AIMAN EZZAT

CEO of Capgemini

Thierry de Montbrial, Founder and Executive Chairman of Ifri and the WPC

Ladies and gentlemen, we are going to begin. This session will be in French. Technology must not necessarily be left in the hands of the English language. I would like to thank Aiman Ezzat, the CEO of Capgemini, for being with us this morning. I myself had the honor of being on Capgemini's board for several years. It is a great company.

Aiman, we have a lot of ground to cover. To start the discussion, I am going to ask you to talk about the idea of digital technology as a genuine industrial revolution, which may actually be a super revolution. Maybe we can also talk about artificial intelligence as a revolution within the revolution.

Aiman Ezzat, CEO of Capgemini

Hello. Thank you for having me. Indeed, the digital revolution is equivalent to the industrial revolution. All the rules of competition are changing. What matters to consumers is changing. The physical product is still important, but what consumers increasingly value, and what they are willing to pay for, is intelligence, the digital component of the product. Take the example of a car. What it does, how it evolves and what a driver values about it is fundamentally changing. Software is becoming an integral part – and constitutes a substantial cost – of the car's future development and competitiveness.

All the rules are changing one way or another. It is in this respect that we are talking about a digital revolution.

Similarly, software developers and data analysts can be considered digital revolution workers. That is what is fundamentally changing. We are shifting from a physical world to a world where the physical world and the digital world converge. And everything is undergoing a transformation at the corporate, national, operational and consumer levels.

Thierry de Montbrial

Actually, this is more than an industrial revolution. Not to delve into history, but is it not much more than an industrial revolution? In terms of changes in society, behavior, and so on, it seems to me that this is much more than anything we have seen since the industrial revolution.

Aiman Ezzat

As far as the social part is concerned, it is. It is a revolution that goes beyond how the industrial revolution changed the evolution of societies and interactions between people, in particular.

Thierry de Montbrial

AI, artificial intelligence, is at the heart of the digital revolution. Isn't it also a revolution in itself?

Aiman Ezzat

It is, like the rest of the digital revolution. AI is not new. ChatGPT has thrust it into the public eye, but AI is not new. It has been around for decades. It is the basis of statistical thinking. It has been around for a very long time. Now it is getting bigger. Why? Because computing capacities, and especially data management capacities, are growing at an exponential rate. That is why we can manage data much more efficiently and handle exponential quantities of data. Hence AI's growing applicability. However, the concept of AI is not new, including the concept of generative AI. Generative AI is the ability to manage not just data, but also text, voice and video.

We are witnessing a change. Why is AI considered the new oil? Data, and how data can be harnessed to improve decision-making, speed up innovation systems, boost business efficiency and accelerate education: that is what is changing with AI. Why is this a real revolution? Because today's computing and data management capabilities let us do things that were absolutely impossible to imagine even ten years ago.

Thierry de Montbrial

The general public was surprised to discover the miracles of ChatGPT, and this sparked a collective fantasy. The social and political issue that arises is the disproportionate weight our expectations are putting on the power of AI, particularly in the corporate world. As if we are suddenly going to change, improve and transform everything thanks to generative AI. In other words, it is a matter of reality versus expectations.

Aiman Ezzat

Absolutely. We had the AI "hype cycle". At the beginning of last year, AI was a hot topic and total change was expected within a very short time. The reality is that there is a difference between adopting technology and the time it takes in terms of adoption and the potential of the technology.

The potential for AI and generative AI exists. However, adopting it is much slower. Why? Because processes, organizational methods, reflexes and the way people work must change. And whatever models are developed, instilling this change in human beings and getting them to change their reflexes is another matter. The idea of time in terms of adoption is important, but that is true with any technology.

Thierry de Montbrial

Can you give us some examples? Because you have a fair amount of experience at Capgemini.

Aiman Ezzat

What has sped up the hype around generative AI in particular is customer service productivity, especially the multiplication and automation of call centers thanks to more intelligent agents through generative AI. This has created the hype of "I can do this anywhere." This is not true. In fact, what can be done at one call center, where rapid productivity was achieved, cannot be done elsewhere.

Now, when it comes to AI applications, there are many assistants. Sales assistants, even in a factory, there are assistants for operators to say what the best next decision would be based on the current context. So it must always be remembered that the concept of HITL, Human-in-the-Loop, is still important; they are assistants. They do not decide in the operator's place. Instead, they suggest decision-making options. Many sales assistants, customer service assistants, in many places, in companies.

