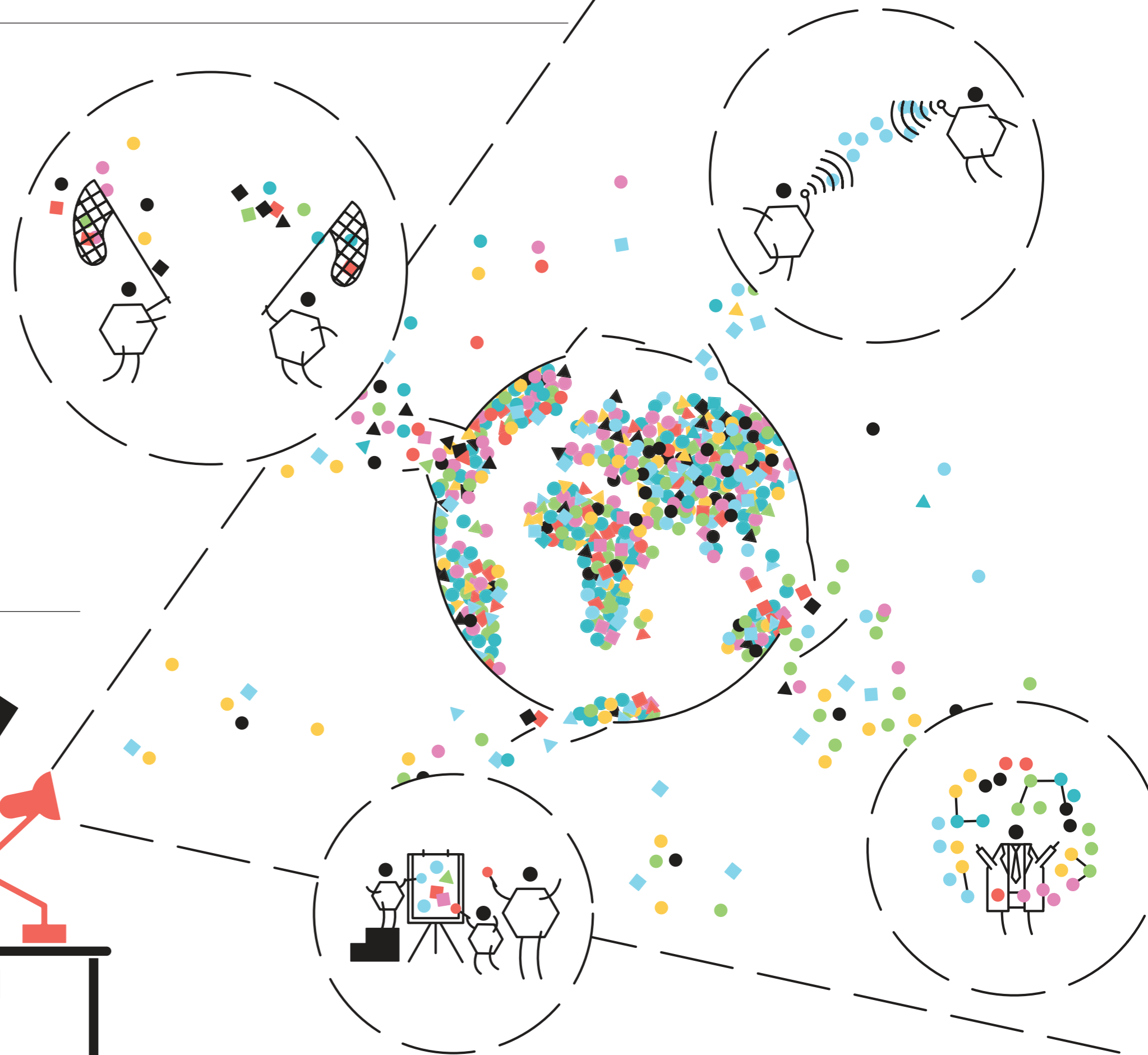


Mapping the future

Information and communication technologies are bringing us closer together, breaking down old barriers and making predictability a thing of the past. But what does that mean for our day-to-day lives? Our Global Agenda Council experts point the way towards a brighter future.

