

World Economic Forum Annual Meeting 2016 Mastering the Fourth Industrial Revolution

Davos-Klosters, Switzerland 20-23 January



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Preface



Klaus Schwab Founder and Executive Chairman



W. Lee Howell Head of Global Programming Member of the Managing Board

For 46 years, the World Economic Forum has brought together leaders and leading thinkers in Davos-Klosters, Switzerland, to exchange ideas and seek answers to the fundamental economic questions of the times.

The Davos agenda has reflected the world's focus on managing successive waves of economic crisis: stabilizing the financial system; countering concerns of regional disintegration; and increasing urgency about unemployment, unfulfilled social contracts and inequality. From year to year, the tide of technology has been rising, bringing with it promise and peril for the global economy.

The technology wave has finally crested. At the Annual Meeting 2016, under the theme Mastering the Fourth Industrial Revolution, technology shifted from a supporting role to the spotlight. More than 2,500 participants from all walks of life came together in Davos to prepare for a future of exponentially disruptive change as assumptions about growth models were overturned, the international balance of power continued to fray, and scientific and technological breakthroughs stood poised to transform economies and societies.

The Meeting provided an unparalleled platform for co-design, co-creation and collaboration for global leaders from across business, government, international organizations, academia and civil society.

The programme focused on learning from experts, peers and unique experiences, as participants shared new approaches for managing three essential forces for the future stability and sustainability of the national, regional and global economies:

mastering the speed, scale and force at which the Fourth Industrial Revolution is reshaping the economic, social, ecological and cultural contexts in which we live; addressing a rapidly changing security and humanitarian landscape in which emerging technologies also play a key role; and solving problems of the global commons, from climate change to the future of the internet, through new models of public-private cooperation and the application of breakthrough science and technology solutions.

This report serves as a valuable document to stimulate deeper thinking on the Fourth Industrial Revolution. We gratefully acknowledge our Partners, Members and participants, as well as the Meeting Co-Chairs, for their leadership and guidance throughout the event. Thanks also to leaders from the Forum communities, including Social Entrepreneurs, Global Shapers, Young Global Leaders and Technology Pioneers, who played a significant role in the design and development of the various sessions.

On behalf of the Managing Board, thank you again for your participation and working together in the collaborative and collegial Spirit of Davos.

We look forward to welcoming you at our regional events and other meetings throughout the coming year, as well as in Davos in 2017.

Co-Chairs of the Annual Meeting 2016



Mary Barra
Chairman and Chief Executive
Officer, General Motors
Company, USA



Sharan Burrow General Secretary, International Trade Union Confederation (ITUC), Brussels



Satya Nadella Chief Executive Officer, Microsoft Corporation, USA



Hiroaki Nakanishi Chairman and Chief Executive Officer, Hitachi, Japan



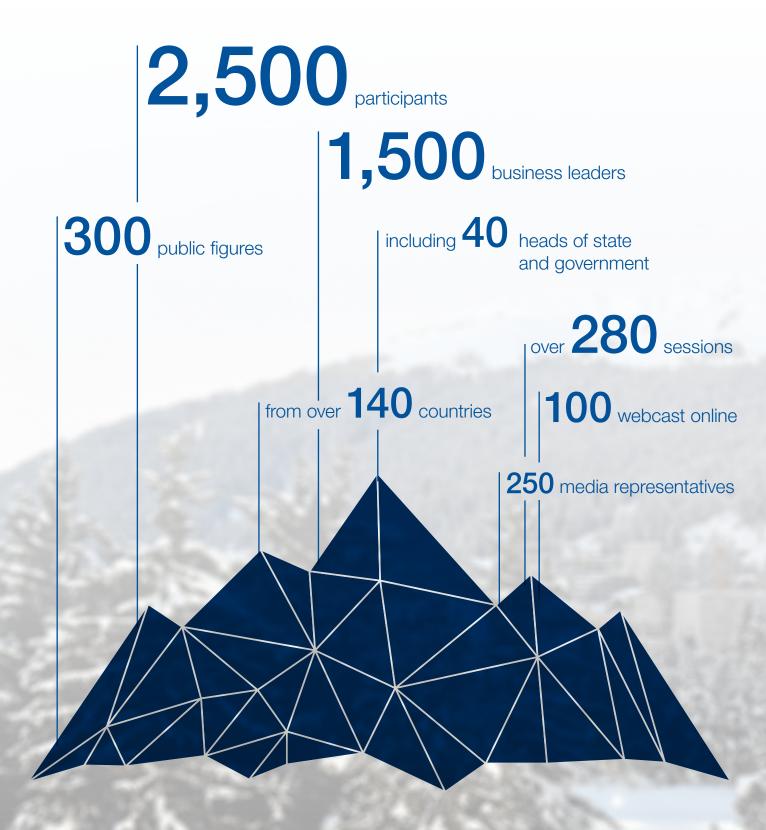
Tidjane Thiam Chief Executive Officer, Credit Suisse, Switzerland



Amira Yahyaoui Founder and Chair, Al Bawsala, Tunisia

Facts & Figures

Annual Meeting 2016 in numbers



Davos Highlights



Four winners of the Crystal Award 2016

Four distinguished artists were honoured at the 22nd annual World Economic Forum Crystal Awards ceremony for their achievements and exemplary commitment to improving the state of the world through their craft. American actor Leonardo DiCaprio, a passionate advocate for environmental sustainability, was recognized for his leadership in tackling the climate crisis. Chinese actress Yao Chen, who dedicates her time as UNHCR's honorary patron for China, received the award for her leadership in raising awareness of the global refugee crisis. Award-winning musician will.i.am, who advocates for good education through the i.am angel Foundation, was honoured for his leadership in creating educational opportunities for the underserved. World-renowned artist Olafur Eliasson, known for his large-scale installations and designs, won the award for his leadership in creating inclusive communities. The award ceremony was followed by a concert performed by acclaimed cellist Yo-Yo Ma with an ensemble of master musicians. including Sergio and Odair Assad, Sandeep Das, Johnny Gandelsman, Cristina Pato, Kathryn Stott and Wu Tong.

Attp://www.weforum.org/agenda/2016/01/meet-the-davos-2016-crystal-award-winners



Top panel to meet water challenge

UN Secretary-General Ban Ki-moon and World Bank President Jim Yong Kim announced at Davos a highlevel panel to mobilize urgent action on water and sanitation-related Sustainable Development Goals. Chaired by the presidents of Mauritius and Mexico, the panel will comprise heads of state and government both from developed and developing countries, with support from the World Economic Forum's networks and platforms. According to the UN and World Bank, at least 663 million people lack access to safe drinking water and 2.4 billion people lack access to basic sanitation services, such as toilets or latrines. To meet the targets set out in SDG6 – ensuring the availability and sustainable management of water and sanitation for all – the panel will focus on public-policy dialogue, private-sector models and civil society initiatives, as well as promote efforts to mobilize financial resources and scale up investments.

A https://sustainabledevelopment.un.org



RED campaign raises \$350m in 10 years

Since its launch a decade ago at the World Economic Forum Annual Meeting 2006, the RED campaign has raised more than \$350 million to fight HIV/AIDS in Africa. The proceeds, with donations coming from several Forum Partners, go directly towards life-saving anti-retroviral treatments for those that cannot afford it. AIDS has killed more than 34 million people since its discovery in 1981, and today, more than 37 million people are living with HIV, with mothers continuing to pass on the virus to their children. Co-founded by Bono, lead singer of rock bank U2, RED's mission is to make it easy for people to come together and join the fight against the virus. He is also the founder of ONE, an advocacy organization campaigning for government policy that saves lives and improves futures in the poorest parts of the world – in line with the Forum's mission.

A https://red.org



Strengthening global trade

The World Economic Forum and International Centre for Trade and Sustainable Development (ICTSD) launched in Davos a detailed blueprint for strengthening the global trade and investment system. The set of proposed reforms outlined in the Strengthening the Global Trade and Investment System in the 21st Century report describes a pathway for better aligning and eventually reintegrating the world's myriad regional free trade and investment agreements, as well as for adapting rules and institutions to recent changes in the world economy, such as global value chains, the digital economy, services, climate change and Sustainable Development Goals. The proposals include measures that support progress on many global issues, including boosting global growth and employment, ensuring food security, combating climate change and environmental degradation, and strengthening the legitimacy of the global trading system. The report is part of the Forum-ICTSD's E15 Initiative, which has engaged over 400 experts from around the world in 15 expert groups and three cross-cutting task forces, in partnership with 16 other institutions.

http://www.weforum.org/global-challenges/ international-trade-and-investment/projects/e15initiative

The Humane Age

To address the key global challenges confronting the world effectively and sustainably, mastering the Fourth Industrial Revolution – the wave of technological advances that are changing the way we live, work, stay alive and interact with each other and machines – is essential.

Why any company, organization or individual must get a handle on the rapid advances in technology and not let the opportunities created by the Fourth Industrial Revolution slip by was made clear from the first session of the Annual Meeting 2016. Just one week after President Barack Obama asked him to take charge of "mission control" for America's new "moonshot" to cure cancer, Vice-President Joe Biden appeared at the Congress Centre in Davos to facilitate a discussion of what the initiative's priorities should be with leading scientists, doctors and technologists. He put across plainly the need for warp speed. "Our goal is to make a decade worth of advances in five years," he said. "We are not looking for incremental changes; we are looking for quantum leaps."

The key outcome of the gathering: get a handle on the data. The treasure trove of information on cancer cases,

research and treatments across a wide range of fields including genetics, engineering and health insurance, has to be tapped. Applying a big-data approach should yield ways to ramp up progress in fighting the disease by speeding up research and improving access to new treatments. But to glean valuable insights from the vast amounts of data will require agreeing on common standards for collection, interpretation and access.

