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# DIGITAL Ecosystems

Innovation and disruption in Latin America

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# Technologie

Technological revolutions are marked by innovations that radically change production models and generate economic growth.

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# PROLOGUE

The purpose of this book is to study the opportunities and challenges that the acceleration of the digital transformation process represents for Latin America economies. We define digital transformation (also called the digitization of production, digitization of the value chain, or Industrial Internet<sup>1</sup>) as the changes associated with the widespread adoption of digital technologies in production processes, with the consequent shift in operating models and competitive dynamics. Technological revolutions are marked by innovations that radically change production models and generate economic growth. In this sense, digital transformation refers to changes in the production of goods and services in a technological context. This entails a restructuring of value chains through the introduction of communications, applications, platforms and digital content. Contrary to other earlier technological shifts, such as the adoption of electricity or railroads, digitization is based on the evolution of several components, including semiconductors, communication networks, computer engineering, data analytics, access devices, robotics, artificial intelligence and sensors.

The incorporation of digital technologies in production processes is not an easy task. It is not merely a question of automating business processes that were originally conceived in physical production environments and supported by "analog" technologies. Digitizing production implies a fundamental transformation of businesses, requiring a refounding of the bases that lead to the creation of value: digitization helps differentiate products and increases the user's willingness

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<sup>&</sup>lt;sup>1</sup> We use the terms Digitization of Production and Digitization of the Value Chain indiscriminately throughout this book.

to pay as well as reducing costs based on quantum leaps in efficiency. Likewise, digitization allows for the disintermediation of competitors or the creation of a new value proposition for customers. Considering the radical nature implicit in digital transformation, we believe it is imperative to undertake the definition of its guidelines and provide recommendations that can help Latin American companies face this process.

This study summarizes essential elements of the ongoing research carried out by the *g*A Center for Digital Business Transformation (*Centro de Transformación Digital de gA*). This institution was created in 2013 to study the impact that digital technologies have on businesses in Latin America<sup>2</sup>. Within its research areas, the center has analyzed the state of digitization of production processes by economic sector and country, and the degree to which companies in the region have undertaken a digital transformation, understood as the development of digital strategies, the reconstitution of value chains, the development of new applications, the redesign of organizations, and the associated management of cultural change. All our research is based not only on what the consulting teams at *g*A learn from their clients, but also on an ongoing program of surveys and field research conducted throughout Latin America.

Beyond conducting research, the qA Center for Digital Business Transformation is a space for dialogue among private sector executives, government representatives and members of the academic community. Its creation has been guided by the conviction that the digitization of production is one of the most important challenges to be faced by Latin American economies in the next decade. In this regard we believe that, in addition to taking advantage of the experience of other industrialized nations, our continent must generate its own analysis and conclusions of the digital transformation taking place in Latin America. As we all know, much of the theoretical and empirical research on this phenomenon is based on the study of the experience and trends taking place in industrialized countries. Without underestimating the importance that this has for our continent in terms of predicting the problems that Latin America must face, the fact is that the specific characteristics of our economic systems, the innovative capacity of our societies, and the availability of human capital require that digital transformation be studied from the Latin American perspective. That is our commitment and our invitation to the reader.

<sup>&</sup>lt;sup>2</sup> See our first study from the gA Center for Digital Business Transformation. Latin America 4.0: The Digital Transformation in the Value Chain. The upcoming challenge for Latin American business. Miami, Fla. 2015



# THE KEY THEMES OF THIS BOOK

- 1.1. The concept of digital transformation
- 1.2. The disruptive impact of digitization
- 1.3. The difference between native digital companies and those that have to lead a digital transformation
- 1.4. A conceptual framework for tackling a digital transformation
- 1.5. Digitization of production: the great challenge for Latin America

## Chapter 1.

# THE KEY THEMES OF THIS BOOK

As its title suggests, this book puts forward the statement that the development of a digital ecosystem implies a revolution for Latin American economies. This revolution embodies an acceleration in the pace of innovation and an adoption of new digital technologies in production processes. Moreover, the digitization of production is essentially a disruptive process that occurs at the level of specific functions within a company while also affecting the value chain of industries. No sector is free from the disruptive impact, although those companies that are among the first to take on the challenge of digital transformation can leverage their technological leadership into a competitive edge. However, the challenge of the digitization of production processes is not only the responsibility of leading companies. All companies – large, medium and small – must also face this transformation since it represents a requirement for Latin American economies to continue developing, and thus achieve a competitive position globally.

#### 1.1. The concept of digital transformation

We define digitization as the process of socio-economic transformation resulting from the massive adoption of digital technologies by individuals, companies and governments. Digital technologies include products and services that range from traditional devices for accessing information, content and applications, servers, operating and application software, telecommunications, and platforms for Internet access. As such, the concept of digitization applies to changes in the

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individual consumption of digital products and services as well as the deployment of tools and platforms that enable companies to reduce transaction costs, create economic value based on differentiated products, and disruptively transform traditional value chains.

In its origins, a restructuring of the industries that produce digital goods and services triggered a transformation of the telecommunications, information technology, mass media, and cultural products value chains. The massive digitization of content and communications platforms and the spread of the Internet brought about a fundamental change to these industries, enabling a convergence between production chains. This has led to the emergence of the so-called digital ecosystem. In this new environment, the original segmentation between content distribution, applications and connectivity has disappeared, creating a unique interdependent structure (see *Figure 1-1*).

Beyond the convergence phenomena, the emergence of the digital ecosystem value chain has led to the creation of new stages and the emergence of non-traditional players. For example, developers of digital platforms (a non-existent function in the original value chains) have created new value propositions such as the link between supply and demand for specific products (e.g. purchase of airline tickets, barter of rooms in individual's residences, and search for job opportunities). Although these platforms already existed previously in "analog" form, their operations did not have the economic efficiency resulting from digital





platforms such as Mercado Libre, Despegar.com, Airbnb, Uber, or LinkedIn. In addition to platforms that link supply and demand, digitization has enabled the launch of applications focused on providing communication services (such as Skype, or WhatsApp). Finally, digitization has allowed the launch of platforms whose function is to link the search for information and digital advertising (Google, Bing), as well as social networks (Facebook, LinkedIn and Taringa).

Within this context of a reconfiguration of the digital ecosystem structure, technological innovation has not slowed but accelerated, leading to the emergence of technologies that complement the original infrastructure of computers, software and telecommunications networks. Among the new technologies that are being assimilated are those that link the physical space (raw materials, machinery and industrial plants) with the virtual domain by incorporating additional information inputs in the production of goods and services. This kind of technology includes sensors for monitoring production in real time, 3D printers and robotics. The second type of technologies that enable digital transformation are those that provide the ability to securely share information between firms within a production chain. These technologies include cloud computing and platforms that ensure cyber-security. The third group of technologies includes the platforms capable of processing and analysis of large data sets, machine learning applications, and collaborative platforms. They yield a greater capacity for monitoring and predicting future trends (that is, creating intelligence) in the management of production processes. Thus, beyond the contribution of traditional technologies, the digitization of production includes the assimilation of new digital technologies in value chains of industries with the objective of incorporating collaborative methods in the design of products and provisioning of inputs, gaining flexibility in production, and adapting to the transformation of distribution channels (see Table 1-1).

