ICCA 2063 - Exploring The Next Fifty Years
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To help us explore what the next fifty years might hold, ICCA asked our industry futurist to peer over the horizon and help us understand the science and technology developments that might shape our world and explore the implications for associations and their events.

1 Introduction

As futurists, we spend our time exploring the forces, factors, ideas and developments that could shape our destinies over the next five to fifty years. We have a particular focus on the disruptive scientific and technological developments that could reshape life as we know it. Most of us find it hard to think that far ahead and so it is worth pausing for a second to think about the last fifty years. What has changed since 1963? Many of us may be too young to remember! However, a look of the development timelines tells us that much of what we take for granted didn't exist. For example, mobile telephony, desktop computers and mass air travel were all largely a pipe dream - and even colour television was only available in limited forms in the USA and Mexico.

When we think about the scale of what has been achieved in the last fifty years and the platforms that are now in place such as the mapping of the human genome, the internet and nanoscale manipulation of matter, we begin to get a sense of the scale of what might be possible in the next fifty. In this article, I will introduce some of these new frontiers in science and technology, explain how they could interact with a changing global economic landscape and highlight the implications for work, jobs, associations and their events.

I start by exploring developments in four key domains that will touch on all our lives - i) biological and life sciences, ii) information technology and the successors to the internet, iii) manufacturing, robotics and new materials, and vi) human enhancement. I then explore how the intersection of these domains is holding out the potential for transformational change in the nature of life itself and resulting in what could be truly world changing scientific initiatives. The next section examines how the global economic and political landscape could be transformed and discusses possible scenarios for how these future factors could combine to reshape the world of work. The final section concludes by examining the resulting implications for associations and their events.

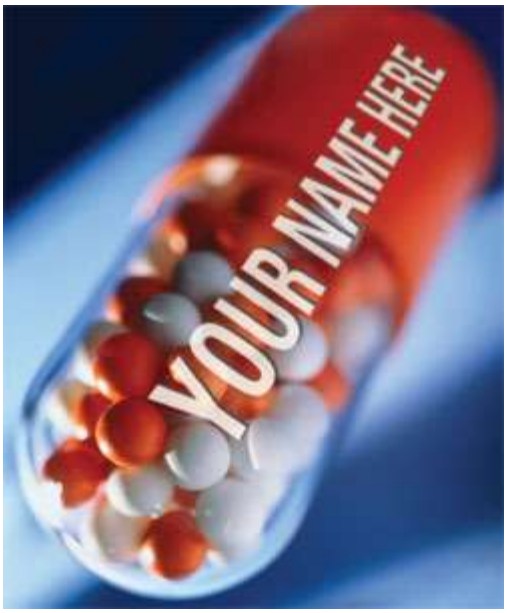
The developments highlighted will take place at an unpredictable rate over the next five decades and some are already with us now - forcing us to face up to how we should address them. Many of the developments highlighted could lead to expansion of existing associations. Others - particularly those that cut across scientific disciplines - may drive the creation of totally new representative bodies. How existing associations and others in the conventions industry choose to respond will be largely a matter of choice. While some may perceive change as a threat, others will focus on the opportunities created and respond through innovations in their strategies, service offerings, pricing and delivery model.

2 Future Frontiers of Science and Technology

2.1 Biological and Life Sciences

Major advances are taking place in fields as diverse as life extension, genetics, personalised medicine and synthetic biology. In developed and developing economies alike, life expectancy is increasing dramatically - rising by 1-5 months per year depending on where you live. The over-80's are already the fastest growing group in the population. By 2025 it will be common for people to live to 100. Over the next 50 years the global population could rise from around 7 billion today to 9-10 billion, with lifespans of 120-130 years or more being commonplace. Gerontologist Aubrey de Grey argues that ageing is a disease not a natural condition and through our lifetimes there will be a series of advance which could extend life expectancy such that life spans of 500 years or more could be realistic. How will associations acknowledge members attending their 200th congress?