"We can do more if this information is widely shared," Biden said. José Baselga, Physician-in-Chief and Chief Medical Officer at the Memorial Sloan-Kettering Cancer Center, noted that not enough work has been done to analyse data on cancer cell mutations. "In the computer science revolution, medicine has been left behind," he said.

Big data focus

Participants across sessions pinpointed the big-data aspect of the Fourth Industrial Revolution as a common and urgent priority. The proliferation of mobile devices, online sensors and other means of collecting information digitally has made it possible to obtain detailed, accurate and real-time data on everything from purchases to patient care. Digital platforms, including sharing-economy apps such as Uber and supply-anddemand matching services such as Airbnb, allow for instant interaction. information exchange and closer and broader collaboration, be it to develop a rapid test for people with a fever or connect a driver with a car to a passenger who needs to get somewhere fast.



"I believe the auto industry will change more in the next five to 10 years than it has in the last 50."

Mary Barra

Chief Executive Officers and Chairman of General Motors, USA; Co-Chair of the Annual Meeting 2016

In the session on internet fragmentation, US Secretary of Commerce Penny Pritzker warned of the dangers of digital Balkanization. Preserving the free flow of data online, she said, is not just about large companies but is also about small and medium-sized businesses. "They are very much threatened. Entrepreneurship and innovation are a big part of what the internet enables. It is imperative that we keep the internet flowing since it undergirds business."

Natarajan Chandrasekaran, Chief Executive Officer and Managing Director of Tata consultancy Services, put it more starkly. "The future of the human race is tied to the future of the internet," he said. If the international community is not able to sort out governance issues including standards for data protection, we will miss a huge opportunity. "The more we delay, the more we are going to lose."

The dark side

Fourth Industrial Revolution technologies and the many ways they can interact with each other and enhance human performance can be used to achieve solutions from the mundane to the marvellous. We can create robots that pick only ripe blackberries and ones that will interact with an autistic child. We can use genetics to clone a sheep and to cure Huntington's disease. We can use apps to find the nearest café and to locate a survivor of an earthquake or reunite a refugee family.

But there is the dark side. Terrorists have employed the same messaging apps that permit free and easy communication to coordinate attacks. The internet is a source of both knowledge for good and information of use to those who mean ill. And of course, there is the old argument that technology kills jobs and increases inequality.

"The central question is whether technology can be harnessed for systems change," said Annual Meeting Co-Chair Sharan Burrow, General Secretary of the International Trade Union Confederation (ITUC). "Can we get to a zero-carbon, zero-poverty world?" Not with current business

models and approaches to public and private governance, Burrow argued. Technology has to be shared equitably to create opportunities and not foster greed, she stressed.

A bigger opportunity

However, blaming technology for such problems as the rise of inequality or unemployment would be a mistake, said Erik Brynjolfsson, Director of the Initiative on the Digital Economy at the Massachusetts Institute of Technology (MIT) Sloan School of Management. "The biggest misconception is the idea that technology will come for our jobs. The bigger opportunity is to use technology to enhance performance and augment human activity." He concluded: "Technology can be used to destroy and create jobs. There is no economic law that everyone is going to benefit equally. You have to put the policies in place."

Leaders must wake up, Marc R.
Benioff, Chairman and Chief Executive
Officer of US technology company
Salesforce, declared. "We are in
a leadership crisis. We are seeing
technological shifts and changes on
a scale we have never seen on this
planet. These require severe and
extreme leadership. Countries that are
having a problem are those with the
weakest leadership." Henry T. Greely, a
Stanford University law professor, said:
"All of us need to begin to understand
and grapple with how we want to
shape these technologies."

Goal is to stay human

The norms, rules and regulations, and even the thinking about the moral and ethical challenges that are needed to shape the world of the Fourth Industrial Revolution have to be done quickly, without succumbing to hype or helplessness. The overarching goal has to be stay human – or rather, as Greely put it, "to become more humane". Justine Cassell, Associate Dean at Carnegie Mellon University's School of Computer Science, said: "It is through comparison with robots that we will know what it is to be human."

For Meeting Co-Chair Amira Yahyaoui, Founder and Chair of citizens action group Al Bawsala, the question of what makes us human is not relevant. "We are at a crossroads," she said. "We should not just stay human; we should become better humans."

"To maintain sustainable economic development, we need to shift our focus from speed to quality."



Li YuanchaoVice-President of the
People's Republic of
China



Al reality check: no need to download your brain just yet

The arrival of supercomputers that can play poker (bluffing included), velvet-voiced digital personal assistants that answer questions and give directions, driverless cars and even robot sex partners has stirred excitement about artificial intelligence (AI). Add to the hype recent warnings from such science and technology icons as Stephen Hawking and Elon Musk of the consequences of giving machines moral responsibilities and the danger that human-made automatons could go out of control and turn on their creators. Science fiction contains many macabre predictions – could a person's knowledge, memory and personality be downloaded, one's very being preserved in a system of circuits?

Let's not rush too far ahead of reality. It is true that 2015 was a big year for Al. For the first time, drivers could take their hands off the steering wheel and have a computer do the work. Major progress was made in getting machines to do the boring parts of white-collar work such as legal document searches, to read facial expressions and emotions, and even to negotiate a deal with other machines. Last year, it could be argued, Al went from curiosity to conventional – or at least something more visible in daily life.

"We are starting to see these technologies move out of the data centres and into the world," said Matthew Grob, Executive Vice-President and Chief Technology Officer at US wireless technologies company Qualcomm. Zhang Yaqin, President of Baidu, the Chinese search engine company, agreed: "Al is really going mainstream."

Al has not yet taken over our lives. Some of the exciting products and services are not yet as intelligent as we may imagine. Siri, Apple's Speech Interpretation and Recognition Interface program, which serves as a mobile personal assistant and knowledge curator, is a far cry from J.A.R.V.I.S., the seemingly omnipotent intelligent computer in the *Iron Man* films. Siri voices prepared answers to a prepared set of questions. "If Siri really understood your questions and listened in on person-to-person

conversations, then it could be the ideal personal assistant," said Stuart Russell, a Professor of Computer Science at the University of California, Berkeley.

Autonomous cars undergoing trials may have been spotted on the streets of San Francisco but are not yet ready for market. A driver cannot leave everything to Al and still has to take over when the computer in a vehicle gets confused because of its inability to distinguish people in proximity from objects, or is in a situation where it has to deal with the unexpected and make a split-second decision that could entail an ethical choice. Government approval for driverless cars to be commercialized is still years away.

Robots may be common in modern factories and automatons that learn are becoming more sophisticated. But robots that can do something simple – such as pick up drinks or pick berries from a bush – are still not a reality. For computers, it turns out, "manipulation is a lot harder than driving a car down a freeway," said Andrew Moore, Dean of the School of Computer Science at Carnegie Mellon University. "To be as dexterous as a human being, a robot has to have complex hands. It's very expensive to develop that technology."

While algorithms and hardware capability are improving rapidly, "we don't have anything to worry about machines taking over in the near future," Grob said. Yet it is hard to overhype Al's impact. "It will change our lives, mostly for the better," he predicted.

Russell said: "Everything we have that is good in our lives is the result of our intelligence. So if AI can amplify our intelligence, then we could be talking about a golden age of humanity."







01: Jim Yong Kim, President, World Bank, Washington DC; Daniel Kablan Duncan, Prime Minister of Côte d'Ivoire; Sharan Burrow, General Secretary, International Trade Union Confederation (ITUC), Brussels; Paul Polman, Chief Executive Officer, Unilever, United Kingdom; Laurent Fabius, Minister of Foreign Affairs and International Development of France; Erna Solberg, Prime Minister of Norway; Ban Ki-moon, Secretary-General, United Nations, New York 02: David Cameron, Prime Minister of the United Kingdom

Prime Minister of the United Kingdom

03: Luis Alberto Moreno, President, Inter-American Development Bank, Washington DC

04: H.M. Mathilde, Queen of the Belgians; Tejpreet Singh Chopra, President and Chief Executive

Officer, Bharat Light and Power, India

05: Hilde Schwah

O5: Hilde Schwab, Chairperson and Co-Founder, Schwab Foundation for Social Entrepreneurship, Switzerland; Lee Sang-Yup, Distinguished

Professor and Director, Korea Advanced Institute of Science and Technology (KAIST), Republic of Korea **06:** Mary Barra, Chief Executive Officer, General Motors Company, USA 07: Gary D. Cohn, President and Chief Operating Officer, Goldman Sachs, USA 08: Adam Posen, President, Peterson Institute for International Economics, USA; Douglas W. Elmendorf, Dean, Harvard Kennedy School, Harvard University, USA 09: Participants at a roundtable discussion 10: Forum Debate: The Privatization of Science

















01: L. Markus Karlsson. Business Editor, France 24, France; Rowsch N. Shaways, Deputy Prime Minister of Iraq; Elif Shafak, Author, Turkey; Sir Mohammad Jaafar, Chairman and Chief Executive Officer, Kuwaiti Danish Dairy Company, Kuwait; Justin Welby, Archbishop of Canterbury, United Kingdom; Jean-Paul Laborde, Assistant Secretary-General and Executive Director of the Counter-Terrorism Committee Executive Directorate (United Nations)

Nations)
02: Participants at a
virtual reality session
03: Andrew R. Sorkin,
Columnist, New York
Times, USA; Paul
Kagame, President of
the Republic of Rwanda;
Satya Nadella, Chief
Executive Officer,
Microsoft Corporation,
USA; Sheryl Sandberg,
Chief Operating Officer
and Member of the
Board, Facebook,
USA; Anand Mahindra,
Chairman and Managing

Director, Mahindra & Mahindra, India; Zachary Bookman, Chief Executive Officer, OpenGov

04: Mario Draghi, President, European Central Bank, Frankfurt; Lionel Barber, Editor, Financial Times, United

Kingdom 05: Susumu Tonegawa, Picower Professor of Biology and Neuroscience, Massachusetts Institute of Technology (MIT), USA 06: Irene B. Rosenfeld, Chairman and Chief Executive Officer, Mondelez Global, USA 07: Manuel Valls, Prime Minister of France 08: Christine Lagarde, Managing Director, International Monetary Fund (IMF), Washington

DC

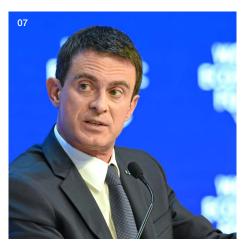


















A template for peace in the cyber age

It is bad enough to constantly read news about terrorist attacks, territorial disputes and ethnic conflicts. How much worse can things get if the tools of technology and the interconnected world were to be deployed in the service of hatred and violence?

