Leading in the Age of Digital Disruption

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Abstract

At everis, an NTT DATA Group company, a team consisting of 65 members is currently working to create solutions for existing companies by applying disruptive approaches. Half of the team is expert in technology such as artificial intelligence, machine learning, crowdsourcing, robotics, and blockchain, and the other half has expertise in business domains such as design, marketing, finance, and legal issues. This article describes the importance of digital disruption and the disruption initiatives by the NTT Group based on a speech given by Marc Alba, Chief Disruption Officer of everis, at NTT R&D Forum 2018 Autumn on November 30, 2018.

Keywords: disruption, digital, cloud

1. Evolving and maturing digital transformation

To start with, I will present a general context about the current momentum of digital transformation, where we are now, where we are coming from, and where we are going.

Around 2012, we had the first wave of digital transformation. It was really about social/mobile, and the "digital" became a part of our lives *in glass*. When I say "glass," I'm talking about screens. With mobile phones, tablets, and that kind of devices, we had "digital" through our screens. It was really about channels, connections, and interactions. The four letters S-M-A-C, representing social, mobile, analytics, and cloud, changed the world completely in less than 10 years, and that was connected to the third-generation of mobile communications (3G) and 4G. This wave also led to the significant growth of Google, Amazon, Facebook, Apple, and Samsung, referred to as GAFAS.

About one or two years ago, we had the second wave of digital transformation. Everybody agreed on calling that wave the AI (artificial intelligence)-first world. After being fundamentally based on the channels and the way we use them, the concept of "digital" suddenly came back to "silico" (to the hardware) such as graphics processing units (GPUs), field-programmable gate arrays (FPGAs), and application-specific integrated circuits. We needed to have hardware that makes AI fast enough for deep learning and machine learning, and a completely new generation of chips *in silico* were created. Companies like NVIDIA and Xilinx are now working a lot with GPUs and FPGAs. "Digital" moved to a new type of "silico" and microcomputers.

"Digital" is now moving to the relationship between humans and machines. I live in Boston in the Unites States. One of the hot topics there is social AI. It is about the relationship between humans and machines. Human-robotic iterations, digital empathy, digital trust, this is the new big thing. Our work around the relations between humans and machines, both hardware such as robots—social robots, personal robots, service robots—and purely digital chatbots and

robo-advisors, is proving that humans can create very special relationships with these machines (in the wide sense of both phygital and digital ones).

We are currently working with young kids. They create a very special empathy with machines. We are also working with older people, and it is surprising to see how they also engage in a special relationship with machines. AI is moving from the cold AI, where it can seem fearsome, for example, humans against machines, to social AI. That is the second wave, and the enabling technologies are AI, robotics, machine learning, Internet of Things (IoT), and edge computing. We are also slightly shifting from 4G to 5G. In the first wave, four technologies changed the world. Now those five new technologies are adding to these four ones. Thus, nine technologies at the same time are changing all industries, all geographies, and all societies. It is the first time in human history to experience that number of disruptive technologies at the same time changing potentially any business and any industry.

Regarding the third wave of digital transformation, this is the foresight; it could be wrong, or it could be accurate. Our vision is that the next big shift of "digital" will involve "digital" entering three new domains.

The first domain is *digital in physio*. It means we are talking about 3D (three-dimensional) printing, additive manufacturing, and digital fabrication. The first time you create something in "digital." With "digital" you will be able to create tangible objects.

The second important domain is *digital in bio*, meaning living bodies. "Digital" becomes embodied in life. Part of the work we are doing is connected to digital biology, synthetic biology, and genomics. Now our human body can have the same rule of software. We can apply it more to the human body than to animals. That is a completely different shift. This is just emerging, but it should ramp up around 2020 or 2022.

The third domain is *digital in virtual*, which refers to virtual reality, augmented reality, mixed reality, and such. Our limited experience until now indicates that somehow there is still some hype around virtual reality, but by 2020/2022, virtual reality can probably overcome the complexity we have right now.

This third wave is what we call *phygital*, which combines *physical* and *digital*. What you have is "digital" penetrating into physical objects, human bodies, living bodies, and also the rise of synthetic reality.

The main problem we will have by 2020/2022, and at NTT we are busily working on, is what happens with more loads of data, because we are getting close to reaching the limits. So quantum computing and quantum communications will be very important, and we will need to find sufficient computing power. Obviously, 5G will be taking off in this third wave, and we will have amazing new capabilities through 5G.