Which are the industries and/or production chains that benefit from the transformation of the digital ecosystem? All of them, although in different ways and intensity. Manufacturing industries benefit from digital technologies to the degree that they gain more efficient access to raw materials, while vendors in the supply chain reduce their transportation costs and optimize inventory levels. Service industries can reduce delivery times, improve customer experience, and gain access to human capital. Oil and mining companies optimize their access to supply chains, increase prospecting capacity, and reduce their transportation costs to processing points (such as refineries) and to the final consumer. These examples demonstrate the overall impact of the transformation that the digital ecosystem exerts on the production of goods and services and, ultimately, on economic growth.

Table 1-1.

Interaction between d	ligital technologies	and aspects of inn	ovation in production	on processes

		DIGITAL TECHNOLOGIES								
ACDENTO	Hybridization of the physical and digital world		Communication and data processing		Management Applications					
OF INNOVATION		3D Printing	Robotics	Cyber-security	Cloud computing	Broadband	Platforms	Big Data/analytics	Applications (ERP, CRM)	Financial flows
Collaborative development of goods and services										
Configuration of industry value chains										
Flexibility and efficiency of production units										
Supply Chain optimization										
Transformation of distribution										

Source: Adapted from Indra Business Consulting. Connected Industry 4.0

#### 1.2. The disruptive impact of digitization

Digital transformation (also called digitization of production, or industrial Internet<sup>3</sup>) does not mean merely adopting digital technologies to automate processes and reduce labor costs. We regard the digitization of production as a fundamental technological discontinuity that affects the competitive environment and restructures how industries are organized. The substitution of a traditional technology for a disruptive one is not a universal process (meaning that it is not carried out in a uniform way by all firms within an industry). Only those companies that lead in the adoption of new technologies and implement the resulting new business models become dominant once the new production paradigm is established.

Therefor digital transformation represents, in our view, a technological discontinuity associated with the process of "creative destruction" described by Schumpeter. Just as electricity changed industrial production, traditional production chains tend to be transformed under the influence of the digital ecosystem. In traditional value chains, the objective function was to sell goods or a service, and generate economic value from a reduction in operating costs and/or an increase in the willingness to pay because of the value-added differentiator. In

<sup>&</sup>lt;sup>3</sup> See Barcena, A. *La nueva revolución digital. De la Internet del consumo a la Internet de la producción.* Presentation to the Fifth Interministerial Conference on IT in Latin America and the Caribbean. Mexico City. August 5, 2015.

the new value chains, the classical linear organization of players and functions tends to evolve toward a configuration of multidirectional interactions. In this new context, the traditional objective function of creating value based on the reduction of production costs and product differentiation is enriched by the need to monetize intangible assets such as information on customers, markets, and products. To the traditional measures of economic value must be added the optimization of interactions and links between functions to reduce transaction costs between autonomous platforms, such as the supply chain and distribution channels.

The restructuring of production units through the assimilation of processes based on the adoption of digital technologies can lead to a radical change in the economic structure that provides the foundation for certain markets. Note the case of Skype, the platform that today represents the leading global operator in terms of telecommunications traffic. Having emerged in 2003, by 2009 computerto-computer traffic via Skype had surpassed all other traditional telecommunications operators in terms of distance telephony global traffic<sup>4</sup>. In 2015, Skype already controlled approximately 50% of global traffic for international long distance, with approximately 560 million users and was managed by just 500 employees.

The disruptive impact of digitization can also be demonstrated through fundamental changes in industrial production chains. These changes can be expressed through the "virtualization" of certain stages in the production chain, which enables leading companies to vertically integrate across the production chain and assume positions that allow them to strategically control the customer base or capture new revenues. Take the classic example of Apple when the company entered the music business through the combined launch of iTunes and the iPod in October 2001. Today, iTunes controls 64% of legal music downloads worldwide.

In Latin America, the Argentine agricultural company Los Grobo demonstrates a radical change in the traditional production chain based on the assimilation of digital technologies in the production, management and logistics processes. The vertically integrated traditional agricultural model is based on ownership of land and machinery, information on production processes is concentrated with the landowner. In contrast to this concept, Los Grobo's organizing principle is the capacity to coordinate a series of contracts with owners who lease their lands, contractors who carry out sowing and harvesting operations, and suppliers of agro-inputs (see *Figure 1-2*).

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<sup>&</sup>lt;sup>4</sup> Source: Telegeography.



Figure 1-2. Los Grobo: Value chain

The disruptive character implicit in the digitization of production processes forces companies to accept the need for fundamental change. However, this challenge is not faced uniformly, which results in winners and losers.

1.3. The difference between native digital companies and those that have to lead a digital transformation

Digital transformation affects companies that have been "born digital" in a different way from those that were created and grew in a "physical and analog" environment characterized by manual or partially automated processes. The company that is "born" digital has the benefit of being able to fashion its initial business model based on the intrinsic characteristics of the Internet, is unencumbered by a legacy physical environment. In contrast, the company that was born in a "physical and analog" world faces the need to rethink the fundamental elements of value creation, starting with the incorporation of digital technologies. New processes, value chains, and organizational and cultural characteristics are some of the parameters that define the new company. In this context, the fundamental problem for the "traditional" non-digitized company is how to move along the road of transformation towards the new environment.

For the native digital company, digital technologies are a facilitator for creating two-sided markets based on platforms<sup>5</sup>. A digital platform can efficiently link suppliers and users of goods and services. The classic example of a platform is Google, which offers individual users the ability to search for information and producers the possibility of advertising their products. By definition, a platform includes a set of components (hardware, software, services) and standards (technical standards, protocols for exchanging information, operating principles, and contracts governing operations) to be followed by users on both sides in their transactions. Each business model based on a platform determines that one side is subsidized (i.e. does not pay to join the platform) while the other provides the subsidy (the side that generates economic benefit). The competitive advantage of a business based on the platform concept is centered on multiple network effects<sup>6</sup>.

Beyond the paradigmatic case of Google, the Internet sector includes countless examples of business models based on digital platforms. In Latin America, the e-commerce platform Mercado Libre builds its competitive advantage on multiple network effects that feed back to create a dominant position in a market where the "winner takes all". Likewise, Mercado Libre's business model allows the operator to outsource several retail chain functions, retaining the strategic control point that is the relationship with the seller of goods.