The mapping of the human genome and subsequent advances have opened up the possibility of targeted treatment and personalised medicine. Genetic diagnostic services such as **23andme.com** already offer us the ability to assess our genetic health across over 240 medical conditions and traits for only $99. Over time, the range of personalised genetic information available will expand dramatically, be stored on our mobile phones and we will expect conference organisers to use the data to personalise our attendee experience from food to seating. Advances in genetics combined with accurate computational models of the human anatomy should help us detect, predict and prevent disease at a genetic level before it damages the body. Our clothing or embedded devices could double as a source of continuous monitoring and drug delivery - targeting precise dosages of medication to specific areas of the body.

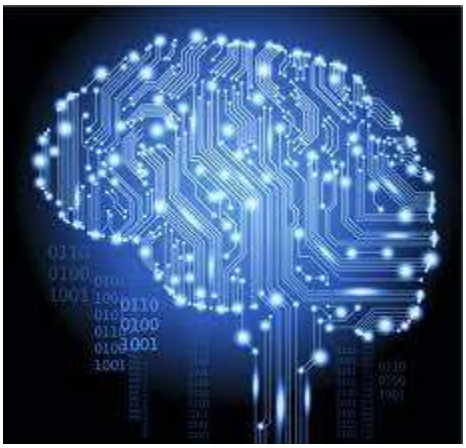


Source: http://www.genomicslawreport.com/wp-content/uploads/2011/06/Personalized-Medicine.jpg

Medical advances will also see developments such as Nanorobots that can be swallowed or injected into the body to undertake diagnosis and treatment of diseased cells and organs. 3D printing and other techniques will enable clinicians to repair, grow or build organs outside the

body in 'test tube' conditions, coat them in our stem cells to reduce the risk of rejection by our immune system and then implant them into humans with success rates of close to 100%.

Rapid progress in the cognitive sciences and neuroscience are providing deeper understanding of the brain, memory and consciousness. Such advances should help us defeat diseases such as Alzheimer's and Parkinson's and allow us to maintain and enhance human memory. Research is well underway on developing an 'exocortex' - using external memory and processors to extend the brain's storage capacity and processing power in the same way that we might upgrade our computers. Some would argue that our smartphones are already serving as a proto-cortex performing some of these functions.



Source: http://futurehumanity.files.wordpress.com/2012/09/digital-mind.jpeg?w=500

2.2 Information Technology, The Internet and Beyond

We are already witnessing a transition from portable devices to wearable technologies. Further miniaturisation will enable the next stage of evolution as devices are increasingly embedded in the human body. Beyond that, the use of biological materials to perform information processing and data networking tasks could see devices literally being grown, implanted and grafted into the human body. The internet and its successors could also go through many evolutions over fifty years. A multi-sensory internet offering touch, smell and taste sensations could be with us in less than a decade. A fully conversational interface offering instantaneous translation could be available on a 15-20 year timescale. Beyond that, the focus shifts to the possibilities that open up once we can connect human brains directly to the web.

Devices like the Epoc headset already let us communicate directly with computers by scanning and learning the patterns of brainwaves associated with basic commands (e.g. up, down, open, close). While such devices have limited functionality today, this will increase significantly over time. Future generations of mobile devices will offer this Brain Computer Interface (BCI) functionality as just another app alongside full instantaneous language translation, full body monitoring, stress counselling and personal coaching.

A range of experiments already demonstrate that full and direct brain to brain and brain to computer communications could be with us within the next 15-25 years. Transmitting not only commands but complete thoughts, our whole approach to gathering and analysing information will undoubtedly be transformed. At the same time, proponents of the so called 'technological singularity', such as Ray Kurzweil, argue that, by around 2045, the cognitive

capacity of a highly connected super-intelligent computers and machines will surpass that of unenhanced humans. The vision is one where humans will then use a variety of BCI tools to connect into a global web of knowledge and ideas. The implications of such a vast and collective intelligence are so radical that many suggest it could bring about transformations that we cannot today foresee or understand.

