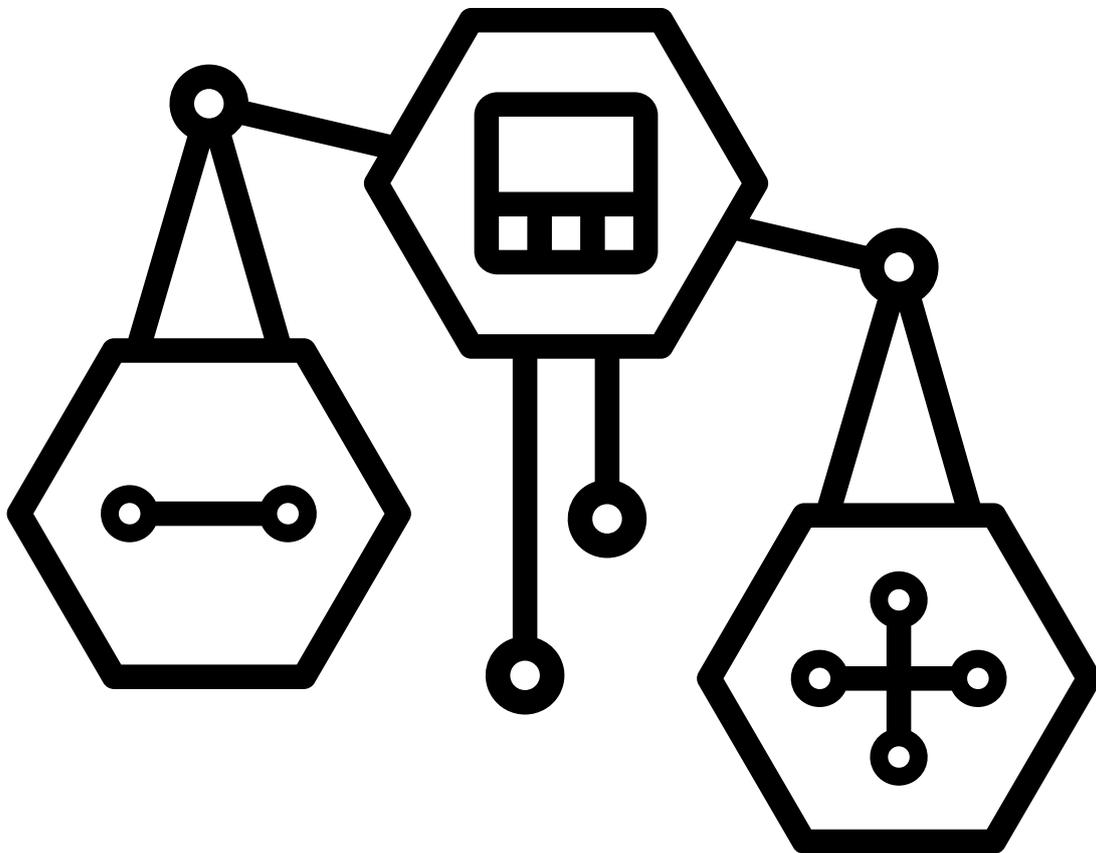


# Technology and inequality

A fairer and more prosperous world



• The State of World Inequality: What Does the Prosperity Index Show?

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• The role of the government vis-à-vis, the private sector, and other actors of the society, must be rethought.

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• Internet is the infrastructure for social mobility. The internet is also a major force of equality.

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***Technology and inequality.***  
*A fairer and more prosperous world*

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FTF | Fundación Innovación Bankinter

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The views and opinions expressed in this report are those of the author and do not necessarily reflect the position of the experts that participate in the Future Trends Forum meeting.

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Thank you so much

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# Adrian Wooldridge

## Prologue

Adrian Wooldridge is The Economist's management editor and writes the Schumpeter column. He was previously based in Washington, DC, as the Washington bureau chief where he also wrote the Lexington column. Previously he has been The Economist's West Coast correspondent, management correspondent and Britain correspondent. He is the co-author of "The Company: A Short History of a Revolutionary Idea", "A Future Perfect: The Challenge and Hidden Promise of Globalisation", "Witch Doctors", a critical examination of management theory, and "The Right Nation", a study of conservatism in America. His most recent book is "Masters of Management: How the Business Gurus and their Ideas have Changed the World—for Better and for Worse".

► **ONE of the most depressing** developments of recent years is that mega-tech has reinforced mega-inequality: most of the gains of economic progress have accrued to the top 1% who can use new technology to make themselves more productive and then sell the fruits of their efforts to a global market. But it does not have to be that way: technological innovations can be used to level playing fields and boost opportunities. Technological innovation can make it easier to find talented children by allowing schools and companies to search through huge bodies of data (for example by looking for children who are particularly good at video games). It can reduce the costs of pro-

viding labour-intensive services such as education by making on-line courses and teaching available over the internet. It can provide children with much better vocational guidance and on-the-job training. Such breakthroughs will not be created automatically: it is possible to envision a future in which the elite become ever more productive and the masses are pacified with cheap television and video games, bread and circuses for the electronic age. Much depends on public policy: governments need to seize on the opportunities provided by the technological revolution and use them to help tackle inequality and universalise opportunity.

# Will the world be a better place in the future? Or not?

0.0.

► **The world as we know it is changing**, and it's happening at a faster rate than ever before. Society, the economy, and technology are inextricably linked: they're the perspectives we need to reflect from when we think about the path our current innovations are leading us down. The big question is: can technology eradicate, or at least reduce, the world's inequalities? And further still: are recent technological developments leading us to a more equitable world... or quite the opposite?

This report is the result of the conclusions reached at the latest Future Trends Forum (FTF)<sup>1</sup> *think tank*, organised by [Fundación Innovación Bankinter](#), and held in Madrid in June 2016.

Leaving political ideology and the distribution of wealth debate to one side, thirty experts met for the FTF session to attempt to analyse the impact of new technologies on personal "prosperity": a concept based not solely on income, but on other factors such as (perception of) personal freedom, access to education and healthcare, and opportunities to start up businesses.

How can technology help improve these conditions?

There are a number of small initiatives providing good examples. The **Copenhagen Wheel** project, presented in December 2009 at a United Nations Climate Summit, and conceived and developed by [MIT Senseable City Lab](#) is an initiative to convert ordinary bicycles into electric ones. But not only that. The bicycles are also equipped with mobile sensors to capture information such as road conditions and air quality.

The relationship between prosperity and technology is as broad a question as it is ambitious. As such, the latest FTF debate focused on four big questions:

How does technology affect the distribution of prosperity? How can technology improve equality? Do we need new institutions? Who will lead the change?

► <sup>1</sup> Recognised by the University of Pennsylvania as [the best science and technology think tank in Spain](#), and one of the top ranked in the world.

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#FTTIn



Philip Lohr



#FTFInequality

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# Inequality across the world

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1.0.



# Paul Caruana

## Prologue

Paul Caruana Galizia is Head of Quantitative Research in the Prosperity Index team. Before joining the Legatum Institute, he was Marie Curie Fellow in economics at the Humboldt-University in Berlin, an Economist at Neptune Investment Management, and an Analyst in Facebook's Measurement Solutions Team. He holds an MSc and PhD in economic history from the London School of Economics. He has written two books and a number of journal articles mainly in economic history.

### ***The State of World Inequality: What Does the Prosperity Index Show?***

► **We know the story well by now:** global inequality is on the rise, the richest one per cent own half of the world's wealth. This is what most people know about inequality, but it isn't the whole story. What do we see if we expand our view beyond wealth to look at a broader definition of prosperity? And what about inequalities between countries rather than individuals? The Legatum Prosperity Index assesses countries on the promotion of their citizens' flourishing, reflecting

both wealth and wellbeing across nine sub-indices of prosperity, including health, education, governance, personal freedom, and the environment.

The Prosperity Index paints a more optimistic picture of the world than the one we see when looking at wealth alone.

Differences in overall prosperity between countries declined between 2007 and 2016. This decline in inequality occurred along with growth in global prosperity over the same period.

These trends - rising global prosperity and declining inequality - were driven by faster growth in prosperity among less wealthy countries. It is through improvements in health, governance, and personal freedom that these countries have grown increasingly prosperous.

While their gains were more modest, wealthy countries also saw prosperity growth. In fact, of the 149 countries covered by the Prosperity Index only 29 saw a decline in prosperity.

Looking at prosperity rather than wealth alone, we see a new story: an increasingly prosperous world, composed of increasingly equal countries.

▶ **Although major issues such as famine** and access to basic services and education persist, it's undeniable that the world is a better place than it was decades or centuries ago. We have improved access to drinking water, infant mortality has improved, and average global life expectancy has risen substantially. According to the Global Monitoring Report, a joint research project between the World Bank and the International Monetary Fund (IMF), there were 702 million people living in extreme poverty (on less than 1.9 dollars per day) across the world in mid-2015. In 2012, there were over 900 million. The expansion of the middle classes in countries such as China, Mexico, Colombia, Brazil and Thailand, is also undoubtedly shaping a more egalitarian world (see charts #1, 2 and 3).

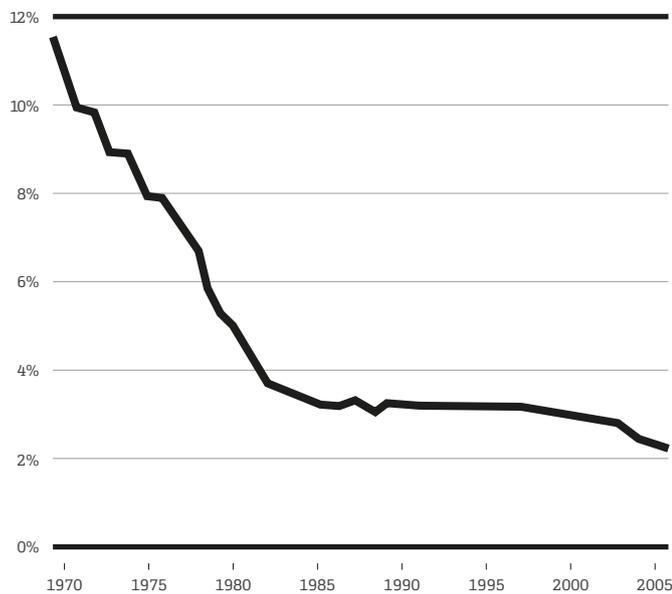
2 ▼

In July, the IMF reduced its 2016 growth projection for the third time, due to Brexit: it now stands at 3.1% .

But some recent figures have rung alarm bells. In April, the IMF cut its 2016 global growth projection to 3.2%, down from the 3.4% projection announced in October last year<sup>1</sup>. At the same time, consultancy firm McKinsey estimate that between 2014 and 2065 average annual global growth will stand at 2.1%, in contrast with the 3.8% registered between 1950 and 2014. Among others factors they cite the stagnation in growth of developed countries, the threat of protectionist policies, and increasing inequality between countries.

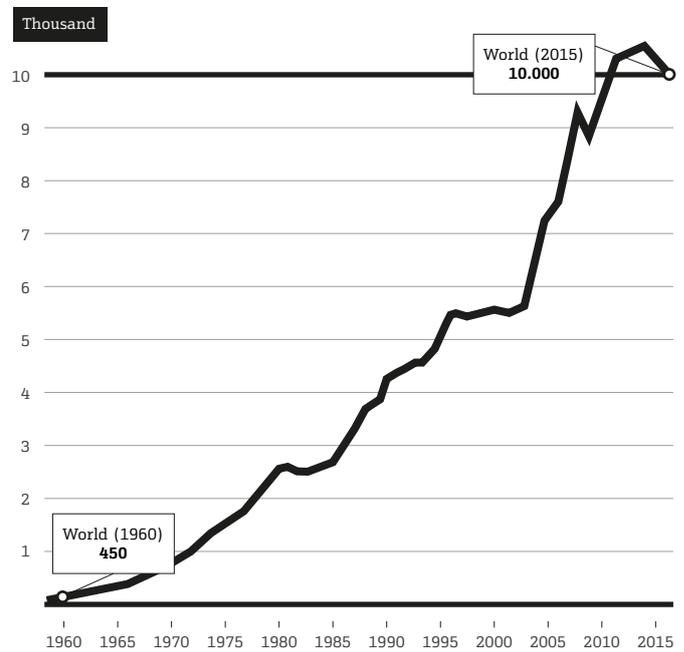
**“Global growth is slowing down. We assume technology generates productivity and subsequently leads to stronger growth, but it’s a false assumption”**, warned **Ivan Rossignol**, Chief Technical Specialist, Trade and Competitiveness at The World Bank (see chart #4).

Chart #1  
**PERCENT OF WORLD POPULATION LIVING ON LESS THAN \$1 PER DAY**



Maxim Pinkovskiy and Xavier Sala-i-Martin. "Parametric Estimations of the World Distribution of Income". NBER Working Paper #15433. October 2009.

Chart #2  
**GDP PER CAPITA (CURRENT US\$)**



World Bank national accounts data, and OECD National Accounts data files.

Rossignol explained how society's improved access to new technologies is failing to produce the structural change that should theoretically happen in developing countries: the move from a primary economy to one based on services. Similarly, **employment created by the information technology industry is not adequately compensating for the level of job losses brought about by technological progress.**

In his opinion, the realignment of technology and productivity is something that will take time. **"Digital dividends digital will come, but we have to be patient"**, he said. In its World Development Report 2016, the World Bank confirmed that the *digital dividend* (that is, the impact new technologies have on society) has in fact turned out to be much less than expected. **"What's the point of distributing computers in African schools if teachers don't know how to use them?"**, asked Pierre Guislain, Senior Director, Transport and ICT, World Bank, in a recent interview with Expansión.

*The poor are less poor... but the rich get ever richer.*

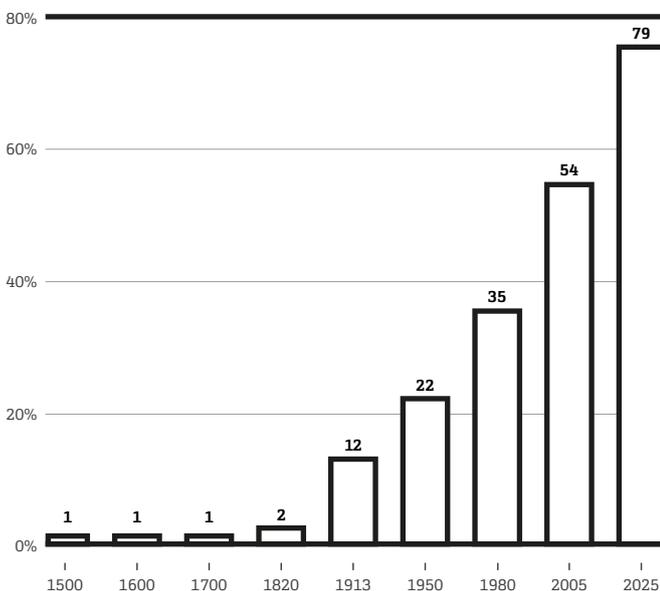
Investment in communications networks or the deployment of devices in the planet's most disadvantaged areas are indeed positive steps, but they are not enough to guarantee the democratisation of a region's services or to empower a society. The first challenge, then, is to help create the fertile ground needed to stimulate the positive use of new technologies (enterprise support policies, social freedoms, training in new skills, etc.) which will in turn lead to wider improvements to society and the economy.

Poor people are becoming less and less poor, but it's also true to say that new technologies have led to the appearance of new fortunes.

The book *Capital in the Twenty-First Century*, written by French economist Thomas Piketty in 2013 reveals

Chart #3

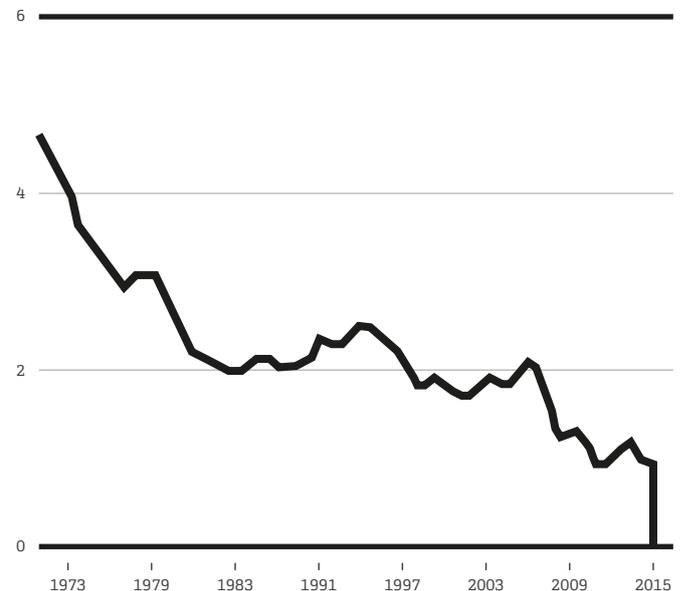
**WORLD: SHARE OF MIDDLE CLASS IN POPULATION**



"Second Among Equals: The Middle Class Kingdoms of India and China", por Surjit S. Bhalla.