In contrast to companies that were "born digital", companies that were born and grew up in a "physical and analog" environment based on traditional processes and value chains face a much more complex digital transformation. For example, Copa Airlines, the Panamanian airline, had to transform its distribution system over the last decade to compete with global passenger reservation networks and Internet platforms, while optimizing its profitability levers (performance, load factor, and cost). To address these challenges, the company deployed a suite of digital applications ranging from mobile ticket purchases and virtual traveler customer care to optimization and coordination. In other words, Copa Airlines had to change its basic principles of value creation to face the competitive threat and changes in the dynamics of the airline business.

The digital transformation of companies that were born in an "analog and physical" world, as is the case of Copa Airlines, is not easy. Simply stated, two paths are open for these firms. The first option is to create a "digital" business unit, independent of

<sup>&</sup>lt;sup>5</sup> See Eisenmann, T. et al. (2006) "Strategies for Two-Sided Markets", *Harvard Business Review*, October.
<sup>6</sup> The network effect determines that the value of a service for a user depends on the number of other users who use the service. Accordingly, network effects are economies of scale on the demand side since the benefit to the user (and therefore their willingness to pay) increases with the number of users or users of the platform. Markets affected by high network effects are served by few competitors and, ultimately, tend to be markets where the winner takes all.

the original business. This new business unit operates in parallel with the original organization. However, it presents radically a different characteristics: a different market strategy, value chain, organizational culture, human resources, and information systems. In a way, this "digital" unit could be considered a "spin-off". This is what a Latin American multinational household appliances company has done, consequently keeping two redundant distribution channels operating simultaneously: the traditional one that relies on distributors to reach the market and the "digital" one that targets consumers directly. How does a transition from this configuration of two parallel operating models to a single digitized company work? The migration should occur gradually, with the pace dictated by the success that the digital unit achieves in the marketplace. Simply put, to the extent that the digital unit reaches a sales volume higher than the traditional physical division, the migration would progress until the original business unit disappears, and the digital unit would emerge as the new digitized company. It is important to mention that we rarely find companies that have achieved this integrated digital organization. This is partly because the migration process is still at an embryonic stage.

The second option is to undertake the digital transformation from "within" the original business. In this case, the refounding of the company occurs in a similar way to the process reengineering wave of the 1990s, albeit in a more radical fashion. Instead of launching an independent business unit, the transformation occurs within the original company. In an attempt to control the implicit risk of such a transformation, many companies approach this process sequentially, beginning at the ends of the value chain, either by digitizing the supply chain or by transforming distribution channels.

Our experience working in the digital transformation of large companies shows that both options carry risks to consider before embarking on one path or the other. The first option – the creation of an independent digital business unit – has a logical advantage: it preserves the independence of the new digital unit, which allows it to define its operating model without facing the limitations of the original environment. Without the restrictions and restraints of the original organization, the new business unit is "born" digital. At the same time, the organizational independence of the new entity allows the recruitment of human resources attracted by the challenge of digital incubation. On the other hand, this path also carries numerous risks. Initially, the founding of the digital unit poses the need to coordinate market access for both units ("physical" and "digital"). Confusion by customers can be one of the problems. Another problem could emerge in terms of conflicts with distributors and agents in the distribution channels, as was faced by the Latin American multinational company referred to above. For example, the digital business may result in a significant disruption to the original division of

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Beyond these problems that occur at the beginning of this road to transformation, there is the problem of how to migrate the entire organization to the new digitized environment. The autonomy of business units tends to create "corporate orphans" since, being isolated from the original organization, the digital unit lacks the necessary support to develop. At the same time, it may face difficulties in finding a permanent place in the organization. This phenomenon has been studied in the context of how large companies innovate and create new businesses.

The second option – facing the digital transformation "within" the company's original organization – also carries risks. The very close link to the original business configuration tends to limit creativity and places constraints on internal entrepreneurship. At the same time, being incubated within the original business, the company will have more difficulty attracting the ideal type of human resource.

The dilemma is clear. On one hand, the "digital" independent unit can lead to the creation of a corporate "orphan", with the implicit difficulties of coordination and transition to the single model. On the other hand, a transformation within the company can lead to a situation where the benefits of digitization are not achieved simply because the internal organizational dynamics limit the refoundation effort. What to do? In our view, the key is to maintain a balance between independence and integration of the new digital unit.

First, the initial creation of independent units the incubator laboratory conditions to be generated without the constraints imposed by the original business. However, this new unit creates resistance and conflicts the original business. Second, in this context, it is essential that senior management provide the support and protection to allow the new unit to continue to develop and thrive. The commitment of the company's management to digital transformation represents the appropriate signal to the whole organization that the new business unit represents the future of the enterprise. Third, when creating the new unit, the conflict and disruption areas that occur naturally and should be controlled must identified (problems in distribution channels, different cultural characteristics of human resources). Each area should identify mechanisms that limit conflict (e.g., confusion in distribution channels could require the segmentation of channels and markets). Fourth, the strategy to migrate from independent units to an integrated digital company requires the execution of a gradual process of implementation by markets or regions. Should lastfor a limited period to restrict the disruptive potential of operating two parallel businesses.

#### 1.4. A conceptual framework for tackling a digital transformation

The risks of digital transformation for companies that have been born in "physical and analog" contexts are repeated in other aspects, such as the dilemma between turning energy toward the new digital model versus optimizing existing operations and processes. In other words, focus management attention on the creation of the fully digitized future company or respond to urgent needs for improvement implicit in the current operating model? If the answer is to work on the two tasks simultaneously, the next question is: how to do it?

To do this, it is useful to invoke the conceptual framework of enterprise architecture based on three "layers": systems of record, systems of differentiation, and systems of innovation<sup>7</sup>. The concept of systems employed here is holistic; it not only refers to information systems but also includes business processes, organizational structure, and human resources capabilities. The upper layer is where competitive threats materialize (new entrants in the market, new disruptions that constitute a threat to organization that lack a well-planned digital strategy). The processes that make the company unique, and differentiate it from the other competitors reside in the systems of differentiation layer. The bottom layer, systems of record, provides the organization's infrastructure. The goal here is to optimize and standardize, adopting best practices. The first layer, systems of record, consists of transformation or improvement projects that last for months or even years. The second layer can have development cycles of a few months, and the upper layer can have even shorter cycles.

A company that faces the dilemma of where to prioritize its transformation activities cannot choose to focus on one layer and postpone work on the others. The "layers" of enterprise architecture are interrelated through "connective tissue" or structural connections between processes, data, systems, applications, platforms, and technologies (see *Figure 1-3*).

Because of these interdependencies, it is very difficult to disassociate one layer from the other and consequently, to focus on only one of the three. One alternative is to address the challenge in a sequential manner, which involves starting by refounding the operating systems, then moving on to the upper layers. It is obvious that this option is not realistic. A client in the telecommunications industry in Argentina mentioned that the competitive pressure in the industry is such that postponing innovation projects until the operating systems have been transformed results in the loss of any competitive advantage. The key is how to work simultaneously on all three levels.

