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A SMART DIGITAL ECONOMY

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ABSTRACT

We have seen many waves of technology-led business disruption—from the automation of basic computational and business process functions to disruption led by the internet. The launch of smartphones drove the next disruptive wave through mobile and brought widespread accessibility to the internet and a new channel to consumers. The proliferation of digital devices with increased connectivity—the Internet of Things—and globalization of the workforce drove the next wave of disruption: digital. With more channels to reach consumers and their increased expectation on how to interact with organizations, every company invested in efforts to become digital enterprises.

While the initial technology waves were about simple automation of existing business processes with technology playing a supporting role to the organization, the recent disruptions are bringing technology closer and closer to the core of every business. As one revolution ends, the powering technology doesn't go away; it just becomes so widely adopted that it can be taken for granted.

Augmented humanity is one of the next digital shifts. Every company wants to become an algorithmic enterprise and bring intelligent systems into their organizations. However, the transition to realize the full benefits will go beyond technology and requires a transformation in people and processes of equal magnitude.

1. Introduction

I am honored to be invited here to speak to you today, and it seems appropriate that what I am going to talk about was inspired by my own time at university. Institutions like this are incredibly important in driving forward our thinking beyond the pure digital arena and into the impact of technology on humanity.

I used the internet for the first time when I was seventeen years old. It was 1995, and I was at university. I was so excited at the potential that I could see: the ideas around collaboration and access to information, as well as the social and economic possibilities. I was inspired and excited and yes, perhaps, a little naive in the way that seventeen year olds probably often are. In fact, it inspired me so much that I transferred from my degree in philosophy to a degree in computing, which is not as big a leap as you might think.

Figure 1: based on an article,
Source: Michael Porter

2. Contents

This picture (Fig. 1) is based on an article by Michael Porter, who, among other things, writes for Harvard Business Review. You can see that point in 1995; it lies at the intersection between the first and second wave. The wave beforehand was focused on automation and standardization and was largely about automating individual business processes. The challenge then was how do you take advantage of the productivity gains made possible by automation and standardization and still differentiate as a business? From 1995 onwards, during that second wave, technology really started presenting us with some different opportunities. We could connect the activities of different businesses to each other. We could bring consumers into businesses, and we could start to answer that challenging question about differentiation.

That is the wave I have been part of for most of my career, but my seventeen year old self has been disappointed because the reality just hasn't lived up to what we could imagine back in 1995: technology has constantly been the constraint and has held us back. So, what I want to talk about today is the fact that this has now changed.

The shift we are seeing today, has allowed technology to run far ahead of our imagination. We are now the constraint: our organizations, our ability to keep up, and our own imaginations; and I am personally excited and inspired all over again.

What I want to do this morning is take you through the engines that have provided a platform for the growth that we will continue to see over the coming years. These are what I called the engines of change; they underpin what we have seen today. Each one, rather than being replaced by the one before is having an amplifying and multiplier effect, and what we are seeing today is how we use these technologies together.