It doesn't matter whether you're talking about climate or economics, urbanisation or employment; digital applications are reshaping every facet of our existence and presenting us with a bewildering array of opportunities and threats. Every conceivable gain brings its own associated challenges, from increased online vulnerability to the simple frustration of an emerging technology not functioning properly. So how can we distinguish the path of progress from the inevitable dead ends and pitfalls? We asked a few select Global Agenda Council Members to show the way towards a technologically enhanced future. ►



Data immune system

Digital and communication technologies allow devices, objects and individuals to communicate with each other virtually anywhere and any time. That generates an exponential increase in the amount of data that can be captured, stored and analysed, and as such the conflict between digital security and privacy is of paramount importance, says **Joichi Ito**, Director of MIT Media Lab, and a Member of the Global Agenda Council on Informed Societies.

“Yes, we can protect privacy and make things more secure – it just requires more cost,” he says. “But it is also important to point out that the people who fight for our freedoms and our privacy are typically not governments, but NGOs. So the key to resolving these conflicts will involve bringing in NGOs to help balance the multistakeholder discussions, and the design of protocols and procedures. While governments will play an important role, they can’t be the primary convenor. People assumed the US government would be such a convenor until they learned through Edward Snowden about National Security Agency surveillance. That threw into stark relief the downside of counting on the same people to provide your security as protect your privacy.”

The process for figuring out how to balance privacy and transparency is similar, reckons Ito, to the human body and its immune system. “You don’t

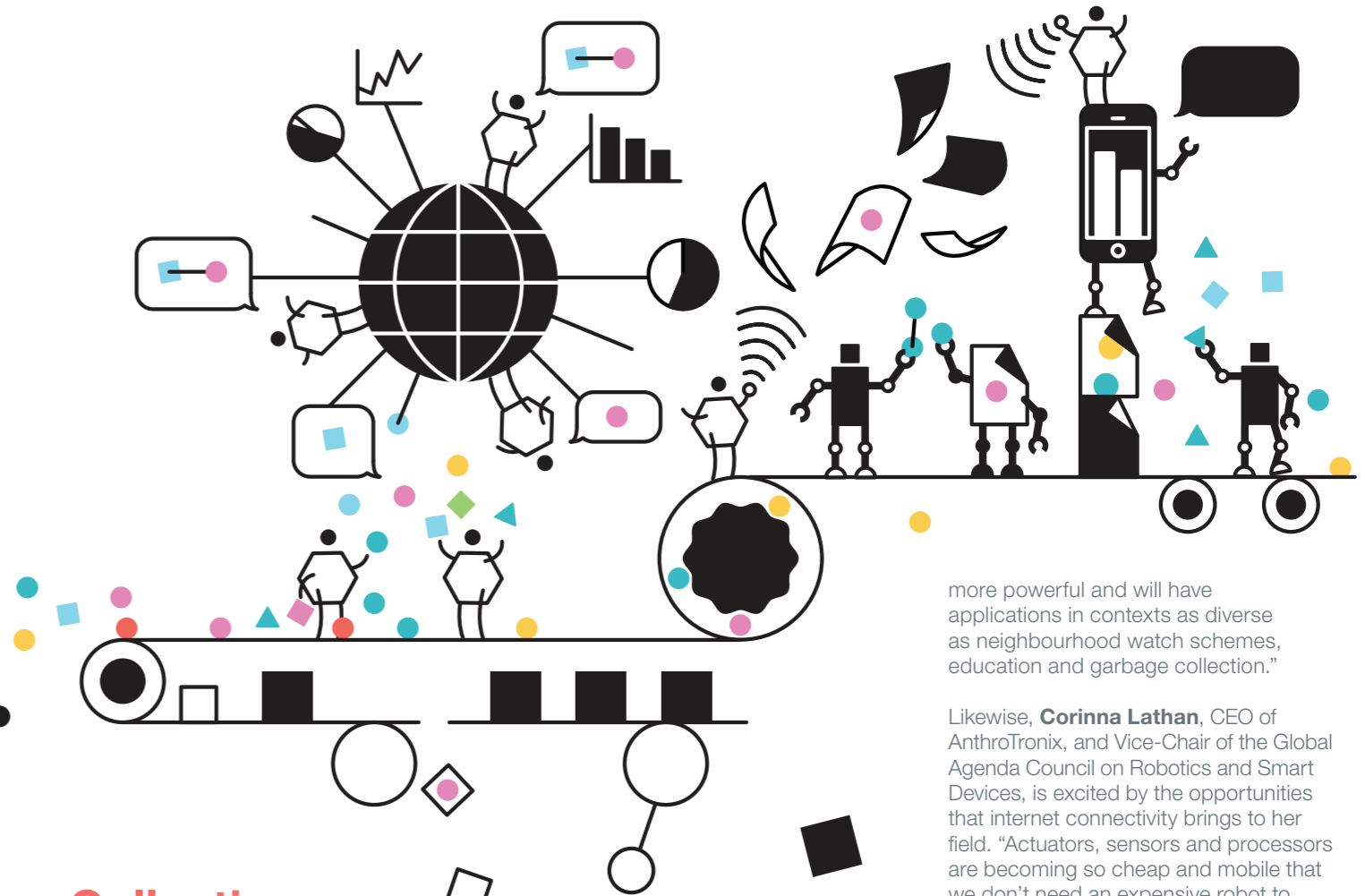
get stronger by trying to eliminate everything, by turning off the internet or making everyone have ID cards,” he explains. “Instead, the system gets more robust the more it gets attacked. Each time a WikiLeaks or Snowden shows weaknesses in the system, the system gets stronger. There are short-term costs, but in the longer term it’s like a child catching a cold – it’s how they develop an immune system.”

