Hinton Lecture Thursday October 27th 2016

White Heat: why technology changes everything

Good evening ladies and gentlemen, it is a pleasure to be delivering the 19th annual Hinton Lecture tonight.

I did not have the privilege of knowing Nicholas Hinton but in researching this lecture it strikes me that he was an exemplar of a person who fulfilled the obligation upon us all to make the world a better place, in particular during his leadership of the Save the Children Fund and the National Council of Social Service, now the National Council of Voluntary Organisations. He described his style as "tough but honourable" an approach I have a lot of affinity with.

In my own professional career, I have spent over thirty years in financial services working in many different parts of the world, culminating with serving as Group Chief Executive of Barclays during some of the most turbulent times in the history of the industry.

At Business School in the late eighties we debated the Milton Friedman view that business should seek only to maximise profits. As he put it "the business of business is business". But for me this was always too narrow a focus and consequently fundamentally unsatisfying. I believed then as I do now that businesses exist to serve all their stakeholders; customers, colleagues, shareholders and society in both the short and the long term and that these interest need to be constantly optimised.

Perhaps it is strange to hear a former bank CEO say this but I also believe that there is an obligation upon all of us to make the world a better place through our actions. I have tried to live that credo, although not always successfully, in my professional and personal life through my business interests and other activities for example as Chair of Business in the Community, an organisation dedicated to promoting responsible business under the Presidency of His Royal Highness the Price of Wales and as Shadow Chair of the Institute for Apprenticeships a Crown body that becomes operational in April 2017.

In many ways we live in the most exciting times in the history of mankind. Medical advances have extended life expectancy for many, economic activity has lifted hundreds of millions of people out of poverty in the developing world and modern technology allows us to communicate and do business instantly all over the world. And yet we also face many significant challenges; population growth, climate change and rising inequality to name but a few.

If mankind is to continue to advance we are going to have to respond more effectively to these challenges and to do that against a background of perhaps the most important force of all shaping our future; technology.

I called this lecture "White Heat; why technology changes everything" as a deliberate nod to the speech Harold Wilson gave in 1963 at the Labour Party conference in Scarborough. Re-reading that speech things appear to be eerily similar to today

He began by talking about Britain's place in the world saying with an almost post Brexit comment

"From now on Britain will have just as much influence in the world as we can earn, as we can deserve"

And went on to discuss automation, what we would now call robotics and computing power, stating;

“Now the computers have reached the point where they command facilities of memory and of judgement far beyond the capacity of any human being or group of human beings who have ever lived”

He went on to talk about the need to produce more scientists, for an effective industrial policy, for a coherent approach to apprenticeships and concluded that the scientific revolution

“cannot become a reality unless we are prepared to make far reaching changes in economic and social attitudes…The Britain that is going to be forged in the white heat of this revolution will be no place for restrictive practices or for outmoded methods”

Indeed the sixties were a time of intense technological progress including the invention of the laser, fibre optics, heart pacemakers, the LED, the BASIC computer programming language, the compact disc, hand held calculators, ATMs, DRAM computer memory, the UNIX computer operating system, the single chip microprocessor and the ARPA Net, the precursor to the Internet.

In transportation, the world’s only supersonic passenger aircraft both had their maiden flights in the sixties. The Russian built Tupolev TU-144 on 31st December 1968 and the Anglo French collaboration, the Concord, on 2nd March 1969. The more prosaic Boeing 747 first flew on February 9th 1969 and is still with us today.

In an example of how we can sometimes get forecasting technological progress spectacularly wrong Boeing executives believed that only 400 747s would ever be built as they would be superseded by supersonic aircraft. By September 2016 more than 1500 of the 747 type aircraft had been built, almost four times the original estimate, while the Tupolev ceased flying in 1983 and Concord in 2003.

And of course man landed on the moon when Apollo 11 touched down on the 20th July 1969.

As a child of the sixties I was fascinated by technology and somewhat precociously referred to Tomorrow’s World as my favourite TV program. Whether you were the Prime Minister or a small child it felt as though the sixties were a golden age of progress.

Yet in the decades to come innovation and technology accelerated. Think, the internet, pc/laptops, mobile phones and tablets, email, DNA testing, MRIs, robotic surgery, open source software and services such as Linux and Wikipedia, GPS and geolocations services (without which Uber is impossible), ecommerce, solar and wind energy, social networking, RFID (did you use contactless on the tube today?), and digital photography.