R&D offers many potential advances, especially in pharmacology. The more development cycles can be shortened, the earlier we can foresee that a molecule will not have the expected impact, the sooner we can stop it and shorten the ten-year cycle between discovery of the molecule and bringing a drug to market. It becomes possible to shorten the cycle. Generative AI and AI are having a major impact and we are seeing concrete advances in this area.

Thierry de Montbrial

Can you give us an example of failure, a dead end?

Aiman Ezzat

Dead ends are all the productivity trials. I think the reports, including by the IMF and others who have released blood-curdling reports saying that 400 million jobs will disappear because of generative AI, etc., were completely alarmist and have had a very negative impact because they scared many people. So when people talked about generative AI in companies, they said, "I don't want it because it means I won't have a job tomorrow." This view of the future was far too alarmist. Two years in, we can see that we are not at all where we thought we would be in terms of productivity.

Thierry de Montbrial

That is really interesting, because if we look back at the relationship between jobs and technological progress, there have always been predictions of doom and gloom. The steam engine and the railroad are examples. And the prophets of doom have always been proved wrong.

Aiman Ezzat

That takes more time. In other words, added value arrives, but it takes much longer because it goes through a human being; it is not a machine.

Thierry de Montbrial

The question of education, etc.

Aiman Ezzat

Exactly.

Thierry de Montbrial

Some governments, regulators, and so on are increasingly calling for AI to be regulated. I think you have thought long and hard about this.

Aiman Ezzat

We are impacted by what is happening. The right balance must be found between innovation and protecting citizens. My idea is to try and regulate the use of technology, not technology itself. Americans and the Europeans have different views. Americans say, "Here is what we recommend," and the Europeans regulate with the AI Act. The AI Act regulates the development of technology, which is a very dangerous thing because it actually kills innovation.

Trying to regulate something new that is not understood seems dangerous to me. I think that if nuclear power were approached the same way we approach artificial intelligence, we would never have had nuclear power. We are over-regulating at the source something we do not understand. So we are killing innovation.

Thierry de Montbrial

What do you mean by "we"? Europeans, I assume?

Aiman Ezzat

Europeans. The Chinese regulate nothing, so anything goes there. The Americans give guidelines and leave it at that, although California may be going the way of Europe. Plus, everything is getting very disparate around the world. If a company has AI models, it does not go by the same operating rules at all, depending on whether it is in Europe or the United States, which becomes an operational nightmare. The risk is that innovation will move abroad because startups and companies find it too complicated to operate in Europe.

Thierry de Montbrial

You just said, "California may be going the way of Europe." Could you elaborate on that?

Aiman Ezzat

In terms of regulation. They are talking about regulations on data protection and technology use, technology regulation, and so on, that would be similar to European ones.

Thierry de Montbrial

Are you talking about the State of California?

Aiman Ezzat

Yes.

Thierry de Montbrial

There is also increasing talk about sovereignty, about the relationship between digital technology in general – and artificial intelligence in particular – and sovereignty. You do not have to be a genius to understand that there are potential contradictions. On the one hand, digital technology crosses borders and obstacles. Consequently, sovereignty, technologically speaking, implies having to put up barriers. Could you elaborate?

Aiman Ezzat

There is a real problem with that because when you talk about technological sovereignty, it starts with semiconductors. To make semiconductors, you need materials. Nobody controls the entire value chain. Nobody. On the other hand, we are seeing attempts to do that. For example, the Americans are trying to limit exports of certain semiconductors or technologies to China, while the Chinese are banning the export of certain materials that are needed for the development of semiconductors.

The main thing is to find the right balance, but we also need to accept that absolute technological sovereignty does not exist. Take the cloud, for example. In Europe, we say, "We need sovereignty over the cloud." But what level of sovereignty are we talking about? If we are talking about defense systems, that obviously requires full sovereignty. Over the technology, cybersecurity, data, everything. We can develop European systems that will be much less sophisticated but will still meet our defense needs. On the other hand, for some public uses, there is no need for technological sovereignty. For businesses, we need data sovereignty.

We must define levels of sovereignty and find solutions that match the sovereignty we need. And that depends on the applications we have. In my opinion, the confusion lies in the collective idea of absolute sovereignty and the fact that it does not exist. The issue is to clearly define the levels of sovereignty we need and the solutions that meet these levels of technological sovereignty.

Thierry de Montbrial

This distinction is very striking. Not everyone understands it, is that your point?

Aiman Ezzat

We are trying to raise people's awareness, but that takes time.

Thierry de Montbrial

Are any of today's global governance institutions, formal or informal, intelligently addressing the issue? Or are they addressing it unintelligently?