These three waves are all about the same idea. "Digital" is like a virus. It's penetrating more and more facets of our daily lives. It can be humans, it can be a car, it can be a home, it can be a city, it can be a sport (**Fig. 1**). If you look at these different items of evolution in each of the phases of maturity of "digital," you see the same pattern. First of all, you have the single entity that becomes somehow connected and socialized and obtains more capability to embed analytics. After that, it can plug in intelligence, and it becomes more smart and autonomous. All of the items go through the same pattern.

All that vision I just presented about the third digital wave is really our best guess. We really do not know what will happen. Imagine that quantum computing is delayed for some reasons, and imagine any of the expected outcomes change. What is clear is that beyond the next two to three years we do not have the clarity to see what will happen. That is a big problem.

The fundamental question of this first block is how can we prepare ourselves for a world we cannot imagine? You in your work, you at home with your family, you as a human being. Six years ago, my wife and I had triplets as our first kids. The main question we had three years ago is which school should we send them to? Because most of the schools are conceived for a world that's no longer there. They are conceived for a world where you need to memorize things and develop calculation skills, which are less and less relevant. If we were to think about the skills we need, it would be the ability to continue to change, the ability to adapt, and the ability to judge what is relevant and what is not, what is trustworthy and what is not, among an almost infinite source of data and information. Conventional schools do not train for that. So, there are some fundamental questions behind all of the massive changes that are transforming our daily lives.

2. Digital disruption

What is crystal clear to us is that this discipline is called *disruption*. In fact, the idea of disruption goes back a long way. Joseph A. Schumpeter in 1911 wrote a book entitled "The Theory of Economic Development,"

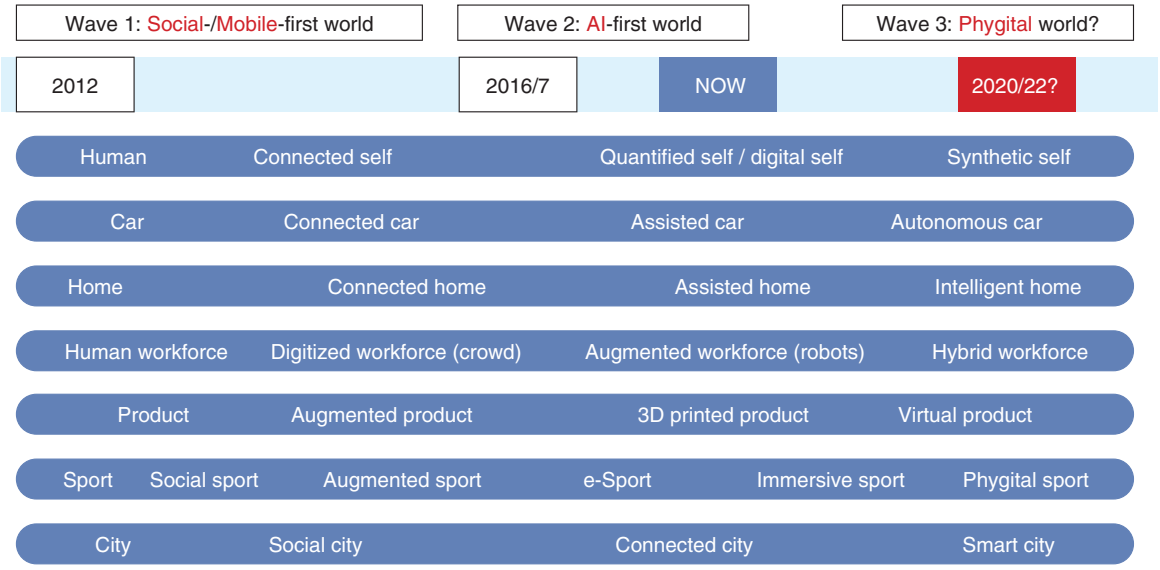


Fig. 1. Transforming our lives through "digital": Internet of Everything.

where he talked about *creative destruction*. The idea behind creative destruction is that you have industries and new technologies that come and change everything. Destroying things to create something new becomes a dominant way of operating and doing business. Thus, destruction/disruption have been around for a long time. The concept itself goes back to 1995, when it was introduced by Clayton M. Christensen, who wrote "The Innovator's Dilemma." However, disruption combined with "digital" takes completely new dimensions. This is what I would like to elaborate on.