From the above, it might seem that while you are in it every decade looks like the golden age of progress but I believe we have reached an inflection point, where the development of new technologies will lead to a dramatic acceleration of shared knowledge, connectivity and resources in this world, with profound consequences for us all

To be clear, I believe that this new “white heat” will benefit society, the environment and the global economy more than it disadvantages us. We have every opportunity for our nation to lead in what some call the fourth industrial revolution just as we did in the first but it will not happen by accident.

Later in this lecture I am going to examine the potential impact, the good and the bad, of White Heat on us as a society. I will set out the actions I believe we need to take whether we come from the voluntary sector, from business, from the public sector or beyond.

And while I will be candid about the threats we face, I hope you will leave today with a sense of optimism.

By understanding what technology is changing, we are primed to act.

So to aid that understanding, let's spend a few moments looking at what is happening with the underlying technology, why the rate of change is accelerating and why it is profound.

In June of this year the World Economic Forum published a report on the Top Ten emerging Technologies that will change the world in 2016. They are:

1. Nano-sensors and the Internet of Nano-things. Many of you will be familiar with the Internet of Things or IOT where the expectation is that there will be 30Bn connected devices by 2020. Nano sensors builds on IOT to allowing tiny devices to circulate the human body or be embedded in construction materials. This will have a huge impact on medicine, architecture, agriculture and drug manufacture.
2. Next generation batteries that enable everything from extending the range of your Tesla to the creation of mini electric grids for remote villages in rural parts of the developing world.
3. The Blockchain or distributed ledger. An immutable version of the truth held in multiple electronic places simultaneously. Facilitates the development of cryptocurrencies and could presage the end of banking as we know it.
4. Two-dimensional materials such as Graphene, consisting of an atom-thick layer of carbon that is stronger than steel and conducts better than copper, will help to drastically cut productions costs for everything from air and water filters to wearables, and make aircraft lighter, smartphones more flexible and solar panels more efficient.
5. Autonomous vehicles. Rapid advances are being made here, such as the Uber test in Pittsburgh. This technology will ultimately reduce road traffic deaths and pollution. Of course there is also the potential for the elimination of large number of jobs. For example over 3 million people drive for a living in the USA today.
6. Miniature computer models of human organs will accelerate advances in medical and drug research
7. Perovskite Solar Cells that are much more efficient that the classic silicon cell

8. Artificial Intelligence and machine learning. Smart digital agents will keep track of your finances, monitor your health and even advise you on your wardrobe. This has the potential to eliminate huge swathes of professional jobs in medicine, law, financial services, education and accountancy.
9. Optogenics. The use of light to address severe brain disorders such as Parkinson's and Alzheimers diseases.
10 Systems Metabolic Engineering. Rather than digging raw materials out of the ground why not grow them using microbes reducing cost and environmental damage.

Now any list like this is going to be more illustrative than comprehensive but let me give you a more specific example of how technological advances will change my industry, financial services.

I am on record as saying that I expect 20-50% of jobs will be eliminated from the industry in the next decade and here's why.

Smartphone apps and 4G are already driving significant reductions of up to 15% per year in branch traffic and that is just the beginning. New technologies like distributed ledger and artificial intelligence facilitate the building of a radically different banking system.

With the first, there is the potential to reduce or eliminate the role banks play in intermediation not just of payments but of savings and lending and capital raising too. This could go so far as to eliminate the need for maturity transformation where banks use their balance sheets to borrow short, for example current account balances, and lend long. for example mortgages. Eliminating maturity transformation would result in a much more secure system as the mismatch between timeframes for borrowing and lending would be removed.

With the second, the ability to collect and curate all relevant information about you as an individual and then to present that profile to a range of counterparts for lending, saving etc should result in a much lower cost but also more effective banking system.

Imagine Susan is checking her favourite social media app using virtual reality. Overnight her automated financial agent has been checking mortgage offers for a property Susan has identified using the search function of the social media app. Using almost perfect data about Susan, her finances, education, lifestyle, employment prospects and risk tolerance the agent has identified the best mortgage for Susan. The mortgage happens to be provided by the automated agent of a large life insurance company. The automated agents have already exchanged all the data both parties need to advance the loan and a smart contract has been created. Once Susan triggers the contract the loan proceeds are disbursed and title transferred to Susan with the property charge noted.

Payments are set up automatically for Susan but adjust dynamically above a floor depending of Susan's expenses in any month so if she spends less or receives more income more of her mortgage balance is repaid in that month.