The answer to the above question is: unimaginably worse. If you want to wipe out everyone in New York City today, said Stuart Russell, Professor of Computer Science at University of California, Berkeley, you would need a million machine guns wielded by a million soldiers supported by 5 million civilians and backed by a nation-state to pay for all of it.

But as the Fourth Industrial Revolution deepens, it will be possible for just one human being to pay for a million autonomous machine guns equipped with artificial intelligence – and order them to attack New York. "Any skilled engineer can take control remotely of any connected 'thing'," explained Andre Kudelski, Chairman and Chief Executive of digital security firm Kudelski Group. "Society has not yet realized the incredible scenarios this capability creates."

Global security experts are getting educated quickly. In December, unknown parties launched a cyberattack on the power grid of Ivano-Frankivsk region in Ukraine, denying more than 100,000 people electricity for six hours. And the terrorist group Da'esh, also known as ISIS, is using social media and mobile communications to recruit young people in Western countries.

Great power geopolitics, in which state players and their proxies use force or intimidation to expand (or protect) territory and influence, is unfortunately alive and well. But the Fourth Industrial Revolution is changing the traditional ways that states anticipate and plan for security risks, and the actions they can take to protect their people. Complicating matters is the emergence of extremist non-state actors such as Da'esh.

Strategies for action

What can be done? Diplomats, security experts, academics, IT specialists, military and intelligence leaders and even hackers participating in the Annual Meeting of the World Economic Forum in Davos looked at the issue from a number of angles and came up with a variety of approaches.

First, the immediate threats to global security must be neutralized. US Secretary of Defense Ashton Carter said that the Da'esh strongholds of Mosul in Iraq and Arak in Syria, the "parent tumour" of the terrorist network, will be retaken in 2016. The template will be the successful campaign by Iraqi forces to defeat Da'esh in the city of Ramadi last year.

Second, the roots of extremism and other existential threats to global security must be studied and



"For workers, there are no jobs on a dead planet."

Sharan Burrow

General Secretary, International Trade Union Confederation; Co-Chair of the Annual Meeting 2016

addressed. People, particularly the young, are most vulnerable when they have lost hope and feel alienated from society. Time and again, Meeting participants stressed the importance of access to education, healthcare, employment, entrepreneurship and a living wage to every citizen.

Good governance, inclusive economic growth and decisive action to end inequality were also emphasized.

The various religions have a key role as well. One panel discussion brought together the Grand Mufti Shawki Ibrahim Abdel-Karim Allam of Egypt, Islamic scholar Ayatollah Ahmad Iravani of Iran, and Archbishop of Canterbury Justin Welby.

All three said religious leaders and believers must heal the Sunni-Shia divide within Islam and the gap between Islam and Christianity. They must prevent the hijacking of religion in the geopolitical fight for influence between states, and the misuse of religion to legitimize violence and hate.

Third, security institutions and approaches must be reconfigured to be able to respond to the challenges posed by the Fourth Industrial Revolution and leverage its capabilities. Da'esh should be confronted in social media and the internet. The intelligence services should be open as much as possible to engage with the public using Fourth Revolution tools.

The intelligence community should strive to develop a proper and proportionate role, one that strikes the right balance between the occasional need to intercept communications in aid of keeping the peace and the right of citizens to privacy.

Finally, international agreements are required to deal with cyberattacks on critical infrastructure, develop new rules of engagement in the deployment of weaponized artificial intelligence devices, and manage other Fourth Revolution innovations that have implications for global security. The International Campaign for Robot Arms Control advocated a total ban on autonomous weapons.

No to Cassandras

At the Annual Meeting, President Nicos Anastasiades of Cyprus and the Turkish-Cypriot leader Mustafa Akinci announced that they were close to an agreement to end the divided island's decades of conflict. It was a reminder that security is always possible despite what seem like intractable problems and technological innovations that bring game-changing consequences.

There is no lack of other successes, including the return of peace in the Balkans, the end of the civil war in Sri Lanka, the political settlement in Northern Ireland and the waning of the insurgency in Colombia. "Problems have been solved before; they can be solved again," said Espen Barth Eide, Head of Geopolitical Affairs and Member of the Managing Board of the World Economic Forum.

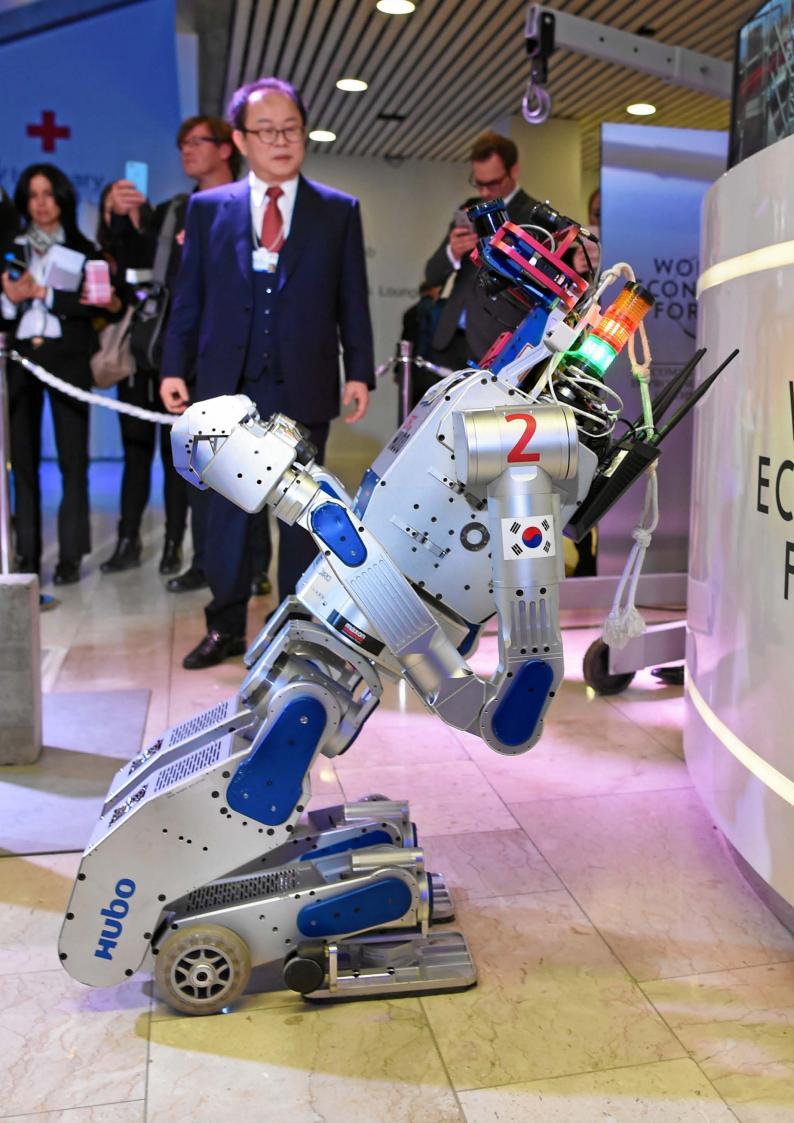
"The fact is, change is occurring in the world for the better, and it is occurring faster, moving faster than perhaps ever before," said US Secretary of State John Kerry. "I don't believe that the road ahead should be defined by the Cassandras who see only turmoil and challenge."

Without in any way underestimating the challenges that lie ahead, the world's citizens and their leaders should keep this in mind as they grapple with the massive changes that are redefining the very foundation of global security.

"There has never been a time of greater promise, or greater peril."



Klaus Schwab, Founder and Executive Chairman, World Economic Forum





Vikram Chandra, Presenter and Editor, New Delhi Television (NDTV), India; Arun Jaitley, Minister of Finance, Corporate Affairs and Information and Broadcasting of India; Nouriel Roubini, Professor of Economics and International Business; Leonard N. Stern School of Business, New York University, USA; Sunil Bharti Mittal, Chairman, Bharti Enterprises, India; John T. Chambers, Executive Chairman, Cisco, USA

Another economic crisis?

China's economy is slowing and risks a hard landing. Monetary policies in the United States, Japan and Europe are diverging. The United Kingdom may exit the European Union. Oil prices have fallen 70%. Financial markets are swooning. Is the global economy headed for yet another crisis?

The broad consensus at the Annual Meeting of the World Economic Forum in Davos? Not really.

"We see global growth in 2016 as modest and uneven," said Christine Lagarde, Managing Director of the International Monetary Fund (IMF). "There is modest optimism but significant risks." The IMF expects 3.4% growth in world GDP this year and 3.6% in 2017.

