT
BEST SUIT YOU

ADDITIONAL
COMMITMENT
AS PART OF TRAVEL

For Individuals

Develop views on what you prefer to keep private and actively choose products that reflect those views [22, 26]

Get involved in the development of technology by providing feedback or developing your own skills, so that your perspective can guide those products to work for you [22, 26]

Explore seeing travel as an act of exchange between you and a local community: what do you have to offer? Where might be interesting given your hobbies and skills? [39]

**Connecting the ideas from 20
thought leaders from 14 countries
has sparked new lines of inquiry for
future conversations and research.**

How can technologies developed by a small highly skilled workforce be capable to guess what everyone needs?

Will the era of customised experience make it easier for us to avoid those we disagree with and we would have otherwise interacted with along the way? Will this make for a more polarised world?

What are the values of the digital world? How are they determined?

What does it mean to work for a digital company in the digital world? Who sets the rules?

Is the allure of technology dangerous to our human decisionmaking if it encourages us to rely of simulations and calculation rather than judgement?

Does tourism need to stop seeing itself as the movement of people and instead ask how it can be the creation of new experiences and connections?

If sustainable tourism is about sustaining and supporting local environments, how can the industry retain an ongoing dialogue with communities who live in and know that location best?

Context

What if the perception of both time and space changed?

All of us have the basic need to connect with one another. This connectivity is the bedrock of healthy and empowered societies. It ensures that we all benefit economically, socially and intellectually by sharing and learning.

The world is becoming more physically and digitally connected, to the point that not only places become closer, but realities merge and time may take on a different meaning.

The merging of physical and digital landscapes has created new intertwined layers of information – which extend, augment and create virtual reality. This will profoundly change our lives, how we travel, how we perceive our physical spaces, how we make decisions.

While a full-scale mirror world does not exist yet, we already have a glimpse of these new realities through the navigation tools and augmented reality games already available on our smartphones.

There is a new generation of artists and technologists at work who are creating mirror worlds or digital twins that transcend our natural barriers and time. As their work continues, self-driving cars or everyday accessories such as glasses will be able to read the mirror world, while navigating the physical one.



As these digital technologies pervade every corner of our lives we need to avoid another digital divide between rich and poor, but also between genders. Across the world, men are 21 percent more likely to have access to the internet than women. In the least developed countries this number rises to 52 percent. A 2021 report of the Alliance for Affordable Internet showed that in a large number of low and lower-middle-income countries, the digital gender gap has remained nearly static over the last decade, at around 30.5 percent.

Digital communication can create opportunities for travel and tourism by putting unknown and unexplored locations on the map. However, these benefits must be balanced against sustainability considerations. In 2019, over a billion tourists travelled to the world's most popular destinations thanks to more effective digital information. At the same time, while there are obvious economic benefits to a thriving tourism industry, mass tourism can also create overcrowding and pollution, creaking infrastructure, as well as damage to the cultural fabric of a community.

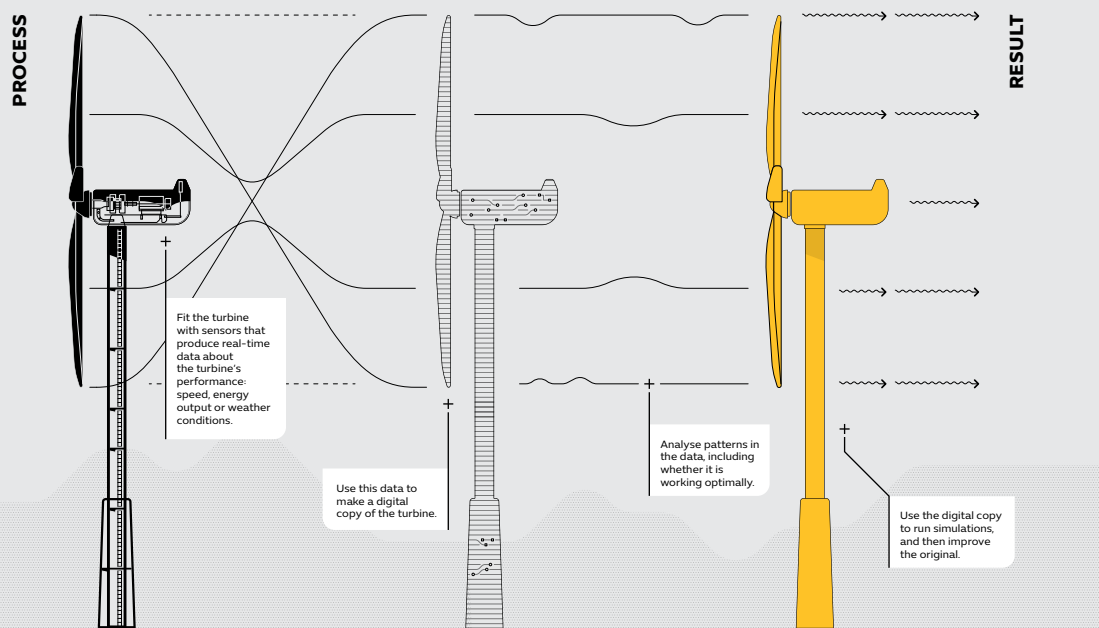
In 2020, the COVID pandemic brought global tourism to a juddering halt, reducing visitor numbers by up to 80 percent and threatening billions of jobs.