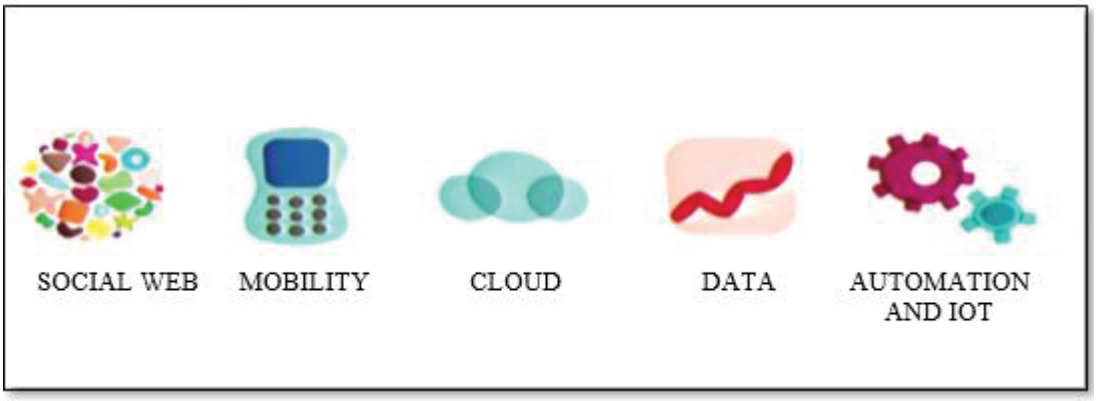

Figure 2: Platform for growth

The first one is social web. This is beyond apps like Facebook, LINE and Twitter. It shows the ecosystem—of which they are a key part—comes together, and how it has become a new means of production. One of my favorite stories in this space is that of Xiaomi, the Chinese smartphone and hardware manufacturer. They are the fourth largest smartphone manufacturer in the world, and they did not exist 6 years ago. The first thing they did as a business—before moving into product development or manufacturing—was to cultivate a small community with a strong interest in smartphone technology. They built this community from 10 to 100 and beyond. They then used this community to understand the challenges faced by users with current smartphone technology. As a result, the first product that Xiaomi produced was software. They built a new operating system for the Samsung phone, because the feedback they got from this newly formed community was that people needed a smoother, less bloated operating system for their Samsung smartphones. It was highly adopted and allowed them to grow this community even more. Six months later, when they produced their own smartphone, it sold out in minutes. By cultivating a community, by selling to that community and by having that community take care of marketing for them, they have created an incredibly successful company, and the social web was the driver.

The second is mobility. This is not just about mobile phones, but all mobile devices: tablets, laptops, wearables and more. Mobility has allowed some less economically developed countries to overtake more economically developed countries. One example of this is an ability to leapfrog some infrastructure constraints that places like Australia has had to navigate and are still navigating, sadly. It is an amazing opportunity.

It has also enabled a coming together of the physical and digital worlds. We may laugh, but Pokémon Go represents the first mass uptake of augmented reality. It would not be possible without the social web and without mobile. So, again you see the amplifying effects of these foundational technologies.

On to cloud—there was a conference I was at a few years ago where a man called Alistair Cockburn, previously from Netflix, stood up and said the only way financial services institutions were going to be able to pass regulations in five years was by being in the public cloud. There was shock in the room because even two years ago people were still quite nervous about cloud technologies, particularly in the highly regulated financial sector.

Fast forward to today, we are already seeing evidence of this being the case. The competitive landscape of cloud as a platform is providing better ways, streamlined ways, to meet onerous regulation. It has also led to a transformation of companies who began

by taking advantage of technology and now use that knowledge and experience to provide a platform for others. Amazon is a great example of this. Is Amazon a place that sells books and other items, or is it a cloud provider? They certainly make a lot more money out of being cloud provider than they do selling things, and they are increasingly seeing themselves first as a platform for business and for driving economies.

When it comes to 'Data,' I am purposefully not preceding it with the word 'big.' You do not have to have big data, to have data that is valuable. Big data is interesting. It is an area of study that we spend a lot of time on at ThoughtWorks, but data engineering, data analysis, data visualization are all starting to change the ways businesses, governments and other organizations think about the way they interact with each other and with consumers, as well as how they approach decisions.

Don Tapscott, who, if you are looking for someone that seems to be able to predict the future, is a man to watch. He wrote a book about fifteen years ago, maybe twenty years ago, a lot of which is very true today. In another conference I attended, he said that we would soon see data treated as an asset class in the same way as we see things like properties, plants, materials, or money. It will be increasingly seen as a separate asset class and will start appearing on financial statements of companies.

I think we already see this in the way that venture capital firms invest. And this is another huge step, an amplifying step.

Just to look at the flip side for a moment is that those advantages of data also come with danger. There is a liability in every piece of data that any organization chooses to hold, Privacy Security Fear. New movements with more awareness of these dangers are starting to promote different approaches. The Germans call this, and I will mispronounce this, "datensparsamkeit" which is an approach to austerity with data. It started to be legislated in some countries and is a really interesting movement to watch.

We are also seeing social movements wake up some of the dangers around data. There are dozens of companies that have experienced data breaches in the last year which constitute huge impacts to the bottom line. So, data is incredibly powerful, but a big responsibility as well.