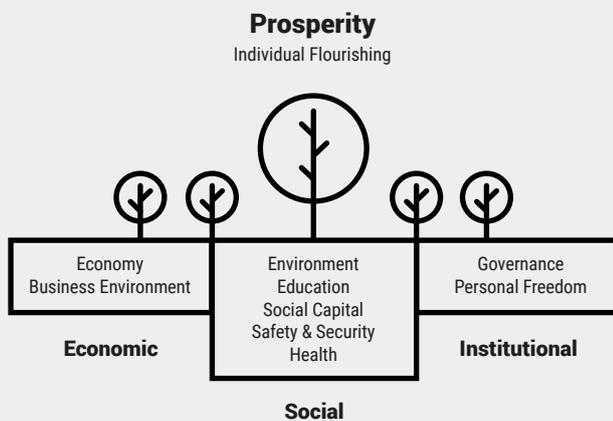
Chart #4

**GLOBAL PRODUCTIVITY**



Source: World Bank. Five-year moving average of median growth of labor productivity per hour worked, in percent, in 87 countries.

## 👁️ | The Legatum Prosperity Index



Traditional macroeconomic measures aren't the best (or only) way of evaluating the world's progress. The Legatum Institute Foundation offers an alternative, the Global Prosperity Index, which takes into account both economic prosperity and social well-being. It examines the usual factors relating to the success or progress of a country such as Gross Domestic Product (GDP), as well as others such as access to education and healthcare, the ease of starting a business, levels of instability, or the perceived freedom of inhabitants. Further information: [prosperity.com](http://prosperity.com)

In the opinion of FTF experts, a country's prosperity is most likely to be determined by, in this order: access to education, access to healthcare, personal freedom, the economy, public security, regulation/bureaucracy, social capital, the business environment, and lastly, the environment (a factor Legatum recently added to the index).

The order of priorities will change depending on each person's place of origin and personal experience. For someone from a conflict zone, public security would be a main determining factor, while someone who's experienced a healthcare crisis would most likely rate healthcare and environment as their highest priorities.

that in recent years (data available up to 2010) economic inequality between the richest 1% and the rest of the population in Europe and the USA has grown faster than at any other time since before World War II<sup>3</sup>. Some theorists attribute this trend to business opportunities brought about by the information age.

During the FTF **Adrian Wooldridge** argued that there had been a reduction in social mobility. As he sees it, technology is furnishing businesses with a level of scalability never seen before: and it's helping the perpetuation of the elites in the highest ranks of society. "It's producing a marriage between plutocracy and meritocracy", he warned. In other words: a poor person's chances of becoming a great leader are becoming more and more remote. **These are bad times for the Americandream.**

"And what's worse", said Wooldridge, **"the technological revolution threatens to bolster this trend.** If you have an opportunity to invent something or to start up a company, the probability that it'll turn into a thriving business is higher than ever before. But at the same time, technology is eradicating huge numbers of jobs. Any jobs that can be codified or mechanised will be destroyed. A huge abyss is opening up at the heart of our society".

How can we turn this phenomenon around? **Can technology be part of the solution?**

### 3 ▼

The reality is as always more complex than a single mathematical equation as put forward by Piketty, who compares capital yield with the growing wealth of a country. Wealth founded on innovation leaves behind an "inheritance": a legacy for society greater than its actual economic impact at a given moment. Innovation lays the foundations for future development.

# Technology: part of the problem, or the solution?

## 1.1.

► **Both.** "Technology is destroying employment but it's increasing egalitarianism at the same time. It creates opportunities for the masses, it gives resources to the masses that before would only ever have reached the

elites. Technology is a component of globalisation: it's reaching every corner of the world. Technology can be used to unite society, just as it can be used to divide it", remarked **Adrian Wooldridge**, Management Editor and Columnist at The Economist.

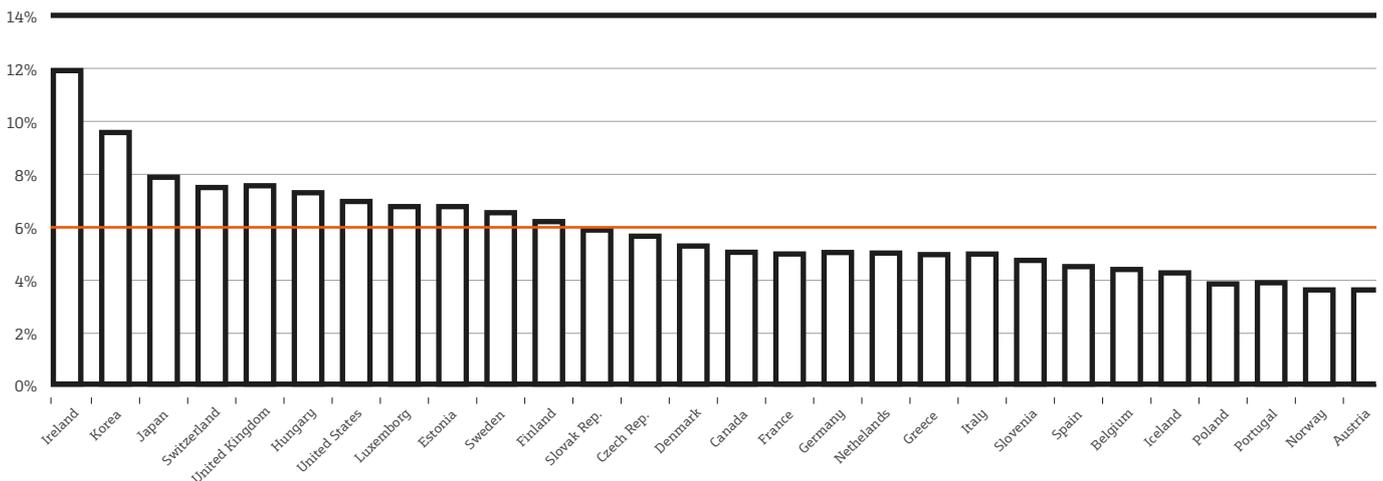
Ultimately, **technology is and will be an accelerator to alleviate inequality across the world**, but it brings with it certain challenges. As we saw before, the rapid deployment of technology hasn't resulted in any increase in measures of global productivity. The contribution of information and communications technologies (ICT) to GDP is, at least for now, modest, as the following chart shows (see charts #5a and 5b).

"Technology is producing inequality, but technology itself isn't the problem", stressed **Soumitra Dutta**. Dutta is considered an authority on the impact of new technologies (especially social media) on the business community. He is the author of the Global Innovation Index (GII) and worked on the first Networked Readiness Index in 1999, which came from the current Global Information Technology Report from the World Economic Forum. "In 1999 we expected that the futu-

Gráfico #5a

### THE SIZE OF THE SECTORS AND ITS CONTRIBUTION TO GDP GROWTH IS STILL RELATIVELY MODEST

Share in GDP, OECD countries, 2011



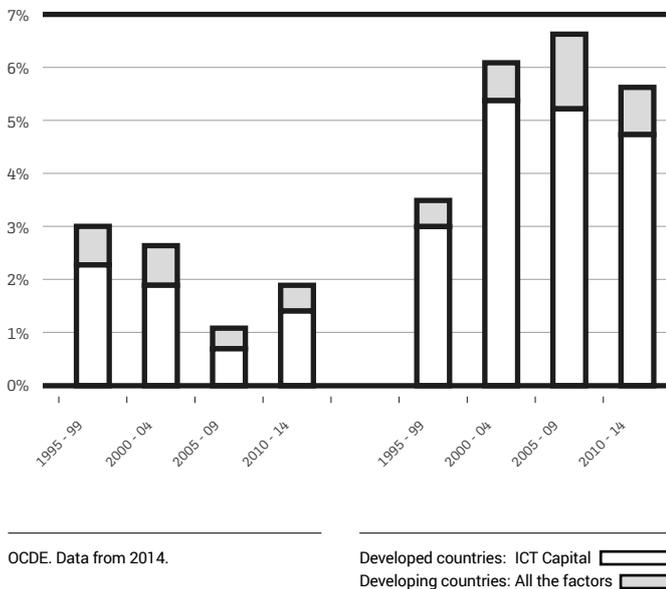
OCDE. Data from 2014.

OCDE. average (6%)

Gráfico #5b

## THE SIZE OF THE SECTORS AND ITS CONTRIBUTION TO GDP GROWTH IS STILL RELATIVELY MODEST

Contribution to GDP growth, 1995 - 2014



re would offer improvements in equality, an increase in access to information, greater levels of personal freedom, and a boost in global growth. Many of those projections have indeed come about, thanks in a large part to technology, but at the same time the gap between more advanced markets and developing countries has widened", he explained.

One of the exceptions is in the deployment of mobile technology. In 2005, developed countries had a market penetration 18 times higher than developing countries: by 2013 that proportion had reduced by half. At the end of 2012, 420 million people were still living out of the reach of a mobile signal.

## Technology and employment: how will the future look?

In actual fact **technology itself is not the problem: it's a catalyst... for better or worse.** "Technology magnifies everything. In this case, it magnifies difference. The gap between rich and poor countries, between urban and rural areas, will go on widening for the simple reason that technology is evolving at an ever greater pace", Dutta points out.

The second negative consequence of digitisation is the **"appearance of new business monopolies**, which in some countries have sufficient power to introduce regulations in their favour" according to **Ivan Rossignol**, Chief Technical Specialist, Trade and Competitiveness at The World Bank.

Thirdly, it continues to contribute to the huge number of job cuts that the ICT industry is failing to compensate for (see chart #6).

Will robots end up replacing our entire workforce? A lot of research has been carried out on the subject. This report doesn't intend to go into it in great detail, but experts agree that the jobs most affected by **developments in robotics and artificial intelligence** are those requiring an average level of qualification. Why?

David Rotman, Editor of MIT Technology Review, explains the phenomenon in the article *How Technology Is Destroying Jobs*, published in June 2013: "Jobs requiring creativity and problem-solving skills, often assisted by computers, have proliferated. So have low-skill jobs". As such, there is a "polarisation" of the workforce and a "hollowing-out" of the middle class. In other words, these **advances are leading to greater inequality in the labour market.**

It's also undeniable that the rate of automation of certain jobs is outpacing the creation of new positions. According to a study published in 2013 by University of Oxford Professors Carl Benedikt Frey and Michael Osborne, **automation will have an effect on 47% of professional roles in the medium-term.**

As was concluded at the 24th FTF session, summarised in a report entitled *"The Machine Revolution"* human and robots are destined to work alongside each other. "Artificial intelligence will do the hard work (cross big data and find patterns), but we will always need human judgement to prioritise one pattern over another". **What will happen in the long-term?** Historically, net employment tends to recover over a number of years. The arrival of new disruptions has always called for

*Technology  
is producing  
inequality, but  
technology itself  
isn't the problem.*

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**Soumitra Dutta**

Dean of Cornell College of  
Business and trustee of  
Fundación Innovación Bankinter.



new specialists to spring up, and a lack of work is an incentive for people to come up with new business opportunities. Similarly, some businesses (as many start-ups demonstrate) wouldn't even exist if it weren't for the efficiency offered by new technologies. Amazon, Salesforce, Facebook and Uber would have been unfeasible just two decades ago.

Nonetheless, Harvard University economist **Lawrence Katz** questioned whether the Digital Revolution will follow the same pattern. "If technology is transformative enough, who knows what will happen?". The training and education of workers will play a crucial role in the outcome.

At the beginning of the 20th century, the disappearance of millions of jobs in agriculture was counteracted by new public education systems, which raised

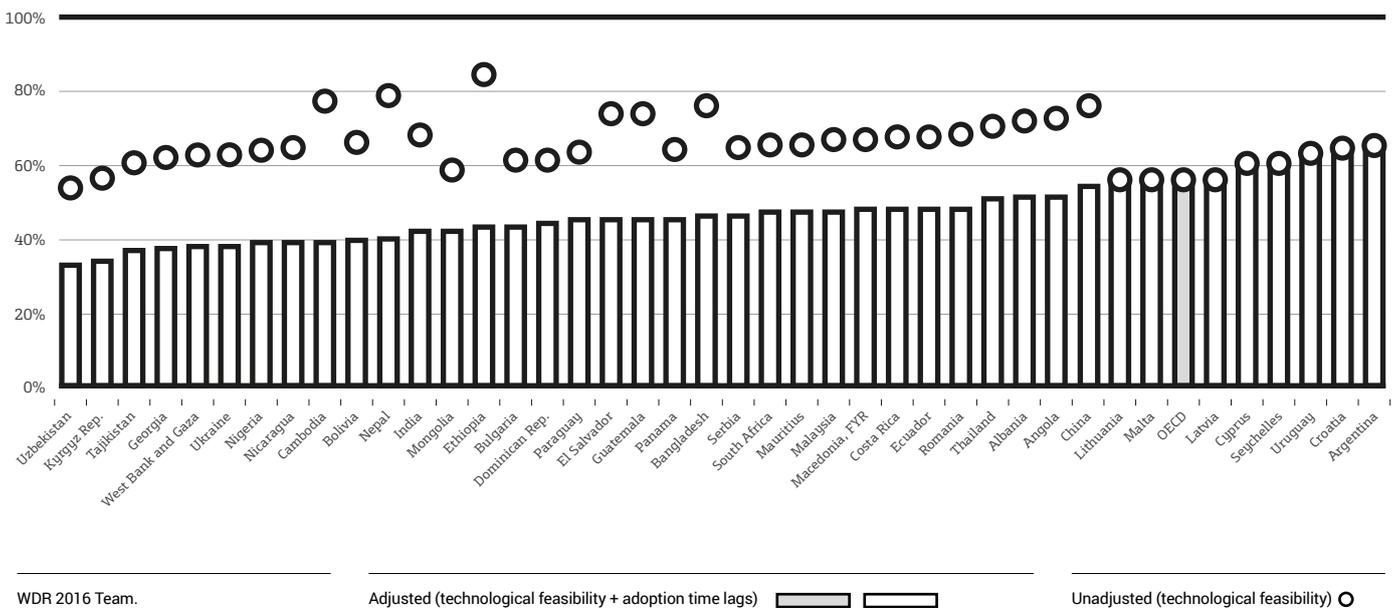
the average level of citizens' qualifications and prepared them for work in the secondary sector. Sped up by new technologies, the shrinking of that middle class could lead not only to a more unequal society, but a less politically stable one too. It would also be problematic for governments to finance ultra-specialised higher education for a significant proportion of the population.

"If mechanical-computing inventions will do our jobs better and without breaks, what role will people have in the labour market of the future?" questioned the report entitled "The Machine Revolution" from Fundación Innovación Bankinter. **Can online education rescue future employment prospects? Would a universal income system make the transition less painful?** We will talk about this in the coming chapters.

Gráfico #6

**FROM A TECHNOLOGICAL STANDPOINT, TWO-THIRDS OF ALL JOBS ARE SUSCEPTIBLE TO AUTOMATION IN THE DEVELOPING WORLD, BUT THE EFFECTS ARE MODERATED BY LOWER WAGES AND SLOWER TECHNOLOGY ADOPTION**

*Estimated share of employment that is susceptible to automation, latest year*



WDR 2016 Team.

Adjusted (technological feasibility + adoption time lags)

Unadjusted (technological feasibility)

# Is inequality always damaging?

## 1.2.

► **The answer may seem obvious**, but it isn't. The dawning of a globalised and hyper-connected age came from the "democratisation of opportunities", founded on meritocracy as opposed to geography or socioeconomic class. But **ameritocracy is in itself a source of inequality: the strongest make up an elite which, thanks to the multiplying powers of technology, becomes stronger still.**

"Why is the question of inequality so important to us? After all, the capitalist system is based on inequality: the idea that people must receive different rewards according to their contribution to the system, that people need incentives to do their jobs, that if someone has a good idea they should receive money to exploit it, market it, capitalise on it, and create businesses", wondered **Adrian Wooldridge**.

In his opinion, it's a question of levels. **The key is to find an optimum level of inequality.** "We've moved away from a world where we had just the right level of inequality to give people incentives and motivation, towards one in which the level of inequality threatens the very legitimacy of the system", says Wooldridge.

In his book *A Brave New World*, Juan Martínez-Barrea, Spanish ambassador for Singularity University predicts the coming polarisation of the global labour



market. "More than ever before in history, individuals will be split into two large groups". He explains: "Only those offering distinctive added value will be able to continue to command high incomes for their work. The remaining workers, those without any clear distinction, will be easily substituted by low-cost workers from emerging countries or, as a result of that same pressure, will see their salaries unrelentingly driven down. (...) **We're heading for a polarised, yet radically open world**".