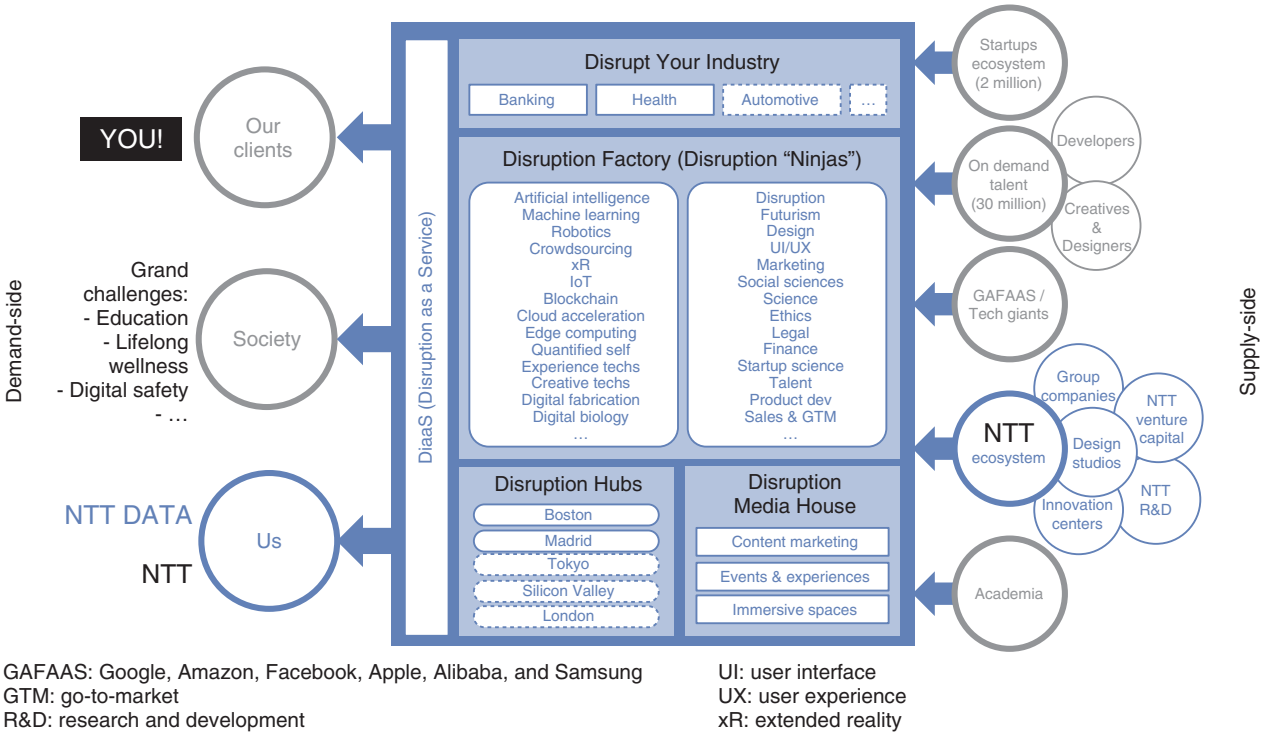
Some of these facts I will present now may seem very threatening, but the message I am trying to convey is completely opposite. The message behind these big threats is actually very positive. There are massive opportunities for those who know how to leverage them.

The lifespan of companies is declining. Being a big company was once a competitive advantage, but it's losing the resilience it had before. In the five and a half years from January 2011 to July 2016, the number of *unicorns* substantially increased. Unicorns are companies that seemingly came from nowhere but had stock values that were over 1 billion US dollars individually. So all these companies are new entrants in the market and are reinventing the industry. In addition, if you look at three to five years before, many of the unicorns were concentrated in the United States. The world is becoming more and more flat. You can create a new disruptive company anywhere. With more players comes more democratization.

Another interesting factor to take into account is the concept of the Tech Oligopoly. It refers to Apple, Google, Microsoft, Amazon, and Facebook. These players have ecosystems to compete in many markets. In the beginning, they focused on their core competencies, but now they are entering the fields of retail, healthcare, and payments. These players combined with startups are shaking up all the domains and industries. Beyond the disruption in business ecosystems, what you have is also a general disruption in other domains like politics and social systems.