Should Susan experience any financial difficulty, the potential for this will be detected by the agent and remedial actions suggested to Susan. In the worse case, default, a series of actions will be triggered in the smart contract to fairly deal with the situation for both lender and borrower.

This is not science fiction. In fact I could introduce you today to companies developing every aspect of the experience I described. It is only a matter of time until this is a reality. In fact in this scenario, there is no bank only intelligent agents acting for each counterparty and parties who have and need capital coupled with distributed ledger technology to record the payment, loan and change of property ownership. The customer experience should be almost instant and very low cost and the system itself will be much safer as all the risk of intermediation is removed.

Of course banks aren't going away any time soon. They have millions of customers, powerful brands and an intimate knowledge of regulation. But equally, as we have seen in other aspects of our lives, there is nowhere to hide when technology creates transformation and it is hard to think of an incumbent that has successfully migrated to the new world. In fact the opposite is true; think Kodak, Nokia, Blockbuster.

Kodak invented digital photography but with a mental model based around selling film of 24 or 36 exposures could not conceive of a world where people would want to take and keep thousands of pictures. Nokia invented the smartphone but saw it as a niche high end product. Apocryphally when they first encountered the iPhone they couldn't understand why there was only one button. And Blockbuster felt that mail distribution of DVDs was merely an alternate channel as opposed to a platform that ultimately facilitated the streaming of content.

So far, I have argued that although we always believe that ours is the golden age of technological progress we are in fact in an entirely different era where the degree of change will be on an unprecedented scale.

I have provided some concrete examples of possible impact of such change from financial services and I believe that one of the many consequences of this will be that in twenty years a bank branch will be as common as a Blockbuster store. There will also be a very significant reduction in employment in the industry.

But will the future be utopian or dystopian?

In the utopian view technology enriches our lives. We live longer and healthier, we can access all of the knowledge of mankind and we can experience parts of the world we could not visit using virtual reality. Large parts of what we now call work have been automated away by machines that can now constantly improve their own performance leading to continuous productivity

improvement. Autonomous vehicles of all kinds have dramatically reduced road traffic accidents, pollution and insurance costs. We can learn any subject we want from Art History to Japanese Cooking with a few clicks or taps.

Technology levels the economic playing field and actually reduces inequality maybe coupled with a fiscal mechanism such as Unconditional Basic Income provided to every citizen. We have much more leisure time and in a consequence of interest to this audience we use a little of this free time to volunteer and make the world a better place.

Sounds good doesn't it?

But what about the alternate, dystopian future?

In this scenario technology relentlessly automates work away. In fact McKinsey estimated in November 2015 that as many as 45% of the activities individuals are paid to perform can be automated by adapting current technologies equating to $2 Trillion of wages in the Unites States alone.

Of course the 3 M jobs that involve driving in the US are gone but the impact is not limited to low skilled low wage work but affects everyone including the medical, financial, legal and managerial professions.

As this work gets automated away it creates downward pressure on wage rates for the vast majority of jobs that remain. Of course there would still be a small number of very highly paid people in high creativity, technology based and entrepreneurial professions but the net effect would be to create rapidly rising inequality.

It is also likely to accelerate the closing of the gap between the developing and developed world as the borderless nature of technology and lower wage base tilts the economics in the favour of the former.

A potential consequence of all of this would be rising unemployment, inequality, social unrest and geopolitical tension. Brexit, Trump and rise of extremism in continental Europe would be as nothing compared to the impact of these trends.

Reality of course will likely lie somewhere between the utopian and the dystopian. Indeed
I said earlier in the speech that I believe that while technology will be a net positive for society we need to act now if we want to maximise the opportunity.

But what does that action require?

Firstly, skilling and re-skilling becomes critical.

When my children studied IT at school a decade ago it seemed to consist mostly of how to create a powerpoint presentation, excel spread sheet or database: in other words it had very little to do with information technology. While I am certainly supportive of teaching coding skills in school it would be a mistake to regard the question of skilling purely in terms of a technology focus. Indeed coding itself is likely to become increasingly automated over the coming years.

A high degree of competence in english and maths is today mandatory. Problem solving, innovation, creativity and collaboration are also highly desirable as well as language skills relevant to future potential markets such as China.

And skilling must be a lifelong process. The good news about longevity is that we are all going to live longer but the perhaps slightly less good news is that we will be working longer too.