Resilient economic activity in the United States would help the world's largest economy grow 2.6% in both 2016 and 2017. China, the second-largest economy, is forecast to slow to 6.3% and 6.1% in the next two years, after GDP expanded 6.9% in 2015.

The world's two other engines of growth, Europe and Japan, are expected to grow 1.5% and 1%, respectively. All this was good enough for Martin Wolf, Chief Economics Commentator at the *Financial Times*. "The basic lesson is not to be worried about markets," he said. "We have some big issues, but the United States, Europe and China look OK and they are the core of the world economic system. So, it should be all right – cheer up."

Even Nouriel Roubini, one of the few economists who foresaw the 2008 global financial crisis, was relatively optimistic. He cautioned against reading too much into the financial market meltdown so far this year. "Markets tend to be manic depressive," he said. "They go from excessive optimism to excessive pessimism."

Like other economists in Davos, Roubini thinks a hard landing in China is not likely. "My view for the last few years in China is that we will have neither a hard landing nor a soft landing," he said. "I would say China is going to have a bumpy landing."

But everyone is acutely aware of the risks. In Europe, Lagarde pointed to the UK's possible exit from the European Union and the influx of people fleeing war in Syria and other places as red flags. However, she added: "If the refugee crisis is handled well and the integration process is conducted in a cohesive and organized way, it will be an upside for growth."

George Osborne, Chancellor of the Exchequer of the UK, argued that the reforms Britain is seeking from the EU would mean a "yes" vote in the 2017 referendum. "I am optimistic we will get a deal for Britain and for the EU," he said. "I want our continent to be a source of innovation, growth and jobs. If people see we are delivering that change, they will want to stay in a reformed EU."

The IMF expects 2016 growth of 4.3% in emerging markets, held back by forecast recessions in Brazil and Russia. But even as Chinese growth decelerates, India is expected to expand 7.5% and South-East Asia 4.8% this year.

"We need a high growth rate sustained over a long period of time," said Arun Jaitley, India's Minister of Finance, because poverty is still endemic in the world's second most populous nation. Ensuring prosperity for all is what it's all about.















01: Klaus Schwab, Founder and Executive Chairman, World Economic Forum; Ashton B. Carter, US Secretary

of Defense

02: H. Cuneyd Zapsu,
Chairman, Cuneyd Zapsu
Danismanlik AS, Turkey;
Ahmet Davutoglu, Prime Minister of Turkey



03: Priorities for the United States in 2016 session

94: Jacob J. Lew, US Secretary of the Treasury talking with Thomas L. Friedman, Columnist, Foreign Affairs, New York Times, USA **05:** Zhang Xin, Chief

Executive Officer and Co-Founder, SOHO
China, People's Republic of China

06: Joel Sartore, Contributing
Photographer, National
Geographic Magazine, USA

07: Satya Nadella,

Chief Executive Officer, Microsoft Corporation, USA

08: Javad Zarif, Minister of Foreign Affairs of the Islamic Republic of Iran

01: Fiona A. Harrison, Benjamin M. Rosen Professor of Physics and Astronomy, California Institute of Technology (Caltech), USA 02: Participants at the Annual Meeting 2016 of the World Economic of the World Economic Forum in Davos 03: Shawki Ibrahim Abdel-Karim Allam, Abdel-Karim Allam, Grand Mufti, Egyptian Religious Edicts Authority (Dar Al Iftaa Al Misreya), Egypt; Justin Welby, Archbishop of Canterbury, United Kingdom 04: Hiroaki Nakanishi, Chairman and Chief Executive Officer, Hitachi, Japan

Executive Officer, Hitachi, Japan 05: Fareed Zakaria, Anchor, CNN International, CNN, USA; Benjamin Netanyahu, Prime Minister of Israel













Governance of a brave new world

The global commons is an ever-shifting landscape. Borderless, connected and interdependent, it is mapped by the systems that drive our world. This new geography, powered by technology, needs coherent, transparent and inclusive global governance. Are we up to it?

In 2015, the international community committed to increased financing for development, agreed to in Addis Ababa; the 17 Sustainable Development Goals (SDGs), adopted within the framework of the 2030 Agenda for Sustainable development in New York; and the Paris Climate Agreement (COP21).

A very ambitious agenda for turbulent and troubling times. Geopolitically, our world is becoming increasingly complex and potentially vulnerable. What used to be local is now global. The tragic Syrian catastrophe, for example, reverberates across the world. When China decides to transition its economy, global financial markets roil in response.

Painful lessons

The Ebola crisis is a painful reminder of the world's initial slow reaction as an international, interconnected community. The virus raised its ugly head again in January 2016 – have we learned our lessons? Are we prepared? Climate change is a persistent existential threat. Are we doing enough? Will we do enough?

A global network of systems, including finance and trade, underpins our interconnectedness. Do we have the tools to manage them? Sharan Burrow, General Secretary of the International Trade Union Confederation and a Co-Chair of the Annual Meeting, put it bluntly: "There are no jobs on a dead planet. Achieving the SDGs and realizing the promises of COP21 will require incredible systems change ... it will be faster than any industrial

revolution we have faced to date." The response is new jobs for the green economy.

Christine Lagarde, Managing Director of the International Monetary Fund, said that COP21 "was a big boost but now we need to invest in infrastructure to deliver".

The Asian Infrastructure Investment Bank (AIIB) is open for business and could set an example for quality investments in the economy of the future. Jin Linquin, AIIB president, said: "AIIB will be clean, lean and green as it seeks to invest in sustainable projects." Jin noted that while Asia is "awash in liquidity", money is not capital. Long-term finance is paramount. Transparency and good governance are a magnet for investment.



"The Fourth Industrial Revolution should be a revolution of values."

Amira Yahyaoui Founder and Chair, Al Bawsala, Tunisia; Co-Chair of the Annual Meeting 2016

Private sector potential

The private sector must take the lead, backed by governments and civil society. There was enormous momentum from the private sector during the Paris Climate Agreement negotiations, according to Paul Polman, Chief Executive of Unilever. "We understood the enormous costs and threats involved, but also the enormous opportunities presented in changing our system," he said.

Global financial systems are vulnerable – a painful lesson learned from 2008. Disruptive innovation in the development of applications, processes, products and business models sparks debates about the role of the regulator and whether financial regulation can guarantee safety across the system and promote growth. These profound technological and strategic transformations in financial services raise questions about what regulatory reforms can foster inclusion and avert future shocks.

A lighter touch

Regulators and industry players are debating just how much regulation is needed to steer a steady course. However, everyone agrees that the global payment system should be regulated because it operates as a public utility. As in most debates about regulation, how much is too much and how much is enough? A light regulatory touch is needed.

Emerging economies such as India and China have been rebooting their economies. India is planning huge infrastructure projects, setting up appropriate institutions and enacting legislation to fuel growth. China, recently the subject of much handwringing in the financial community, cut its interest rate to stimulate local demand, something Lagarde hailed as "a normal and proper way" to move towards sustainable growth.

Lagarde said that the policy frameworks for the Fourth Industrial Revolution must change. "We don't measure the value of things very well," she said. "We will need to change the way we look at the economy."

Global trade is slowing down and popular support for trade is waning. Trade is on the public's radar, but that is not necessarily a positive development when many consumers are uninformed about its manifold benefits. Europeans are demonstrating against the EU's negotiations with the US on the controversial Transatlantic Trade and Investment Partnership (TTIP).

Trade benefits

European Commissioner for Trade Cecilia Malmström pointed out that while trade negotiators are busy negotiating, the public is left behind. "We need to explain that trade is good, but the public doesn't trust the negotiators." Many consumers are concerned about the provenance of the goods they buy, but most are unaware of the multitude of benefits trade can deliver to developed and developing countries.

Both Malmström and Roberto Azevêdo, Director-General of the World Trade Organization, agreed that it is time to turn the narrative around and make the case for trade. TTIP promises huge returns. The challenge is how to communicate these potential benefits to consumers.

No one can argue against the concept of inclusive growth – the top 1% and the so-called "bottom of the pyramid" are leitmotif in conversations about inequality and pervasive poverty. Inequality is widening, which is bad for growth. Where there is growth, inequality fuels precariousness and fragility in communities. Where economists, policy-makers and others disagree is how to achieve it.

Education and training

Some advocate better access to opportunities through education and jobs; others argue for redistribution, for example, through the tax system. However, everyone agrees that regressive taxation exacerbates inequality. Where they disagree is how to address it. As Nobel Prize winning economist Joseph Stiglitz said: "Our economic system isn't working for the majority of our citizens. You have to ask why. If we had fair tax systems, we wouldn't need redistribution."

There is reason for hope. Chrystia Freeland, Canada's Trade Minister, said that during her door-to-door campaigning in the October 2015 federal election in Rosedale, Canada's most affluent neighbourhood, she warned voters that a Liberal government led by Justin Trudeau would raise taxes. She asked whether people would rather live in a society of inclusive prosperity or a gated community of the 1%. The result? Freeland won the election.

"The best antidote to hate is tolerance."



Sheryl Sandberg Chief Operating Officer and Member of the Board, Facebook, USA



What on Earth are we doing?

The new Earth Time-Lapse series at the Annual Meeting 2016 offered a startling perspective on how the problems of the Global Commons can be tackled through the application of breakthrough science and technology.

The visual exploration of Earth through high-resolution time-lapse satellite imagery of Earth revealed patterns of transformation over the past three decades in areas such as coral reefs, urban sprawl, deforestation, retreat of glaciers and fires at night. The maps make visible the driving forces of climate change. The impact of the two leading sources of greenhouse gas emissions – the energy industry and deforestation – is dramatic.