# Major factors affecting prosperity

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2.0.



# Henry de Sio

## Prologue

Henry de Sio is an author, international keynote speaker, campaign and innovation strategist, and organizational coach. His book is entitled, *Campaign Inc.: How Leadership and Organization Propelled Barack Obama to the White House*. He was appointed Deputy Assistant to President Barack Obama at the beginning of the new administration, and he was Chief Operating Officer (COO) in the 2008 Obama for America presidential campaign.

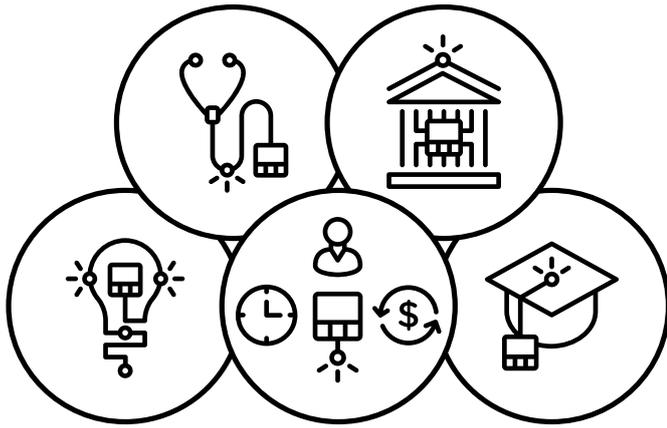
Henry serves as the Global Chair of Framework Change at Ashoka and also works with leading social impact leaders across sectors and geography to promote a new framework for preparing the next generation youth to step confidently into our fast-changing world as leaders and changemakers.

## *The New Operating System For Our Changemaker World*

► **The world is undergoing** a dramatic evolution from old, industrialized societies to modern, change-based systems. Changemaking capabilities once reserved for a few elite leaders – printing presses, distribution channels, broadcasting networks – are now at our fingertips and can be immediately applied to any problem opportunity. The resulting “Changemaker Effect” is causing social change to explode in every direction.

The promise that comes with this transformed environment also brings complex societal and institutional challenges. In January 2016, the Federal Reserve Bank of St. Louis reported that US growth in jobs of repetition is stagnant, while “non-routine” jobs are steadily climbing. The World Economic Forum estimated that 65% of children entering primary school will ultimately assume job types that are nonexistent. Yet, students continue on an assembly line designed for vocations that are now phasing out – a vestige of our repetition past – and individuals across society struggle to acquire the outlook and capacities required to thrive in disruptive change.

We need a dramatic global recalibration to this new environment, complete with a new operating system for living and working together. Here we can look to social entrepreneurs, society’s corrective force, for the framework needed to navigate this new strategic landscape. First, empathy is crucial when rules can’t possibly keep pace with the speed and complexity of change. Empathy-based ethics is now the cornerstone for our everyday dealings. Second, the capacity to tear down walls and form a team of teams around any complex problem or opportunity is a requisite skill going forward. Third, new leadership requires every player on the team be an initiator. Each person has to see the big picture and advance solutions that contribute to positive social outcomes. Finally, everyone today must be a skilled and practiced changemaker, committed to freely and effectively innovating together toward the good of all.



cial contributions. Knowledge also leads to better development of added-value goods and services, which are a lot harder to replicate. “In the 21st century, the challenge for any country will be to become an ideas factory”, Dan Senor and Saul Singer say in best-seller *Start-up Nation*.

But certain barriers get in the way of access to education, above all university education. The first is economic. Countries will always have limited resources, so governments find themselves at a crossroads: provide universal education, to improve average levels of professional skills; or provide a system of the highest possible quality with a limited reach, that helps develop the most strategic sectors of its economy? What’s the ideal balance?

Teaching methodology also plays a crucial role in the future employability of students. According to [OECD data](#), countries with the lowest rates of long-term unemployment include South Korea, Finland, and Japan: all of which have well-renowned education systems.

In this chapter we will look into the potential of new technologies to reduce the world’s educational inequalities.

# Education

## 2.1.

► **“Education is the most powerful weapon which you can use to change the world”,** said Nelson Mandela. But now, well into the 21st century, reality shows us that quality education is still not well-distributed. Education lays the foundations for growing an economy, and as we saw in the previous chapter, is one of the key factors affecting the prosperity of a society. In the long-term, young people furthering their studies and acquiring better skills helps to increase efficiency, productivity, and a country’s external accounts, as well as providing the State with increased taxes and so-

## *Primary and secondary education*

### Aim: universal primary education

First, it should be stressed that while 57 million children across the world still don’t receive a school education, access to primary education has actually improved remarkably in recent years<sup>4</sup>.

The explosion of the internet opened the door to knowledge for 4 billion people in developing countries. In 1999, **Sugata Mitra**, a teacher in New Delhi, made a hole in the wall of a school and placed a computer with internet access facing out on to the street. This experiment proved that disadvantaged children, in spite of having no knowledge of English and not having recei-

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In September 2000, 189 UN member states committed to drastically reducing poverty and inequality across the world by 2015. The “[Millennium Declaration](#)” set out eight major “[Millennium Development Goals](#)”. Achieving universal primary education is one of them.

ved any basic education, were still able to browse the internet and access all different types of content. Technology can also be employed to design and distribute free textbooks to developing countries. Let's look at an example. **Worldreader** is a global non-profit organisation with headquarters in San Francisco and branches in Europe and Africa. Its mission is to eradicate illiteracy among the poorest people in the world. Founded by former Amazon and Microsoft employees, the organisation makes up educational kits containing *e-readers* and *e-books* that they distribute around schools in Africa and, as of last year, India. They currently have a catalogue of over 39,000 titles, read by more than 450,000 people every month.

### **One Laptop Per Child: what went wrong?**

The ongoing computerisation of teaching in developing countries doesn't seem to be getting the results it was hoped it would. More than a decade after the implementation of the first *One Laptop Per Child (OLPD) programme*, PISA examination results have shown no improvement<sup>5</sup>. Youth unemployment hasn't decreased, and there's been no rise in GDP either.

As outlined in a report published by the European Parliament's Science and Technology Options Assessment (STOA) office progress is a lot slower than was projected. The study, that takes into account major macro-economic variables, points out that **countries with better levels of academic achievement – better results in the PISA Report - in fact make "modest" use of new technologies in their schools**. And in fact: countries with better PISA examination results such as a China and South Korea are not the most digitised ones.

**"Technology may improve access to information, but it doesn't substitute the teacher"** Ivan Rossignol, said during the FTF .

What's more, technology even seems to be widening the gap that exists between social classes. "Creating technological environments in the educational system without first setting out clear goals could do more harm

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European countries have shown no improvement in Maths ratings for the last three sessions of the PISA test.

## | **Khan Academy case study**

In recent years a number of ambitious start-ups have sprung up, dreaming of modernising the antiquated educational system in line with new business demands, and at the same time making it accessible to people regardless of their social class or location in the world. The majority of them, such as Minerva, Singularity University, and Knod, are aimed at helping young people all over the world specialise and go on to find work.

Worthy of its own special mention is **Khan Academy**. Despite his limited means Sal Khan, an American with a Bangladeshi father and Indian mother, managed to study at MIT and Harvard Business School. In 2004 he started helping his young cousin with her Maths studies. Soon after, other friends and family members started to ask him for help, and Khan thought it would be more practical to start giving his tutorials over the internet. That was how one of the most disruptive projects the education field has ever seen began.

His English YouTube channel now has over 2.5 million subscribers. His online web portal is available in more than 36 languages, offering free video lessons at primary and secondary level in Maths as well as Biology, Physics, Chemistry, Art History, and even Programming.

than good. **Giving computers to students from low-income families can substantially worsen their academic results", states the European Parliament report**, quoting research from Jacob L. Vigdor and Helen F. Ladd, professors at the University of Washington and Duke University respectively. "Inequality emerges as a consequence of not using the technology correctly". Other recent OECD research reveals that although children from wealthy and disadvantaged both connect to the internet for comparable amounts of time, the former use the internet more to look up information or read, and to a lesser extent to chat or play video games.

The World Bank acknowledges that the distribution of new technologies in developing countries is failing to generate “dividends” expected for society and the economy. Is it just a matter of time? Can new technologies help train the best-qualified generation in history?

## Higher education

### Challenges facing universities in the digital age

**There must be something wrong with a world where talent can't find employment, and businesses can't find talent.**

Firstly, educators and employers see the world in very different ways. According to a report entitled *Education to employment: Getting Europe's youth into work*, carried out by consultancy firm McKinsey and based on surveys from 5,300 young people, 2,600 employers, and 700 educational centres, in eight EU countries: **74% of educational centres consider recent graduates to be prepared for work, but just 35% of business owners say the same thing**. What's more, 27% of employers point towards the lack of skills in young graduates as one of the main reasons they fail to fill vacancies, and a third believe this lack of skills is creating significant issues for their business in terms of cost, quality, and/or time.

How is such a discrepancy even possible? Who can be blamed for high rates of youth unemployment, which is higher than 50% in countries such as Greece and Spain? Or for the high proportion of young people who are over-qualified for the jobs they have?<sup>6</sup> Everybody. Governments, business associations, private companies, educational centres, families... Each has some level of responsibility, and there must be involvement and collaboration from everyone to make sure the system truly prepares professionals for the demands of a global and hyper-connected world.

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In Spain, according to Asemplo, a temporary employment agency, over half of the positions created since 2013 have one thing in common: the people occupying them are over-qualified.

Let's break it down. Apart from a few dissenting voices, such as that of PayPal co-founder **Peter Thiel**<sup>7</sup>, FTF experts agreed that university plays a vital role in creating an adequately trained and competitive society. And it's becoming more and more significant: according to EU estimates, by 2020 10% more jobs will require a university degree.

But in order to provide the quality and quantity of university talent the future labour market demands, barriers to access must be broken down, educational systems must be adapted to the needs of the digital era, channels must be opened up for companies to find the talent they need (and vice versa), and finally universities need to put more flexible systems in place to engage with former students' training needs.



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Peter Thiel has set up a 100,000 dollar grant to anyone who quits their university studies to work on a start-up (<http://thielfellowship.org>). It's interesting to note that Thiel, born in 1967, was a very involved student at university: He holds two degrees from Stanford University: Twentieth-Century Philosophy, and Law, and he founded The Stanford Review newspaper that still exists today. The Thiel Fellowship is open exclusively to students who have been accepted by prestigious universities, presupposing a certain level of talent and a higher-than-average probability of success.

*The goal of higher education must be twofold: first, to raise the average level of education of society as a whole, and second, to develop elite talent.*

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**Ángel Cabrera**

President of George Mason University.





*The challenge we face is clear: quality education is not well-distributed. Ultimately, end results also depend on external factors such as students' neighbourhoods, the family setting, etc. Which is why a mentor's role is so important: they can guide students, not only ensuring they continue with schooling, but also helping them to make decisions based on actual methods and approaches.*

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**Richard Kivel**

Advisor, entrepreneur, Professor at MIT and Chief Operating Officer at IXCELA (The Internal Fitness Company).

The **four big challenges facing the university system**, in terms of inequality of opportunity, are the following: the **cost of higher education**; an **education system that has barely evolved over the last century**; **improve graduates' employability** and **adapt the education system to a constantly changing world**. We'll now look into each of these in more detail.

**1) Economic barrier:**

According to the McKinsey report mentioned previously, 20% of European students who quit university studies do so for financial reasons, and 26% point to the necessity of having paid work as the reason for not completing their studies. Similar figures are reported in the United States. "In the 1990s, students at North American public universities paid 25% of their enrollment fees, and the remaining amount was paid by the State. Nowadays, the State only covers just over half. So a student who paid on average 3,000 dollars in the nineties will now pay 7,000 dollars: more than double the amount. In the United States, enrollment fees have increased by 2.5 times the inflation rate", explains **Angel Cabrera**.

Academic costs vary enormously by country, but according to KcKinsey the most crucial economic factors are the limitations and obligations place on certain forms of financial assistance. This is where technology could come in as a potential ally: it could offer more flexible and economical approaches to learning (online training) and funding (*crowdfunding*). We'll look at each of these proposals at the end of the chapter.

**2) Study paths:**

We saw previously how 35% of European employers believe recent graduates are not equipped with the skills needed for the labour market. In a world where knowledge can quickly become outdated, is it possible to offer a more valuable education? The answer is yes. Education could be more practical, with teaching faculties including professionals in the field. And more flexible, allowing students to combine their studies with work experience in businesses. These elements would mean students would leave university with the qualities they need to be eager and dynamic workers. This new reality demands a more practical training path, closer to the realities of the business world. Skills

such as creativity, autonomous thinking, team-working and decision-making need to be taught, as well as knowledge. Instead of basing education on the study, listen, and repeat model, institutions should be working more actively with businesses when designing their curriculums.

A method gaining ground across all stages of education is the so-called *flipped classroom*, that in effect reverses the teaching process. Instead of teachers explaining the lesson in class and students then carrying out assignments at home, students read the theory at home, and then when they come to class they ask, share, and talk about what they've learned.

New technologies (basically digital tablets and electronic whiteboards) play a crucial role in these new educational models. Some of the main benefits of the use of these devices are improvements in problem solving, increased student motivation, and improvements in spacial awareness.

### 3) Identifying talent:

As we saw before, young people are failing to find employment at the same time as businesses are failing to find qualified professionals. The solution could lie in the better identification and support of talent from an early age. In this context, Cabrera recommended making use of technologies that allow the identification of talent from secondary school level, as well as those allowing the more equitable distribution of resources. And experts taking part in the latest FTF forum all agreed on the importance of the presence of a mentor. "The challenge we face is clear: quality education is not well-distributed. Ultimately, end results also depend on external factors such as students neighbourhoods, the family setting, etc. Which is why a mentor's role is so important: they can guide students, not only ensuring they continue with schooling, but also helping them to make decisions based on actual methods and approaches» added **Richard Kivel**.

### 4) Continuous training:

Finally, a constantly-changing world needs constantly-improving professionals. "Education is no longer something you do for a fixed amount of time», said **Sergio Martínez-Cava**, Managing Director of Fundación Innovación Bankinter.



*Global growth is slowing down. We assume technology generates productivity and subsequently leads to stronger growth, but it's a false assumption.*

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**Ivan Rossignol**  
Chief Technical Specialist  
in the Finance and Private  
Sector Development (FPD)  
of the World Bank.

*It's telling that in countries such as Spain, where the construction sector shrunk by 62% between 2005 and 2011, the number of Architecture and Building students increased by 174% in the same period.*

MOOCs are a great example of how new technologies can help workers continue training throughout their professional careers. Online, free courses are available to the whole world from institutions and universities including the most prestigious ones in the world, such as Harvard and Stanford, and Fundación Innovación Bankinter itself via [Open Akademia](#). "They may not have shown themselves to be effective in the democratisation of education across the world<sup>8</sup>, but they have shown how useful they can be for the ongoing training of workers", remarked Cabrera.

**Alper Utku**, with a campus in Ankara (Turkey), said in his opinion disruption in the university world is likely to come from start-ups operating outside traditional academic institutions. "We have to rethink our notions of curriculums, qualifications, campuses, and funding etc. Future prosperity is in the hands of a small number of disruptors", he said during the FTF session.

### Vocational training, a less prestigious alternative

This type of training is **in great demand on the market, especially for professions relating to the digital world**. According to European Commission estimates, 3% growth is predicted for employment as a whole in 2020, whereas STM occupations (Science, Technology, and Mathematics) are predicted to grow by 14%. Improving the information available to young people at the time of choosing their training path (the most in-demand professions, salary information for different professions etc.) could be of great use. Just 28% of young European people consulted in the McKinsey report knew about employment success rates for the courses they chose. It's telling that in countries such as Spain, where the construction sector shrunk by 62% between 2005 and 2011, the number of Architecture and Building students increased by 174% in the same period. The internet is an excellent source of information. A well-known example is the **National Careers Service** in the United Kingdom. The searchable database includes information about salaries, hours, requirements, sector trends, available training programmes, and more.

## **Solutions**

### Technology to make higher education more accessible

› **Shorter, more flexible courses** One of the ways teaching costs could be reduced is for universities to divide courses into shorter modules, focusing on particular specialist areas or skill sets. This would entail universities following the example of newer institutions, business schools and start-ups, with a key difference: university students would have the flexibility to combine subjects that make the most of their talent and improve their future employability, receiving certificates in

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Data on registration on MOOC courses show students are for the most part male, white, and have high purchasing power. Moreover, 70% of users combine courses with their jobs. This is backed up by a study from the University of Wharton in Pennsylvania which analysed 875,000 students using the [Coursera platform](#).