In a lifespan of 100 years, we might be working for seventy of them and it is highly unlikely that the skills we leave the education system with at the age of 18 or 21 will still be wholly relevant over that entire time period. We will therefore need to continuously re-skill ourselves throughout our working lives as work and opportunities change. Employers have a vested interest in this process and government can create supportive conditions but the individual themselves will need to take primary responsibility here.

Technology itself can create wonderful opportunities for skill acquisition where everything from a business school class in finance to how to de bone a chicken can be learnt on line.

Secondly, we need to foster an entrepreneurial mindset amongst our citizens. As work changes and we live longer it becomes much less likely that we will work for one or two employers in one or two businesses or functions. Indeed, we might start out at a large company, move to a smaller one, work as a contractor and start a business during our working lives.

And again technology can be a great facilitator of such opportunities. We hear a lot about the “gig” economy today where people will drive a few hours a week for Uber, let their flat on AirBNB or deliver takeaway for Deliveroo but it is so much more than that. Artisans in Yorkshire, Florida or Kenya can now market their products through global platforms such as Amazon and Alibaba while graphic designers can live in India but work for manufactures in Germany.

These opportunities can only be accessed where there is a real entrepreneurial drive and we must begin to teach this at the kitchen table all the way through primary, secondary and tertiary education.

Thirdly, as information becomes ever more freely available the protection and control of how that information can be used and by whom becomes critical. Today we freely give information about ourselves every time we make a Google search. We do this because we get something in return, the search output.

Society needs to be clear on the responsibilities of the various parties in such exchanges. I believe increasingly that individuals will want to take back control of their information and be much more selective about how it is shared and we are already beginning to see advertising models based around this principal for example.

Finally, we clearly need the right infrastructure to support a digital economy. Ubiquitous high speed broadband is a must and this is not just an issue for remote rural communities but even for parts of central London. The digital infrastructure must be treated as a core utility and managed as such with the appropriate investment and regulation.

These four areas may seem self evident but they are critical if we are to benefit as a nation from the ever increasing impact of technology.

There are also profound consequences for the voluntary sector also and as an example I would like to share some of the questions we are confronting in Business in the Community.

As many of you know we are a membership organisation representing approximately 900 mostly large and medium sized businesses in the United Kingdom. Our job is to promote responsible business and the key challenge is to use technology to amplify this movement. There are some obvious areas to focus on, some of which may have relevance for your organisation.

Firstly, how can we curate our content in a more accessible way using web, mobile and social media?

Secondly, how to we use technology to make our organisation more effective? Can we automate more activities, can we use social media tools to foster and increase collaboration?

Thirdly can we use technology to extend our reach to organisations we have had less impact traditionally, particularly small businesses?

Fourthly, can we use technology to increase the international impact of the organisation?

I don't have ready answers to any of these questions today but the first step is to ask them and to engage the whole organisation in formulating the possible answers, a process underway under the leadership of our new Chief Executive Amanda MacKenzie.

You maybe asking similar questions of your organisation yourself. One thing is for sure, no part of society is immune from the threat and opportunity represented by technology and that includes the voluntary sector. Like all other parts of society the key to ensuring a successful outcome will be strong leadership. To my mind leadership is the process of defining a compelling vision of the future, a strong rationale for that vision, a credible action plan to achieve the vision and finally and most importantly the process of relentless and authentically pursuing that vision.

It is important that all of us in leadership positions are constantly asking ourselves the question what does the future look like? What are the opportunities and threats? How can we effectively respond to these opportunities and threats? And then to codify the response in the categories that I have described above.

Of course leadership is not easy. Human beings resist change and so if we are to create effective change we must also understand the individual hopes, needs and fears of the people that we lead. Only when we do this can we be effective as leaders in addressing what our people need in order to succeed.

Finally, leadership is above all about a relentless and authentic pursuit of a better future. We all know that almost from the beginnings of executing a plan things will not go as foreseen or intended. Therefore we must be relentless in constantly adapting the plan in order to achieve the objective. But most importantly we must also be authentic. If your leadership behaviour is not congruent with what you expect from the organisation people will see through that in a heartbeat and you will have lost them.

Leadership then is above all the most important element of responding effectively to the changes that we have been discussing.

In conclusion, there is no doubt in my mind that we are living in a new white heat of technological revolution which will only intensify over time.

I have suggested that significant action is required in the ares of skilling, enterprise, information and infrastructure if we are to succeed in addressing the threats and seizing the opportunities of our time.

While I remain an optimist, it is clearly up to us as a nation, as businesses, as voluntary organisations and individuals as to whether we forge a new and better future in this white heat or simply melt away.

Thank you.