<sup>&</sup>lt;sup>7</sup> This concept is based in part on Gartner. *Accelerating Innovation by adopting a Pace-Layered Application Strategy*. January 9, 2012.

#### Conceptual diagram of enterprise architecture



Source: adapted from Gartner (2012)

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The answer requires carefully defining a path that integrates the initiatives in each layer, identifying the technological interdependencies that exist between each one and recognizing that the timing of migration is fundamentally guided by strategic imperatives. The items that should guide the definition of this journey should be: 1) a strategic overview of the company's competitive position and its capabilities, 2) a formulation of the value proposition for the firm's customers, 3) an understanding of the firm's economic objectives and position in the industry's value chain, and 4) the capabilities required to meet such objectives. On this basis, a migration map can be drawn up which includes six building blocks of initiatives:

- Empowerment of senior management and consensus agreement among line executives on the path chosen for the transformation
- Definition of clear financial objectives, including capital investment, reduction of costs generated by operating efficiencies, and revenue growth to be achieved through increased productivity and market expansion
- Development of a framework for the transformation of business processes that includes the full potential of digital technologies in the operating model
- Alignment of staff with transformation goals, using communication workshops, training, change management programs, creating incentives to ensure that the staff is part of the change process
- An internal information technology organization capable of incorporating new technologies into the existing architecture (applications, data structure, infrastructure)

• A roadmap that includes an implementation agenda for all required initiatives over a 3 to 5 year horizon

It is within this framework where the sometimes-contradictory objectives at work in each of the layers can be addressed.

To summarize, the digital transformation of a traditional company is not without risks. The refounding strategy must be carefully defined a priori to avoid risks. As has been discussed so far, digital transformation is a fundamental factor in increasing the efficiency of production processes, with the additional potential to generate disruptive effects that, despite the implied volatility that they cause in traditional chains, contribute to the creation of new business models. With this framework of analysis, we will examine the situation in Latin America in relation to this process of digitization of production. What progress has been made so far in terms of digital transformation companies in the region? Can any effects of this transformation be detected in terms of an increase in overall productivity? If this is not the case, what is its cause?

1.5. Digitization of production: the great challenge for Latin America

The short-term outlook for Latin American economic growth is not very attractive. In 2015 the economies of Latin America contracted -0.4%, while they have grown only 0.2% in 2016. This estimate is due in large part to the decrease in world commodity prices<sup>8</sup>. For example, world price fell by 47% in 2015 and closed 2016 a further 27% lower. Similarly, the metric ton of soybeans fell from US\$ 538 in 2013 to US\$ 393 in April 2016<sup>9</sup>. The medium-term prospect suggests a gradual recovery. Only by 2017 is Latin America's gross domestic product growth rate is expected to reach the level recorded in 2011. However, the International Monetary Fund recently published a report with projections that remain pessimistic even for 2017.

In this context, to stimulate economic growth, Latin America faces a fundamental challenge productivity must be increased. An analysis of the contribution of

<sup>&</sup>lt;sup>8</sup> Economic Commission for Latin America and the Caribbean. *Economías de América Latina y el Caribe crecerán solo 0,2% en 2016 en complejo escenario global*. Santiago: December 17, 2015.

<sup>&</sup>lt;sup>9</sup> World Bank. Precios de Materias Primas (May 4, 2016)

productivity to economic growth in the largest Latin American countries over the last fifteen years shows that, although labor productivity has contributed to the growth of gross domestic product, the impact of the knowledge economy (which includes human capital, information and communication technologies (ICT) capital, and multifactor productivity) has been very low or outright negative. This reinforces the importance that digitization of production has for increasing productivity in the continent.

# The level of investment in digital technologies among Latin America's companies is relatively high.

To understand the reasons for the limited contribution of ICT to Latin American economic growth requires first the measurement of the level of adoption of digital technology by Latin American companies. To do this, we have calculated an index of digital infrastructure development by industry relying on national industrial censuses from five countries on the continent (Argentina, Brazil, Chile, Colombia, and Mexico). In all five countries studied, the level of adoption of digital technologies is high. In fact, as a comparison, the level of adoption of digital technologies by Latin American businesses is not significantly different from that of mid-developed countries, such as Spain and Portugal (see *Graph 1-1*).



Source: Katz et al. (2016)

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"There has been a Revolution in manufacturing, its name is Programmable Automation, and that American industry has failed to capitalize on it".

(Robert Solow, 1987)

# e Automation

However, despite the high levels of digital adoption by Latin American companies, the contribution of information and communication technologies capital to economic growth is still small, as evidenced by the lack of correlation between the rate of infrastructure digitization by economic sector and country and its contribution to economic growth, as calculated by the Economic Commission for Latin America and the Caribbean (see *Graph 1-2*).

With this evidence, the relevant question to ask is: why, despite the high adoption of digital technologies, does their economic contribution remains so limited?

# The impact of digitization on productivity is not automatic

In a short article published in 1987, the economist Robert Solow argued that the automation of business processes in the United States had not resulted in an increase in productivity. Professor Solow stated that:

"One of the central beliefs is that there has been a Revolution in manufacturing, its name is Programmable Automation, and that American industry has failed to capitalize on it. (....) (We) are somewhat embarrassed by the fact that what everyone feels to have been a technological revolution, a drastic change in our productive lives, has been accompanied everywhere, including Japan, by a slowing-down of productivity growth, not by a step up. You can see the computer age everywhere but in the productivity statistics."<sup>10</sup>

This statement – which implied that manufacturing automation had not increased productivity but had decreased it – triggered numerous attempts to explain this paradox. Among these, MIT's Eric Brynjolfsson (1993) argued that the paradox raised by Solow could be explained by four factors: 1) inadequate methodologies for measuring inputs and output (particularly in industries that rely heavily on information), 2) a lag between investment in information technologies and any benefit, caused by learning and necessary adjustments in organization and processes, 3) information technologies are especially effective in the redistribution of income between companies, which does not imply an increase in total output, and 4) mistakes in the management of information technology resulting from the lack of explicit measures to determine the value of information<sup>11</sup>.

<sup>&</sup>lt;sup>10</sup> Solow, R. "We'd better watch out", New York Times, July 12, 1987, p. 36

<sup>&</sup>lt;sup>11</sup> Brynjolfsson, E. "The productivity paradox of Information Technology", *Communications of the ACM*, vol. 36, No. 1, pp. 67-77.