My statement here is that we should not see all these complexities only as threats. They are definitely threats, but behind big threats you also have huge opportunities. These threats are not like innovation but are more connected to disruption.

I will try to explain the main difference between innovation and disruption. I will use the car as an example. In innovation, basically the rationale is "I want to improve on the car." The starting point is a car. Your mindset is hooked to a car and it's biased, so you will end up producing a better car. In disruption, you would not say "I want to improve on the car." You would say "People and goods need to move around anyplace, anytime." That would lead you to different approaches to create a novel Hyperloop, Waymo, Tesla, Waze, whatever. In innovation, the idea is to take existing solutions and make them better. In



GAFAAS: Google, Amazon, Facebook, Apple, Alibaba, and Samsung
GTM: go-to-market
R&D: research and development
UI: user interface
UX: user experience
xR: extended reality

Fig. 2. Disruption by NTT DATA/NTT.

disruption, the idea is to take problems and find different solutions. The main problem compared to not so many years ago is the speed of change. More and more technologies are being introduced, and we are attaining more and more capabilities; if innovation is combined with a lot of disruption to create new ways to solve problems, in a few years, you can have a dominant position in the market. Playing with two or three technologies that may look completely different could lead to major disruption. For example, IoT and AI and blockchain and the cloud.

3. Disruption by NTT DATA/NTT

This is what we are selling and building as the NTT Group (**Fig. 2**). We are creating this platform so as to connect all the capacity we have as a Group itself—the NTT research and development laboratories, all our Group companies, networks, innovation centers, and design studios with ecosystems, with startups, crowdsourcing, and academia. What we are building is a factory to address the problem and apply a disruptive mindset and disruptive approaches to create completely different solutions.

We are now working on 20 disciplines. I have time to select a couple of them and show you the type of complex challenge we are trying to solve.

As shown in **Fig. 3**, all the on-premises services are moving to the cloud; this can be storage, apps, or computing. Now what we are observing is a new massive trend, which is that anything a company might need can be moved to an on-demand system. This is what is called *liquid organization*. You can create a whole company without having anything, not even employees. All these names you have here are products we have built. This solution basically involves getting all employees without hiring any of them through crowdsourcing. This platform can create any digital content without hiring any creative agencies or any marketing agencies. It is really moving into the concept of *cloudification*. All those assets that a company might need from knowledge, data, AI as a Service, are really pushed to the cloud. This is the concept we are working on.

Another domain we are working on, which is extremely strategic and extremely interesting, is shown in **Fig. 4**. The left side of the figure is the current model of all our interactions as consumers with tech giants. We are producing a lot of data such as consumer data, producer data, financial data, social