When the screen displays fires at night, bright orbs light up along the northeastern coast of Africa and in the upper Midwest of the United States, pinpointing the concentration of flaring of gas at oil installations in Egypt and fracking operations in North Dakota.

The Earth Space tool puts together NASA Landsat images and graphic overlays. Google Earth Engine allows for zooming in or out and moving back and forth in time. The interactive map is the product of a collaboration between the Carnegie Mellon University's Robotics Institute, Google and the US Geological Survey.

An immediate application of Earth Space is to combat illegal logging. By monitoring deforestation in Africa every two weeks, it has been possible for government to track logging and catch the poachers as they return to the forest to haul out lumber.

"The sheer volume of visual data is daunting to explore by conventional means," said Rebecca Moore, engineering manager of Google Earth Engine. "Together we can now offer an intuitive, effortless method to explore the planet in space and time."



Welcome to my world

Virtual reality has the power to transport people to places such as the remote Great Sandy Desert of Western Australia and the refugee camps of Syria. And what makes civilization and the human experience is the connection between art and science.

Thanks to the latest digital technology, cultural heritage sites – from the ancient Mogao Caves at Dunhuang in China's Gobi Desert to the temples and palaces of Hampi in Karnataka in India – can come to life like never before, bringing your next museum visit to a whole new level. Such advanced technology can allow the viewer to zoom into the tiniest brushstroke and zoom back out to the panorama.

"This is proof how much digital technology with storytelling and visualization can help us get closer to the arts and

bring back to life and preserve human culture," said Paola Antonelli, a senior curator at the Museum of Modern Art in New York. "It allows us to see things that cannot be seen easily elsewhere."

Martin Vetterli of the Swiss National Science Foundation, wants to take collaboration and open source to a new level. He envisions a Wikipedia-like space for art that would have the appropriate standards and make available art for people to consume in high-quality form – like a non-commercial version of Spotify, for instance.

All these efforts are part of the Fourth Industrial Revolution, the digital revolution that is characterized by a fusion of technologies that is quickly blurring the lines between the physical and digital worlds.

















01: Tidjane Thiam, Chief Executive Officer, Credit Suisse, Switzerland; Herbert J. Scheidt, Chairman of the Board, Vontobel Holding AG, Switzerland; Paul Bulcke, Chief Executive Officer, Nestlé SA, Switzerland 02: Silk Road musical collaboration at the Congress Hall 03: Kevin Delaney, President and Editor-in-Chief Quartz - Atlantic Media, USA; Nelson Henrique Barbosa-Filho, Minister of Finance of Brazil; Enda Kenny, Taoiseach of Ireland; Joseph E. Stiglitz,

Professor, School of International and Public Affairs (SIPA), Columbia University, USA; Zhang Xin, Chief Executive Officer and Co-Founder, SOHO China, People's Republic of China 04: Geoff Cutmore, Anchor, CNBC, United Kingdom; Erik Brynjolfsson, Director, MIT Initiative on the Digital Economy, MIT - Sloan School of Management, USA; Sharan Burrow, General Secretary, International Trade Union Confederation (ITUC), Brussels; Maurice Lévy,

Chairman and Chief Executive Officer, Publicis Groupe, France; Marc R. Benioff, Chairman and Chief Executive Officer, Salesforce, USA 05: Christiane Amanpour, Chief International Correspondent, CNN, United Kingdom; Tammam Saeb Salam, President of the Council of Ministers of Lebanon; Haidar Al Abadi, Prime Minister of Iraq 07: Linda A. Hill. Professor of Business Administration, Harvard Business School, USA 08: Joseph R. Biden Jr., Vice-President of the United States **09:** Andy Serwer, Editorin-Chief, Yahoo Finance News, USA; Alfonso Prat-Gay, Minister of Finance of Argentina; Kenneth Rogoff, Thomas D. Cabot Professor of Public Policy and Professor of Economics. Harvard University, USA; Barry M. Gosin, Chief Executive Officer, Newmark Grubb Knight Frank, USA











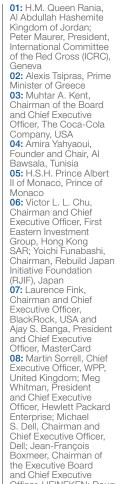




















Tackling the global refugee crisis

There are more humanitarian crises raging across the world today than at any other time in modern history. Disasters are no longer the concern of aid agencies alone. Everyone has a role, from policy-makers to private sector, faith leaders to film-makers, and ordinary people, all connected through social media.

Dominating the humanitarian agenda in 2016 is the global refugee crisis – 60 million people across the world are displaced by war, violence and environmental disaster. Civil war in Syria has forced 11 million from their homes. Four million have sought sanctuary in Turkey, Lebanon and Jordan, while more have joined the 1 million-plus refugees who fled to Europe last year. Nearly 4,000 of them drowned in the waters off Greece.

Europe's politicians – pressured by populists – are scrambling for solutions. Germany, so welcoming to refugees last summer, is suffering a backlash. President Gauck, speaking at Davos, called for quotas, saying "if democrats do not want to talk about limitations, then populists and xenophobes will". Border controls have sprung up across the continent, prompting Mark Rutte, the Dutch Prime Minister, to warn that without a solution in six to eight weeks the EU's passport-free Schengen area could collapse. The EU is considering forcing refugees to seek asylum in Greece by preventing their onward passage.

There are rational solutions, but they need imagination and courage to implement. "We are willing to create economic zones where refugees can find employment", said Queen Rania of Jordan, whose country hosts 1.3 million Syrians. Without the independence and self-respect that employment brings, refugees stuck in camps lose hope and fall prey to recruitment by extremists.

To make this idea happen, however, requires investors to relocate supply chains to the region and train refugees in skills they can later take home.

Turkey has granted work permits to the

2.5 million refugees on its soil and is providing eduation to 700,000 of their children. Germany's Finance Minister Wolfgang Schäuble has called for a new Marshall Plan to invest billions in the regions from where the refugees have come.

Europe also needs to learn how to integrate refugees better. Austria has a good record of integrating migrants, engaging with local Muslim leaders to find young role models to encourage migrants how to behave. In the US, David Lubell has created Welcoming America, an innovative NGO which works to make the "host soil" of local communities a more fertile and welcoming environment for the migrant "seeds" to take root.



"The refugee crisis is not a Turkish crisis, it is a global crisis."

Ahmet Davutoğlu Prime Minister of Turkey

Private sector engagement

Humanitarian crises are getting more protracted – often lasting decades. "As these crises multiply, aid agencies cannot meet humanitarian needs alone. They need the assets and knowledge that companies bring," said Helen Alderson, a director with the International Committee of the Red Cross (ICRC). In Côte d'Ivoire, ICRC has partnered with Philips, the Dutch technology giant, to create 1,000 rural healthcare centres, networked to urban centres. For Philips, the model is more about sustainable, enlightened self-interest than charity or corporate social responsibility (see box below).

Rapid emergency response is always a challenge – both for governments overwhelmed by disaster and for international agencies scrambling to reach the crisis zone. Shaffi Mather, an Indian entrepreneur, has launched a start-up called M-Urgency to provide emergency medical response. The model is based on Uber. One tap on your smart phone connects you to the nearest doctor or paramedic who can come to your aid. The World Health Organization and the International Red Cross/Red Crescent movement – with its network of 17 million volunteers are on board. Mather has raised \$2 million and is rolling it out in India, Dubai and Israel.

During disasters, M-Urgency's healthcare professionals agree to provide life-saving response for free. Otherwise, there is a modest charge; in India, it's just \$5 per call-out. The model generates sustainable revenue delivering a return to investors. But what happens in crises when the mobile phone network is down? "This is the power of Davos," said Mather. During the Annual Meeting 2016, he met with Inmarsat, the British satellite telecommunications company, which agreed to provide satellite links to disaster zones to create a local wireless mobile network.

HelpNow is a new app that supports relief efforts by pulling together vital data – often crowdsourced – that's needed in the hours after disaster strikes. The aim is to build a common, open-source dataset to connect resources with needs in real time. The app can be preloaded with details

of hospitals, aid stockpiles and road access in vulnerable areas. By saving time, this app can save lives.

In Lebanon and Jordan, Mastercard and MercyCorps are collaborating to provide a million refugees with charge cards and mobile money. The cards can be credited either with cash or commodity e-vouchers, enabling users to buy food and goods from local traders. "If you can get cash in the hands of people, it gives them greater dignity and it empowers them to make decisions about their own lives," said Neal Keny-Guver. Chief Executive of MercyCorps. "It helps local markets and it helps counter gender-based violence. If young women don't have money, it opens them up to exploitation."

Currently, only 3% of humanitarian aid is delivered in cash. But within 10 years, mobile money has the capacity to make the aid industry's huge warehousing and logistics operations a thing of the past, bringing big savings on shipping in aid, said Keny-Guyer.

Human face of suffering

Despite great leaps forward in technology, a recurring theme at Davos this year was "staying human". We cannot hope to solve the planet's protracted emergencies without remembering our shared humanity with those caught in crisis.

Film-maker Sharmeen Obaid Chinoy believes passionately in the power of images to effect change. In her film featuring a female doctor treating suicide-bomb victims in Karachi, and polio vaccination activist Naseem Munir moving through narrow lanes with armed guards, Obaid Chinoy said: "I wanted to show that Muslim women can be this kick-ass force that you've never seen before."

In the Davos virtual reality space, a film called *Clouds Over Sidra* brought home to participants the human side of suffering. The film follows a young Syrian girl called Sidra around her refugee camp. The feeling of intense proximity to her family and friends was very powerful.

"Young scientists don't only care about science, they really care about the world."