Source: http://www.mondolithic.com/wp-content/uploads/2008/11/sciam_brain-computer-interface.jpg

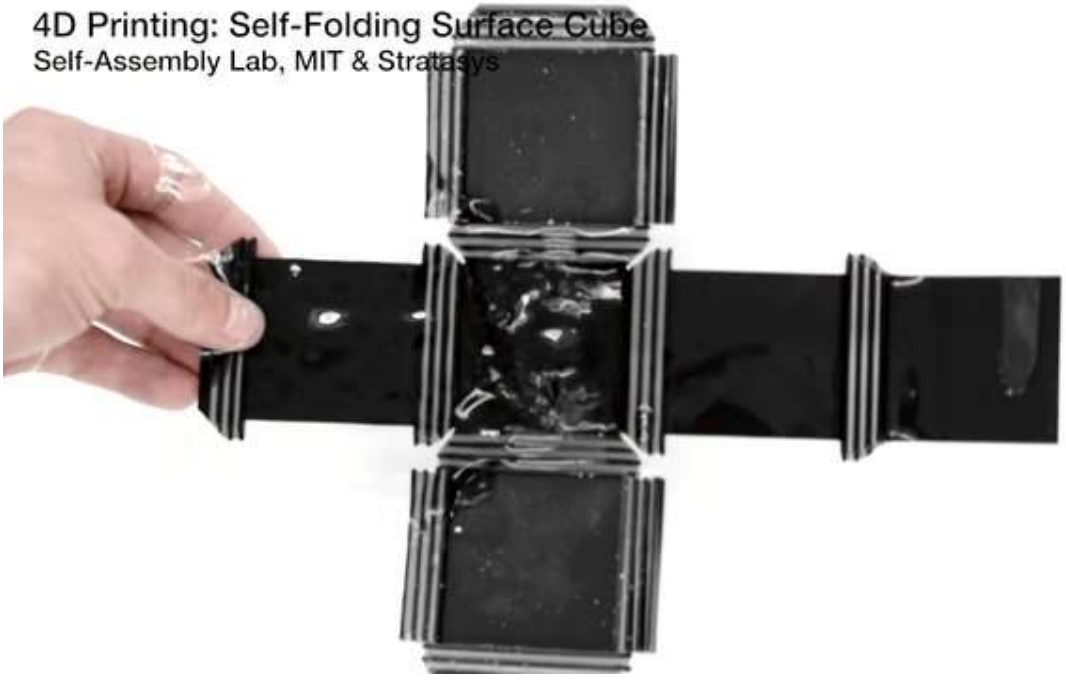
The concept of directly connecting our brains to the future internet opens up vast possibilities for humanity as a whole and for associations within it. With access to a literally limitless pool of information, insight, conversation and activity, the potential for brain overload is very real. Hence, the role of associations as content curators could become ever more critical, collecting, sorting and providing access to information. In those situations where we want to access data on a specific topic or download it direct to the brain, associations may act as the portal. Such functionality could extend to convening instant dialogues between members and with experts. Taking this one stage further, associations could provide a service where we rent out the unused capacity in our brains to others requiring short- or long-term processing power. Once our brains are connected, the possibilities are literally limitless - for example, medical monitoring devices connected directly to the nervous system could effectively spot conditions at the earliest stage of development, help us sleep more intensively and even switch off selected portions of the brain while we are still awake to enable us to rest more effectively.

Advances are already well underway in artificial intelligence (AI) and collective intelligence - for example IBM's Watson computer recently won the game show Jeopardy and can now outperform expert clinicians in certain forms of medical diagnosis. AI will become ever more

widespread, performing tasks once seen as the domain of professionals in fields as diverse as medicine, engineering, science and the law. AI will play an increasingly important role in enabling us to access, analyse and process the ever-growing amounts of data that will confront us. By 2063 we will need to be downloading a variety of AI apps direct to our brains to help us navigate through the sea of content in the same way as large organisations are increasingly turning to 'big data' management tools today. Clearly there will be concerns over the potential for governments and others to scan our thoughts. For example, could we see the emergence of a pre-crime unit - as foreseen in the film *Minority Report* - arresting us for even thinking about a criminal act.