#### Graph 1-2. Relationship between the rate of infrastructure digitization and contribution of ICT capital to productivity

As is apparent, two of the four factors mentioned by this researcher are particularly relevant to the Latin American reality. The lag between investment in technology and its resulting benefit, as well as shortfalls in the management of information technologies, would indicate that there is a learning process on the part of enterprises, which would lead to a resolution of the paradox over the long term. In fact, numerous studies have also shown that, in general, the impact of ICT on productivity occurs with a temporary lag effect. These studies have also shown that the investment in digital technologies does not have an automatic and simultaneous impact on productivity indices. In fact, for ICT to contribute positively to productivity, its adoption must be accompanied by other structural transformations, such as changes in business processes and organization structure.

Likewise, the impact of digital technologies on aggregate productivity tends to materialize once they are assimilated in a three-stage diffusion process. The first stage concerns the digital transformation of leading companies. This step, carried out by companies such as Arcor, Los Grobo, and Copa Airlines in Latin America, while benefitting the adopting companies, does not by itself imply a significant impact on aggregate productivity. The most important contribution of digitization at this stage is an increase in the competitiveness of leading companies. The second stage includes the assimilation of technologies by industrial sectors characterized by high transaction costs or a network structure such as transportation, finance and retailing. At this stage, an impact on productivity at the sector level starts to be detected. However, the remaining industries are not affected, and consequently, the contribution to aggregate productivity remains marginal. Finally, the impact on productivity of the whole economy begins to materialize once important sectors assimilate digital technologies. This final step also entails the transformation of small and medium-sized companies, considered to be laggards in the diffusion process (see *Figure 1-4*).

This three-stage sequence in digital transformation is particularly important for emerging countries since digital technologies tend to be assimilated initially by a few sectors of the economy, leading to a contradiction: a high level of technology adoption combined with low productivity rates.

The gradual assimilation of digital technologies is also relevant for Latin America at various levels. First, while the region already has companies leading in the digital transformation process (such as Arcor, Copa Airlines, Bimbo, Banco Galicia, and Codelco), these examples represent only the first stage in the impact of digitization on productivity at the macroeconomic level. Therefor, despite the case study evidence, the overall productivity index in the aggregate is still stagnating. In fact, for this metric to improve, the digitization process must proceed throughout the economy, first affecting key industries, but then involving the entire productive system.



## Figure 1-4. Digitization and Productivity: Three levels of causation

Source: Katz (2012)

Second, the transformation process will tend to occur first in those industries whose structure and value chain are most apt to incorporate disruptive digitization. In this respect, regional leaders lead the way regarding where we can expect structural changes at the sector level. A leader of disruption pushes the rest of its competitors to transform or disappear. That is why the transition from the first stage to the second stage will be guided by the "invisible hand" of competitive dynamics.

Third, the transition to the third stage is where the impact of digitization on production is more complex. Small and Medium Enterpises (SME) comprise about 60 - 80 % of Latin American eonomies, depending on each country. By definition, the barriers to digitization in this sector are greater (for example, absence of human capital, lack of entrepreneurial capacity, or simply lack of investment capital). This problem is not uniquely Latin American. Industrialized countries face the same obstacle (see case on the SME sector, "Mittelstand" in Germany<sup>12</sup>). In this case, the role of the State as a facilitating mechanism is key to facilitating SME access to those factors necessary to proceed with digital transformation.

# Still-limited impact of digitization on productivity

Having presented the argument that explains the lack of direct and simultaneous causality between the adoption of digital technologies and the impact on productivity, we have also shown how this effect would materialize over time in Latin America. The analysis of digitization by production processes within the value chain of industrial sectors indicates that it is significantly lower than the adoption of infrastructure. In other words, Latin American companies have adopted digital technologies in a significant volume, but they are lagging in its assimilation into business processes. In order for the digitization of production to improve productivity, companies must restructure their operations, change their organization, and attract talent. These changes have been conceptualized as the "accumulation of intangible capital<sup>13</sup>". Extending the digital transformation of the leaders to the rest of the economy is the great challenge for Latin American companies.

<sup>&</sup>lt;sup>12</sup> Thoemmes, P. (2015). Is the German Mittelstand going to prevail in a disruptively digital world?
<sup>13</sup> Cummins (1998) defined intangible capital as the difference between the price of acquisition of information technologies and the value created once a company has assimilated these productively. The author considers that this intangible capital should not be thought of as a factor of production that can be acquired in the market in the same way that a computer is bought. He reasons that intangible capital should be considered as the way in which a company combines its factors of production to generate value and that, therefore, it must be developed within the company from an internal transformation effort.

Having presented the central themes of this study, the following chapters begin to delve into each one. Specifically, Chapter 2 analyzes the disruptive impact of digitization on processes along the value chain, including the company's operations and how this leads to the reformulation and restructuring of the company's organization and its relationships with others. Based on this, Chapter 3 shares examples of digital disruption in Latin American companies. These examples include the development of two-sided exchange platforms, isolating the characteristics of digital innovators. Chapter 4 presents concrete models and techniques for navigating the digital transformation of a company. Distill the experience acquired by our consulting teams during their work to support clients in Latin America. Chapters 5, 6 and 7 focus on prescriptions for the formulation and execution of the digital transformation journey: possible organizational paths to execute a digital transformation, the design of a roadmap and concrete steps to achieve transformation and obtain its benefits. Finally, chapter 8 returns to the Latin American imperative of tackling digital transformation to improve productivity and foster economic growth in the next decade.



# THE DISRUPTIVE IMPACT OF DIGITIZATION

- 2.1. Enhancing the efficiency of production units
- 2.2. Structural changes in traditional value chains
- 2.3. Digitization as a means to disintermediate traditional value chains
- 2.4. Digitization and the creation of new markets through the deployment of two-sided platforms
- 2.5. Conclusion


# Chapter 2.

# THE DISRUPTIVE IMPACT OF DIGITIZATION

The digitization of production does not mean simply adopting digital technologies to automate processes and reduce labor costs. We envision digitization as a technological discontinuity that affects competitive environments and restructures the organization of industries. In his book "*Mastering the dynamics of Innovation*", Utterback (1996) invokes a historical example to demonstrate the impact of technological discontinuity. The author shows how the industrial production of ice, facilitated by electric refrigeration, replaced the industry that naturally harvested this consumable good over the course of twenty years. With this example, the author describes how a radical technological innovation can develop and replace a traditional mode of production in a short period of time. Before the phenomenon of digitization, Utterback considers that this process had occurred already in many industries, notably with the introduction of the typewriter and the electric lamp.

At the same time, Utterback reasons that the substitution of a traditional technology for a disruptive one is not universal (that is, it is not carried out simultaneously by all firms in each industry). The author believes that only those firms that initially adopt the new production model and then focus on actively incorporating it into large-scale production become the dominant ones once the new paradigm is established. This concept had already been proposed by Schumpeter in *"Creative Response in Economic History"* and in *"Capitalism, Socialism and Democracy"*. In this last work, the economist states that,

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" (capitalism) is continually revolutionized from within by new enterprise, by the introduction of (...) new methods of production modes or new commercial opportunities into the industrial structure as it exists at any moment." (p. 31)

In particular, in "*Change and the Entrepreneur*", Schumpeter emphasized the role of firms that adopt new production modes ahead of time and the positive external factors associated with this innovation.