## 👁️ | Universal access 'vs.' elite education: US case study

**Angel Cabrera**, from Spain, is vice-chancellor of George Mason University, the public university in Virginia State (US), and trustee of Fundación Innovación Bankinter. “The goal of higher education must be twofold: first, to raise the average level of education of society as a whole, and second, to develop elite talent. The North American system attempts to give a response to both of these objectives: it offers a diverse spectrum of institutions, from community universities with low enrollment fees and open admission, through to highly selective elite universities which attract talent from all over the world», he explained. “Opening up higher education to the whole of society is key to increasing productivity and responding the demands of the knowledge economy.

Developing elite talent is key to driving research and innovation. Without it, the US would not be a leader in biotechnology, information technologies and other fields”, he said.

The United States spends on average over twice as much per university student as Spain. But the difference is accounted for not by public spending, but private. In Spain, private spending on higher education accounts for just over a third of the total, while in the United States the figure is almost two thirds. In monetary terms, private spending in the United States (family and donations) is more than four times higher than Spain.

“The problem with the American model is that it creates major barriers to access to higher education for students from middle class or

disadvantaged backgrounds. The problem in Spain is that the country doesn't have comparable access to resources. Issues with public budgets make it unlikely that the Spanish government would be able to significantly increase its spending on higher education. Perhaps a solution would be for the public system to continue to focus on access and average quality provision, at the same time as making it easier and offering incentives for the creation of private, non-profit (or mixed) elite universities», proposed Cabrera. “Online, quality education has still not shown how it can reduce costs significantly», he added.

specific skills. This way of studying is particularly suited to training in technologies, given the high level of specialisation required and diversity of roles new technology businesses are looking to fill.

› **Crowdfunding.** Until now, education has been funded primarily through public budgets, sponsorship from large businesses and other funds, and private donations. The digital age opens up new opportunities: microsponsorship, or *crowdfunding*, through which employers, former students and even students themselves can make small contributions that help finance training programmes. Through *crowdfunding* sponsors have the power to choose programmes they want

to fund, which would tend to point towards the best courses and degrees. Contributions could be made via the internet, increasing the visibility of all the programmes offered.

**More funding from businesses.** Involving the business sector in education funding would mean curriculums could be better aligned with the needs of the labour market. It's currently common for large businesses to sponsor lectureships or set up agreements to offer work experience to students from different institutions. In a similar vein, some companies design training plans for employees in partnerships with universities or business schools.

**Online training.** Education across the internet requires fewer physical assets, and as such its cost is reduced. It's difficult to substitute the face-to-face learning experience, but online training is put forward as a better alternative for delivering personalised content and carrying out individual follow-up with students. [Arizona State University](#) introduced adaptive learning technology on a Mathematics course, with the following results: an 18% increase in pass rate, and a 47% reduction in dropout rate.

### **Solutions to align universities with the needs of the labour market**

- › **Involve companies in designing course content** If young people fail to develop the skills and abilities employers are looking for, they run the risk of being excluded from the labour market, or at the very least facing a considerable reduction in their earning potential. Businesses and academic institutions need to work together in higher education, requiring better communication and joint working from both parties.
- › **"Serious games"**. These digital tools apply gaming principles to teaching different subjects. It's a cheap and low-risk way of offering personalised training, to enhance material learned in theory. *Serious games* have been effectively employed in numerous business programmes, and have shown their efficacy in keeping employees' knowledge up-to-date, improving motivation, and increasing efficiency.
- › **Bootcamps**. This is a term originally used to describe military camps in the US, but is now applied to highly specialist mini-courses on website or mobile development. Unlike MOOCS or *webinars* that are studied online, *bootcamps* are a type of face-to-face training.

### **Solutions to improve youth employability**

- › **Digital mentor**. Digital platforms make the concept of student mentoring from an early age (secondary education) more accessible and scalable. Artificial intelligence can be employed to create digital advisers that help students choose their academic path, where to study, build their own curriculum etc.

- › **Gamification platform to identify talent**. The internet could be used to help universities and businesses identify young talent. Both academic institutions and businesses could compete for the best-qualified young people.
- › **Social networks for collaborative learning**. "MOOCs were initially about creating collaborative learning environments where people could enrich each others' learning experiences as opposed to the mass distribution of content. We still don't understand how best to do this, but the possibilities are immense" said **Angel Cabrera**.
- › **Crowdsourcing**. These campaigns, generally spread via the internet, can be aimed at university or vocational training students inviting them to take part in business innovation projects. They would act as a source of new ideas, and would help businesses recruit talent.
- › **More and better public information**. Government institutions can help young peoples' employability by providing online information about career choices, job prospects and salaries.
- › **New integrated institutions**. Going against the fragmented approach taken by education policies in much of the world - in Spain for example, each of its 17 Autonomous Communities has individual control - an integrated approach would result in the sharing of best practices and the elimination of overlap (more efficient management of resources).

### **Solutions to adapt education to a constantly changing world**

- › **Distance learning**. Distance learning with a more flexible timetable will play an increasingly important role. Workers in the digital era will need to reinvent themselves numerous times throughout their career trajectory: with the need for continual training, the internet is king. And it's not exactly new. Already in 1971, [Open University](#) in the United Kingdom began to teach courses on television, and the first public distance learning university, [FernUniversität](#) in Hagen (Germany) was opened in 1975.
- › **MOOCS**. These are massive-scale, open courses. Highly prestigious institutions and universities such as Harvard, Stanford, MIT and Fundación Innovación Bankinter (via [Open Akademia.](#)), have joined the trend. MOOCS are always online and free. Perhaps

this is why only between 10% and 12% of people who sign up for the courses actually finish them. Businesses must seek ways they can incentivise people to finish a course, which involves identifying which employees have the aspiration and will to learn before starting the course.

› **Start-ups**. The education sector is still waiting for the appearance of a corporate giant, a start-up ready to revolutionise the sector as Google did for search engines or Facebook did for interpersonal communications. the development of *cloud* technologies, the urgent need to develop scientific and technical vocations; the necessity of rethinking antiquated learning models; and increasing internet access for 4 billion people living in developing countries create a perfect breeding ground for the birth of a new start-up to establish a new global trend in education.

Ultimately we need to remember that governments, educational institutions, business associations, private companies, students, and parents all need to be involved in the process of making sure the system helps to train fully-prepared professionals for a world in which the only constant is change.

*MOOCs were initially about creating collaborative learning environments where people could enrich each others' learning experiences as opposed to the mass distribution of content. We still don't understand how best to do this, but the possibilities are immense.*

# Health

## 2.2.

› **Within 30 years, human beings will be able to live to 120 years old**, maintaining a reasonable quality of life. Advances in the early diagnosis and treatment of cancer, genetic research, and artificial intelligence are just some of the innovations that will make this possible.

**But we're a long way off getting rid of inequality** in healthcare. Wealth, education, racial or ethnic group, urban or rural location, and the social conditions we live or work in all have an impact on our health, the quality of care we receive, and our life expectancy. Broadly speaking you could say that those lucky to have a high income and level of education will live longer, and vice versa<sup>9</sup>.

Many of the barriers to universal primary healthcare can be bridged thanks to technology. Firstly, **"the ability to adequately train doctors and enable them to reach remote areas is often a technological issue**. How can people be educated who don't have the privilege of studying in Europe or the US? This is an issue that could perhaps be solved using technology", proposed **Richard Kivel** during the FTF.

Positive steps have already been taken. In the 1990s, the Clinton administration offered medical practitioners and patients all over the world free access to the National Library of Medicine (NLM). Another incre-

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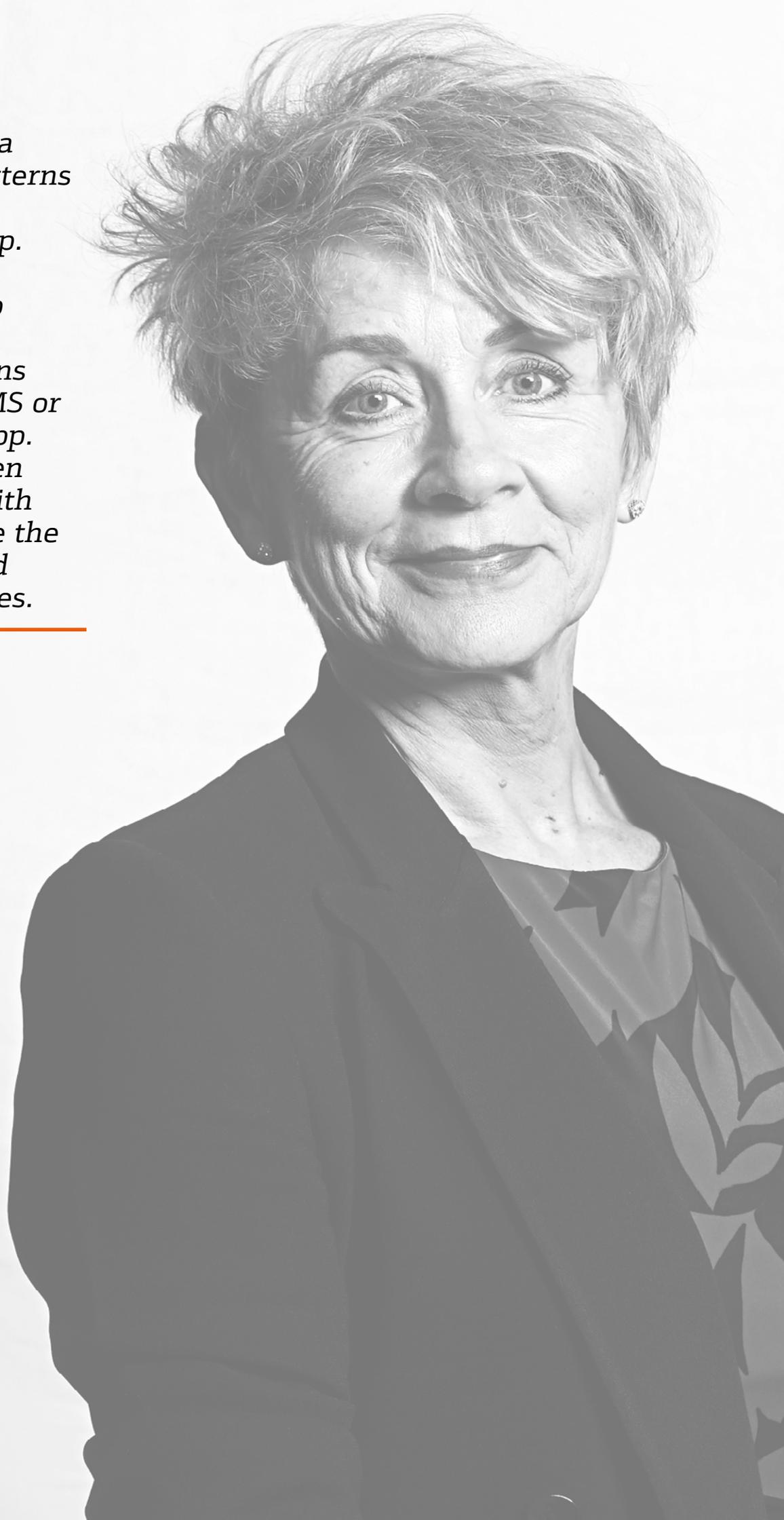
Life expectancy is a complex parameter. It's skewed by the first year of life, something depending not only on the quality of healthcare but also access to drinking water, drainage, education level, and other factors. In general, health statistics are intimately related to aspects aside from healthcare, such as living conditions, diet, and occupation.

*You can extract a multitude of patterns by studying the health of a group. From there, you would be able to send alerts and recommendations to people via SMS or mobile phone app. People could then communicate with others who have the same illness and share experiences.*

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**Uschi Schreiber**

Chair of the Global Accounts Committee and EY's Global Vice Chair.



dibly useful search resource for medical practitioners is PubMed, a project developed by the National Center for Biotechnology Information (NCBI) that allows the access to bibliographic databases compiled by the NLM (Medline, Premedline, *Genbak* and the *Complete Genome*). Medline is the NLM's most important database, covering various different medical fields such as medicine, oncology, nursing, dentistry, veterinary, public health, and preclinical sciences. It currently has more than 15 million bibliographic references of jour-

## 👁️ | Design that Matters

Where we don't have capital or infrastructure, we still have our imagination. In 2008, four years after the tsunami that devastated the coasts of southeast Asia, an MIT professor called **Timothy Prester** went into a hospital in Indonesia. In 2005, the city of Meulaboh had received eight modern incubators, donated by organisations in developed countries. Three years later, not one of them was being used. Hospital staff couldn't read the English instruction manual, and had no idea how to fit it.

Then Prester had a look around. The World Health Organization (WHO) calculates **that 80% of the medical equipment received by hospitals in developing countries ends up gathering dust in the corner**. But out on the street, Toyota vans were jettisoning around all over the place. So he decided to produce an incubator made with automobile parts. That way, anyone who knew how to repair a van would be able to take charge of the maintenance of the incubators. **He designed an incubator using a motorbike battery, and added lamps to give off heat.**

Design that Matters is the non-profit organisation Prester founded with one mission in mind: to design well-thought out products designed specifically to improve the health of newborn babies in developing countries. As well as incubators and other equipment, he's designed a device to diagnose pneumonia which uses a reusable sensor (instead of a conventional disposable sensor costing 10 dollars) and doesn't need any cables (which had previously been a major cause of broken equipment).

nal articles from 1960 onwards, from over 5,000 international health science journals. **It's possible that recent free global access to medical and healthcare information has saved more lives than any other health innovation.**

Secondly, **technology plays a key role – and is a positive economic factor – when it comes to educating people** on healthy lifestyles, what foods to eat, and on the importance of going through with the treatment recommended by their medical practitioner. They're small actions that add up to a huge impact on society. The abandonment of treatment is thought to add up to a global cost of 11 billion euros per year.

If we look again to US government activities we find initiatives such as MedlinePlus, the website for the National Institutes of Health for patients, relatives and friends. Published by the National Library of Medicine of the United States, the world's largest medical library, MedlinePlus offers free, reliable and updated information on illnesses, diseases and well-being in easy to read language. Hospitals, associations and public administrations have the power to significantly increase the **preventative and palliative** impact of this resource by, for example, developing mobile phone apps for the public.

Thirdly, **technology helps the development of clinical progress and clinical research**. Tools such as big data, *wearable technologies*, 3D printers, and the *blockchain* offer a wealth of opportunity.

In this chapter we'll look further into inequality in developed and developing countries, and consider ways in which new technologies can offer potential solutions.

## *Developing countries*

It's clear that there are more serious levels of inequality in developing countries. In developing countries, the infant mortality rate is still 43 deaths for every 1,000 live children born<sup>10</sup>, and 8,500 children die every day from severe malnutrition. Last year, 1.5 million people died of tuberculosis, an illness it's possible to vaccinate people against. **The right to health is a long way from being equal.** But once again, **technology can offer efficient ways of at least reducing the problem.**

*Technology helps the development of clinical progress and clinical research. Tools such as big data, wearable technologies, 3D printers, and the blockchain offer a wealth of opportunity.*



The research and development of new medicines is a long and costly process. Digitisation can help shorten the amount of time laboratories take to launch a new product on the market, or to launch a new application of an existing product. This could in turn reduce costs and make medicines more accessible.

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\*The “Millennium Declaration”, signed by 189 UN member states in the year 2000 set out eight major “[Millennium Development Goals](#)”. Reduce the under-5 child mortality rate; combat HIV/AIDS, malaria, and other illnesses; and improve maternal health, were three of the eight goals.

There are also now digital tools that can be used in remote zones or places with fewer resources, such as:

- **Wearables:** “These measure body temperature, blood pressure, and/or pulse, and the information is sent instantly to your mobile phone. It’s a simple and economical way for medical practitioners to carry out continued monitoring of certain chronic illnesses, or a way in which users can monitor their own health and swap certain habits for healthier ones”, said Kivel.
- **Uschi Schreiber**, went into the usefulness and sustainability of **telemedicine**. One of the major challenges in the field is the fact it requires a certain level of familiarity with new technologies, although applications are getting more and more simple to use.
- For Schreiber, data analysis (big data) is a field showing serious potential. “You can extract a multitude of patterns by studying the health of a group. From there, you would be able to send alerts and recommendations to people via SMS or mobile phone app. People could then communicate with others who have the same illness and share experiences”. Ultimately, Big Data opens the gateway for the creation of new health services, and also offers a more effective way of distributing drugs and medical equipment.
- In fourth place, **3D printing** is already being used to manufacture *low-cost* artificial limbs in developing countries. A company called [Not Impossible Labs](#) for example, dedicates itself to printing artificial plastic limbs for more than 50,000 people who’ve lost arms or legs in the conflict of South Sudan. It takes six hours to produce one and they sell them for 100 dollars - a cost generally covered by a government institution or non-profit organisation.
- **Drones** are already being used for the distribution of medicine in remote areas. [Matternet](#) This startup with headquarters in Silicon Valley, promises to give us a lot to talk about in the coming years. It all started when founder Andreas Raptopoulos realised the problems they were having in Papua New Guinea distributing basic essential goods such as medicines. His drone (called *Matternet One*) is controlled from an easy to use mobile phone app. After their experience in Papua New Guinea, the company went on to repeat their work in other African countries, as well as in Haiti.