Ito sees an important role for dialogue in this process. “Privacy and security issues affect everyone. There should be a constant public debate, and it’s important to identify the neutral players. The Forum is a great convenor for these conversations; it has the stature and power to bring intellectuals together and the Global Agenda Councils have access to most of the biggest brains. I’m fundamentally an optimist about the hyperconnected world and I believe that those brains will find the solutions we need. We’re a resilient people and what doesn’t kill us will make us stronger.”

Robert Madelin, Director-General for Communications Networks, Content and Technology at the European Commission, and a Member of the Global Agenda Council on the Future of Media, says people must be reminded that they don’t have to surrender control. “The whole data privacy thing is being

run as a fundamentalist issue where, like a religion, it’s about rights,” he says. “Fundamentalism and reaction are always the twin obstacles to innovation. How do you overcome them? By showing that all of us can own a share of the future. That there is a future where hyperconnectivity will not make us objects, but individuals who can still have autonomy and control.”

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more powerful and will have applications in contexts as diverse as neighbourhood watch schemes, education and garbage collection.”

Likewise, **Corinna Lathan**, CEO of AnthroTronix, and Vice-Chair of the Global Agenda Council on Robotics and Smart Devices, is excited by the opportunities that internet connectivity brings to her field. “Actuators, sensors and processors are becoming so cheap and mobile that we don’t need an expensive robot to package them. So we’re approaching the next stage of the internet of things, a world of little robots,” she predicts. “All of these interactions and connections will be generating data and knowledge in the broadest sense, which will help us understand ourselves and each other better: from small data about our personal health to big data that helps us understand why, after 30 years of trying, we’re still no closer to encouraging more girls into the STEM (Science, Technology, Engineering and Maths) field.”

But realising the potential will mean breaking down some of the silos that still exist, maintains Lathan. “For example, the FDA (Food and Drug Administration) regulates medical-related apps, but it’s not clear what exactly it covers. We might reach a situation where individuals can use them, but not hospitals,” she says. “Likewise, we’re relying on companies like Apple and Samsung to bring these important apps into the arena. So these technical and regulatory silos need to be broken down to create an ecosystem where innovation can flourish.”

Collective awareness

Communication technologies will also increase the power of individuals and organisations to work together across time zones and continents. “Digital technologies hugely expand the notion of collaboration,” says **Tim Brown**, CEO of IDEO and Chair of the Global Agenda Council on Design and Innovation. “It used to be, ‘Can we get half a dozen people into the room?’ Now it’s collaborating with people all over the globe, but also collaboration with the technology itself.

“And the idea that every object and space will collect data and collaborate with other objects is a very different way of thinking about our physical world. It requires designers and engineers to think about physical objects as pieces of software that are constantly evolvable, and which can be constantly designed. At that point the world starts to look more like a complex biological network than a machine.”