Along these lines, digitization can and should be considered as a technological discontinuity that affects traditional production chains. The degree of impact of this discontinuity can range from a deep understanding of consumer behavior facilitated using of data science tools for the analysis of large databases to the substitution of the labor force in tasks that are relatively routine using artificial intelligence applications. Many of the benefits associated with its introduction are tied to the innovative leadership assumed by a small group of companies in any industry. At the same time, we must recognize that digitization generates processes of "creative destruction" within industrial sectors, leading not only to the emergence of new companies but also to the disappearance of others.

Why do we associate digitization of production with the disruption associated with "creative destruction" described by Schumpeter and with the "technological discontinuity" studied by Utterback?

Just as electricity changed the ice production industry before it was harvested, traditional production chains as defined by Coase<sup>14</sup> (1937) and Stigler<sup>15</sup> (1972) tend to be transformed under the influence of the digital ecosystem. In the traditional value chain that preceded the introduction of digitization the objective function is to sell a good or service, where the source of economic value is generated from a reduction in operating costs and/or an increase in willingness to pay because of the value-added differentiator. In the new value-added networks, the classical linear organization of actors and functions tends to evolve toward a configuration of multidirectional interactions. In this, the need to monetize intangible assets such as information (customers, markets, products) is added to the traditional function of creating value based on the reduction of production costs and product differentiation. In this case, the traditional measures of economic value are added to the optimization of interactions and links between functions to reduce transaction costs between autonomous platforms (supply chain, sales channels, etc.).

<sup>&</sup>lt;sup>14</sup> Ronald Coase, Nobel prize economist, who introduced the concept of transaction costs to explain the nature and limits of firms.

<sup>&</sup>lt;sup>15</sup> George Stigler: Nobel laureate whose research focused on the structure of industries, market dynamics and public regulation.

Traditional production functions include capital invested in the acquisition of production infrastructure (machinery, buildings, vehicles, systems) and human capital responsible for operating the infrasructure. The analysis of the competitive performance of markets recognizes that to these inputs must be added the ability of a company to efficiently manage processes such as the supply chain, distribution channels, and customer care<sup>1</sup>. The progressive assimilation of digital technologies has exponentially increased data processing capacity to such an exent that information input has acquired an importance comparable to that of investment capital and human capital<sup>2</sup>. If this is so, information (generated by exponential growth in processing capacity and analysis) becomes a production factor that can be monetized.

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 <sup>1</sup> Penrose, E., (1959). the theory of the Growth of the Firm. Wiley, New York.
 <sup>2</sup> Braunstein, Y. (1985). "Information as a factor of production, sustitutability and productivity", *The Information Society* (3) 3, pp. 261-273

The restructuring of production units (i.e. companies) through the assimilation of processes based on the adoption of digital technologies can lead to a radical change in the economic structure of businesses. Note the case of Skype, already referred to in chapter 1, that represents as of today the largest operator in terms of global telecommunications traffic (see *Graph 2-1*).



Graph 2-1. Growth in long distance telephony versus Skype

Source: Telegeography. Skype traffic continues to thrive. January 15, 2014

Based on peer-to-peer communication on digital platforms, in 2015, Skype controlled approximately 50% of global long-distance traffic, with approximately 560 million users administrated by only 500 employees.

The disruptive impact of digitization can also be seen through fundamental changes in industrial production chains. These changes can result from the virtualization of certain processes in the production chain, allowing leading companies to integrate vertically and assume positions that yield strategic control of the customer base or the capture of new revenues. Look at the classic example of Apple, also cited in chapter 1, when it entered the music business through the combined launch of iTunes, a music platform based on innovative storage and control of piracy, and the iPod, a device supported by a flash memory chip, in 2001. Today, iTunes controls 64% of the legal download of music worldwide. Its release, in part as a reaction to Napster's entry, signaled the beginning of a legal disruptive era in the music business. This process has not yet been concluded to the extent that business models continue to change and compete.

In our view, the digitization of production has three fundamental disruptive effects: (1) the streamlining and, consequent, efficiency improvement of stand-alone production units, (2) radical changes in the production chains of entire industrial sectors, and (3) the creation of new markets by deploying two-sided platforms. Each of these effects will be discussed in turn.

# 2.1. Enhancing the efficiency of production units

Following Smith's (1776) example of the pin factory, the structure of a production unit is defined by assembling a series of stages ranging from the acquisition of raw materials to distribution of the finished product to market. In designing its production structure, a firm must make decisions about the functions that will be executed within the company and those that will have to be outsourced since, occasionally, due to economies of scale, it becomes more economical to acquire a function from a "specialist" located outside of the enterprise than implement it internally. Similarly, the company must decide which inputs it is going to control and which can be purchased in the market. This is the process that Williamson (1985) describes as defining the efficiency frontiers of the firm. *Figure 2-1* describes a typical organization of a production unit.

The inputs, components, and functions that are outside the zone marked with the red line are those that are acquired in the market, while those inside the zone have been internalized. In this context, the digitization of production can have an impact at two levels. On the one hand, each function can raise its level of



#### Figure 2-1. Organization of a production L

production performance simply by increasing the efficiency associated with the task automation and reducing transaction costs related to the acquisition of products and services necessary for the pursuit of that task (Williamson, 1985). For example, the transaction costs required for the acquisition of inputs in the market (corresponding to Stage 1 in figure 2-1) can be reduced using marketplaces, supplemented by traditional services such as electronic payments. On the other hand, digitization can optimize interactions between functions. For example, the supply chain can optimize its purchase level of raw materials by having better visibility of market trends generated by distribution channels. Similarly, distribution channels can avoid the occasional situation inventory shortages by allowing greater coordination with manufacturing functions In this way, a company that incorporates digital technologies in its processes beyond the level of each specific function (or stage, as defined in figure 2-1) can reduce, in an integrated manner, its costs and differentiate its product which, in the end, increases its profitability.