The final foundational underpinnings of the new wave that we are seeing now is the internet of things, which I think people often feel is mysterious and crazy and science fiction. It's really just the internet with more 'things' attached to it. I know that is simplistic, but it's also true. However, with all of those additional devices, it's the interactions that are made possible by this wave of technology, being able to interact with people, devices being able to interact with each other, creating ecosystems that feed each other without human intervention. I am going to talk a little bit about this future in a moment.

Figure 3: The consumption of technology and regulation

Before then, however, one of the other things to think about at this point is where technology does, the consumption of technology, and regulation come together?

In the past, a lot of businesses have used regulations to protect their organization and to look after their own interests, and while we will continue to see some of that, more and more often we are seeing a shift in the way regulation is applied. But I will start with the technology for a moment. As these technologies—the social web, mobility, cloud, data, internet of things—come together, the desire for them increases. Consumers get used to using them, they normalize this use quickly, and they demand more. There was a study recently that suggested that as soon as a consumer had an experience that felt more seamless with one retailer, this lifted their expectations of every other retailer that they interacted with. So these experiences build a desire for continuous improvement from technology, and that has actually shifted the position of power of consumers as well.

We are now seeing consumers sitting in the driving seat of how organizations operate, what they produce, and even in some cases the 'customer is the CEO' of many companies today. I think that might be a slight step too far, in my mind, but the power is immense. It's not just about ease of access, it's about transparency as well. There was a cruise ship off the coast of North Carolina a while ago when a massive storm arose. Traditionally, that cruise ship company would have determined what happened, sent out a press release and managed all communications; however, in this case, they had no chance to do that. The passengers on the cruise ship were filming and uploading to YouTube in real-time, people falling over people, trashed rooms, and people being unpleasantly ill. The ability for organizations to control the message has been reduced enormously. The power is in the hands of the consumer.

And then in terms of regulation, one of the things we are seeing in China is that in these new spaces, the early movers—like Alibaba—are actually the ones creating the regulatory space. China is holding back from creating onerous regulation too early in order to build around what the successful companies are doing. But even outside of that, if you look back nearly ten years, you can see PayPal repeatedly fighting with regulators, again and again and again. Fast forward to about six months ago, maybe a year ago, and they have formed a powerful alliance with organizations like Apple, like Alibaba, and have been able to shift that regulation. So whilst those organizations are pushing regulatory change, we also have governments embracing regulatory change and consumers are pushing change as well.

Tesla, for example, made it possible for all Tesla vehicles in North America to be self-driving by sending them a software update. It wasn't legal to have self-driving cars in most of the states in US, and so you also had a push on regulatory change coming directly from consumers. Again this is something that I don't think I have seen during most of my career but is happening on a daily basis today.

Now, we have those foundations, we have the underpinnings that took us there, a shift in demand, and we have immense optimism about future growth. However, just in case you're wondering, I was working in 2001 when there was a similar feeling of optimism. I was working when the bubble burst, and I was made redundant. I do not feel we are heading for another bubble. I don't think this is inflated in the same way, and there are a lot of reasons for that. Part of it is the geographic spread. We are seeing this growth outside of just North America and Europe; we see the growth of Asia. There are a lot of different things that underpin this growth and make it feel different, but it is also those underpinning technologies that are allowing it to be different. It's a much broader, much morewell adopted movement that we are

seeing today, which I think protects us from that idea of massive collapse. We will see companies collapse, but I don't think an industry collapse.

But going back to my 17 year old imagination just for a minute, I am quite excited again and maybe naïve again the way that I was at 17 about what we can imagine, and the way that technology now enables us to create this weird, different and frankly quite unknown digital future through experimentation.

Now that we have those foundations—what comes next? I am not going to talk in detail about all of these because I can't talk for hours, but one thing we've done at ThoughtWorks is we started stitching together a series of storylines— storylines that we use to try make sense of what we see. This third wave of technology has us walking into an experience driven future. It's much more complicated and much more fun frankly, but we are starting to stitch together what we call seismic shifts that pull together business movements, technology movements, people movements and try to make sense of them.

I am going to talk to just one of these today. When you are thinking about the future of the digital economy, what does the future employee look like? What will they do? How do they act? What is the world of work they enter into? I hope the answer is not that they are replaced. I hope the answer is 'augmented.'