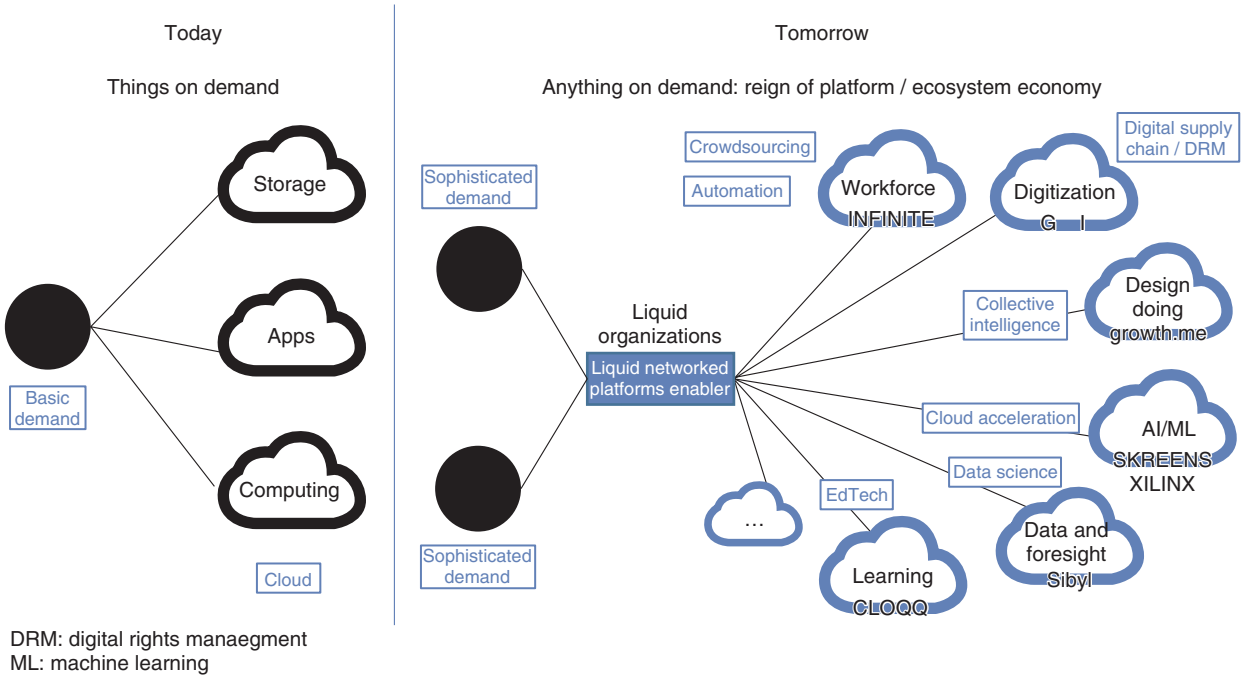


Fig. 3. From things on demand to anything on demand.

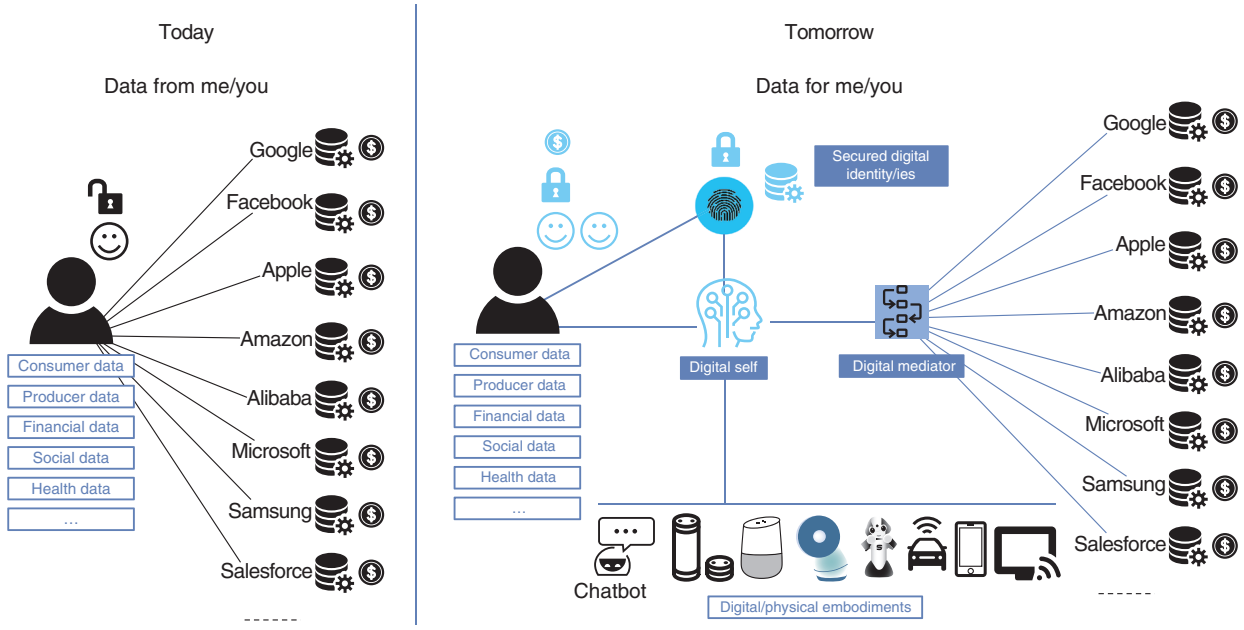


Fig. 4. From data from me/you to data for me/you.

data, and health data. All of these players are somehow operating through them as they capture data. We feel we are happy because we have good services, but the underlying model is completely asymmetric. We own the data, we produce the data, but we play into the hands of these service providers or platformers.