Aiman Ezzat

There are discussions on a global level, but sometimes it is people talking past each other. I am talking about our customers and a company over time. When I make development decisions about technology or the localization of certain aspects, data or operating methods, if regulations keep changing, it is exasperating. So the problem is not just which regulations and agreements to establish, but their stability over time.

Thierry de Montbrial

You touched on the issue of data. Data means exchanging information, and economic life *de facto* implies crossing borders. If we try to approach this question a little philosophically and politically, how can the irreconcilable be reconciled, that is, between the economic necessity of exchanging data and the case-by-case need for regulation?

Aiman Ezzat

I think that some of the regulations on personal data are the sticking point. Regulations like the GDPR were a good step forward for personal data protection, and I think that was important. Otherwise, abusive uses of data could really be excessive. Regulations must protect certain data.

Companies are obviously also trying to protect their sensitive data and intellectual property. However, if exchanging data is not allowed, economic growth will slow down considerably. There are success stories, like what has been done at the European level on something like Catena-X. In the automotive industry, it is a success. On the other hand, in the medical field, for example, a lot of data that could help to improve diagnosis, medical research, and so on is not circulating. However, some entities, including government bodies, refuse to share data with research institutes, for example. This is counterproductive since it slows down economic growth, research and the search for solutions to society's problems.

Thierry de Montbrial

A key aspect of sovereignty, geopolitical issues and so on, perhaps even the main aspect today, is cybersecurity. Looking at all the conflicts in the world, particularly in Europe, Ukraine, Russia, cybersecurity is almost at a whole new level. Can we say a few words about how security issues have changed in relation to the sovereignty issues we just mentioned?

Aiman Ezzat

First, cyber threats are a systemic risk, so they will never go away. What's more, they are constantly changing. It is a balance between attacker and defender. If the attackers become more sophisticated, we must learn to defend ourselves better. We must guess what the attackers will be up to next in order to defeat them.

Hackers are not the only ones to worry about. States can also be the culprits. They also attack each other. There are companies, individuals and states. I think companies have made a lot of progress. In terms of all the different ones we work with, cybersecurity and corporate protection have come a long way over the last five to ten years.

We also see advances in terms of protection concepts and capabilities, with concepts like zero trust. These ideas are making headway and allowing us to think progressively, not just about pure defense, but also about internal organization, so that when someone breaks in, they can only go to one place, so that we can identify the person regardless of the protection methods they use. Things are getting more sophisticated on this front, but so are the attackers, especially state agents. We have been talking a lot about this, with the penetration of electrical transmission systems, for example, which is obviously very dangerous. In the future, cars will be connected computers. Planes will be, too. If a car is tampered with, crashes could be artificially created.

In an increasingly connected and digital world, cyber threats are growing at an exponential pace. The next revolution will be the quantum revolution. Today, cyber progress is incremental. Attackers and defenders are making headway, but quantum computing will make all of today's cryptography rules obsolete, as though suddenly there is no defense anymore.

The good news is that quantum computers are not ready yet. A few applications are starting up, but they are very unstable, so we still have a few years ahead of us. Nevertheless, we need to start thinking ahead.

Thierry de Montbrial

But it will come?

Aiman Ezzat

Yes.

Thierry de Montbrial

Are we pretty sure?

Aiman Ezzat

We can never be sure until it happens, but it is coming.

Thierry de Montbrial

I compare it to nuclear fusion, for example.

Aiman Ezzat

No, it is much further ahead than nuclear fusion. We are talking about 2029–2030, but it might come later. However, algorithms that simulate quantum attacks can be developed so that we can already start looking ahead and organizing our defenses. What we must not do is wait until quantum computing is fully developed to start defending ourselves, it's like Y2K. Everyone will have to do it in a very short time and obviously we will not get there.

Thierry de Montbrial

That does not sound very uplifting. Cyber-crime is still uncharted territory.

Aiman Ezzat

It is a real systemic risk that will never go away.

Thierry de Montbrial

Which means there is a lot of work to be done.

Aiman Ezzat

It must continue. It is an investment priority for most big companies.

Thierry de Montbrial

Now I would like to ask a question that is a little more about geopolitics, a subject you care about very much. We have discussed this several times. I am talking about the digital industry. I will stick to the subject of cybersecurity. There are states, there are companies and there is the relationship between them. The United States has always been quite strong in this regard. We have been talking about the military-industrial complex since Eisenhower. Today, we can talk about a military-digital-industrial complex. Some countries are very strong, notably the United States, but so are smaller ones such as Israel. Israel is extremely advanced in these matters.

Aiman Ezzat

Especially cybersecurity and AI.

Thierry de Montbrial

So are Russia and Ukraine.

Aiman Ezzat

Russia, Ukraine and Iran.