2.3 Manufacturing, Robotics and New Materials

In the manufacturing world today, much of the excitement focuses on 3D printing - which is already enabling us to print everything from blood cells to entire houses. As the functionality, speed and price of such devices improves, a wide range of possibilities open up. Many envisage us having home 3D printers or community fabrication centres where we go to print the items we need as we need them - recycling unwanted products. On a 20-30 year timescale we may see the emergence of devices that effectively break unwanted goods back down into their raw ingredients to be used as feedstocks for 3D printers. Going a stage further, 4D printing is already being mooted. The idea is that we will print objects that can literally change their properties over time e.g. aircraft wings that change shape as an airplane transitions from normal to supersonic flying speeds. On a fifty year timescale we could also see the emergence of 'atomically precise manufacturing' - literally engineering the functionality of devices down at the atomic level.



Source: http://b.vimeocdn.com/ts/435/780/435780633_640.jpg

Robots are already in widespread use - for example the Chinese mobile phone manufacturer Foxconn is in the process of installing around one million robots that will largely replace human operatives. With rapidly declining costs, improving functionality and the advances

being made in AI, the potential for robotic adoption will be widespread. Over the next few years we will see them in increasing use in applications as diverse as classroom teaching assistants, basic nursing, warehouse operation and military roles. On a fifty year timescale robots could be performing almost any task we associate with humans today - from delivering lectures to medical diagnosis or piloting a plane.

In the materials domain, advances in a range of fields such as nanoscience are yielding a new generation of lightweight, super-strong and highly functional super-materials such as graphene that could change how we design, manufacture and use objects in the future. In parallel, the concept of Biomimicry - or nature based design - is also becoming a reality with an increasing number of objects such as cars (fish), trains (Kingfishers) and self-cleaning glass (leaves) being developed based on mimicry of naturally occurring properties. Vertical farms, buildings made from fast-growing trees and biodegradable packaging are all seeking to blur the boundaries between the physical and natural environment.

2.4 Human Enhancement

Human enhancement, or human augmentation, is the artificial enhancement of human abilities through chemical, technological or biological means. The aim is to improve faculties such as mental performance, physical strength, speed and stamina. Although this is not a new idea, scientific advances will almost certainly scale up its impact significantly in the future. Key fields of enhancement being pursued include:

Chemical enhancement – using drugs used to improve physical and mental performance. Many people are already using drugs intended for attention deficit disorder (Ritalin) and sleep disorders (Modafinil) to boost concentration and mental performance. Over time, a range of highly personalised cognitive drugs could emerge to improve higher mental functions such as learning, concentration, creativity and memory.

Technological enhancement – A range of augmented body parts and ***exoskeletons*** are already available to replace damaged limbs and augment human muscles to restore movement or lift heavy weights. More novel technologies are also emerging that might augment the mind or improve human design at the core by editing our DNA. For example, **trans-cranial stimulation** is the use of electric currents to stimulate specific parts of the brain to improve attention spans, memory and resulting productivity.