We know that technology brings new challenges to a healthy culture of human connection: it can contribute to polarise societies or drive overcrowding as the result of digital trends. At the same time, technology can also help overcome some of these challenges, especially in the areas where it becomes more tailored to the needs of individuals and communities trying to learn more about themselves or their connection to place and environment.

WHY WOULD YOU MAKE A DIGITAL TWIN?

To make a virtual equivalent of a physical object for important simulations that wouldn't be possible without it.

Example: wind turbine



5 ways digital twins can help the world run better:

- 1 Digital twins can monitor energy consumption and reward the most efficient homes.
- 2 Medical staff can work on 'virtual organs' to better understand how they work.
- 3 Assistance in engine repair of all kinds.
- 4 Guide architects and engineers through the design and operation of a building.
- 5 Minimise costs associated with travel to field operations in the oil and gas industry.

50 YEARS AGO NASA USED THE FIRST DIGITAL TWIN TO SAVE THE ASTRONAUTS ABOARD APOLLO 13, WHEN AN EXPLOSION IN THE OXYGEN TANKS CRITICALLY DAMAGED THEIR MAIN ENGINE AND LEFT THE VALUABLE OXYGEN SUPPLY LEAKING INTO SPACE.

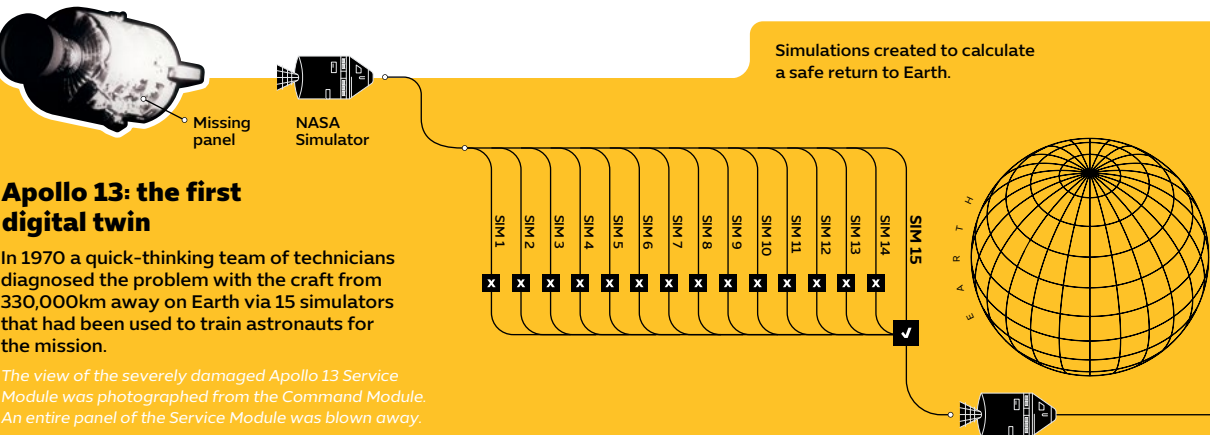


Image source
NASA

UNESCO World Heritage sites

Overtourism, overdevelopment and damage to the environment are threatening the status of UNESCO World Heritage sites. In 2021, 34 new sites were added, but many others are at risk of being downgraded.