It's worth remembering that though new technologies harm employment, they also help talented individuals do what other people aren't trained to do, or do them in a more efficient manner. In a similar vein, technology helps to reduce inequalities deriving from inadequately trained staff in regions of Africa and southeast Asia.

## Developed countries

Inequality also exists in the first world. Here's an example: The United States spends by far the highest amount on health in the world compared with other countries. The average life expectancy is 78.8 years, but in the US, black people's life expectancy is 3.4 years shorter<sup>11</sup>. In the European Union, life expectancy for people aged 30 varies in some countries by up to 10 years, depending on whether or not they've studied higher education<sup>12</sup>.

Inequality in healthcare isn't just a social injustice: it represents a major cost for the public purse. According to the European Commission's "conservative estimates", this cost fluctuates between 1.5% and 9.5% of Gross Domestic Product (GDP)<sup>13</sup>. **Can technology reduce this gap, and contribute to extending the lives of all communities in society? Emphatically, yes.**

New technologies have the **potential to revolutionise the quality of healthcare and help create more efficient and sustainable healthcare systems**. Telemedicine, genome research, biotechnology, wearable devices, and drones can all contribute to the prevention of illnesses, early diagnosis, and better distribution of medicines. They also have the capacity to speed up much-needed change from a reactive and large-scale healthcare system, geared towards the care of acute diseases, to one which is more preventative and gives a better response to the rapid growth of chronic diseases. **It's in-**

11 ▼

Data from 2014. Source: [Centers for Disease Control and Prevention \(CDC\)](#).

12 ▼

Data from 2010. Source: Eurostat.

13 ▼

"Investing in Health" Report, European Commission. February 2013.



*We have to rethink our notions of curriculums, qualifications, campuses, and funding etc. Future prosperity is in the hands of a small number of disruptors.*

**Alper Utku**

Founder European Leadership University.

**evitable that as we live longer and longer lives, the incidence of certain chronic diseases will increase.**

**The current approach we take to health needs to shift focus. And it needs to do it quickly.** By 2050, the number of over 65s in the European Union will increase by 70%, and the number of people over 80 will increase by 170%<sup>14</sup>. According to the European Commission, this could raise health spending by one or two

## PatientsLikeMe

It's one of the most disruptive start-ups in the healthcare field, and one of the most successful. PatientsLikeMe is a social network for patients and their family members, where people can find others who've gone through the same experience as they have. It's clear to us all that the way we handle things emotionally can play a major role in how we face up to or recover from illness. Brothers Benjamin and James Heywood and their friend Jeff Cole, all MIT engineers, founded the company in 2004. Five years before, another Heywood brother, Stephen, was diagnosed with

Amyotrophic lateral sclerosis (ALS), a neurodegenerative illness with no known cause. When they were searching for more information about how to live with the fatal condition, or how best to care for a patient with ALS, they came up with the idea of setting up a digital platform. PatientsLikeMe now has over 400,000 members and 35 million entries about different illnesses. It operates solely in the United States. It's a non-profit organisation, earning income from the sale of information added anonymously to the site to insurers, pharmaceutical companies, and other partners.

There are other similar start-ups on the market. One of the most prominent is [People Who Global](#) (Personas Que, in Spain), a multi-channel platform for people suffering from illnesses and their family members, with an integrated social network, follow and reporting tools, and interesting content. It's headquarters are in Madrid, and it already operates in Spain, France, Germany, the United Kingdom and Italy.

percentage points of GDP for each member country. We currently need four people to sustain every European citizen over the age of 65. In 2040, the proportion will be half that<sup>15</sup>.

The unsustainability of the current system is an issue which worsens year on year, and if the necessary measures aren't put into place a larger and larger proportion of the population will be excluded from advanced treatments against illnesses such as cancer. In other words, we run the risk of inequality rising to a level we've never seen.

The latest financial crisis has made everything a little more difficult. During the last few years, TFP (*total factor productivity*) **indexes used to calculate the cost-benefit of any new advances, suggest a level of**

#### 14 ▼

Source: Eurostat.

#### 15 ▼

Report "[Towards Social Investment for Growth and Cohesion – including implementing the European Social Fund 2014-2020](#)". European Commission, 2013.

**depreciation in productivity, caused fundamentally by outdated technological equipment.** But we mustn't be too pessimistic. **Soon, taking care of our own health will become a totally different experience.**

In developed countries, the following technological advances will have the greatest impact:

- **Digital medical history:** Many developed countries have begun to digitalise their databases, so patients and healthcare professionals will have guaranteed access to relevant clinical information. The challenge lies in ensuring systems have excellent levels of compatibility and interoperability.
- **Blockchain:** This technology makes it possible to transfer money or documents completely anonymously and securely, without the need for a costly technological infrastructure. It means we could create universal clinical histories, among many other services.
- **M-health (*mobile health*):** According to consultancy firm IDC's predictions, 65% of interactions between patients and health providers will be made via mobile devices in 2018. Consultancy firm Accenture calcu-

lates that *m-health*, with add-ons such as gamification, could account for a 35% reduction in healthcare spending per person. Apps can play a crucial role in prevention, enable families to interact, and provide emotional support.

- **Wearable technologies:** Until now, *wearables* have had a firm focus on *fitness* and personal well-being, but soon they'll be used as tools for continual monitoring too. It's thought that by 2018, seven out of ten institutions (hospitals, insurers and others) will have their own apps and wearable devices.
- **Big data:** Analysing large bodies of data means patterns can be extracted to help medical practitioners make early diagnoses or prescribe personalised and more effective treatment plans based on other patients' experiences and those with similar symptoms.
- **The Internet of Things:** Heavily linked to the previous trend, having sensors in the home, on our clothes, or on the devices we carry can help detect anomalies and symptoms, and prevent the development of certain acute diseases.
- **Self-diagnostic technologies:** This is an area still in its infancy, but it has enormous potential. It's now possible in many developed countries to buy kits that tell you your predisposition to develop particular illnesses, or whether you've caught a particular virus.
- **Nanotechnology:** Nanoscience, in particular nanotechnology, has a large number of applications in the medical field. It means illnesses can be diagnosed much earlier, from fewer numbers of molecules or cells. It's also being used for controlled drug release, which makes treatments (against cancer for example) much more effective.

The application and funding of each of these potential disruptors is of course reliant on different countries' healthcare systems. There are as many different types of healthcare systems in the world as there are countries. Each has their own circumstances in terms of inequality of access to healthcare and health spending, but all nowadays are united by the explosion of a common trend: the **empowerment of citizens**.

And this empowerment stems from the same source: information. "Patients go to an appointment and ask the doctor about different treatments they've read about, about the surgical techniques their surgeon will

be using, or ask why they've been prescribed one medicine over another. **Thanks to the internet and the increased availability of mobile devices and wearables, patients can take control of their own health**", remarked Richard Kivel.

## ***Challenges: governance and privacy***

One day in the not too distant future, we will all carry around our medical history, a list of any medicines we take, and emergency contacts, in our mobile phones. And many of our doctors appointments will happen via video call. **We already have the technology to do it.**

*We want personalised services and to have our good health, but at the same time we're afraid of giving out our personal details.*

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### **Mick Yates**

Founder of LeaderValues, Professor at the University of Leeds and Advisor of IORMA and Balcroft.



## 👁️ | Warning: a “cyber-pandemic” is approaching

Marie Moe is a researcher for SINTEF, a Norwegian research centre. She was a speaker at the latest International Cybersecurity Conference last June in Tel Aviv. Moe shared her own experience as a victim of malware in her pacemaker: “At twenty years old, I was acting like a seventy year old. Something was wrong, but nobody knew what it was. Eventually a friend came up with the answer: a computer worm had got into my pacemaker. If nobody had found it, it’s possible I wouldn’t be alive today”.

Cases like Marie Moe’s are becoming less and less rare, and show how important it is to protect our vital information from hackers, and also protect our devices: they could save our lives one day. Pacemakers, breathing apparatus, and infusion pumps are all the result of a highly technologically advanced industry, but they have major security flaws.

In 2015, health was already the most affected sector in terms of computer attacks, according to IBM. The enormous amount of sensitive information held by hospitals, insurers, and pharmaceutical companies make them ripe for exploitation by cyber-criminals. Think about the price data can command on the black market, where a person’s medical records could be several times more valuable than a credit card.

**Why is it taking so long to happen?** Two things: health policies, and the fear of risking the confidentiality and security of millions of peoples’ medical records.

“**Technology is just a tool.** The main issue is that governments think first about the goals they want to achieve and the type of society they want, and only then look for the technology to make it possible”, said **Urschi Schreiber**.

And healthcare information is incredibly sensitive, its privacy is a crucial question. Legislation in most first world countries considers patients to be the “owners” of their medical history. People have the right to share their medical history with hospitals or medical practitioners, but the information actually belongs to the patient. It seems a logical argument up to this point. But can citizens themselves guarantee the security of their clinical data? Who’s responsible for guarding it? Is it logical to keep medical records divided across different filing systems in different institutions?

During Fundación Innovación Bankinter’s *Future Trends Forum* (FTF) **Mick Yachts** looked back on the Icelandic government’s initiative to capture the DNA of all its citizens. To date around 30% of Icelanders have given DNA samples, the analysis of which could be used to help prevent illness or to come up with more effective treatments. “We want personalised services and to have our good health, but at the same time we’re afraid of giving out our personal details”, he reflected.

## Solutions

As we’ve seen throughout this chapter, both rich and poor countries are facing the three same major challenges for their health systems: confront the fact that the population is living longer, improve the overall quality of healthcare, and reduce inequality. These challenges need government that goes beyond healthcare, taking into account for example ways of lengthening peoples’ professional lives. But let’s go back to health, and how new technologies can help achieve the goals of governments and organisations such as the OECD, WHO, and the World Bank.

### Ways healthcare can be made more efficient

› **Information technologies:** Communication between hospitals, services within the same hospital, and even diagnostic imaging machines and medical practitioners can make huge improvements to the efficiency of a centre, as well as reducing the likelihood of errors, ultimately saving lives. Well into the 21st century, we

still have a way to go in this respect, even in the most developed countries with the longest life expectancy on the planet.

› **Telemedicine and m-health:** Remote care is usually associated with an increase in productivity, but its impact goes further still. There are a lot of success stories out there and they could be rolled out to most countries in the world. These tools have a number of different applications and could be used for prevention, diagnosis, treatment, monitoring, and management in healthcare, and enhancing quality of life.

› **Collaboration:** A lack of collaboration between academic institutions, research centres, hospitals, and international organisations often results in the duplication of work. New technologies make collaboration easier.

### How to manage an ageing and longer-living population

› **Regenerative medicine:** By using methods from cellular therapy and tissue engineering with the help of simulation technologies and data analysis, we have the means to restore our bodies' cell, tissue, and organ functions. In a similar vein, researchers have discovered a relationship between the length of telomeres (found at the end of a chromosome) and Klotho protein abundance and life expectancy: thanks to the use of simulation technologies we will be able to develop treatments using the curative power of these "natural properties" of the human body.

› **Preventive medicine:** One of the major changes to come is the evolution of the current large-scale curative medical model to a preventative, personalised model. By analysing big data it will be possible to search for patterns which will help medical practitioners make early diagnoses, or prescribe more personalised (and more effective) treatments based on the experience of a set of patients with similar conditions and/or symptoms.

› **The Internet of Things:** Introducing sensor systems into the homes of older people is a way of effectively monitoring health, by triggering alerts automatically when any anomaly or symptom registers. This wide-reaching trend encompasses the use of wearable devices, *smartwatches*, *smartbands* (bracelets), nec-

klaces, and even clothes. Such technologies are easy to use and anyone can wear them without any technological know-how. And they're becoming ever cheaper.

### Solutions to improve access to healthcare in the developing world

› **"Developing world first"**. As we've already seen in the example of *Design that Matters* (page 39), donating medical equipment from the developed world to less advanced countries is not a viable solution. The World Health Organisation (WHO) estimates that 250 million dollars-worth of equipment in the southern hemisphere is wasted every year. It is far more effective to design products and solutions with the environment in mind: taking into account limited numbers of staff to maintain equipment, and the lack of replacement parts.

› **Funding alternatives:** To date, the healthcare sector has had little experience of alternative sources of income, for example *crowdfunding* or bond issues.

*Healthcare information is incredibly sensitive, its privacy is a crucial question. Legislation in most first world countries considers patients to be the "owners" of their medical history.*

# Organisations

## 2.3.

► **A country's business** environment is another major contributing factor for prosperity. The reason is simple: **companies create work**. In exchange for your time and knowledge, a business (or a decent one, at least) will pay you a salary at the end of the month. But not only that. **Your profession tells something about who you are, and plays an important part in your happiness.** Which is why it's so important. Matters such as how easy it is to start a new business, levels of bureaucracy, legislation with respect to bankruptcy, and labour flexibility, can all determine the difference between employing few or many people, success and failure, or happiness and unhappiness.

And now we have to take another dimension into account: we live in times of aggressive and global competition, meaning organisations need to totally rethink their organisational structures, their business models, their strategies for recruiting and retaining talent, and even their corporate cultures. **In the 21st century, only companies that are able to innovate at the rhythm dictated by the market will survive.** And every single one of us, employers and employees, are taking risks along the way.

This is where a particularly fashionable concept comes into play: **Digital Transformation**. This is again a question of taking advantage of new technologies to create a more efficient, open, flexible and dynamic structure. We will only be capable of creating sustainable businesses if we turn to digital transformation.

Much has been said and written on the **ways we can successfully tackle the digital transformation process**. Basically, change will only be effective if it has the commitment of a company's senior management board, and if it takes the shape of tangible changes that can be made across an organisation.

During the *Future Trends Forum* (FTF), consultant and organisational innovation expert **Henry de Sio** predicted the **"end of silos"**. De Sio, who served as Deputy Assistant for Barack Obama's first presidential



*All companies and institutions must transform themselves from a model based on silos, with departments all having their own respective leaders, to a more horizontal model, where teams are set up on an ad-hoc basis for each different task.*

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**Henry De Sio**  
Global Chair of Framework  
Change Ashoka.

campaign, thinks all companies and institutions must transform themselves from a model based on silos, with departments all having their own respective leaders, to a more horizontal model, where teams are set up on an ad-hoc basis for each different task.

This new way of working in organisations would also alter the function of the leader. "Their task is no longer to give orders, but to work together with employees, who themselves have the power to make their own decisions. This doesn't mean there needs to be a lack of discipline. On the contrary, "the collaborative atmosphere and way employees are empowered makes them want to be the best they can be, to be more responsible and proactive. **It's a path of no return**, because employees themselves are starting to insist they take on this level of responsibility".

The quest for greater responsibility the workplace is one of many attributes shared by so-called **Millennials** (born between 1981 and 1995). Other things they look for when choosing a job, according to a study from the consultancy and auditing firm Deloitte, is a company's level of social commitment, the flexibility of working hours, and the possibility of receiving training.

## ***The 'uberisation' of the economy***

The business world is being shaken up by another major change: the "uberisation" of the economy. To adapt to this soon to be all-encompassing trend, companies will need to have successfully taken on board the organisational and cultural elements digital transformation has brought with it.

When we talk about "uberisation", we're referring to the huge social shift whereby people now prefer to "have access to" as opposed to "possess" things. **Why buy a house, if you can rent one and live where you need to be at different times?** Why buy a car, if it's parked up more than 80% of the time? Why buy a software license, if you can get the service on the *cloud* and just pay for the times you use it?