Figure 4: Seismic shifts that put technology trends into context

We believe that tasks will undoubtedly be replaced but not people and not the human element. This experience driven movement as opposed to technology driven movement, I believe, reinforces that. Software and hardware already augment our capabilities. Google already augments my memory. When I can't remember something, the first thing I do is just check out Google. I am not sure if that makes my own memory better or worse actually, but it's already happening. We have machine learning and artificial intelligence that has started to provide ways to improve the way we make decisions.

Again, I think, importantly, we are not talking about removing all human judgment because our ability right now to take all of the things that we bring to every decision that we make may well be there

one day but not yet. Machine learning is incredibly important, but, as with everything, there is a danger. In every decision we make, we have bias.

When we build code to drive machine learning, there is bias, and one of the really interesting things to look out for in the world today is how do we make sure that the kinds of machine learning and artificial intelligence that are going to have dominance in our economy are built in a way that makes the field as level as possible and reduces that bias. I am not sure if it is possible to entirely remove it.

The other misconception is that we often think of robotics as replacing blue collar work. There is lot of knowledge work, white collar work that artificial intelligence and machine learning and data are also going to replace. But again, I think it's important to think about the fact that we can focus on replacing tasks and not people. The idea of this creating most space for judgment and less for analysis is one, I think, that is really exciting.

The next point I want to make is around virtual and augmented reality. If you have been watching the technology space in the last six months, it is everywhere. One of the things that has driven this is the fact that we no longer need incredibly expensive gear; the cost is now reasonable, accessible.

All you need is your smartphone and a headset, and you are away. The level and pace of change and the costs of those units has come down so much that it is much more accessible, and I am excited to see what will happen in that space now. We have teams in Singapore, Australia, China, and other parts of the world playing with these and thinking about what's possible and again thinking about the human aspect. There is one client in Australia, who, in the words of their CIO 'sells pictures of second hand houses on the internet'—they are a property listings business—but they are looking at augmented reality to enable people to explore properties they have never physically been to and have already invested a lot of money into that.

Our teams were experimenting with this technology and while this CIO was interested, I don't think he believed he would see anything new. Then suddenly, he just turns and said "what was that?" It was a virtual reality dog trotting along behind him. In their own experiments, this client had missed bringing in things that make a house a home—like a dog. This is what experience driven means.

We need to make sure we are bringing the digital experience and the human experience together with the technologies that we have on offer.

The other important thing is that I am not just talking about efficiency. A focus on pure efficiency is the race that no one wins and doesn't lead to invention. It does not lead you to massive innovation; it leads you to slightly better, and I think we all deserve more than 'slightly better.' In particular, in academic settings that becomes more important.

3. Conclusion

Universities are places where we can think broadly and deeply about topics beyond just what a simple business case is. I really hope that the university here and the network of universities that are present can continue to do that.

The real challenge for the digital economy is to figure out how to increase effectiveness, not efficiency; how do we get better outcomes for everybody; how do we truly make more and create more and imagine more for the potential of humanity; what will a human augmented by technology mean for you and your organizations and your communities.

We have already seen people adjust incredibly quickly; we normalize new technology very fast. I can't even believe that ten years ago I did not have a smartphone because I am not sure how I would survive without it now.

We are seeing that the pace of change is getting faster and faster, and it's people who are more able to adapt and keep up

than organizations are and that creates a really interesting tension in our industry.

So, I am excited just like when I was 17 and at university and trying to work out what to do with my philosophy degree. I'm excited to be part of what we can imagine next, especially where I see the world can be one of continuous learning and continuous discovery.

I am not saying this just because I am here at the university, but spaces like universities are so important to think beyond what organizations like my own can easily do because we are much more constrained by the organization. At a university, we are only more constrained by humanity, and that's a much bigger playing field.

Finally, as leaders and as thinkers in this space, I encourage everyone here to consider and to really imagine—which is my most overused word of the day—how we can create truly inclusive, a truly, truly inclusive digital economy. As leaders and thinkers we must consider our broader responsibility to people who might otherwise be left behind.

If we think about the ways economies have developed over time, we can think about the UK and the coalmines in the 1970s. Very few people were made jobless through those economic changes as they re-trained and went into other careers. We are now seeing industries rise and fall much more quickly than we did in the 1960s or 70s.

But these things are learnable and teachable, and we have a responsibility to uplift our entire community to come along and build this economy with us.