# 2.2. Structural changes in traditional value chains

Beyond the impact that digitization can have on a given firm, it may also have a disruptive effect on the production chain of a given industrial sector. In his *"Division of Labor is Limited by the extent of the market"*, Stigler (1951) suggests that the functional theory of a firm originally presented by Smith can be extended

to understand processes of vertical integration throughout the development of an industry. Stigler introduces the concept of a production chain (later called the value chain) and explains that the process of vertical integration and fragmentation of the chain can be illustrated by the life cycle of an industry. According to Stigler, in the origins of the development of an industry the production chains tend to be vertically integrated to satisfy the development requirements (new products, production techniques, relations with consumers). That is, the structure of a new industry is composed of competitors who control all the functions and inputs needed to deliver the product to the market. As a result, extensive integration exists at the early stage of industry development (young firms need to manufacture their own inputs, they must persuade customers to shift purchases to their own products, they must design specialized equipment, etc.). As the industry matures, when some of these design and production techniques as well as procurement of inputs have been developed, economies of scale become one of the most important factors of performance, which fragment the production chain. In other words, as customers and independent specialists become more knowledgeable of the technology and as reliability increases, the incentive to maintain a forward market presence decreases At this point, competitors tend to outsource certain functions to "specialist" firms that offer certain functions at lower costs. Stigler also mentions that, in subsequent industrial development stages, the search for strategic control of particular functions (such as access to a certain raw material or some application in the cloud) or customers leads firms operating in the production chain to vertically integrate again. Therefore, according to this author, industrial production chains tend to go through vertical integration and fragmentation processes throughout the life cycle of an industry.

Digitization affects the value chain dynamics in the cycle as outlined by Stigler. For example, in strictly digital industries, while processes of vertical integration and fragmentation are still present, their interpretation in terms of the life cycle of an industry is the opposite of that originally presented by Stigler. In the beginning of digitally-enabled industry, extensive fragmentation exists at its origin due to efficiency, knowledge, patents, stock market trend or industry developments. This is enabled by platform modularity. Therefore, **contrary to traditional industries, in the origins of digital industries, production chains tend to be born fragmented**. See, for example, the configuration of the production chain of the mobile content business in its origins in *Figure 2-2*.

When the mobile content industry was launched, both because of economic reasons and lack of knowledge, no firm could controll all stages of the production chain. In this context, digitization acted as a facilitator in the assembly of stages, functions and inputs. However, during the industry's process of

# Figure 2-2.

# Production Chain of the Mobile Content Industry (First stage)



Source: Katz (2015)

maturation, some companies, driven by strategic considerations (search for customer control, or higher profitability stages), attempted to vertically integrate. For example, content developers integrated forward by taking positions in the content development and editing, and manufacturers of terminal devices integrated backwards to capture a closer relationship with users. As a result, during this process of vertical integration, the production chain is refined (see *Figure 2-3*).

Vertical integration in digital chains such as mobile content is driven by different motives:

- To leverage economies of scale or scope: unit costs can be reduced by sharing fixed costs
- To reduce transaction costs: as mentioned above, the internalization of functions can result in costs lower than their acquisition in the market

# Figure 2-3. Production Chain of the Mobile Content Industry (Second stage)



Source: Katz (2015)

- To reduce coordination and control costs: certain assets can be more valuable if used in a coordinated way
- To implement strategies of price discrimination or product differentiation: integration can result in an opportunity to differentiate the product from competitors or charge different prices to different market segments, making it essentially a similar product.
- To achieve a strategic positioning: integration allows the development of complementary capabilities
- To leverage market strength: this could be motivated by the need to exercise dominant positions in the industry or protect margins associated with sunk investments.

It is important to note, however, that fragmentation might re-occur at later stages of industry development as result of failure in achieving synergies, incompatible business models, and/or the recognition that full integration does not yield the expected strategic superiority.

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The same development process, described above for companies operating in discrete positions in the mobile content production chain occurred in other areas of the digital ecosystem (*see Figure 2-4*).

The original fragmentation of the digital ecosystem value chain occurred primarily because the vertically integrated companies that existed in the previous development stage of the information industries (video distribution, telecommunications) did not have a complete understanding of the new business concepts and changing market trends. Innovative dynamics began to originate in firms located in the so-called periphery of the ecosystem (called the periphery because these are, at its origin, small highly-innovative companies located at the edges of the organization of the industry). And Facebook, Google, Netflix, Skype, eBay and Amazon, among others, emerged.

However, the fragmentation of the production chain posed a challenge to participating firms. For a fragmented production system to function efficiently, two conditions must be fulfilled: modularization (i.e., each function must be capable of interconnecting with others based on a series of common processes and protocols) and the existence of an "assembler" (i.e. a function that allows all stages to communicate with each other). The first condition was solved with the Internet, while transport operators provided the second condition. **The Internet provided the platform that allowed interoperability between stages of the chain**.



# Figure 2-4. Original Configuration of the Digital Value Chain

In this new operational paradigm, modularization increased the capacity of imitation to the extent that products and features were no longer required to be developed *de novo*, but the necessary technological modules could simply be acquired. "Assemblers" (i.e. telecommunication operators) provided the networks that allowed input producers to communicate with intermediaries and reach the end user.

The trend toward fragmentation facilitated by modularization and assemblers began to be affected by the decision made by firms that occupied specific positions to acquire companies in adjacent stages of the chain. Almost immediately, with the emergence of the fragmented production chain, firms occupying unique positions began to look for diversification opportunities in other stages. This reintegration was not a response to market maturity, or "classic" vertical integration conditions as Stigler originally conceptualized, but was guided by the need to assume strategic control of certain stages of the chain (e.g. the relationship with the end user).

What are the control points in the production chain of the digital ecosystem? Apple launched the iPhone and the AppStore with the goal of consolidating its relationship with the end user and attempting to commoditize telecommunications operators. Other new control points in this ecosystem are located at the borders of each stage of the value chain. At the beginning of the ecosystem, telecommunications operators, in their function as "assemblers", occupied a key control position. However, "modularization" and interoperability have led them to lose power to the extent that discrete-stage occupants can communicate with each other without having to submit to an "integrator"; they only need a physical connection. In this way, the Internet's architecture, based on TCP/IP protocol<sup>16</sup>, facilitates the development of a communications platform that breaks down the traditional economic structure of costs and prices.

Another motivation for entering other stages of the production chain is the search for value chain positions that either yield superior profitability or preserve market dominance. The trend toward merging aggregation and communication platforms, for example, explains Microsoft's acquisition of Skype, the acquisition of WhatsApp by Facebook, the diversification of Google into Google Talk, and Apple's push into Facetime (see *Figure 2-5*).

And so, in this context of fragmentation and simultaneous diversification we arrive at the present situation. Firms such as Facebook, Google, Microsoft, and Amazon continue to seek positions in adjacent stages of the production chain, reinforcing

<sup>&</sup>lt;sup>16</sup> TCP/IP (Transmission Control Protocol/Internet Protocol) is the basic communication language or protocol of the Internet.

#### Figure 2-5.

# Current configuration of the digital value chain



their dominant positions drawn from network effects and economies of scale. At the same time, innovation continues to be intense in the periphery, although new entrants (such as Instagram, Waze, or WhatsApp), if successful, are acquired by dominant platforms, which reinforces their positions<sup>17</sup>. This dominance tends to be cemented with limits placed on the interoperability of each platform. In other words, "modularization" tends to have its limits, more so if it facilitates the entry or expansion of competitors.