Designing in complexity was the topic of a recent Global Agenda Council on Design workshop at MIT – other workshops this year have focused on education, the urban environment and the role of governments. “What we seek with these roundtables are meta-level patterns and principles,” explains Brown, “and we’re creating a report we can share with other Councils so they can apply a design lens to what they are working on.”

For Madelin, the greatest empowerment could come through collective awareness. “Today we have more powerful, affordable, mobile computational capacity with which to make more sense of the data,” he says. “The really interesting transformation is collective awareness. A pair of Nike shoes can already tell you how fast you ran and how that compares with yesterday’s run. It makes data about you measurable and sets that in a context of past performance. But the next level – collective awareness of what your peers are doing too – is even



Innovation at the edge

Today the old silos, boundaries and other limits that used to separate us from one another no longer protect us from the actions of others. And that means we can no longer keep the gains of technological progress to ourselves, says Ito. "We have been arrogant in thinking that any technology that made more money was a good thing," he argues. "We have been irresponsible in creating technologies that diminish global progress in order to make local progress. The cost of creating science and technology is diminishing and you find that some of the highest impact developments are happening in unfunded startups, not in big research labs. Innovation is being pushed to the edges where there is less control."

"So we need to be thinking at a systems or global level, and making people responsible for the technologies they build and fund." Encouraging more design-thinking is a critical part of making that happen, he says. "Scientists and artists can detach themselves from morality. They are just pursuing truth. But designers and engineers have to think about how well the science or innovation will work with other parts of the system. They make the choices about how it will impact on society."

The democratisation of the tools of design and manufacture is helping to proliferate design-thinking, says Brown. "The opportunity for people to participate

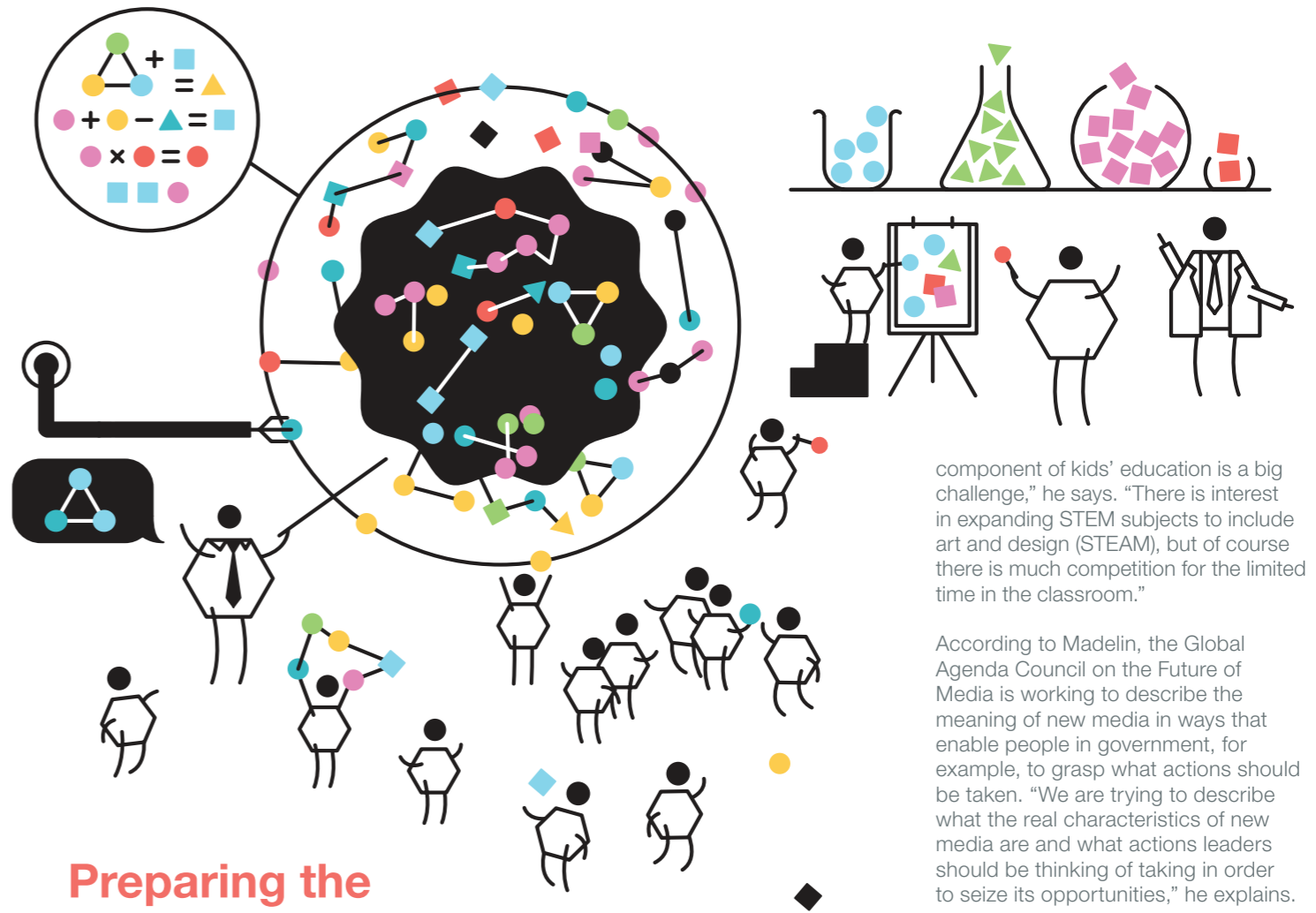
and collaborate in design is increasing very quickly, while on the manufacturing side the emergence of 3D printing and libraries of ready-made design is enabling us to create low runs of cost-effective products – it's going to transform the way we think about design for the developing world if we create solutions that are tailored for specific locations."