This "uberisation" is seriously attractive from a consumer perspective, but it has major implications for the labour market and business world. **Why employ a team of designers if you can choose from thousands of de-**

## **signer's proposals on sites like Freelancer.com and end up paying less?**

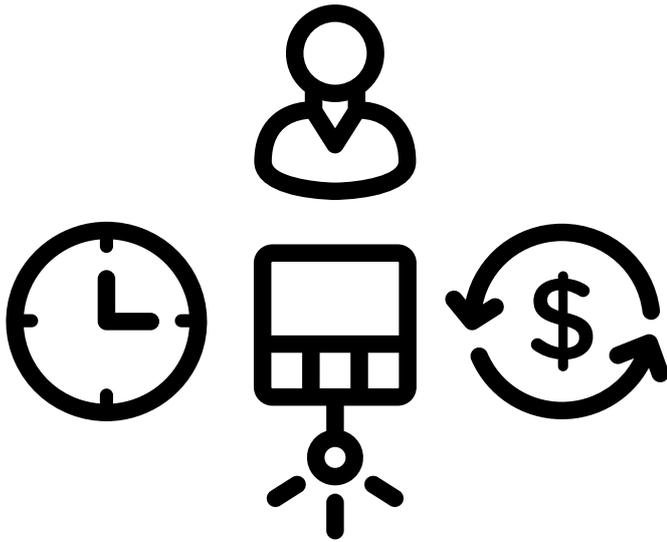
In his book *The Inevitable* Kevin Kelly, editor of Wired magazine, questions the sustainability of online business models, in a world where as consumers we're used to getting everything and paying very little (or nothing) for it.

It's easy to see what the consequences could lead to: in the short term, more job cuts. In the medium term, the "**uberisation**" of staff (skeleton staff combined with a number of collaborators who all compete for the same

*When we talk about "uberisation", we're referring to the huge social shift whereby people now prefer to "have access to" as opposed to "possess" things. Why buy a house, if you can rent one and live where you need to be at different times? Why buy a car, if it's parked up more than 80% of the time? Why buy a software license, if you can get the service on the cloud and just pay for the times you use it?*

work based on price). A good majority of the working population will work as freelancers, but it'll be some time before the income they receive will be enough to maintain a decent quality of life.

This tendency towards a more precarious way of working, along with the number of jobs made obsolete due to artificial intelligence and robots has stirred up an old debate: **Could a universal basic income put an end to the growth of inequality?**



## Business innovation in the 21st century

### Agile methodologies

Historically, advances in technology - aside from simple incremental improvements - would take ten years to get from initial idea to a final product, and another ten years to launch the product on the mass market. The "10/10 Rule", a term coined by commentator **Steve Johnson** in his book *Where Good Ideas Come From*, had been true for decades... until the arrival of YouTube. And the speed at which other digital tools have been adopted, such as Facebook, WhatsApp, Instagram or Snapchat, has only accelerated things further. And in the physical world, new technologies mean new inventions are getting to market and reaching mass audiences faster than ever. "It's never been cheaper to get a prototype of a product, gauge a market reaction, and scale up to success", said **Larry Keeley** during the FTF.

"Innovate or die, that's the choice. That's not to say we always get innovation right, but at least you'll learn so-

omething in the process" said **John Hoffman**, chief executive of GSMA, organiser of Mobile World Congress (MWC), an international conference. Even good ideas with a talented team and funding in place can fail. Sometimes it's just not the right time. Chemical giant 3M is an old poster child for second chances. Many of its products, including the ubiquitous Post-it note, were the fruits of failed inventions which, as time went on, happened to be found a new use.

This new innovation process, mastered so perfectly by the likes of companies such as GE and 3M follows more or less the same path: a potential idea is brought forward; market analysis is carried out to see if there's room on the market; the business idea is adapted according to initial *feedback*; the first prototype is developed; the prototype is shown to a selection of employers, distributors and potential consumers; the first version of the product is launched on the market; the product is adapted following the market reaction; the value proposition is settled; new functionalities are developed, resulting in a more final version of the product; the first marketing budget is spent; and, lastly, the successful experience is replicated in other sectors or other geographic areas. These are so-called **agile methodologies (scrum, lean, etc.)**. "Nowadays you can reinvent, change, and adapt your ideas as many times as you want, without needed to invest as much money as you did before", Keeley comments.

### 👁️ | Hyperloop

This is one of the most exciting start-ups of our times. Hyperloop is a solar-powered magnetic train, capable of reaching 1,300 kilometres per hour, that could revolutionise urban and long-distance transportation. The company stands out as one of the first to integrate crowdsourcing and collective talent into its organisation. It has a skeleton staff, but crucially any person in the world is invited to take part in the project. Potential workers need to commit to a minimum of ten hours per week. As the company has no income at present, collaborators receive stock options as a form of remuneration.

## 'Crowdsourcing': Reaching new talent

Nowadays, organisations are looking beyond their usual pool of employees for ideas. Through ideas competitions, start-up incubators, collaboration projects with universities, and simply by asking for help over the internet, **companies can benefit from ideas beyond their own four walls.**

In 2013 GE announced its "Jet engine bracket challenge" on online platform GrabCAD. After almost six months the winner was chosen, and the design came from a young person from a small village in Indonesia. If it wasn't for their **open innovation** initiative, a multinational giant like GE would never have found him. "Businesses benefit from the ideas of others, and society benefits from it being possible for someone from a hidden corner of the world, or someone who doesn't have the means to study at a good university, to be able to get their ideas out there", **James Gallman** pointed out.

## Solutions

› **Knock down "silos"**. According to **Henry de Sio**, Human Resources Consultant and "Global Chair for Framework Shift" at Ashoka, a social entrepreneurs' network, organisations need to knock down all their walls, get rid of their rigid structures, and replace them with dynamic structures where teams are set up for every task on an ad-hoc *basis*. That way, every project would have the best-qualified team possible. Moreover, a team's diversity means everyone can learn from each other.

› **More horizontal structures**. In 21st century companies, the role of the leader is also changing. Even though people continue to be responsible for different tasks (although fewer in general) a leader's function ceases to be to give orders and permissions, and moves to a more supervisory role, to guide a group of empowered workers, all with greater decision-making powers.

› **Collaboration with start-ups**. When large and small businesses collaborate, everyone's a winner: big firms get new ideas and technology, and the freshness and dynamism small businesses bring are contagious. And start-ups benefit from a larger businesses'



*Businesses benefit from the ideas of others, and society benefits from it being possible for someone from a hidden corner of the world, or someone who doesn't have the means to study at a good university, to be able to get their ideas out there.*

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**James Gallman**  
Leader and Strategic  
Workforce Planning at GE.



*In an informal economy, the only standard is confidence. Because it's a more flexible system, new business models are allowed to spring up. They can be tested without limitations... apart from the law of supply and demand.*

**Niti Bhan**

Founder Emerging Futures Lab (EFL).

market knowledge and brand recognition. There are various ways companies can collaborate: corporate incubators are the most successful, and tend to have more involvement from the established business. In Spain, companies such as the brewery Mahou San Miguel have set up start-up incubators, where employees from the company itself act as mentors to the chosen businesses.

› **Employ more millennials... and let them move up.**

Having a diverse workforce (in terms of age, country of origin, level of study, personality, etc.) tends to make it more successful, because it has a wider scope of reality. Following on from this, having people move between companies, or different departments within the same company, enriches an organisation. Young people have an especially enriching contribution: they bring fresh ideas and different ways of seeing the world and the consumer. But for this philosophy and knowledge to truly penetrate an organisation, there needs to be movement in the higher-up positions too.

› **Experiment more: the informal economy.** The founder of Emerging Futures Lab (EFL), **Niti Bhan**, defends the role the "informal economy" plays in society today, above all in less-developed countries, in terms of the perils of over-regulation. In an informal economy, the only standard is confidence. Because it's a more flexible system, new business models are allowed to spring

up. They can be tested without limitations... apart from the law of supply and demand.

› **Flexible work regulations.** When it comes to hiring, firing, or restructuring a company, flexibility can be fundamental to the survival of companies, especially small ones (SMEs). It's up to public bodies to legislate in favour of flexible working regulations which can guarantee a certain level of social responsibility from business owners or employers at the same time. "Labour laws should be sufficiently flexible for companies to be able to substitute, train, or mobilise their workforce when they need to. That's the only way they'll be able to get the most out of digitisation", says **Soumitra Dutta**, Dean of Cornell College of Business.

# Entrepreneurs

## 2.4.

► **In 1988**, the then chief executive of Nokia, **J. O. Niemi-nen**, said: “When an inventor in Silicon Valley opens his garage door to show off his latest idea, he has 50% of the world market in front of him. When an inventor in Finland opens his garage door, he faces a metre of snow”. The place you’re from or the place you choose to set up a business is important, but in the digital era, the borders have been broken down. **Globalisation takes talent, creativity, and competitiveness into consideration, not maps.**

We need entrepreneurs because they are the source of innovation. Furthermore, starting a business offers a work opportunity for many talented young people. Of course, not all start-ups will change the world, nor will they all innovate at the same level, but their contribution to economic and social progress is fundamental. For this reason, increasing their visibility could work as an incentive for many other young people (and those who are not so young) to follow this path<sup>16</sup>.

**Larry Keeley**, director of Deloitte Consulting and co-founder and chairman of its innovation arm, **Doblin**, talked during the FTF about how wide a field entrepreneurialism is, and how it has yet to fully exploit the digital world.

For Keeley, 21st century **“innovation has had more to do with integrating elements that already exist, as opposed to inventing new things”**. He puts forward an example: “Uber is a combination of small functionalities, all cheap and developed by third parties, put together in an ingenious way. Innovation has become a much a simpler and more democratic exercise, it’s accessible to all sorts of people from all different parts of the world”. That “metre of snow” the CEO of Nokia referred to has been knocked down.

The key, then, lies in knowing how to identify needs and come up with simple and scalable solutions. In this sense, **technology is on the side of the entrepreneurs**. Think for a moment about the wealth of opportunities we have ahead in terms of the **Internet of**

*It’s never been cheaper to get a prototype of a product, gauge a market reaction, and scale up to success.*

**Larry Keeley**  
Founder and President  
of the Doblin Group.



### 16 ▼

It’s perhaps surprising to some that the average age of entrepreneurs is forty. In countries like Greece and South Korea, more than one in four entrepreneurs is between the ages of 45 and 55 years, according to the 2015 Global Entrepreneurship Monitor (GEM) annual report.

**Things and artificial intelligence.** By simply adding sensor systems to everyday objects in our lives we can revolutionise a multitude of small tasks.

And there are many sectors which have yet to come up with a game-changing start-up, like Google did with online searching, or Facebook did with social networks. Education, biotechnology, transportation, solar power, and the collaborative economy are just some of them.

## ***Solving the world's biggest problems, a utopian vision?***

A thin line separates corporate social responsibility and social enterprise. The distinction between the two is a question of priorities: a social start-up's main goal is to be of benefit to society, though it could be at the cost of smaller profit margins.

A social entrepreneur aspires to make the world a better place, but to do so their business needs to be profitable. Very few manage to make a difference. A lack of experience or financial know-how, scant access to capital, and dealing with poor infrastructures (such as decent connectivity), are some of the barriers people face. And often solving life's great social problems isn't a lucrative activity, which is why the responsibility is often taken on by public bodies. **Enthusiasm alone is not enough to take a business forward.**

**Does that mean there isn't room in the market for dreamers? No.** "Technology can break down many barriers, such as access to capital and knowledge, but the skill to innovate and the value a start-up can bring is dependent on the people", **pointed out Henry de Sio**, who works with social entrepreneurs' network Ashoka, as "Global Chair for Framework Change".

Ashoka, a social entrepreneurs' network, is a non-profit international organisation offering individual guidance and *networking* to more than 3,300 social entrepreneurs: it's the world's largest network of social enterprise. At the same time, organisations such as the Bill and Melinda Gates Foundation or accelerators working under the Unreasonable Institute's umbrella are hopeful they'll find entrepreneurs who will make the world a better and more equitable place.



There are millions of examples of start-ups that are managing to solve society's problems through the use of new technologies. **WakaWaka**, for example, is a small battery and flashlight powered by solar energy. Every time they sell a unit on their website (<http://waka-waka.com/>), the company donates another to developing countries such as Tanzania, to replace toxic paraffin lamps. There are a number more shining examples in the west, such as Tentree (US) and Fa-

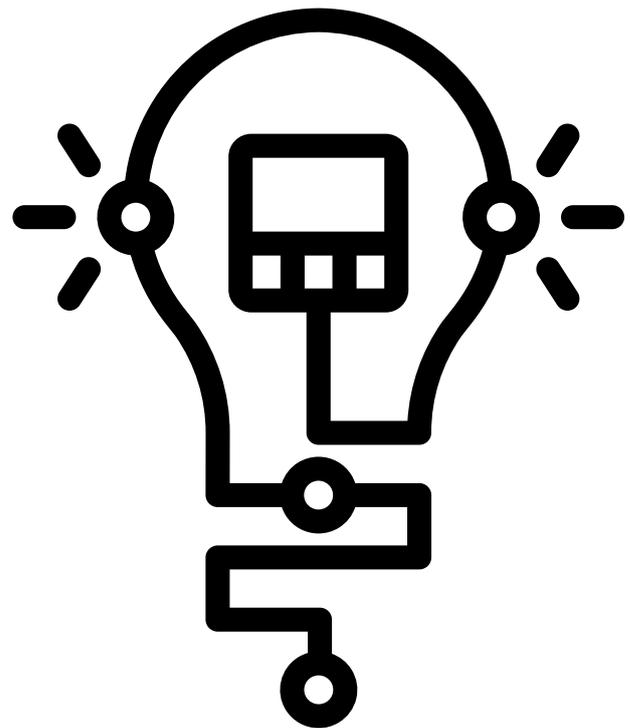
guo (France), two fashion *e-commerce* sites that plant trees across the world each time they make a sale. And in Spain, a psychiatrist called Cristóbal Colón founded a yoghurt factory in 1982 in the small town of Santa Pau (Girona province) to offer employment and assistance to people with mental illness and psychological disorders. La Fageda is now a distributor of yoghurts, ice creams and jams, providing work to almost 300 people, half of whom have a mental or intellectual disability. The company has just finalised a 12 million euro investment plan to renovate its production facilities and continue to grow and create further employment.

## Solutions

- › **Cloud computing.** No technology has played such a significant role in the democratisation of tools such as data analysis and storage as cloud computing. Now, not only files and applications can be uploaded to the cloud, but also infrastructures and processes, and it's all within the reach of SMEs and entrepreneurs.
- › **Social recognition.** It's important to praise the work of entrepreneurs to encourage others to follow a similar path. Which is why FTF experts proposed that local administrations and the media could be involved in giving recognition to the most successful entrepreneurs, making them role models for others.
- › **More training.** After access to funding, the second most common reason for start-ups failing has to do with a lack of training (above all, financial) of the people taking part. The most common reasons are not knowing how to handle cash flow, focusing too much on secondary functions during the product validation stage, and obsessing with a valuation of the start-up during negotiations with private investors. The internet is the perfect channel to get all the right training and put entrepreneurs in touch with academics, professionals, and mentors.
- › **Less bureaucracy.** Every day a company puts off getting started loses it money. And the timescales can go on for more than six months if particular permissions need to be sought. Once again, new technologies can help public administrations simplify their procedures, shortening waiting times and carrying out checks in real time.

Taxation that attracts start-ups and business angels  
Taxation on *stock options*, on start-up members' share capital, or on the profits a start-up makes in its first few years can attract or scare off entrepreneurs and private investors. If business angels and venture capital funds don't find a country an attractive prospect they'll simply look elsewhere. Experts at the FTF agreed an ideal solution would be to find a way of reducing the levy for entrepreneurs reinvesting profits in their company, at least for the first two years of operation.

› **Beneficial regulations in the case of insolvency.** If a limited company is declared insolvent in some countries such as Spain, the employer must commit their own personal assets. In September 2013, a law added "entrepreneur with limited liability" to that list, with certain conditions and limitations.



*Innovation has had more to do with integrating elements that already exist, as opposed to inventing new things.*



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### Agenda. Future Trends Forum

#FTFInequality

#### ● Elements of inequality

##### ● Economic Opportunity

- James Gallman, Strategic Workforce Planning Leader at GE Corporate, USA
- Niti Bhan, Human Centered Strategy for the Informal Economy, Finland
- Henry De Sio, Leadership Group, Global Chair, Frame Change at Ashoka, USA

##### Debate

Madrid June 1st - 3rd



**FTF** Future Trends Forum



# The role of the authorities

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2.0.



# Ivan Rossignol

## Prologue

Ivan Rossignol is the Chief Technical Specialist, Competitive Industries Practice in the Finance and Private Sector Development (FPD) network of the World Bank Group, and head of the Competitive Industries and Innovation Program at the Bank. In this global role, Ivan leads the Bank knowledge agenda on all issues related to Competitiveness, Growth Strategies around clusters, value chains and enclave approaches, and provides quality control on all World Bank financed projects touching on competitiveness.

► **The growth model supported** by the Bretton Woods institutions and adopted by most countries, has led to unprecedented reduction of poverty, and has allowed the emergence of new economic powers. Nevertheless, it has also translated into growing inequalities between the poor and the rich, and recently showed its limits in allowing countries, notably in Africa, to engage into structural transformation. Today, the purchasing power of a university professor or of a qualified factory worker, is lower than what it was 30 years ago.