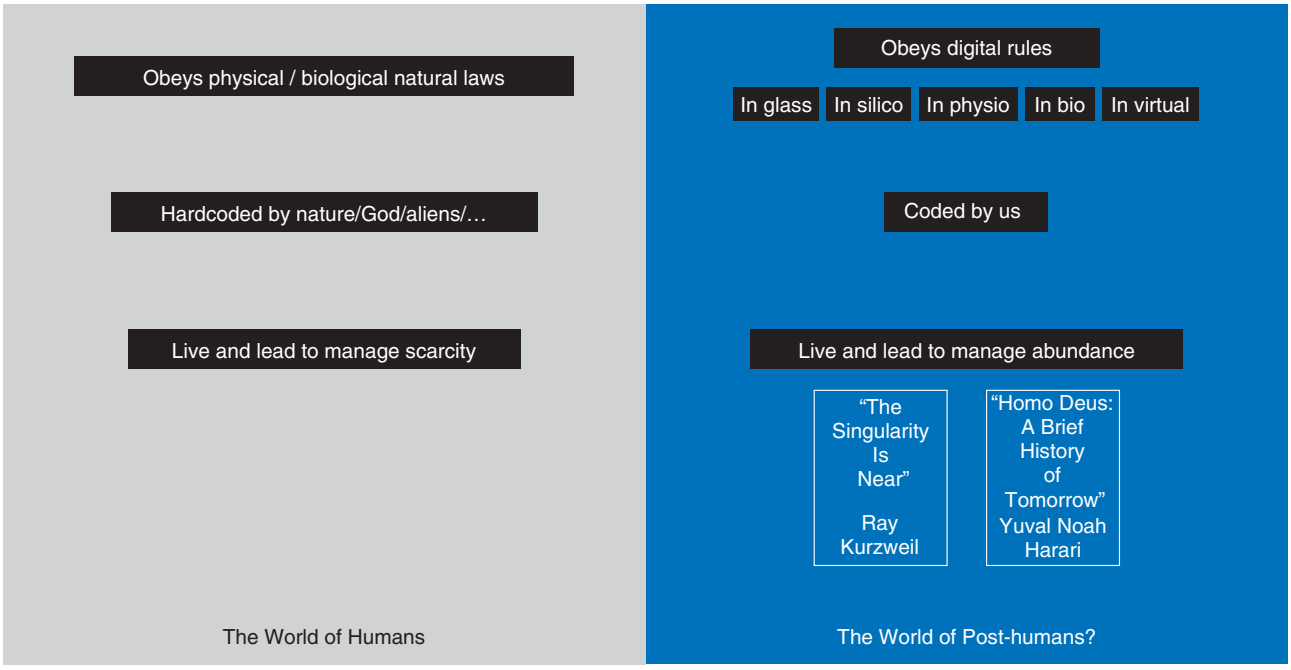


Fig. 5. From scarcity to abundance.

What we are trying to build is a completely new model, which is "I should own the data," "I should govern the data," "I should monetize the data," me as a consumer. This is leading us to create all these series of new agents (center in the figure). The first one is creating the concept of *secured digital identities* where I put my data automatically. We then created the approach of a *digital self*; it becomes like your digital twin. It's not a chatbot, it's far beyond chatbot; it becomes your interactions, your intelligence, to operate the data. The model we are trying to shift is moving from the model in which each user interacts with each player to the model where we have a digital mediator that interacts with these players and eventually creates a new business model for you to realize a return on your investment of your data.

4. From scarcity to abundance

So, what's next? I don't think anybody has any idea. This is my best guess: We are moving in the long run from scarcity to abundance (**Fig. 5**). Once you plug in all the digital rules, all the physical objects in everything, suddenly you are not limited, you do not have hardcoded items for the people, you are able to code anything on the planet earth. I strongly advise you to read "The Singularity Is Near: When Humans Transcend Biology" by Ray Kurzweil. That is a very good reference. In 2045 singularity will start, and many things will change. That is a must to understand the concept behind all of that, which is probably about evolution, from you as a human to a post-human. That is the long run.

The good news is for these longer visions, disruption will be more and more important because the frenzy of changes will be more and more massive and much faster.

This idea is very significant and ambidextrous (**Fig. 6**). Play with these three dimensions in any of your companies, or any of your businesses and organizations. Running the business is extremely important; otherwise you die. Evolving the business is also important because it gives you more defensive strategies. However, to reinvent, kill your business to create the new business. Hacking the business is about disruption, and disruptive innovation is also extremely important.