1. Machu Picchu is limiting capacity to 2,244 visitors per day.
2. Notre Dame Cathedral in Paris plans to reopen by 2024 and conservationists are planning to create a more indepth visitor experience.
3. The Acropolis of Lindos in Greece is under threat from climate change.
4. Australia’s northeast coast - the world’s largest coral reef system – is losing biodiversity and undergoing mass coral bleaching.
5. Venice is in danger from the damage caused by overtourism, which it is driving an exodus from the city.
6. Tanzania’s Selous Game Reserve is at risk from loss of biodiversity and overdevelopment.

Source:
Conde Nast Traveller, September 2021 The Economic Times, June 2021



CONTEXT

Thinking differently about connectivity

A new generation of communication technologies will change the human experiences of connection and how these will fill like in our everyday lives. These technologies will be more customised to our context and will help both individuals and communities manage assets sustainably. At the same time they can also become a crutch to rely on instead of making brave, novel human judgements.

Richer data supports richer decision making

Richer contextual data will likely bring new ways of seeing the world, and ways of seeing different environments and understand different individuals. This could help us better predict how each region, city or community could be affected by policies or world events. It will give us all new tools for making decisions about our private behaviours too: who we speak to and where we travel.

Consumer-scale digital services

At the moment, the data from environmental sensors or satellites – and the digital simulations they are used to make – are often available only to corporate clients. To enable more people to use technologies that can best help them, more of these high-end models will need to be accessible and useable by individuals who want to make decisions about their home or their next vacation.

A future built by humans not algorithms

The excitement of new technology can often lead us to forget that technology only advances in the direction we determine and carries out the tasks it is programmed to do.

It is dangerous to leave this direction to a few technologists or to rely too heavily on technology to help make our biggest decisions. Instead, we need to nurture our creativity and develop narratives and stories about technologies that support future visions that serve us all. This is essential to achieve a fairer, more sustainable engine of progress.

Using detailed digital footprints for sustainable living

Local data is essential in any digital model to capture what will matter in the long run. It can help inform decision-makers about the limits of a location, as well as its assets. This can help understand how to decarbonise a real estate project or decipher what kind of travel would help local industries to thrive.

"Some visitors are looking for authentic experiences- that give them a sense of wellbeing. And they're really interested in going to regional and remote areas to have those experiences, particularly in light of COVID because they feel like they're not in a crowded city and they can get away."

Prof Anne Hardy

"Where you've gone online to buy something, and when we do that on the internet today, it's collecting data about us personally: the sorts of preferences we have, the sorts of things that appeal to us. That is data that's already being used in a 2D digital world today. In the 3D digital world of the future, the ability to personalise that experience is higher."

Greg Cross

A New Era of Personalised Experiences

The internet made it easier to find answers to any of our questions. Deciding what to do with that information is proving to be much harder. Individuals with access to data that have been traditionally available only to corporations can inform better personal decisions and experiences.

Technology tailored to every individual

It is already possible to segment consumers into very small groups, predicting their purchases precisely. Travel companies and national tourism agencies can see what travelers search for online before booking a trip. During COVID, they watched these preferences change in real time. More people wanted to be away from crowds, and were often spending longer researching a destination, and looking for a unique experience once they went there.

A significant change on the nature of data about individuals will come from sensor systems that monitor human movement in physical space. Internet of Things devices or apps on individual phones can show where we go, how long we spend there and who else we interact with.

In the case of tourism, for instance, digital twins can help to create models of destinations that show all of the unusual pathways an individual could take when there. This can help with planning for crowding, but also offering more bespoke experiences for those wishing to avoid the crowds.

"You need to focus on the gathering of data in local environment. And then step-by-step if you get some data sources which are already existing and connect them together and get the enriched information, then everyone says, OK, if we connect this and this together, we can learn something which we wouldn't know otherwise."

Dr Urška Starc-Peceny

Communities using technology for what is valuable to them

There is a parallel case for customising technology to community interests.

The travel sector offers a particularly interesting application for the communities who are impacted by tourism. Being able to use new technologies to deliver their objectives rather than to fulfil the needs of incoming tourists or of the tour companies is an important step towards supporting a travel sector that is inclusive as well as sustainable.

