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Thank you, François. I want to talk about setting the scene on digital. I will try not to repeat what you have read in the newspapers. I will try to approach it by asking, 'Why are we talking about digital? What is the biggest driver behind it? What are the challenges that are already in place in terms of governance? What is the challenge that we will have to face and that we should face today, namely artificial intelligence, which results from it?'

The first thing is why the digital economy or these technologies? I think it boils down to the availability of data. When we started with information technology, you had what we call structured data, which is data produced by systems that are proprietarily managed, such as your accounting system. They are managed and controlled by institutions. As François just reminded us, then we had the Internet, which is not regulated at all. It generated a lot of data and we witnessed the growth during the first e-commerce boom in the early 2000s. We generated what we called unstructured data, meaning that these data are outside the boundaries and remit of institutions and they have significantly grown.

You hear about what people call Big Data. Why does it come on top of structured and unstructured data? Big Data is primarily what is generated by connected devices. Another term used in our industry is the Internet of Things. Just to give you two numbers, in 2010, there were 12.5 billion connected devices. We expect to have 50 billion connected devices in 2020, and all these devices produce more data than any human being can do in one year. Every time we produce data, we still have to think, at least most of us try, and that takes time. The devices are programmed like a jet engine crossing the Atlantic Ocean to produce data constantly on the state of the jet engine.

This drives the growth in the amount of available data. In 2010, we had 1.2 zettabytes. In 2020, the estimate is 44 zettabytes. A zettabyte measures the way you store data and it is 10^{21} , which is massive. The amount of available data is massive and there is wealth to be exploited from these data on both sides. We started by focusing on reducing costs on the efficiency side and then, because that was the culture coming from the proprietary systems, to creating a completely new revenue model.

To be practical, I would refer to the evolution of General Electric. Six or seven years ago, Jeffrey Immelt launched an initiative around digital, realising that possibly the data generated by the underlying assets, being a jet engine, a turbine or a medical device, will have more value going forward than the actual function of the underlying assets. That does not mean you trade one for the other; you still need the functional effect of the underlying assets, but you add a lot with the data.

To see how it works in practice, take Google – 18 months or two years ago, they thought they had an opportunity to go after the insurance market because they could reinvent the way you look at risk. They went and visited quite a few large insurance companies, showing them that they knew their customers better than the insurance company, who had limited access to information on their clients. Therefore they could manage the risk better than the insurance company, but of course, they would let the insurance company manage policies and claims, which is the back office work of these companies. You can imagine the reaction of the insurance companies. They did not accept it, but it shows the disruptive power of this available data.

Another example is Amazon, which in my view is the company that is a pioneer of this new era. Amazon is known as a big online retailer. They started with the e-commerce boom, but they have already gone through all the different steps. They launched Amazon Web Services, which is the most powerful and largest public cloud in the world today. This was done to manage this large amount of data. Then they applied it to their business, which is both on the revenue side, as you can all experience, but also on the logistic side, the way they manage.



You might have seen that last summer, they launched the idea of the drone, which is not a gimmick. The drone is a device to address artificial intelligence. You cannot manage drones the way you manage airplanes because of their size. Again, artificial intelligence could be defined as learning machines, so the drone will have to be autonomous and that is a way to practically approach artificial intelligence. Here we are at the end of 2015 and we already have a company that has integrated all the aspects of digital. That is why I believe we are here.

Now, in terms of governance, which is the topic of this conference, some of the domains have already been discussed and so I regrouped them to make it shorter. I think the first one is about the knowledge worker and the shared economy. The knowledge worker started at the end of the 1990s with the democratisation of the Internet. We empowered people to make decisions by themselves. Now it has taken on a bigger scale. François mentioned Uber and others; these are the types of models. 30% of jobs in the US are independent jobs that are digitally enabled because the individual has an environment that allows him or her to offer services, bid for delivery, bid for maintenance or whatever, and be independent. It is a profound change in the way we look at our economy.

The second thing is about democracy and privacy. I think we are completely schizophrenic here between the citizen and the consumer. Considering the consumer side, there is no privacy. It is a given. We all know if we subscribe to a Google or Facebook service, we are not the client. The clients are the advertising companies. We are not. We provide data. We provide information, or Google transfers meeting information to make a business, so we have given up. One last recent example in terms of governance is how comes that Zuckerberg alone can decide if he wants to activate the Safety Check on Facebook without connection with the authority and provide it as a public service? It is his own decision. There is a question about democracy and privacy.

The third one is around extraterritoriality. It has been discussed, notably in Europe, about the Safe Harbor or about the recent decision from Microsoft to open a data centre in Germany, subcontracted to T-Systems, a subsidiary of Deutsche Telekom, to protect European data from this, but it is a decision made by an American company. I have nothing against it and we work very well with them, but it is a reality. There is a complete extraterritoriality. In finance, in the regulated world, we see then emergence of the so-called FinTech. All these solutions that are available today, crowdfunding being one of the most known or most popular, are not regulated. The same is true of Bitcoin, the virtual currency, which is technically extremely interesting, but regarding its application in financial services, it creates some questions in terms of governance.

The last topic in my regrouping would be around cybersecurity and cyber warfare. I think that is a topic we cannot avoid here. Over the last two years, we have seen a surge. There are now attacks every day, which was not the case before. They come from different sources. We know about government. Then you have a structure in organised crime. You have very organised crime. I do not know if this is the official taxonomy, but that is the way we see it, with huge means, equivalent to state. Then you have the average organised crime and the non-organised crime, but they are all very active, posing all different threats and all different types of approaches. Then you have the political movement. One of the most famous is Anonymous. Then you have the hobby hackers. It is still a threat.

This entire environment is the reality today and poses serious governance questions, but I think that the most fundamental one we are facing, as I said at the beginning, is artificial intelligence, which we call deep learning systems. This means that the machines are programmed so that they can learn from the different interactions and transactions that they are exposed to. Then progressively, they develop capabilities on their own and there is a lot of merit in this development. I mentioned the drones for Amazon.

One of the most advanced companies here is IBM with the so-called Watson technology. Their pilot was *Jeopardy*, which is very well-known in the US. Now it becomes more serious. It is about healthcare, for instance. The positive aspect is the diagnostic in healthcare, where the machine can learn and it is big progress. However, the problem is there are big voices, even in the technology space that should and will benefit from artificial intelligence, that raise concern. You have Elon Musk or Bill Gates. You also have Stephen Hawking, the well-known physicist, who brought our attention to this.

In my view, it should create a debate as important as the one we had on biotechnology and I heard mentioned this morning about the OGM. This is fundamental. The difficulty is the level of abstraction of artificial intelligence. If I create



a new cell for my lever, everybody can relate to its lever. Creating brain functions is something that is far more abstract and in my view, that will make the necessary debate very difficult to engage in, but it does not mean that it is not fundamental.

François BARRAULT, Chairman of Idate/DigiWorld Institute; former CEO of BT Global Services and a BT Group PLC board member

Thank you, Patrick. You have mentioned Amazon, which is typical of what is going on in this business and which has a big impact on governance and policies, by the way. Amazon started their business by shipping goods from their warehouse. Then they stopped the warehouse and then they have asked all the competition to be a central point for consumer orders. Then they are shipping with drones. Then they are creating a profile around the customer and doing a lot of things, including selling cloud at less than USD 1.

It creates a problem of policy and boundaries as well because when you build a business in most of the country, you need to set a purpose, but now, because you have millions of customers, they can create a new business overnight around the world and strip thousands of jobs, thousands of economies. That is something which has no precedence, in my view.