Yes, the emergence of new technologies has favored some countries. But this development, as positive as it is on people's lives, has unfortunately not always - and in aggregate not yet - led to the creation

of enough jobs to absorb new entrants in developing countries and to lower unemployment rates in richer countries. This paradigm has developed to such an extent that the future of some cities is questioned in the face of delocalizing industries.

Amyarta Sen, Thomas Piketty, Dani Rodrik, and other economists, are helping us decipher the problem. Nevertheless now is a time for courage and action, which may require us to think beyond the mainstream of economic thinking. New practical solutions must be identified and tested. The role of the government vis-à-vis, the private sector, and other actors of the society, must be rethought so that new frameworks of economic growth and development be found.

Given the challenge, solutions are needed urgently.

*For greater social equality we need strong governments who can think beyond the confines of legislation, and we need laws that encourage technological development.*

**John Lyons**

Founder and CEO of the International Cyber Security Protection Alliance (ICSPA).



► **Technology belongs to its users.** It is created by them, and for them. However, public institutions - both national and supranational - are able to influence, at the very least, the speed at which a new technological market develops. Ultimately, the public sector is responsible for ensuring progress that results in greater wealth... for everybody.

Nevertheless, there is a perception that public administrations and regulators are always one step behind; that consumers are the ones that set the space of innovation. And there's good and bad news in that respect. The good news is that both perspectives are right: **there's a huge gap between digitalisation in wider society and the digitalisation of the public sector.** The bad news is that there's a lot of work to be done. "Governments could be doing a lot more to invest in digital solutions with social impact", concludes the Global Information Technology Report 2016 from the World Economic Forum in collaboration with INSEAD and Cornell University.

Government intervention is important: firstly, it directly influences companies' capacity to adopt new technologies (without a concise legal framework for example, a lot of investment is postponed or moved to other regions). Digitised companies are not only more efficient, but they also open their operating range to a greater number of potential clients. **Innovate or die, that is the question.**

Furthermore, the digital availability of public services, such as online access to the police, health, the management of documents and permits, or digital identification, can contribute enormously to the perception of prosperity in a country. **Did you know that one and a half billion people in the world don't have an official ID document?** "For greater social equality we need strong governments who can think beyond the confines of legislation, and we need laws that encourage technological development."

Another major sphere of activity surrounds **open data**: the open and free availability of all information relating to public projects and those funded with public money. "That information, whether it relates to weather forecasting, water quality, the number of bins in a neighbourhood, or crime data, can all be used by both local authorities and entrepreneurs to develop new services. It also serves to raise **remarked.**"

But as we saw in previous chapters, technological development also brings with it some unwanted repercussions: such as a tendency for monopolies to spring up, and huge numbers of job cuts. Governments in the 21st century are facing a dilemma: **speed up technological development** – and with that help pave the way for a more productive model of the future – **or try to contain it** – in the hope it leads to fewer job cuts and safeguards the privacy rights of citizens. But apart from a few rare exceptions, it's generally assumed that a policy of digital acceleration is the most beneficial path for countries in the long-term.

Some classic digital acceleration measures suggested by economists are:

● **New growth strategies:**

- Boost R&D investments
- Support the growth of strategic sectors
- Education and training
- Transparent regulatory changes

● **Trade development:**

- Promote global value chains
- Competition policies

● **The socialisation of technological benefits:**

- Facilitate technology purchases
- Promote mobility

Each of these measures has been properly analysed. **Ivan Rossignol**, Chief Technical Specialist, Trade and Competitiveness Global Practice of the World Bank Group put forward these possible risks:

"Giving society more technology doesn't necessarily result in higher levels of productivity, or in an improvement of teaching standards".

"Public assistance contributes to the appearance of new corporate giants, with monopolistic powers. And what's more, these monopolies are the ones that receive the majority of publicly funded R&D grants".

"A new class of entrepreneur has emerged: one that values freedom above any kind of job security. It's the *uberisation* of employment".

Rossignol concluded: "It's worth thinking about whether trying to accelerate the process always leads us to a better and happier society. Progress should be measured in more human terms, going beyond GDP".

"It is the responsibility of public bodies to consider the

most significant challenges faced by a society and how to tackle them, to think about what kind of society we want to build and what steps need to be taken to get there. For a company, the world is simply moving forward too quickly", added Uschi Schreiber, Global Vice Chair and Chair of EY Global Accounts Committee. **Governments are not in themselves defining factors of a country's prosperity, but they undoubtedly have a hand in generating it, or ruining it.**

*That information, whether it relates to weather forecasting, water quality, the number of bins in a neighbourhood, or crime data, can all be used by both local authorities and entrepreneurs to develop new services.*

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**Philip Lader**

Former Non-Executive  
Chairman WPP Group.



# Solutions

## 3.1.



*A great example of how a State can contribute to the technological development of a country can be found in Singapore. In thirty years, we've gone from being a developing country, to a developed country.*

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### Tan Chin Nam

Former Permanent Secretary and Singapore Public Service and Senior Corporate Adviser.

## Long-term vision

► **It's hard to put the brakes** on technological development. Society sets the trends, and that then dictates how countries regulate any new activities. It's the responsibility of governments to help create the fertile ground to make good use of new technologies possible, which in turn results in general improvements for society and the economy.

**It's not enough to simply invest in infrastructures and deploy new technologies.** Or rather, that's just the first step. "It's harder to make changes to institutional frameworks, the education system, the business

world, copyright laws, and all the other factors that influence the development of technologies", said **Soumitra Dutta**, Dean of Cornell College of Business. "**We need vision and strategic planning**", Dutta summed up during the FTF.

Dutta acknowledged how there are few examples of countries who've regulated technological development, and even fewer who've done it successfully. He went on, "without a certain amount of vision and planning, and without there being an existing ecosystem of *partners* (public and private companies, start-ups,

## 👁️ | Singapore: a case study Legatum Prosperity Index ranking: #17

A great example of how a State can contribute to the technological development of a country can be found in Singapore. By the end of the 1960s, this country emerged as a manufacturing hub for cheap transistors and other basic devices, but over the years it has evolved. It invests 2.2% of its GDP in research and development<sup>17</sup>, and is considered one of the easiest countries in the world in which to do business. In thirty years, we've gone from being a developing country, to a developed country" said So Chin Nam, who spent over thirty years working for the Singapore

Government as Managing Director of Economic Development, Chief Executive of the Tourist Board, and Permanent Secretary of the Ministry of Manpower. So Chin Nam is also a trustee of Fundación Innovación Bankinter. Singapore's transformation has been progressive and constant. With no less than seven national technology development plans behind it, it started to orient itself towards providing basic training for all citizens, then to the creation of new job positions, training the workforce in different specialisations, attracting capital, technological development,

and finally, innovation. Now, a new national plan acts as an umbrella over all previous programmes. Named the Smart Nation Initiative<sup>18</sup>, it aims to capitalise on the Internet of Things to create a 'smarter' country.

17 ▼

Source: [OCDE. Data from 2014.](#)

18 ▼

Source: [World Bank. Data from 2015.](#)

Further information:

<http://www.smartnation-forbes.com/>

investors, banks...), a society and its businesses will be hard-pressed to digitalise in an organic way".

Having that long-term vision will help governments to make better investment decisions. "An excess of ambition has prompted, in many cases, programmes and services to be set up and never subsequently used by citizens. **Public budgets are limited, so it's important to plan carefully**", said **Ivan Rossignol**, Chief Technical Specialist, Trade and Competitiveness Global Practice of the World Bank.

**Adrian Wooldridge**, the Economist's Management Editor and columnist gave a word of caution against the increasing number of anti-system movements: "Reactions against unemployment and corruption are everywhere: and they can lead to shortsighted, protectionist policies based on rage, not reason. A divided society is a huge threat to democracy and equality. We must empower citizens, get them the right technology, and teach them how to be more productive". And like any other solution to a complex problem, it takes time.

## ***Support enterprise and free competition***

**Iqbal Quadir** said **the best way of invigorating an economy and reducing inequality is to support entrepreneurs, given that they are the ones who bring about innovation**. It stands to reason then that a more attractive tax system and fewer business start-up costs will encourage enterprise and investment in start-ups. More competition reduces corruption and nepotism. Similarly, promoting the development of start-ups and regulating in favour of free competition makes it harder for new monopolies to form who have the power of making and breaking the rules of the marketplace. According to Quadir's theory, institutions, entrepreneurs and citizens all have a task to do in society and an economy can only progress when all three are getting their work done.

The major problem is the speed with which everything is changing. **With no historical reference points to look**

## 👁️ | Israel: a case study Legatum Prosperity Index ranking: #38

Israel is a country ten times smaller than the state of Utah, founded less than seventy years ago. It has hardly any natural resources, it stands on semidesert ground, and is surrounded by historic enemies. But nonetheless it has become the world's second largest R%D investor in terms of percentage of GDP (4.1 in 2014)<sup>19</sup> and is one of the twenty highest per capita<sup>20</sup> income countries. Thanks to the invention of drip irrigation and, subsequently, other technologies applied to agriculture, medicine and the military sector, this small country of 8 million inhabitants has become a hub for technological innovations. Today's Israel is the result of an unprecedented mixture

of a creative and nonconformist culture, good universities, military discipline and well-considered political decisions. In 1993, the Israeli government created a venture capital fund called **Yozma** ('initiative' in Hebrew). Yozma ("initiative" in Hebrew). The experiment worked, and the number of start-ups and foreign investments soon multiplied. Currently, Israel's government continues to play a crucial role in this ecosystem, giving grants that cover up to 80% of the costs of starting a new project. Besides Yozma, the government set up the **Office of the Chief Scientist**, under the authority of the Ministry of Economy, which helps projects in sectors or areas where there are

greater difficulties in finding financing. The country is also working on attracting international talent, for which reason the Government recently approved the 'Start-up Visa', a residence permit for up to one year for foreign entrepreneurs.

- 19** ▼ In 2013 South Korea knocked them from first position worldwide, where it had comfortably been for over a decade. [OECD data](#).
- 20** ▼ Source: World Bank. Data from 2014.



back to, it's complicated to work out which is the path we should follow. Which is why **Larry Keeley**, director of Deloitte Consulting and Co-founder and Chairman of its innovation arm **Doblin** proposes opening ourselves up to experimentation: something that could be led by entrepreneurs and private companies. "Governments need to put faith in entrepreneurs and try out lots of different things to see what works and what doesn't; test pilot projects on control groups, and put money into the ideas that generate real progress and prosperity".

### Digital acceleration policies

Governments are faced with the dilemma of accelerating of putting the brakes on digital development or rather, the job losses it entails. In general, the experts who came together at the latest *Future Trends Forum* (FTF) supported accelerating the development of new technologies and new markets, by not only putting plans into place for technological infrastructures, but also by providing better access to education and specialist training, measures to boost internationalisation and attract foreign investment, and laws to reduce barriers to entry on technological markets.

On the contrary, regulating new sectors and taking protectionist measures could be considered ways of containing the technological development of a country.

## **Open data**

Is the term for the open and free availability of all information relating to public projects and those funded with public money. This is one area with a great amount of political and social consensus, but it's nonetheless lagging behind when it comes to adoption at a global level.

It's clear that data is valuable. By analysing it you can get hold of all sorts of information, which institutions, companies, and entrepreneurs can use as a basis for developing new products and services. **And information can uncover social, economic, and environmental injustices too, on an international, local, or neighbourhood scale: it's the best weapon there is against corruption.**

## **Increasing the accessibility of politicians via the internet**

From [Morgan Stanley](#). Information, and above all social networks, can help change things.

Social networks have become one more battleground for political parties, and platforms such as Twitter are now candidates' loudspeakers to spread their message over the internet. A law compelling all elected politicians to be visible on these platforms could help increase confidence among the public, and raise awareness about certain social activities. The impact is exponential: **a person with 150 contacts in their social network can reach three million potential contacts.**

And not only social networks. Platforms like [Change.org](#) function as a loudspeaker for society, and allow individuals to express their opinions or dissatisfaction about a product, brand, or social injustice. **Never before have the voices of citizens been so loud, and never have they held so much power.** There's never been such direct *feedback* or a way of instantly establishing a constructive conversation with voters or clients.



*The best way of invigorating an economy and reducing inequality is to support entrepreneurs, given that they are the ones who bring about innovation.*

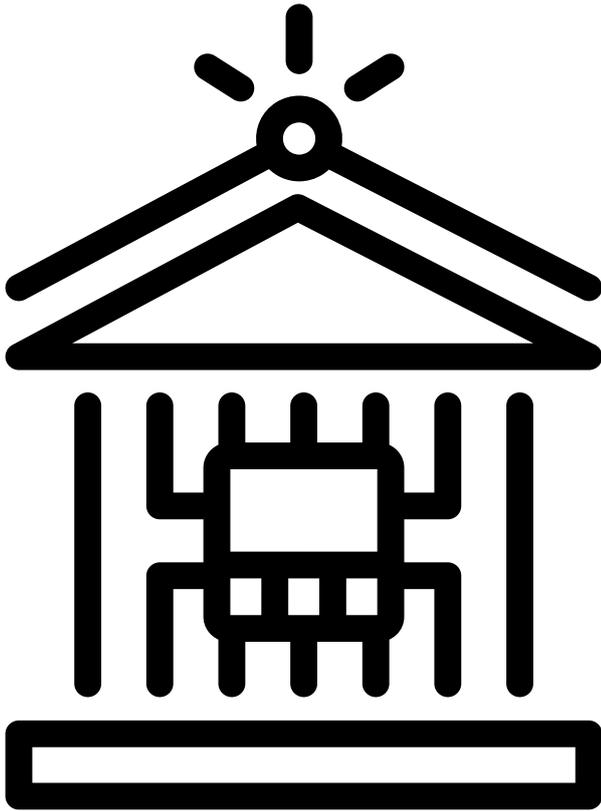
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**Iqbal Quadir**

Founder and Director Emeritus,  
Legatum Center at MIT.

## **Public-private cooperation**

Collaboration between government institutions and private companies can help deliver the process of digitisation more efficiently and effectively. Information and communications technologies (ICT) can be employed to guarantee access to basic services like education, healthcare, and finance. An example of successful public-private collaboration can be found in Holland, where a private company has provided online access to the current case law and justice system.



Law is in fact one of the most backward sectors, digitally speaking, in terms of the internal adoption of new tools, giving citizens access to legal information, and accepting digital communications as evidence in legal cases. It is estimated<sup>21</sup> that 4 billion people around the world have inadequate access to the justice system.

## ***The digital transformation of institutions***

Digital technologies speed up the adoption of new social and economic dynamics that must be understood by the people who have the responsibility to regulate them. The digital economy demands a new leadership style: it must be more transparent and direct for citizens. It should be less bureaucratic, so it doesn't prevent organisations from innovating at the speed the

21 ▼

Global Information Technology Report 2016 (World Economic Forum).

## **👁️ | Grameenphone: not everything is dependent on public money**

In 2000, Bangladesh had one of the lowest telephone density rates in the world: 0.26 telephones for every 100 inhabitants. In terms of landlines, the Bangladesh Telegraph and Telephone Board (BTTB) had just 350,000 lines in operation for a population of 125 million. Encouraging development of the private sector was fundamental to improving the country's basic infrastructure, and a developed private sector helped develop the infrastructure.

This was when Grameenphone came into being, a programme that introduced telephones to towns and villages with an enormous impact on rural areas. A 2006 Ovum study concluded that almost 250,000 Bangladesh inhabitants depend on the mobile phone industry either directly or indirectly, and mobile services account for the contribution of 650 million dollars to the economy annually.

In 2000, the International Finance Corporation (a member of the World Bank), gave the company a loan for 16.7 million dollars and made an initial capital investment of 1.57 million in return for 3% of stock holdings in GrameenPhone.

In 2004, the IFC gave a second loan to the company for 30 million, and in 2006 a third loan, to the value of 70 million. But Grameenphone has to date invested almost 4 billion dollars in the deployment of infrastructures. It is the greatest infrastructure project led by a private company the country has ever seen. And where did the remaining 3.9 billion come from? "Clients have given them, by paying their bills", explained Iqbal Quadir, Founder and Director Emeritus of the Legatum Center for Entrepreneurship.



*We still haven't clarified what new institutions will come from the next shift in the business world. We are still a way from understanding the macroeconomic changes new business ecosystems and the collaborative economy will bring.*

**Chris Meyer**  
CEO of Nerve LLC.

market dictates. And this inevitably involves digital transformation of public institutions themselves.

According to a study from consultancy firm Deloitte Digital completed by 1,200 civil servants in more than 70 countries, **three quarters consider new technologies to be revolutionising the public sector, but others acknowledge that their digital skills are lagging behind those of the private sector.** The lack of digital training of leaders, the difficulty of finding talent, and the inefficiency of *business partners* were some of the causes cited to account for the gap.