"With digital technology being at the heart of every business transaction, if we have a lack of access to technology for women, a lack of skill set, what this does is that it often means limited access to basic services as well as opportunities, for example, to be able to engage in business, which offers many benefits not only to the women that participate, but also to the local economies and communities."

– Cristina Falcone

"It is important to raise awareness on the digital gender gap and encourage women to pursue professions in science, technology, engineering and mathematics. When little girls are not able to see those representation in the media, they would automatically feel that field is not for them."

Asma Shabab

"With digital technology being at the heart of every business transaction, if we have a lack of access to technology for women, a lack of skill set, what this does is that it often means limited access to basic services as well as opportunities, for example, to be able to engage in business, which offers many benefits not only to the women that participate, but also to the local economies and communities."

Cristina Falcone

A female skilled workforce developing technology

It is not just the inclusion of communities that use a technology that will be vital for ensuring it is deployed fairly. We need greater diversity in the perspectives used to build a technology. This fairness needs to start early, when the technology is still under development.

This requires leadership in high-tech areas to become more diverse in order to represent more diverse agendas in the decisions made about which technologies to pursue and how.

"There are seven males for every one woman in roles requiring advanced science, technology, engineering or maths (STEM) skills."

– Asma Shabab

For businesses in general, it can mean taking extra steps towards including underrepresented consumers. Women often have fewer digital skills and so are excluded from using digital products.

If they were actively encouraged to develop customised digital experiences, it would benefit their own business as well as the wider economy and their community. Between 2 and 20 percent of offline, small and medium sized companies export their goods. This becomes 97 percent when they take their business online. On top of this, women on average reinvest more money back into their communities than men.

According to a study by CW Jobs, 64 percent of women who went into STEM occupations said that they choose their job because they saw someone else in that role and decided it was something they wanted too. Without strong role models, this transition cannot happen.

Different appetites for how personal data is shared

Learning from the first internet era, as more and more data about individuals are captured, people will expect to control who has access to their data and to make their own decisions about what is private and what is shared.

For example, companies at the cutting edge of creating digital companions for individuals are already planning to ensure that these new kinds of artificial intelligence are able to offer people the choice about which of their data is kept private.

"The Museum of the Future was created to develop a new language ... to make the consequences of decisions and the consequences of emerging technologies and the consequences of particular policies real and visceral."
Brendan McGetrick

Start by asking how technology can serve you

Today's dominant technologies were built from the ideas of a few visionaries. New institutions hope to engage more people in building hopeful visions of the future and to understand how technology can benefit them in their everyday life.

Using augmented versions of our world is a way to use the technology to educate people about complex technical subjects. Digital and augmented world help bring to life the statistics and technical descriptions of emerging trends and innovations. They can help translate potential visions of the future into a story that is readable by a large audience. This shared language makes it easier for a large group of people to discuss what they want from new innovations.

Although exhibitions are primarily cultural events to be enjoyed, their attitude towards encouraging a more personal relationship with the design of technology is increasingly part of how technology will operate throughout our lives.

Best practice

"The most interesting thing is that the people in these communities responded to every single one of those answers saying: 'this is in Peru, 110 km south east of Cusco. You didn't win, but you're still welcome to come.'"

Rogers Valencia

"When you go to hike to 5000 meters, you actually are a committed traveler. You're not a casual traveler. There is no single piece of paper thrown on the trail. Travelers that go to the extent of hiking on high mountains are actually people who are committed to what we care about most."

Rogers Valencia

Rainbow mountains in Peru

Near the popular tourist destination of Cusco in Peru, there is a beautiful mountain called Rainbow Mountain or Vinicunca in the Quechua language. It wasn't well known. But then an Italian photographer called Giulio Andreotti was traveling in the region and shot the mountain. Emirates Airlines used the photo in an advert in the New York Times and the Times of London and a few other newspapers. However, the photo did not say where it was taken.

The Chilka and Okongata communities who live in the Rainbow Mountain then sent a question to the New York Times for their readers to answer: 'if you tell us where this photo is taken, we'll pay your trip there.'

Four and a half million people replied within a month. Many said it was China or Australia and some answered correctly.

The local communities then replied to all the responses, inviting them to visit. They did it on their own terms, looking for people who were interested enough to reply to the newspaper.