Thierry de Montbrial

No offense to anyone, but what Ukraine and Russia have in common is that both were once Soviet republics. So, they have some of the same practices and ways of doing things. So does Iran, actually. Has Europe made any headway on the military-industrial front?

Aiman Ezzat

We are quite good. Most countries already have bodies like ANSI to defend companies. There is also the whole state and military part, where people communicate.

Thierry de Montbrial

In Europe in general?

Aiman Ezzat

Of course, including between companies. There are systems like CERT, where companies alert each other. When one of them comes under attack, it sends out information about the nature of the assault. The information circulates between companies and states at the same time. I think it works pretty well. Are we the most advanced? I do not know, but I think we have a good operating system.

Thierry de Montbrial

Including in the area of financial support?

Aiman Ezzat

Financial support is a little different because it is by state, with things at the European level. On the other hand, when it comes to communicating about attacks, defenses, what is going on and exchanging information, things are going rather well.

Thierry de Montbrial

Let me address the issue raised before I go back. When we talk about digital technology in the broadest sense, we always say that there are two giants: the United States and China. Oddly enough, we do not talk much about India, which seems to be the country of digital technology in a very broad sense. Capgemini has a considerable commitment in India. Can you tell us a little more about India?

Aiman Ezzat

India is not the most advanced country when it comes to innovation; China and the United States are much further ahead in that area. However, the capacity in terms of digital workers is in India. To put it into perspective, India produces 1.5 million engineers a year, more than China. By comparison, the United States produces 250,000 and France, 37,000. The city of Chennai alone produces more engineers than France, the United Kingdom and Germany combined. That is the real statistic. In this sense, the capacity to develop and maintain digital technology and software is in India. It is in IT, engineering and management. Most global companies rely on India to operate. If there is a hitch in India, American banks stop working.

Most major companies and their backbones, in the Western world at any rate, have a foothold in India and depend on India for their operations. So, in a way, India is a systemic risk that everyone accepts. This is because it has not only the engineering and intellectual capacity, but also the costs make massive investment more affordable.

Thierry de Montbrial

We certainly underestimate this dimension in general discussions on digital interdependence. Time is running out. We are trying to move fast, but we still want to address two topics. First, the relationship between digital technology and the energy transition. How can digital technology help and facilitate the energy transition? Yet digital technology is a major energy consumer.

Aiman Ezzat

This is a double-edged sword. Digital technology, especially computing centers, is a significant source of CO_2 emissions, but it's not only that. Relatively few phones and computers are recycled, which means their carbon footprint is fairly large. Today, the most shared risk is data centers. AI and generative AI, which are even more energy-intensive, will massively increase electricity consumption.

On the other hand, digital technology also helps with the energy transition. Lots of innovations are digital, such as digital twins that help optimize the operation of a steel mill, including its energy consumption. Many advances that will help lower energy consumption also come from digital technology. I believe that over time, ways of running computer centers that consume less energy by using more advanced chips will have to be found. Advances like this will help reduce energy consumption.

We are well aware of the risks involved. When you see companies like Microsoft starting to invest in nuclear power to make sure that their computing centers' future energy needs will be met, you get an idea of how much energy computing centers devour.

Thierry de Montbrial

Last point. We have talked a little about skills, especially with regard to India, engineers, and so on. Now, with AI, new skills are constantly in demand. Has AI changed the way we think about skills?

Aiman Ezzat

Generative AI will generate productivity, especially in software development and testing. But we have been generating productivity in these areas for over 20 years. AI adds an additional layer of productivity. So I think the shortage of digital talent will continue. If we agree that a revolution is underway and that we will need more and more digital workers, the workforce transition will take 10, 20 years, and there will still be a shortage of digital workers.

Capgemini has 340,000 employees. We have an average attrition rate, i.e. 15 to 20%. We hire between 50,000 and 140,000 people a year. These are people we train who then go work elsewhere, including for companies, governments, small businesses and startups. So, demand is obviously still high, and any source of productivity will be welcome to address the shortage.

Thierry de Montbrial

Thank you. We are going to stop here. I would like to make a remark that says something about the mathematician in me. We do not have time, but it could be the topic for a future discussion. The amazing thing about AI, as I understand it or rather as I do not understand it, is that it works and we do not know why. In other words, we have not yet discovered the basic principles that explain why AI algorithms, which are more or less vague imitations of the brain, work, as we have discovered the basic principles in physics, for example. It is a miracle.

We will not unravel the mystery tonight, but I would like to conclude by saying that miracles still exist. Some may be explained later on, some probably will not be, which is part of the charm of human existence. Thank you very much, Aiman.