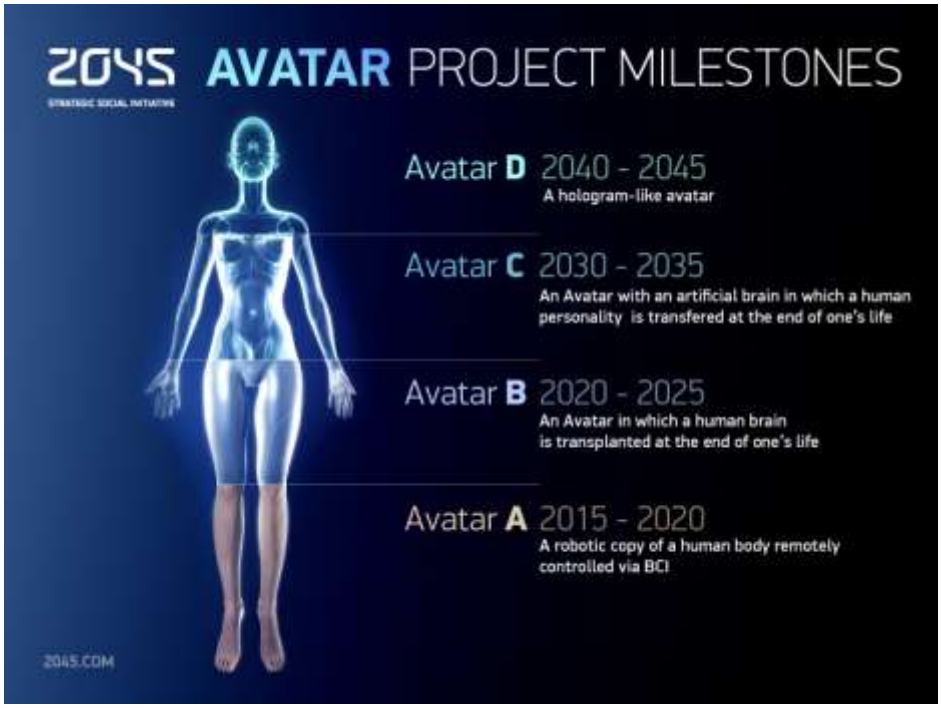
Source: http://www.pakalertpress.com/wp-content/uploads/2012/06/Transhuman-Symbolism-in-Prometheus.png

Nanotechnology and nanomedicine – the ability to manipulate human bodies at the nanoscale might give rise to a whole range of possibilities such as modifying humans to gain extreme intelligence, and transmitting to and receiving data directly from the brain.

Genetic Engineering – the opportunity to alter human genes artificially will create opportunities and raise tough ethical dilemmas. For example, in the future it might be increasingly easy to manipulate employees' genetic make-up to make sure they are fit for a specific job by enhancing their ability to cope with stress or eliminating the gene(s) associated with rage and obesity. Well before 2063, we could be pursuing function-specific genetic modifications - for example having a cheetah's genes spliced into our unborn child in the hope that it will one day become a record breaking Olympic sprinter.

3 Convergence and Transformation

Whilst the developments highlighted above are radical enough when looked at individually, it is when we explore the potential impact of their convergence that the truly life changing possibilities emerge. For example, the convergence of advances in Nanotechnology, Biotechnology, Information Technology and Cognitive Science (NBIC Convergence) offers untold possibilities - including the potential to develop super-smart materials with memory that could yield self-repairing body parts for humans and our cars. Perhaps the most radical convergence initiative underway at present is the so called 'Global Future 2045' initiative and associated 'Avatar Project'. The brain child of Russian entrepreneur Dmitry Itskov, the goal is to establish a new evolutionary path for humanity by making immortality possible by 2045. The initiative is working with eminent scientists around the world in pursuit of a four stage development agenda:



The first stage (Avatar A), goal is to establish robot clones that we can control directly using a BCI. Avatar B would enable us to transplant a human brain into our robotic clone after death. The third stage goal (Avatar C) is to establish a clone into which we can transfer our personality and consciousness. Avatar D pushes our understanding to its limits with its goal of establishing a hologram-style clone of ourselves that lives on indefinitely.

Clearly, there is a lot of scientific progress required to make this a reality and many doubt whether it is achievable. However, significant advances are being made in each of the underlying domains from robotics to whole brain emulation. Should even the basic goals be achieved, these could be truly game changing and would force us to rethink literally every aspect of our lives, humanity, society and the world we live in.