This change in the implicit contract between a community at a destination and those visiting is vital for a better model of tourism in the future. There needs to be a commitment on both sides.

Technology that can help customise experiences should help avoid the mass transit that stresses the environments of popular destinations.

UPS Women Exporters Program

Digital marketplaces, alongside a growing trend in global sourcing, represent markets that women entrepreneurs can engage in regardless of where they're located. To help female entrepreneurs access this, the UPS Women Exporters program has trained over 15000 women in how to engage in e-commerce.

The programme includes basic training in how to set up a website as well as expert insights on how to ship their goods globally and how to handle customs. There are also speakers from government agencies that cover import and export legislation.

Sehid Gahani in Pakistan

In Pakistan, some women graduate as doctors, but they're not allowed to work due to cultural constraints. At the same time, rural villages often do have access to specialist doctors. 'Sehid Gahani' - loosely translated to good health - is a telehealth system that matches female doctors at home with people who need those doctors. This offers women a career in digital healthcare that they could not have in face-to-face care.

Emerging questions for future conversations

How can technologies developed by a small highly skilled workforce be capable to guess what everyone needs?

Will the era of customised experience make it easier for us to avoid those we disagree with and we would have otherwise interacted with along the way? Will this make for a more polarised world?

What are the values
of the digital world?
How are they determined?

What does it mean to
work for a digital company
in the digital world? Who
sets the rules?

Retaining decision-making

There is a danger of assuming that smart technologies can do more than they actually can.

Technologies that model our world in detail are attractive tools for decision-makers facing complex situations. But there is a risk of deputising to an algorithm and forget the importance of our most human attributes: the skills of observation, judgement and creativity that are hard to replicate in a computer model.

“The capability of a digital twin to learn from the data it requires to adapt as it goes is key.”
Prof Yacine Rezgui

Technology that appears to be smarter than we are

We are at the advent of autonomous digital agents that can capture people’s idiosyncrasies in detail. These agents draw from a variety of data and using them to recommend products

The very best algorithms learn from that data without human supervision. Over time, they become smart and helpful black boxes where no one knows how they come up with the insights they do.

“I’m being autonomously animated by my own human brain. The digital people that we created are autonomously animated by their own digital brain. They have a specific role in the digital world, whether it’s help delivering health care, assisting with a shopping experience or with a banking experience.”
Greg Cross

The digital minds of a new generation of advanced digital humans are based on the behaviour of networks of neurons in the human brain. Soul Machine’s advanced digital humans learn from their interactions, becoming ever more independent from their creator.



"We digitised the physics of buildings and we do in such a way that allows us to look at all of the complex processes are going in the building."
Dr Don McLean

The same is happening in the case of buildings. The digital simulation is now based not on the list of materials and object involved but also the exact physics (i.e. behaviour) of how they fit together. The outcome is that digital models can be used to play out many scenarios at the same time: switching the building use or asking how it would respond to different kinds of natural disaster.

These smart models can appear to be more equipped to make decisions – e.g., which product to buy or which concrete to use – than humans. In reality, they are still missing the fundamental ingredients of human intelligence and cognition.

"We can deal with tangible digital twins, and these are buildings, cities and so on and so forth. And we also can deal with intangible artifacts with digital twins. And these are practices, representations, expressions, knowledge that are difficult to represent really using a 3D model."

Prof Yacine Rezgui

"Big data empowers and gives people who don't come from a creative background the feeling that they know better than people who have great experience. I think that's really dangerous because it's 'a little bit of knowledge is a dangerous thing' situation."

Brendan McGetrick

The dangers of trusting data over intuition

The allure of smart black boxes of computer models can make it easy to deputise complex decision-making to an algorithm. However, there are features of human-decision making that even the smartest technologies find hard to replicate. Often it is hard to encode the more intangible subtleties affecting the built environment into a digital model

It is the things that are unclear, half known or tacit that the best human teams are brilliant at folding into difficult decisions. This capacity for judgement should not be lost in the drive to use the latest computing tools.

Data driven insights can feel more secure and safe, but they miss the very thing that gets us to humanity's greatest innovations – the ability to see things differently, to be creative when faced with a challenge.