Elizabeth Blackburn President, the Salk Institute for Biological Studies, USA



Connected healthcare centres

A new collaboration between the International Committee of the Red Cross (ICRC) and Philips, the Dutch technology giant, is delivering life-saving healthcare to Côte d'Ivoire.

After the ICRC identified several key challenges facing prenatal and postnatal care in the West African country, Philips put 120 of its top designers to work to create technological solutions. The result: the Community Life Centre, a local facility to deliver basic healthcare, clean water and solar lighting for crisis-affected populations. The technology will link rural centres to larger hospitals to enable remote analysis of vital signs. The target is to create 1,000 centres in the next three years.

"Working with Philips' designers has helped ICRC to realize what is possible in terms of technological innovation," said ICRC Director Helen Alderson.

In addition to providing valuable health services, the centres will also create jobs. "Each of these life centres will require operating, servicing, maintaining, which in turn creates local employment," said Ronald de Jong, Chairman of the Philips Foundation responsible for the initiative.

As well as delivering healthcare, the solar lighting has the add-on benefits of promoting economic and educational activity after hours.



Experiential learning for participants in the A Day in the Life of a Refugee interaction simulation

Life as a refugee

A bearded man in balaclava and combat fatigues was waving an AK-47, shouting: "Refugee, get down! Turn off your light or you will get us all killed!" It was pitch dark, there were 30 of us kneeling together on the ground. Suddenly, a deafening barrage of gunfire, mortar fire, artillery exploded around us.

As leaders debated the issues of the day – plummeting oil prices, changing climate and global conflicts – in the Congress Centre, across the street at the Annual Meeting 2016 a group got a glimpse of the struggles of what millions go through each day.

According to the UN, the number of refugees and displaced exceeds over 60 million, mainly driven from the Syrian war and other conflicts in the Middle East.

At the Crossroads "Refugee Run", each participant was assigned an ID card and made to pass through checkpoints

and queue for food and medicine. They were then corralled into makeshift tents, all under the watchful eyes of "guards" played by actors, some of whom were once refugees themselves. One man recounted how the Lord's Resistance Army in Uganda turned him out of school at gunpoint and forced him to shoot members of his own family and tribe.

While the creators of the simulation admitted the experience was a fraction of the stress felt by real refugees, even within the 45-minute session one soon got a sense of how quickly one can lose one's identity and dignity.

At the end of the session, Alexandra Chen, a child trauma specialist from Hong Kong, spoke about a young Syrian boy she befriended in a refugee camp. When she had to leave the camp to travel to Davos, she asked him what he would like her to bring back for him. "Just ask them not to forget me," he said.











02: Jean-Pierre

01: Susanne F. Wille, Journalist and Anchor, Swiss Television SRF, Switzerland; Gordon Brown, UN Special Envoy for Global Education; Chair, Global Commission on Financing Global Education Opportunity; Alain Dehaze, Chief Executive Officer, Adecco Group, Switzerland; Johann N. Schneider-Ammann, President of the Swiss Confederation and Federal Councillor of Economic Affairs, Education and Research of Switzerland, Jimmy Wales, Founder and Chair Emeritus, Board of Trustees, Wikimedia Foundation, USA; Angela Hobbs, Professor of the Public Understanding of Philosophy, University of Sheffield, United Kingdom

Bourguignon, President, European Research Council, Belgium 03: Sarah Kenderdine, Professor and Director, Expanded Perception and Interaction Centre, University of New South Wales, Australia 04: Jim Yong Kim. President, World Bank, Washington DC 05: Winnie Byanyima, Executive Director, Oxfam International, United Kingdom; Charlotte Petri Gornitzka, Director-General, Swedish International Development Cooperation Agency (Sida), Sweden; Katherine Garrett-Cox, Chief Executive Officer, Alliance Trust Investments, United Kingdom

06: Forum Debate: A
Cure We Can Afford:
Overview session
07: Kofi Annan, Chairman,
Kofi Annan Foundation,
Switzerland; SecretaryGeneral, United Nations
(1997-2006)
10: Theresa Whitmarsh,
Executive Director,
Washington State
Investment Board, USA
08: Ray Dalio, Chairman
and Chief Investment
Officer, Bridgewater

Associates, USA

09: Hélène Rey, Professor
of Economics, London
Business School, United
Kingdom

























01: The Building More Resilient Arab Economies session 02: Nita A. Farahany, Professor, Law and Prilosophy, Duke
University, USA

33: Emma Marcegaglia,
Chairman, Eni, Italy

44: Lynette Wallworth,
Artist, Studio Wallworth, Australia; Nola Taylor, Martumili Artists, Nyarri Morgan, Artist, Martumili Artists and Neelam Chhiber, Managing Director, Industree/ Mother Earth **05:** Jose Manuel Barroso, President of the European Commission (2004-2014), Portugal **06:** Robert J. Shiller, Sterling Professor of Economics, Yale University, USA 07: Ban Ki-moon, Secretary-General, United Nations, New York 08: Takehiko Nakao, President, Asian Development Bank, Manila 09: The RED campaign celebrates 10 years



Embracing technology to reshape a better future

Political, business and civil society leaders, working together on the World Economic Forum's Global Challenge Initiatives, are having to rethink old models of behaviour to tackle the big issues in a fast-changing world. With the help of technology, they're also making plans for the future.

The World Economic Forum has defined 10 global needs where it can most help to accelerate public-private collaboration. These are: Food Security and Agriculture; Economic Growth and Social Inclusion; Employment, Skills and Human Capital; the Environment and Natural Resource Security; Future of Health; Future of the Internet; Future of the Global Financial System; Gender Parity; International Trade and Investment; and Long-term Investing, Infrastructure and Development.

Participants at the Annual Meeting exchanged notes on progress on these pressing global challenges and on new strategies. The Fourth Industrial Revolution is already influencing their plans. Maurice Lévy, Chairman and Chief Executive of Publicis Groupe, said: "CEOs cannot just sit and say, 'we will wait for decisions from politicians to create a better society'."

Social innovation

With that idea in mind, many corporations are moving away from the old model of social activity as a charity or sideline. They are embedding social programmes into their core activities and looking for buy-ins from all levels of management. If senior management integrates social innovation into long-term planning, with transparent metrics to demand and measure progress, the whole company will respond.

Most companies find that social activities help not only their bottom line but also their branding with consumers, employees and investors. Examples are common. A medical device company, by working on an inexpensive device to reduce deaths during childbirth in the developing world, has developed a new business line; a group of food corporations

reduced calorie counts in their products without seeing any decline in sales; a pharmacy chain ended the sale of tobacco products and saw its stock price rise.

In healthcare, the focus is now not just on improved techniques, but on keeping costs down so more people can benefit. Big and better data is facilitating individually tailored precision medicines as well as smart wellness and preventive care programmes. Using both population and individual data to examine health risks enables earlier – and therefore cheaper – intervention. Better treatment means shorter hospital stays.

As technology improves and better data is made available to healthcare providers and individuals, the conflict



"We shouldn't be afraid of the word 'feminist' – men and women should be able to use the word to describe themselves any time they want."

Justin Trudeau Prime Minister of Canada between precision medicine and public health budgets may prove to be an illusion. "This moment in the history of medicine is the most exciting time in the last 100 years," said Ezekiel Emanuel, Vice-Provost of the University of Pennsylvania.

Renewable energy

The ability to digitize and analyse huge amounts of data is also paving the way for renewables to provide an ever greater part of the planet's energy needs. The biggest problem of solar and wind power right now is that their production is intermittent and usually not at the same time or place as peak consumption.

But distributed production is growing fast, and smart batteries, tailored to individual household needs, and smart grids are on their way to reinventing the whole electricity industry. Instead of giant utilities generating and selling energy, the world will soon see a grid of millions or even billions of households and companies alternately consuming, producing and storing energy in the most efficient way possible.

Developing countries, which often do not have the sunk costs of massive power grids, can move directly to decentralized, distributed power generation. Solar panels in isolated African villages are bringing electricity to people without the need for a grid or utility company. Rice farmers in the Philippines are generating electricity locally from rice husks.

But governments have to act to accelerate the advance of new technologies. They should eliminate fossil fuel subsidies and provide new regulations for an increasingly complex industry. "A more systematic approach is required to integrate renewable energy sources into an overall smart grid," said Hiroaki Nakanishi, Chairman and Chief Executive of Hitachi, and Co-Chair of the Annual Meeting 2016.

Access to banking

Broader access to the financial system is another key development goal. If people do not have bank accounts or credit cards, they cannot take part in the internet of things or any other part of the Fourth Industrial Revolution. Progress has been made – over 700 million people have joined the financial world in the past three years – and global leaders have actionable, proven ideas to bring the remaining 2 billion people into the financial system.

These ideas all require cooperation between governments and financial institutions: simplified regulatory requirements for small accounts; the use of government transfer payments and tax policy as incentives to enter the formal financial system; regulations to increase competition in the banking and telecom sectors; the creation of a national electronic ID; turning local stores into digital financial services hubs; and taking advantage of cell phones to provide mobile banking.

"We now have the tools, the strategy, and the data we need to achieve global financial inclusion," Queen Máxima of the Netherlands said.

The use of new information technologies is spreading even to the very oldest economic sector, as mobile phones allow farmers in developing countries to access data on weather and markets, and to receive training and even insurance.

Governments and businesses must work together so the new technologies will spread while reducing inequality. For that, old-fashioned human values of empathy and tolerance are needed.

Social media has been given a bad press for spreading extremist views, but it has also fuelled democracy, citizen watchdog and civil rights movements. The potential for transparency can be a huge aid in fighting corruption, incentivizing corporate responsibility and reducing tax evasion. Technology can and must make all of us not just more prosperous, but more engaged and responsible global citizens.