4 A New Landscape

In a world transformed by science, what are the implications for cities and nations - will it matter where we live if we can access everything instantly? We believe that geography will remain an important factor for many decades. Nations and cities will still seek to develop a lead in certain sectors and look to build clusters that bring together education, research, innovators and financiers in order to deepen expertise and accelerate the transition from idea to market offering. With such a vast array of new industry sectors opening up, the prospects for vibrant forward thinking cities, regions an countries to thrive should increase.

We also see the potential for competition intensifying between smaller, and hence potentially more nimble, locations such as Singapore and Dubai and larger population centres such as London, New York, Shanghai, Mumbai and Rio. Advances such as supersonic and hypersonic travel will cut journey times between destinations but location will still be important. Although we can conduct trade electronically, cultural and commercial factors will also drive a continued desire to meet, network, build trust and do business.

In this strange new world, what are the scenarios for business and work? Some envisage a dystopian world where robots and the machines have taken over and humans either have infinite leisure time because there is near limitless wealth or are reduced to a subsistence level existence because no one is earning very much. An alternative and more positive view is that whilst employment could reduce in many important current day sectors, there will be a proliferation of new industries employing skilled and well-paid workers. This will require a radical uplifting of the educational system and teaching approaches in many countries and individuals may need to prepare themselves for a working lifespan that encompasses may different careers.

5 Conclusions - Implications for Associations and their Events

Whilst it is hard to imagine what our world and lives could be like fifty years from now, there is a strong sense that basic human needs won't change. For example, it is highly likely that we will still seek human contact and connection, maintain a desire to learn for work and pleasure and retain an interest in working for at least part of a lifetime that could span 120 years or more. All of these suggest strong opportunities for existing and new associations - potentially working with an individual throughout their lifetime - from school through to the end of their life.

We can envisage a model where individuals belong to many different associations to access people and content but look to a few to provide them with a range of core services. Commercial possibilities we can already imagine include hosting our external brain or exocortex, offering us discounted access to human enhancement services and providing automatic updates to our memories of critical information as it becomes available.
In many cases, basic association membership may be free - funded through advertising, sponsorship and a model where we may pay on an activity basis e.g. for attendance at live events. Equally we may be willing to pay for participation in a 15 minute 'brain to brain' small group discussion with an expert. The session would be convened on demand by the association - because enough people expressed the 'thought' that they needed that conversation today and the expert was available. In some cases, those associations offering truly elite and valuable services may be able to continue charging significant up front membership fees.

In a world where our brains are networked and basic membership is free, members could access additional low / no-cost functionality and services if they are willing to accept direct broadcast of sponsorship and advertising messages. These might be placed in a part of the brain that can be scanned in background mode without diverting our attention. This idea of background processing could open up the potential for associations to stream live events or create virtual events that are beamed or downloaded to our brains while we are still at work. Triggers in our brain management apps would then scan incoming content for anything that requires us to switch to foreground attention and maybe even participate in a discussion. Clearly, fifty years from now a holographic representation of us could attend the event in person while we are busy whale watching in Iceland.

While the focus of this article has largely been on the far future, many of the building blocks are already in place or could be with us very quickly. The clear implication for associations is that we will have to think smart about why we would still exist in five, ten or even fifty years time, the member needs we could serve, the ways in which we might deliver services and how we could fund ourselves. This suggests the need for a constant focus on the future and on innovating our proposition continuously - whether that be finding ways of differentiating

our events so they are the must attend live experience for people in our sector, or pioneering breakthrough pricing models for membership. The premium will be on innovative thinking, experimentation and a willingness to look beyond current member needs to help them prepare for a future they may not yet paying attention to.

Rohit Talwar is a global futurist and founder of the research and consultancy firm Fast Future Research. He is currently leading a study for the European Union on critical science and technology developments that could shape the next fifty years and has also conducted major research projects on the future of meetings, associations and international travel. Rohit has spoken in over 60 countries on six continents and has worked with over 50 international associations, governments, and global companies such as Intel, Pepsi, Shell and PwC. www.fastfuture.com rohit@fastfuture.com