Being in a big company having a lot of success is no longer a big advantage. You need to un-learn to relearn. Socrates said, "I only know one thing, and that is I know nothing." You need to have a lot of humbleness. Look at the world with the eyes of children. That's what is behind the quotes.

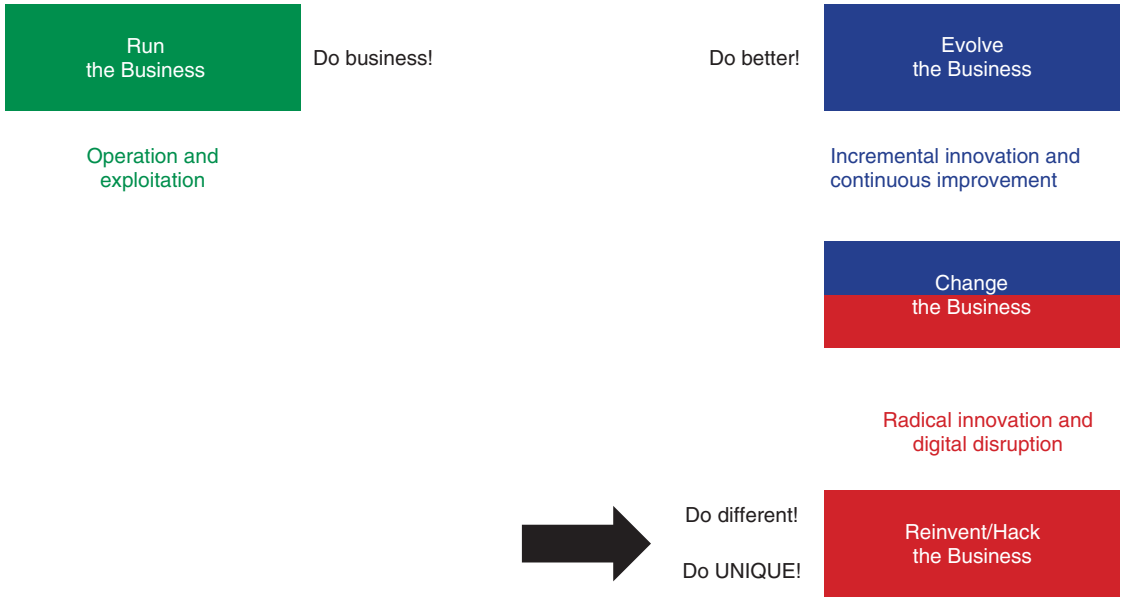


Fig. 6. Ambidextrous leadership.

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Marc Alba is a leading expert in disruptive innovation, entrepreneurship, exponential technologies, digital transformation, regional development, and socioeconomic transformation. Throughout the past 20 years, he has served in diverse positions (researcher, entrepreneur, chief innovation officer, transformation director, founder of non-profit movements, and advisor of a large and varied set of both private and public organizations) that in combination provide him with a holistic perspective of the key socioeconomic challenges that businesses and societies are facing worldwide. He has carried out his activities in multiple sectors, including automotive, telecom, industry, banking, insurance, government, energy, and non-government/non-profit organizations.

Marc is the (co-)author of 5 books and has written more than 100 publications and articles. His latest books are i-Leaders (Innovation Leaders): From the Business of Innovation to the Innovation of Business and The Key to Spain's Transformation: Civil Society Takes the Floor. He is also the co-founder of the civil society initiatives TransformaEspaña and TransformaTalento (TransformTalent), and the originator of the innovation management methodology COTIM (Cash-Oriented Total Innovation Management).

Currently, Marc works as a Managing Partner of the everis Group. He sits on the company's Steering Committee as the Chief Disruption Officer. He is the founder and head of everis NextGen and the NTT DATA Disruption Hub. He is also a Fellow of the everis Foundation and President of the TransformaEspaña Association. He is actively involved in various boards and think tanks related to innovation, entrepreneurship, regional development, and education.

He was born in Africa (Kinshasa, Congo). His collaborators define him as a citizen of the world, humanist, and work lover. He is 45 years old, married, and the father of seven-year-old triplets, Maria, Miguel, and Marc.