Amira Yahyaoui, Founder and Chair of Al Bawsala, and Co-Chair of the Annual Meeting 2016, summed it up: "The Fourth Industrial Revolution is also a values revolution."

"COP21 was a success, but that was the easy part."



Christina Figueres
Executive Secretary,
United Nations
Framework
Convention on Climate
Change (UNFCCC)



Theresa Whitmarsh, Executive Director, Washington State Investment Board, USA; Saadia Zahidi, Head of Employment and Gender Initiatives, Member of the Executive Committee, World Economic Forum: Mara Swan, Executive Vice-President, Global Strategy and Talent, ManpowerGroup, USA

Breaking down gender barriers

Studies show that training programmes to fight unconscious gender bias work – for about 24 hours. Then the old biases return. And the barriers that keep women from achieving parity with men, especially at the highest levels of management, are problems not just for women. Data shows that teams with a significant number of women make better decisions than those without. "If you engage and build diverse teams, you will outperform. So do it because it will help you," Sheryl Sandberg, Chief Operating Officer of Facebook, said.

If no action is taken, the problem will get worse. Fields in which women have achieved success, such as professional services, are forecast to lose jobs, while the STEM fields (science, technology, engineering and mathematics), in which women are under-represented, are gaining jobs.

Education is clearly important, but even companies that see gender parity at entry-level positions lose more and more women the further up the corporate ladder employees rise. Solutions are available. Studies that show the advantage of gender parity to companies' bottom lines should be better publicized and more data should be collected. Companies must intervene – and in some areas consider quotas – in the promotion process to ensure that women are represented at every level of advancement. Management must provide flexible work-life arrangements, which many young men want too.

The good news is that more and more companies are getting the message. Members of the World Economic Forum's Oil & Gas community released a "Call to Action" to close the gender gap within the industry. The declaration, signed by 22 companies worldwide, shows that even the most male-dominated industries can work to break down the barriers.



Nadine Hani, Senior Presenter, Al Arabiya News Channel, United Arab Emirates; Ahmed Heikal, Chairman and Chief Executive Officer, Qalaa Holdings S.A.E., Egypt; Khalid Al Rumaihi, Chief Executive, Bahrain Economic Development Board, Bahrain; Suhail Bin Mohammed Al Mazrouei, Minister of Energy of the United Arab Emirates; Anas Khalid Al Saleh. Deputy Prime Minister: Minister of Finance: Acting Minister of Oil of Kuwait

Building vibrant Arab economies

Between political unrest and plummeting oil prices, most Arab economies today only make the news for misfortunes. But beneath the headlines, innovative governments and companies are moving forward to reform their economies.

Many Arab countries heavily subsidize the cost to consumers of energy – and there's no better time to end those subsidies, which encourage waste and divert resources, than at a time of low energy prices. "We need to take advantage of the reduction in oil prices and build an economy that is vibrant," said Suhail bin Mohammed Al Mazrouei, Energy Minister of the United Arab Emirates. Bahrain and Kuwait are also working to reduce or end subsidies and invest the savings in diversifying their economies.

Jordan opened up its telecom and IT industry over a decade ago and now has a thriving technology sector, as well as an advanced programme of public-private

partnerships in infrastructure. Morocco is working to have over 50% of its electricity consumption from renewables.

Corporations, too, are playing a role. The members of the World Economic Forum Middle East and North Africa Regional Business Council are training over 100,000 young people to enter the workforce. And the need for reform is urgent. Youth unemployment is over 30% and rising, and some of the unemployed will be targets for extremist recruiters. Outdated labour and bankruptcy laws, too much red tape, poor education systems and an inefficient justice system all hold back Arab economies.

But if these areas are reformed, and if some of the region's trillions in local capital is invested in the IT infrastructure needed to take advantage of the Fourth Industrial Revolution, the region's youth bulge would no longer be a problem. It would be an opportunity.



















01: Vishal Sikka, Chief Executive Officer and Managing Director, Infosys, USA; Guy Ryder, Director-General, International Labour Organization (ILO), Geneva; Ali Velshi, Anchor, Al Jazeera America, USA; Laura D'Andrea Tyson, Professor and Director, Haas School of Business, University of California, Berkeley, USA; Arne Sorenson, President and Chief Executive Officer, Marriott International, USA; Andrew McAfee, Principal Research Scientist, MIT Initiative on the Digital Economy Massachusetts Institute of Technology (MIT), USA **02:** Li Yuanchao, Vice-President of the People's Republic of China

03: The Digital Path to Learning session 04: Rosanne Haggerty, President and Chief Executive Officer, Community Solutions, USA

05: Muhammad Yunus, Chairman, Yunus Centre, Bangladesh

06: Jiang Jianqing, Chairman of the Board, Industrial and Commercial Bank of China, People's Republic of China

07: Navigating the Geosecurity Landscape 08: Naomi Oreskes, Professor of the History of Science, Harvard University, USA 09: Robin Niblett,

09: Robin Niblett, Director, Chatham House, United Kingdom; Mark Rutte, Prime Minister of the Netherlands; Manuel Valls, Prime Minister of France; Alexis Tsipras, Prime Minister of Greece; Emma Marcegaglia, Chairman, Eni, Italy; Wolfgang Schaeuble, Federal Minister of Finance of Germany 10: Gordon Brown, UN Special Envoy for Global Education; Chair, Global Commission on Financing Global Education Opportunity























01: Andrew Steer, President and Chief Executive Officer, World Resources Institute, USA 02: Jon Hilsenrath, Chief Economic Correspondent, The Wall Street Journal, USA; Sylvia Mathews Burwell, US Secretary of Health and Human Services 03: Klaus Schwab. Founder and Executive Chairman, World Economic Forum; Joachim Gauck. President of the Federal Republic of German 04: John Dramani Mahama, President of Ghana 05: Paul Polman, Chief Executive Officer Unilever, United Kingdom; Richard Curtis, Writer and Director, USA 06: Mara Swan, Executive Vice-President, Global Strategy and Talent, Manpower, USA 07: Shannon May, Co-Founder and Chief Development Officer, Bridge International Academies, Kenya 08: Humanitarian Hub 09: Ahmad Iravani, President and Executive Director, Center for the Study of Islam and the Middle East (CSIME), USA; Shawki Ibrahim Abdel-Karim Allam, Grand Mufti, Egyptian Religious Edicts Authority (Dar Al Iftaa Al Misreya), Egypt

10: The 21st-Century Dream session



















01: Edward Boyden, Associate Professor,





















Opera ensemble

President of the United States (1993-2001);

USA; Jim Hagemann Snabe, Chairman, Centre for Global

Chairman and Co-Founder, Generation Investment Management,

Industries, Member of the Managing Board, World

02: Rahul Bajaj, Chairman, Bajaj Auto, India; Al Gore, ViceEconomic Forum; Joe Kaeser, President and Chief Executive Officer, Siemens, Germany 03: Future of Global Trade session 04: Laurent Fabius, Minister of Foreign Affairs and International Development of France 05: Amy Wilkinson, Lecturer, Stanford Graduate School of Business, USA; Mitch Barns, Chief Executive

Officer, Nielsen, USA; Richard Solomons, Chief Executive, InterContinental Hotels Group, United Kingdom; Taavet Hinrikus, Chief Executive Officer, TransferWise, United Kingdom; Devin Wenig, President and Chief Executive Officer, eBay, USA; Soraya Darabi, Impact Investor & CoFounder, Zady.com, USA 06: Rebecca
Blumenstein, Deputy
Editor-in-Chief, Wall
Street Journal, USA
07: Klaus Schwab,
Founder and Executive
Chairman, World
Economic Forum;
John F. Kerry, US
Secretary of State
08: A Day in the Life of a
Refugee experience

09: Kevin Delaney, President and Editor-in-Chief Quartz - Atlantic Media, USA; Nelson Henrique Barbosa-Filho, Minister of Finance of Brazil; Enda Kenny, Taoiseach of Ireland; Joseph E. Stiglitz, Professor, School of International and Public Affairs (SIPA), Columbia University, USA; Zhang Xin, Chief Executive Officer and Co-Founder, SOHO China, People's Republic of China









01: David Miliband, President, International Rescue Committee, USA; Witold Waszczykowski, Minister of Foreign Affairs of Poland; Lyse Doucet, Chief International Correspondent, BBC News, United Kingdom; Emmanuel Macron, Minister of the Economy, Industry and Digital Affairs of France; Federica Mogherini, High Representative for Foreign Affairs and Security Policy; Vice-President of the European Commission 02: Enrique Peña Nieto, President of Mexico; Moisés Naím, Distinguished Fellow, Carnegie Endowment for International Peace, USA 03: Lyse Doucet, Chief International Correspondent, BBC News, United Kingdom; Justin Trudeau, Prime Minister of Canada; Sheryl Sandberg, Chief Operating Officer and Member of the Board, Facebook, USA; Melinda Gates, Co-Chair, Bill & Melinda Gates Foundation, USA; Jonas Prising, Chairman and Chief Executive Officer, ManpowerGroup, USA; Zhang Xin, Chief Executive Officer and Co-Founder, SOHO

China, People's Republic



04: Daniel Kablan Duncan, Prime Minister of Côte d'Ivoire 05: Bertrand Piccard, Initiator, Chairman and Pilot, Solar Impulse, Switzerland; André Borschberg, Co-Founder, Chief Executive Officer and Pilot, Solar Impulse, Switzerland 06: Chuck Robbins, Chief Executive Officer, Cisco, USA; Pierre Nanterme, Chairman and Chief Executive Officer, Accenture, France; Susan Wojcicki, Chief Executive Officer, YouTube, USA



of China





















International Monetary Fund (IMF), Washington DC; Kenneth Rogoff, Thomas D. Cabot Professor of Public Policy and Professor of Economics, Harvard University, USA 02: Nadine Hani, Senior Presenter, Al Arabiya News Channel, United Arab Emirates 03: Zhang Fangyou, Chairman, Guangzhou Automobile Industry Group Co. Ltd, People's Republic of China; Zhang Lili, Chairperson, Tianjin Port (Group) Co. Ltd, People's Republic of China; Chen Feng, Chairman of the Board, HNA Group Co. Ltd, People's Republic of 04: Ranil

Wickremesinghe, Prime Minister of Sri Lanka 05: Zoe Keating, Cellist and Composer, USA 06: Paul Kagame, President of the Republic of Rwanda 07: Mark R. Warner, Senator from Virginia (Democrat), USA talking to Randall L.