RETAINING DECISION-MAKING

Emerging questions for future conversations

Is the allure of technology dangerous to our human decisionmaking if it encourages us to rely of simulations and calculation rather than judgement?

Customisation as path to sustainability

Better data and customised decision-making tools can move the world towards more sustainable behaviour.

There are already clear advantages to smart, customised digital technology for supporting more sustainable ways of living. Online activity is a useful warning system for where there might be unsustainable activity in the physical world. Digital models of buildings can similarly warn of issues with a city's resilience to future challenges.

Simulating the behaviour of locations

Every destination has different needs and customised ways of monitoring them. This can support better decisions for the long term of that area. Without local data, any digital model will not be based off what will matter in the long run.

"I think that data offers us the opportunity to actually interrupt decision making ... some of the communities have been hit really hard by COVID, and they've actually put their hand up and said to government: 'can you please stop that? We need to turn the tap off on tourism.'"
Prof Anne Hardy

Local data, for instance, can help inform decision-makers about the limits of a location – its carrying capacity.

Digital models have the computing power to run many simulations at the same time. The model can be used to think through how an environment would respond to different kinds of changes – from visitor numbers to natural disasters.

Previously, this kind of modelling could be done at the scale of real estate development or generic city models. Today, digital twins at the city scale and with much larger computing power can provide hugely improved tools for deciding where to invest in a city or region or what type of regulations should be put in place. By looking at how the features of a city would respond to stress, it's easier to see its weaknesses. This will help decision-makers spearhead the improvements that most matter for their city rather than an approximation of that city.

Communities in popular destination in Australia have struggled when tourist brought COVID to them. Perhaps this could have been stopped in advance if better modelling had been done on how opening the borders could affect marginalised communities.

CUSTOMISATION AS
PATH TO SUSTAINABILITY



“ What if we keep that vision of that future city in our mind and then run all of the scenarios about how we achieve that so that we can create healthy, happy and efficient cities for people? That’s what we’re thinking about at the city level. The flip side of that is we can also create cities that are more resilient to shocks, to climate change, pandemics and disasters. Those things are hard to predict. We’re well aware of this, but we can also plan to be more proactive rather than reactive in those areas.

– Dr Amy Hochadel

Supporting regenerative tourism

As well as protecting communities, better digital models can also help with decisions on how to help those communities thrive. The definition of sustainable tourism increasingly includes leaving an area better off than how it was found – both culturally and economically.

This goal of regeneration needs to come with a clear understanding of how to match tourists' interests and commitments with those of the local community.

“Sustainable tourism is a tourism that leaves the community at least as well off as it was before the arrival of tourists in that area, if not better off. So essentially, it is tourism that takes care of the carrying capacity of the region, that adds to the culture and heritage of the region where the tourists are going to, and it is tourism that adds to the economic and social wellbeing of the area.”

– Arvind Singh

Communicating that tourism can be done differently

There are some early examples of how to encourage people to find experiences outside the most obvious choices and support regeneration. Local industries or culture might appeal to people with specialist interests and hobbies. These could in turn become useful contacts for a local community's exports. Visit Portugal's recent campaign is an example of this (see Best Practice section).

Popular destinations can move some of their assets to rich, digital experiences that don't create crowds. By mapping historical buildings and other locations in 3D, it was possible to reconstruct them as virtual vistas in virtual reality, interactive tabletop and online experiences.

Layers of additional information can augment the experience of heritage locations when delivered digitally. If the original goal of travel is to broaden our horizons, then a digital experience is starting to offer the immersion in another culture's history that can achieve some of this aim. Although a digital experience will never be the same as physical travel, it can increasingly reach some of the same goals. Digital experiences can also be open to thousands of tourists without risks of environmental degradation.

Sustainability starts with local engagement and education

For tourism to be sustainable, tourists, the local communities and the workers will all have to be part of it. Sustainable tourism is achieved by working with the whole community.

But sustainability also comes from learning what it means to survive and thrive in a particular location. It is not just that local communities will need to work together towards sustainability, but their knowledge of their environment is key to that sustainability. For instance, local fishermen are an asset for the construction of their Red Sea destination in Saudi Arabia, as they know the marine environment better than anyone else.

In turn, real estate developments can give back to the community, for instance, by working with local farmers to help them improve their yield. This kind of skills training is not an obvious task for the tourism industry, but it clearly can help the community around a destination to provide a more sustainable food supply for tourists.