The question, says Brown, is how long will it take for these technologies to become affordable and accessible in places where they can do most good? Lathan agrees; "How can it be that mobile devices have outnumbered toilets in a country like India?" she asks. "We've been challenged on our Global Agenda Council on Robotics and Smart Devices to move outside the American and European mindset and to think more globally. A multidimensional model that we are proposing highlights the opportunities and risks in the field of robotics and smart devices, and we're committed to ensuring the model functions globally and in all cultural contexts."

The Council is working on a flagship documentary video, featuring curated thought pieces that explore the subject of integrating robotics and smart devices to improve the quality of life. "The exciting thing about the World Economic Forum is that the diverse group of people it convenes means things are always going

to happen," says Lathan, who argues that the challenge is to stay human-focused.

"How to retain our humanity as we become more tech-focused and centred will be a critical one for the digital native generation," she says. "The model that our Council is creating helps us gain a psychological and sociological understanding of people's needs, desires, capabilities and traits, and a cognitive understanding of the physical and behavioural dimensions of humanness."



Preparing the digital natives

As technology advances and we grow more interconnected, the outcomes of our actions become increasingly uncertain, with many unintended consequences. So how can we prepare ourselves to live in a world that is so much more complex and unpredictable than the one we live in now?

"There is a completely different set of things that we need to be teaching our kids," says Ito. "We need to give them cognitive models of how to live in a networked world where they are learning constantly, incorporating systems thinking and design thinking. At present we're using pre-internet cognitive models to design a world for our kids, who have a very different brain."

Brown is concerned that the schooling system in the Western world has driven creativity out of the curriculum. "Reintroducing creativity as a core

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component of kids' education is a big challenge," he says. "There is interest in expanding STEM subjects to include art and design (STEAM), but of course there is much competition for the limited time in the classroom."

According to Madelin, the Global Agenda Council on the Future of Media is working to describe the meaning of new media in ways that enable people in government, for example, to grasp what actions should be taken. "We are trying to describe what the real characteristics of new media are and what actions leaders should be thinking of taking in order to seize its opportunities," he explains.

"We're concerned about new media literacy and what are the roles and responsibilities of social actors. We probably have to start with teachers – the number of people trying to bring ICT into education is huge, but the number of teachers who don't get it is also huge. Likewise, parents need to feel comfortable with these new technologies, otherwise children aren't going to get the help they need with their homework."

But Lathan says she is confident our children will embrace the challenges of their hyperconnected world, adapting to it almost effortlessly. "Kids move in and out of the digital world so fluidly, to the point where many now take ubiquitous connectivity for granted," she says. "It's becoming the same with robotics. My fourth-grader's after-school activity this year is creating 3D objects in the Minecraft videogame, printing them out on a 3D printer and then controlling them with MaKey MaKey invention kits (which allow users to turn everyday objects into game controllers). Now, that's how you teach digital natives." ■