Officer, AT&T Inc., USA 08: Klaus Schwab, Founder and Executive Chairman, World Economic Forum; Jennifer Doudna, Professor of Chemistry and of Molecular and Cell Biology, University of California, Berkeley, USA; Henry T. Greely, Deane F. and Kate Edelman Johnson Professor of Law, Stanford University, USA; Justine Cassell, Associate Dean, Technology, Strategy and Impact, School of Computer Science, Carnegie Mellon University USA; Angela Hobbs, Professor of the Public Understanding of Philosophy, University of Sheffield, United Kingdom; Amira Yahyaoui, Founder and Chair, Al Bawsala, Tunisia 09: Lakshmi Mittal, Chairman and Chief Executive Officer, ArcelorMittal, United Kingdom; Delos M. (Toby) Cosgrove, Chairman and Chief Executive Officer, Cleveland Clinic, USA

Arts & Culture in Davos

More than 40 cultural leaders joined the World Economic Forum's business, government and civil society communities at the Annual Meeting 2016 in Davos to help shape the global agenda.

Personalities included actor Kevin Spacey, author Elif Shafak, film-maker Sharmeen Obaid-Chinoy, vlogger John Green, photographer Platon, artist Lynette Wallworth and many others. Through their active engagement, they added their inspiring voices and insights on a range of issues, including migration, climate change, cultural heritage and freedom of speech.

"Art offers one of the few places in our society today where people from various backgrounds can come together to share an experience while having different opinions. Disagreement is not only accepted but encouraged," said

Crystal Award winner installation artist Olafur Eliasson.

Reflecting the meeting's theme, Mastering the Fourth Industrial Revolution, many expressed their views through digital exhibitions and immersive installations intended to create awe and reflection. Using visual, literary and sonic journeys, they offered alternative narratives and perspectives on today's myriad challenges, not just cultural but also economic and political.

Arts and culture also has the potential to impact youth. As Spacey said: "It's also about what the tools of theatre and arts and culture, as well as the artists, can do for a kid who has no self-esteem, who suddenly through a poetry project or a theatre workshop finds a way to express themselves, finds a way to stand up. That's better for all of us."



"Acting is a humanizing profession. I'm forced, by the nature of my job, to be somebody else."

Kevin Spacey Actor



World Economic Forum Insight: reports launched at Davos



Global Risks Report 2016

Now in its 11th edition, *The Global Risks Report 2016* draws attention to ways that global risks could evolve and interact in the next decade. The report features perspectives from nearly 750 experts on the perceived impact and likelihood of 29 prevalent global risks over a 10-year timeframe, and examines the interconnections among the risks.

http://www.weforum.org/reports/the-global-risks-report-2016



Resilience Insights

In the report, the Forum's Global Agenda Council on Risk & Resilience takes on key findings of *the Global Risks Report 2016*. The report's insights can spark a more in-depth discussion about how best to build and strengthen resilience to today's risks.

Attp://www.weforum.org/reports/global-agenda-council-on-risk-resilience-resilience-insights



Internet Fragmentation: An Overview

The white paper provides the first systematic overview of the growth of internet fragmentation, highlighting 28 risks that could lead to fragmentation. It concludes that meeting the challenge of internet fragmentation will require vigilance, analysis and international cooperation. The report was produced by the Forum's Future of the Internet Initiative.

Attp://www.weforum.org/reports/internet-fragmentation-an-overview



The Impact of Digital Content

The report focuses on the opportunities and risks of creating and sharing information online, highlighting overarching mobile and digital technology trends and the changes they mean for society.

Attp://www.weforum.org/reports/the-impact-of-digital-content-opportunities-and-risks-of-creating-and-sharing-information-online



Digital Media and Society: Implications in a Hyperconnected Era

The report explores the changing relationship with media, entertainment and information due to digitization and the implications this has on individuals and society. It also highlights key sociological and behavioural evolutions in individuals from increased digital use.

Attp://www.weforum.org/reports/digital-media-and-society-implications-in-a-hyperconnected-era



The E15 Initiative

The policy option papers offer a detailed and comprehensive set of suggestions for improved governance of the global trade and investment system in the 21st century. They are accompanied by a synthesis report, which summarizes and interprets the significance of the proposals for progress on many of the international community's most important shared imperatives.

Attp://www.weforum.org/reports/the-e15-initiative-strengthening-the-global-trade-and-investment-system-in-the-21st-century



The Future of Electricity in Fast-Growing Economies

This report recognizes the need for policy to balance the objectives in the Forum's energy architecture triangle: security and accessibility, short- and medium-term affordability, and environmental sustainability, particularly in fast-growing markets. These are trying to serve voracious new demand for electricity as their economies grow, as more customers are connected to the grid and as per capita consumption grows.

Attp://www.weforum.org/reports/the-future-of-electricity-in-fast-growing-economies



The Future of FinTech: A Paradigm Shift in Small Business Finance

This report reviews the shift in small and medium-sized enterprises financing, taking stock of what the finance industry has provided to date and how the fintech industry has taken over some of the funding with its innovative business models and products.

Attp://www.weforum.org/reports/future-fintech-paradigm-shift-small-business-finance



The Future of Jobs

The Fourth Industrial Revolution will cause widespread disruption not only to business models but also to labour markets over the next five years, with enormous change predicted in the skill sets needed to thrive in the new landscape. This is the finding of *The Future of Jobs* report.

http://www.weforum.org/reports/the-future-of-jobs



The New Plastics Economy: Rethinking the Future of Plastics

This report outlines a fundamental rethink for plastic packaging and plastics in general, offering a new approach with the potential to transform global plastic packaging material flows and thereby usher in the new plastics economy.

Attp://www.weforum.org/reports/the-new-plastics-economy-rethinking-the-future-of-plastics

Acknowledgements

The World Economic Forum wishes to recognize the support of the following companies as Partners and supporters of the Annual Meeting 2016.

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Further Information



The event page of the Annual Meeting 2016 provides access to a richer level of content from the meeting, including videos, photographs, insights and webcasts of selected sessions.





This report is also available to download in PDF or HTML format:



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The report was written by

Alejandro Reyes, Cesar Bacani, Daniel Horch, Dianna Rienstra and Jonathan Walter.

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Upcoming Meetings

World Economic Forum on Africa

Kigali, Rwanda 11-13 May 2016

Rwanda has dramatically transformed since the 1994 genocide and civil war. It is emerging as a regional high-tech hub and boasts one of sub-Saharan Africa's fastest GDP growth rates. It is one of the continent's most competitive economies and a top reformer in improving the business environment. Under the theme, Connecting Africa's Resources through Digital Transformation, the 26th World Economic Forum on Africa will convene regional and global leaders from business, government and civil society to discuss digital economy catalysts that can drive radical structural transformation, strengthen public-private collaboration on key global and regional challenges, and agree on strategic actions that can deliver shared prosperity across the continent.



For more information, email: Africa@weforum.org

World Economic Forum on East Asia

Kuala Lumpur, Malaysia 1-2 June 2016

The World Economic Forum will celebrate 25 years of shaping East Asia's regional agenda in 2016 with both its international and regional multistakeholder communities. The forthcoming launch of the ASEAN Economic Community exemplifies the region's continued commitment to removing barriers to the free flow of goods, services and people while improving sustainability, infrastructure and livelihood. One year after assuming chairmanship of ASEAN, Malaysia will host the meeting, which will be an ideal platform for senior decision-makers from various sectors to facilitate greater collaboration between industry, government and civil society and to address regional challenges.



For more information, email: EastAsia@weforum.org

World Economic Forum on Latin America

Medellín, Columbia 16-17 June 2016

The World Economic Forum on Latin America brings together leaders from all sectors, as well as academic thought leaders and millennials, to explore how a new prosperity agenda can be actively shaped. Returning to Colombia and hosted in the city of Medellín, the meeting gathers at a remarkable place and time: Medellín's transformation over the past two decades is a good example of successful 21st-century urban innovation. At the same time, Colombia is close to an historic accord that promises opportunities for sustained peace, economic progress and social inclusion. These inspiring achievements teach valuable lessons and are a reminder that socio-economic advances require constant attention as well as concerted and strategic action.



For more information, email: LatinAmerica@weforum.org

Annual Meeting of the New Champions 2016

Tianjin, People's Republic of China 26-28 June

Established in 2007 as the foremost global gathering on science, technology and innovation, the Annual Meeting of the New Champions convenes the next generation of fast-growing enterprises shaping the future of business and society, and leaders from major multinationals as well as government, media, academia and civil society. More than 1,500 participants from 90 countries will convene in Tianjin to engage in a truly global experience, addressing today's unprecedented set of intertwined global challenges – economic, political, societal and environmental. For more information, email: NewChampions@weforum.org







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The Forum engages the foremost political, business and other leaders of society to shape global, regional and industry agendas.

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