There are moves to expand formal tourism education beyond training for jobs in hospitality. This would include those who supply the tourist industry and those that benefit from it. Understanding and adapting to that broader community will be part of the process towards sustainability.

"We're a largely island based destination, and so everything we do is marine based at the moment. And so the best captains boat captains come from the local area because they know the water like the back of their hand."

John Pagano

"We are running different projects to reposition the schools, not as a place where you go to learn (of course you continue to do that). But to have a network of institutions that are based on the local community that are responsible to act not only in tourism, but in culture, sport, health that can connect every piece of the community. So we can deliver the training or the education that the community needs, not the training or the education that we think we should do."

Ana Paula Pais

Best practice

"We're using digital twins right now to understand things like when ships come into port, how much we can refuel those ships using electricity when their cargo is leaving port? How much of that cargo can go on trains versus new hydrogen cars, versus electrified cars? What's the best mix? There isn't a silver bullet. And this is why digital twins are so important. We're looking for an optimal scenario, a little bit of this, a little bit of that. And that's what digital twins allow us to do."

Dr Amy Hochadel

Using simulations to plan for decarbonisation

Don Mclean's digital twins simulate adaptations to existing buildings to reduce heat loss or help sustain a building for a longer life. Different options can be modelled and compared to help owners make a decision about where to modify their buildings most effectively. This has been a valuable tool in encouraging the real estate sector to make improvements. Many are wary of wasting money on adaptations that don't really make a difference. The tool is potentially useful for home owners as well in the future.

McLean emphasises that trying to understand how to decarbonise buildings, it can seem overwhelming. If you scale that up to the problem of how to get a whole city to move towards carbon neutrality, it can be so complex that it is hard to make any decisions.

There is also work on digital twins in ports, looking at the same question of how to make the activities of a port more sustainable. This focuses on the energy mix that is used in these energy intensive locations. However, this scale of digital twin must manage extreme complexity, where there is no single answer. It is about providing supporting scenarios for experimentation in the real world.

"We changed our communication two years ago in 2020, and we said that was not the time to visit Portugal. It was the time to read about Portugal."

Luís Araújo

Visit Portugal changed direction during COVID

During the pandemic, Portugal redirected potential tourists towards resources on Portuguese culture, industry and geography. Their aim was to develop a more informed tourist population, who would choose where to go by matching their interests with the locations that best reflected them. The government hopes this will lead to more: literary tourism based on places in novels; cycling and walking tourism; industry tourism to key wine or pottery regions. This will hopefully take the pressure off more overcrowded destinations like Lisbon, the Algarve and Porto.

The Hornbill Festival in Eastern India

The state of Nagaland in Eastern India is home to several tribes with strong annual rituals. To encourage inter-tribal interaction and to promote cultural heritage, the Government of Nagaland organises the Hornbill Festival every year since 2000. It has this name because the Indian hornbill is displayed in the folklore of most of the tribes.

The Hornbill Festival hosts dances, performances, crafts, sports, food fairs and religious ceremonies. The festival both exposes the culture and tradition of tribal peoples, and reinforces Nagaland's identity as a unique state in India's federal union.

Ambassadors to India are encouraged to attend along with many tourists, mainly from within India. The festival can act as a visceral reminder to the diversity of India, and that diversity is a reason for retaining a federal model where communities can manage their own intergenerational cultures.

Tourism Tracer

Tourism Tracer in Australia tracks tourists throughout their entire holiday. With consent, the tracker can see detailed information from how long someone stands at a lookout or browses an art gallery. This level of monitoring can help uncover unexpected subsets of tourists with specific preferences. This can be used to sell tours to others, or make suggestions via the tourist board, for others coming to the region. These can include those are outside the usual well-trodden journeys that have often led to overtourism in popular destinations.

This could lead to a future system where people came to Tasmania, put an app on their phone and the tourism board could send messages out to them and encourage them to go to different places if it looked like some communities were under pressure from too many tourists.

Emerging questions for future conversations

Does tourism need to stop seeing itself as the movement of people and instead ask how it can be the creation of new experiences and connections?

If sustainable tourism is about sustaining and supporting local environments, how can the industry retain an ongoing dialogue with communities who live in and know that location best?