Public authorities' main issue is that they're always late to climb every technological wave. And as such, regulation tends to be out-of-date and incomplete. This is why the World Economic Forum's Global Agenda Council proposes applying agile methodologies, prevalent in software companies, to public administrations.

## ***Do we need new institutions?***

This was one of the prevailing big questions over the course of the two days of the *Future Trends Forum* (FTF), organised by Fundación Innovación Bankinter, but a definite answer was yet to be found.

It was clear that we need national and supranational institutions to guarantee responsible development and

free competition. But less clear was whether this would mean setting up new institutions, or involve reforming current ones which as they stand wouldn't be efficient enough to deal with these new responsibilities.

"We still haven't clarified what new institutions will come from the next shift in the business world. We are still a way from understanding the macroeconomic changes new business ecosystems and the collaborative economy will bring", said **Chris Meyer**.

**We're right at the start of a new era**, and it's going to have a profound impact on the world as we know it. The current north-south division of the world's days are numbered. **Only countries which support innovation and knowledge, and who have flexible, strategic, transparent, and collaborative institutions, will be part of the new "north".**

*Public authorities' main issue is that they're always late to climb every technological wave. And as such, regulation tends to be out-of-date and incomplete.*



# The situation in Spain

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4.0.



# Žiga Turk

## Prologue

Žiga is a structural engineer with a PhD in technical sciences, researcher and professor in construction information technology, design communication and CAD/BIM. Author of several papers, partner and coordinator of EU framework research projects, founding co-editor of scientific journal ITcon. 2007-2008 Minister for Growth, 2012-2013 Minister of Education, Science, Culture and Sports in the Government of Slovenia, 2008-2010 Secretary General of the Felipe Gonzalez's Reflection Group on the Future of Europe, 2010-2011 chair of a High Level Group on the future of European academic networking.

## *Internet Reduces Inequality!*

► **Some argue that the Internet is increasing inequality.** Perhaps. Every change is increasing inequality - between those that were affected by change and those that were not.

**But the Internet is also the best tool we have for reducing inequality and increasing social mobility.**

Disruptive technologies are allowing the young Davids to creatively destruct the old Goliaths. Technological landscape is rapidly expanding, offering new lands to be conquered by new market entrants. **Internet is the infrastructure for social mobility.**

**The internet is also a major force of equality.** The richest and the poorest people in the world have access to the same tools to find information (Google), to watch

videos (Youtube), to learn (Open Courseware), to connect socially (Facebook). There is no such thing as rich people's Google or Facebook. With global youth now spending over 40 hours per week on the internet, during those 40 hours the rich and the poor are equal. They may sleep in very different beds, eat very different meals, but get the same services from, say, Google. **Policymakers should keep the internet that way:** bringing it to places where it does not yet exist, by perhaps making it a human right, not hindering rapid innovation, keeping barriers to market entry low, and, finally, with provisions like net neutrality, prevent the internet from balkanizing into rich- and poor-peoples subnetworks.

# Goal: save "Generation Lost"

## 4.1.

► **Spain's first major problem** is its **fast-rising - and preposterous - youth unemployment rate: 46.5%**<sup>22</sup>. The country is facing the real possibility of a 'Lost Generation'. The result could be disastrous: both in terms of costs for the public administration, and poor future prospects for young people. It already happened with the previous generation: adults who were out of work before the age of 23 in the 1980's continued to earn an average of 12% to 15% less than their contemporaries ten years later<sup>23</sup>.

At the same time, many young people who do work do so intermittently, on a part-time basis or in positions for which they are over-qualified, causing a lack of motivation. Their contracts might not explicitly say the word "temporary", but they know at the back of their minds it will be.

Unusual, complex problems don't often have easy solutions. Training is the most effective tool to improve professional and economic aspirations among the population. Spain currently has the highest rate of school dropouts in Europe<sup>24</sup> and there's major stigmatisation of professional training.

Furthermore, the increased costs of attending university has contributed to weakening universal access to higher education. 29% of young Spanish people say that they cannot afford higher education, and another 27% say that they have no time to study because of work<sup>25</sup>. To make matters worse, combining studies with work is not seen in a good light, and a lot of the time timetables and other university demands make

it almost impossible to use income from a job (even part-time) to pay enrollment fees.

Unemployment is not only affecting new generations. The crisis and the automation of many work positions have created an incredibly difficult situation for people of all ages, many of whom have few options to retrain and find a new job. In the EU-28, Spain has the second highest rate of long-term unemployment, behind Greece. According to data from the 2015 Eurostat, 11.4% of Spanish citizens have been unemployed for more than one year, seven points higher than the average of the community.

Faced with a lack of job offers, young people, as well as those who are not so young, are choosing to start their own businesses. According to the GEM 2015 Report **5.7% of the Spanish population between 18 and 64 years old is involved in entrepreneurial initiatives** (and has been for between 0 and 3.5 years). This represents a 4% increase with respect to 2014 data. However, almost one in every four (24.8%) decided to become an entrepreneur 'due to necessity'. In other words, they did so due to a lack of other work alternatives. Although this parameter has somewhat improved (in 2014 it was 29.8%), it continues to be high, and reflects the difficult work situation that this country is facing.

And in Spain being an entrepreneur doesn't have the same level of social recognition it has in other countries. "Spanish society tends to place less and less value on the success of entrepreneurs. A possible explanation could be its implied link to a cost-profit scenario, or perhaps because setting up a business is seen as a high risk profession", points out the GEM report. It's also worth noting the scarce presence of positive role models, of successful entrepreneurs who could serve as examples for future generations.

Spain is a country made up of small and medium-sized enterprises (and entrepreneurs) that together account for 62% of GDP and more than 90% of employment. Supporting these groups, through a combination of measures promoting training in professional skills, access to funding, and sharing best practice in innovation, could contribute to a general increase in employment figures.

### 22 ▼

Labour Force Survey (LFS). Data from 2nd quarter of 2016.

### 23 ▼

Study Education to employment: Getting Europe's youth into work from McKinsey.

### 24 ▼

Spain is the European Union leader in school failure, with 21.9% of young people between 18 and 24 years having abandoned the educational system after at the most the first year of middle school. This percentage rate is twice the community average (11.1%) and is still far off Spain's aim to reduce school dropout to 15% by 2020, according to Eurostat.



# Solutions

## 4.2.

► **During a brainstorming** and group activity, FTF experts were tasked with finding technological solutions to the inequality issues faced by Spain. These were their main proposals:

### Public sector

- **Establish training** in new technologies from an early age, including the introduction of programming as a compulsory subject at primary and secondary school level.
- **Create business incubators**, financed collectively (*through crowdfunding*), to give visibility to projects and offer training and mentoring. Reduction of taxation for entrepreneurs who reinvest profits or allocate them to social causes, at least during the first two years of operation.
- **Better social benefits** for businesses that promote internal rotation and who provide training to employees.
- **Improve the availability** of information relating to the actual skills the labour market demands, the training courses available, potential career plans, and salary expectations.
- **Mitigate the legal liability** of entrepreneurs in the event of insolvency.
- **Improve public funding channels** for SMEs and start-ups. Fund of funds solutions such as Fond-ICO, inspired by the Israeli Yozma have *previously* shown themselves to be very beneficial. Having said that, the average return on investment of Neotec, previous fund of funds before the Fond-ICO, was negative (- 7% annual loss). In other words, there's either a lack of quality projects in Spain, or the money didn't reach the right ones.
- **Compelling all elected** politicians to have an online platform allowing direct communication with citizens, including the main social networks. Highlight success stories, such as that of the mayor of Jun (Granada, Spain), José Antonio Rodríguez Salas, better known as **@JoseantonioJun**.
- **Avoid the over-regulation** of new digital sectors.

### Private companies

- **Sponsor open** innovation programmes, entrepreneur competitions, *hackathons*, etc.
- **Support incubators** for new businesses.
- **Legal requirement** to include SMEs in the supply chain.
- **Conferences and communications** workshops with start-ups.
- **Set up a digital bank** of expired intellectual property to be used by entrepreneurs, students and non-profit organisations.
- **Develop platforms** based on artificial intelligence to enhance workers' performance and professional development.

### Civil society/non-profit organisations

- **Promote language** learning, especially English. This would give a boost to exports and help create a robust programming industry. Spain is currently ranked at position 29 out of 37 European countries for its English skills.
- **Increase citizen** participation in education via contests and digital platforms etc.
- **Increase the recognition** of entrepreneurs, with the media's support. Create content aimed at different age groups and women, for two reasons: firstly, to improve the employability of all citizens, and secondly to encourage families to support entrepreneurs.
- **Initiatives to teach** programming to all citizens.

*The country is facing the real possibility of a 'Lost Generation'. The result could be disastrous: both in terms of costs for the public administration, and poor future prospects for young people.*

## 👁️ | Code for America/Commons4EU: civic innovation

Code for America is a non-profit organisation set up in 2009 to promote what they call “civic innovation”. The idea is to redefine citizen engagement: based on open data, apps can be developed to improve people’s quality of life. Members (fellows) are paid a salary, and they work with town councils to identify issues that need tackling. “We help government work for the people who need it most”, says Code for America on its website. They also organise an annual conference with leaders from the technological sector to educate citizens on what skills and knowledge they need in the digital age.

A notable initiative in Europe is Commons4EU which unites seven European cities who create mobile or web apps which create solutions to common problems. “Cities face a scenario characterised by shrinking budgets, increasing demands of services from their citizens, and the need to reinvent themselves in their quest to become Smart Cities” explain its developers.



# 12 FTF proposals to combat inequality with technology

## 5.0.

Experts that gathered at the latest Future Trends Forum (FTF), organised by [Fundación Innovación Bankinter](#) put together twelve potential **concrete measures** to combat inequality, all of them related to new technologies. From their proposals, one important conclusion was reached: **without society's participation, without the pressure it can exert, it will be very difficult to make the change. It has never been easier for entrepreneurs and citizens of the world to make their voices heard. Technology is like a huge loudspeaker, and an accelerator for change.** Ultimately, technology is, and will be, a major accelerator to alleviate inequality across the world.

- 1 Recognise the Internet as a human right.** The Internet - without restrictions or censorship - is the door to a whole host of basic services. The establishment of infrastructures that would make this possible would take place, primarily, through public-private partnerships.
- 2 Digital mentors based on artificial intelligence.** Another of the most supported proposals among FTF experts was to develop an artificial intelligence system capable of building digital mentors that could help students - regardless of their economic status - to choose academic courses, choose a place of study, create a curriculum, etc. Given that this would be a virtual system, it could be applied to training individuals throughout their lifetimes. And with good reason, given that, in the Digital Era, citizens will need to keep training throughout their professional careers.

- 3 **Digital 'exam'.** Make children between 10 and 12 years of age take a test - potentially online - to verify their main aptitudes and abilities, particularly those related to personality and digital knowledge. This would allow teachers and mentors to better adapt to pupils' needs, strengthening them in the areas that best correspond with their talents.
- 4 **Introduce crowdfunding** into the education sector, in such a way that companies can fund the studies of disadvantaged pupils who have high potential, who would be identified in advance thanks to big data.
- 5 **Open data in the healthcare sector.** Open and updated information, in the field of health and medical research, has saved more lives than many health and pharmaceutical innovations have in recent years. The FTF has also suggested that this open information could develop into a greater degree of 'open innovation'.
- 6 **Mobile application to quickly** report incidents in the public sphere. Corruption and public uncertainty are problems that can be tackled via simple technologies, such as a mobile application to quickly and anonymously submit reports. This technology could also be applied to the corporate sphere, compensating 'whistleblowers' with tax benefits, or other kinds of benefits.
- 7 **Digital bank of intellectual property.** Large businesses can make intellectual property that they do not use accessible to SMEs and entrepreneurs, so that they are able to create new products and services. In return, they can share ownership of new creations and charge a small fee.
- 8 **Digital bank of skills.** This would entail large companies integrating their internal training programmes and making them available to SMEs, students and entrepreneurs, in exchange for a fee that could be subsidised by public bodies or non-profit organisations.
- 9 **Introduction of specific KPIs** (Key Performance Indicators) on inequality in businesses' social responsibility reports, and a legal obligation to use suppliers that surpass a certain standard.
- 10 **Create a collaborative economy platform** that contributes to reduced prices and provides access to basic necessities in exchange for a subscription, which could be subsidised by public bodies or charity organisations.
- 11 **Digital transformation of the public sector.** Public administrations are in need of restructuring and dramatic digitisation, which can bring them to the same level of technology as citizens and private companies.
- 12 **Legal obligation** to spend a fixed percentage of profits on activities financing connectivity in rural or deprived areas. Base the provision of public funding for academic institutions on the social impact they have.

Predictions	2016	2018	2020
Corporate	<ul style="list-style-type: none"> <li>● Sponsor shark-tank like programs.</li> <li>● Companies to dedicate x% of their profits to bring free connectivity to under privileged areas.</li> <li>● Suggestion to Bankinter Foundation:               <ol style="list-style-type: none"> <li>1) Organize government officials, corporate leaders &amp; entrepreneurs for learning tours in different countries.</li> <li>2) Organize co-creation workshops.</li> </ol> </li> <li>● Work together to set up a skills platform/bank. Offer it to SME, entrepreneurs, students...</li> <li>● Work on IP/ideal bank. Offer everyone the ideas for purchase.</li> <li>● Take initiative &amp; leadership to engage government. Learning Institutions, charity organizations and community to co-create eco-systems.</li> </ul>	<ul style="list-style-type: none"> <li>● Incubate the ai-based lifelong mentoring program to rebalance (to merit from privilege). Access to best/most appropriate skilling opportunities.</li> <li>● Create a technology bank for open source unused IP.</li> <li>● Create a skills bank for start ups and open innovation initiatives.</li> </ul>	<ul style="list-style-type: none"> <li>● Include inequality KPIS their social responsibility reports.</li> <li>● Education for employment.</li> <li>● Contribute to the new open technology bank.</li> </ul>
Civil	<ul style="list-style-type: none"> <li>● Education moon shot.</li> <li>● Education partnership.</li> <li>● Frame Q.</li> <li>● Re-tool the system as an integrated, innovation and skills-based meritocracy for a mobile workforce.</li> <li>● Digital, data based, universal and continuous.</li> </ul>	<ul style="list-style-type: none"> <li>● Crowdfunding-based education programs.</li> <li>● New advisory board by managers, entrepreneurs, politicians, philanthropists... to assess governments in their digital agendas.</li> </ul>	<ul style="list-style-type: none"> <li>● AI-Mentor/coach for 15 phis.</li> <li>● Efficient, friendly, computerized, public sector as service to citizens.</li> <li>● Infrastructure of opportunity for job creation.</li> <li>● Government public services APIs.</li> </ul>
Civil & Corporate			<ul style="list-style-type: none"> <li>● Promote young profiles business start-ups. Who?</li> <li>● Mind-set + swift. A new global youth apprenticeship (life prep) that pathways to new societal premium: Innovative mind, service heart, entrepreneurial spirit and collaborative outlook.</li> </ul>
Public	<ul style="list-style-type: none"> <li>● Blockchain applied to election recount.</li> <li>● Open data in healthcare.</li> <li>● Free wearable devices for all chronic patients.</li> </ul>	<ul style="list-style-type: none"> <li>● Inclusive Europe movement:               <ul style="list-style-type: none"> <li>• Collaboration between national government and EU.</li> <li>• A public, private and people partnership.</li> </ul> </li> <li>● Elementary School with clothes washer for mum.</li> <li>● Adult literacy classes.</li> <li>● Handhold teacher and parents.</li> </ul>	<ul style="list-style-type: none"> <li>● Digital access as a basic human rights for all.</li> <li>● Universal digital access to all basic public services.</li> </ul>
Entrepreneur	<ul style="list-style-type: none"> <li>● More fair/balanced stock distribution among a start-up workforces.</li> <li>● Establish later stage venture funds.</li> <li>● Initiatives by:               <ol style="list-style-type: none"> <li>1) Investors.</li> <li>2) Government with matching funds.</li> </ol> </li> <li>● Study/simulate a subscription minimum income economy.</li> <li>● Recognition and status for proto SMEs. Before start-up registers, it is part of the informal economy. Don't demonize the mothership of innovation + new business. Over regulated bottleneck.</li> </ul>	<ul style="list-style-type: none"> <li>● Reduced cost of living through physical goods shared economy allowing subscription based universal access.</li> <li>● Initiators: entrepreneurs.</li> </ul>	<ul style="list-style-type: none"> <li>● Meritocracy for 21st century. Use data science to identify talent in the population and provide undeserved talent with opportunities.</li> <li>● Initiators: Philanthropist.</li> </ul>