# 2.3. Digitization as a means to disintermediate traditional value chains

A third disruptive effect of digitization is that of facilitating disintermediation in production chains. The concept of disintermediation in a value chain refers to the elimination of certain functions or stages. Digitization allows companies operating in production chains of traditional industries to eliminate stages, virtualizing them and facilitating their vertical integration. We can understand this phenomenon by looking at the music distribution business. Originally, the production chain for the music business was structured according to the diagram in *Figure 2-6*.

In its origins, the production chain for the music business included two channels to reach the end consumer: content distribution and marketing or promotion.

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<sup>&</sup>lt;sup>17</sup> Waze was acquired by Google in 2013, WhatsApp was acquired by Facebook in 2014 and Instagram was acquired by Facebook in 2012.

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The digitization process enabled another disintermediation move, this time driven by the artists.



# Figure 2-6. Original production chain for the music business

According to the distribution channel, the customer acquired music by hiring the artist for a private concert where the compensation flows directly to the content producer from attendees at an event, as the artist receives a portion of the entry fee, or the purchase of an album from a retailer. The second marketing and promotion channel includes a variety of media whose cost is included in the record labels' promotional cost.

The production chain of retail distribution of music is presented in a simplified way in *Figure 2-7*.

Regarding the distribution of albums in the pre-digitization stage of music distribution, the cost structure and revenue splits was as follows (*Table 2-2*).

As shown in *Table 2-2*, in the original business the artist received (at best) 15% of the retail price of the product, while between costs and margins, the other two participants in the production chain received 85% of the album price. In this context, regardless of the justification that the record label and retail distributors could raise in terms of their added value (e.g., recovery cost for content, production and promotion costs by record companies), tension in the production chain was such that some movement toward disintermediation by artists could be predicted prior to digitization. This means that artists would try to integrate forward in the production chain to capture a larger portion of the revenue.

# Production chain for retail distribution of music

ARTIST	RECORD LABEL	RETAILER	CONSUMER
<ul> <li>Create</li> <li>Participate in promotional events (video, interviews)</li> <li>Concerts</li> </ul>	<ul> <li>Discover artist and develop their repertoire</li> <li>Generally advise and guide artists</li> <li>Advance artists' living and other expenses</li> <li>Enlist producers</li> <li>Fund recording sessions</li> <li>Produce and manufacture songs and albums</li> <li>Distribute the music</li> <li>Market the music (videos, advertising, promos)</li> <li>Handle royalty payments</li> </ul>	<ul> <li>Distribute</li> <li>Market reach</li> <li>Revenue collection at POS</li> </ul>	Source: Elberse, 2005

Obviously, this strategy was limited by the magnitude of the market power of the latter. An artist who attracts a large audience would be more likely to vertically integrate and disintermediate the labels than one who has a minority position. That is why, prior to digitization, only the Beatles were able to launch their own label: Apple Records.

Table 2-2.	
Original cost distribution for music business (i	n US\$)

CONSUMER	\$14.99	Retail price paid by consumer at the store
RETAIL DISTRIBUTOR	\$3.00 (20%)	<ul> <li>5% margin</li> <li>15% operating cost and CAPEX</li> </ul>
RECORD LABEL	\$9.74 (65%)	<ul><li>10% margin</li><li>50% product cost</li></ul>
ARTIST	\$2.25 (15%)	

Source: Katz (2015)

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However, the entry of digitization into the music business accelerated the disruption associated with changes in the production chain. The reduction in recording, manufacturing and distribution costs allowed other artists and companies to move along the chain and disintermediate the record labels. The process of disintermediation began first with the emergence of Napster and pirated distribution, but continued legally with Apple (through iTunes and the iPod) and its maneuver to legalize the distribution of music through the disintermediation of retail distribution by presenting a value proposition to record labels that appeared to replicate their original income (see *Table 2-3*).

# Table 2-3.

# Production chain of the music business: Distribution of revenues (in US\$)

	Original	iPod Album
CONSUMER	\$14.99	\$9.99
RETAIL DISTRIBUTOR	\$3.00 (20%)	\$0
RECORD LABEL	\$9.74 (65%)	\$5.60 (56%)
ARTIST	\$2.25 (15%)	\$1.40 (14%)
APPLE		\$3.00 (30%)

Source: Katz (2015)

Note that even under the new scheme of income distribution, the artist did not increase his or her participation. The difference in this case is that digitization allowed Apple to disintermediate retail distributors and present a value proposition to the record labels and artists that set the stage for a new iteration of "creative destruction".

However, the digitization process enabled another disintermediation move, this time driven by the artists. Indeed, when the British rock band Radiohead released their album *In Rainbows*, it was marketed from their own website, producing and distributing it digitally and thereby eliminating two players in the value chain: record companies and retail music distributors (and iTunes as well) (see *Table 2-4*).

In other words, Radiohead's strategy symbolized a second stage of disintermediation and creative destruction<sup>18</sup>. Obviously, this process of production chain reconfiguration has not yet been completed. The music distribution business

<sup>&</sup>lt;sup>18</sup> The experience of Radiohead was followed by disintermediation initiatives from other artists to create their own record labels (Cassandra Wilson) or "streaming" services (JayZ, who created Tidal).

## Table 2-4.

Production chain of the music business: Distribution of revenues (in US\$)

	Original	iPod Album	Radiohead
CONSUMER	\$14.99	\$9.99	Price decided by the consumer + \$0.80
RETAIL DISTRIBUTOR	\$3.00 (20%)	\$0	\$0
RECORD LABEL	\$9.74 (65%)	\$5.60 (56%)	\$0
ARTIST	\$2.25 (15%)	\$1.40 (14%)	Price decided by the consumer + \$0.80
APPLE		\$3.00 (30%)	\$0

Source: Katz (2015)

continues to be involved in a continuous transformation, including multiple business models (subscription, rental, subscriptions to curated playlists, advertising-supported models) and notable conflicts between artists and platforms (as in the case of Spotify and Pandora). However, it is clear that digitization facilitated this process in terms of its disruptive effect on a traditional production chain.

2.4. Digitization and the creation of new markets through the deployment of two-sided platforms

As in the cases of technological disruption presented above, the concept of a two-sided platform precedes digitization. Let's begin by defining the concept of a two-sided market. In the article, "*Platform competition in two-sided markets*", Rochet and Tirole (2003) explain that a two-sided market is based on the interaction between two complementary "sides". The classic example is the credit card market based on the existence of: (1) cardholders and (2) merchants; one side cannot exist without the other. Other examples that precede digitization include the real estate market (sellers and buyers of property), the stock exchange (sellers and buyers of shares), and newspapers and magazines (readers and advertisers).

Note that in each case, a two-sided market is enabled by a platform. For example, American Express or Visa are the enabling platforms of the credit card market, the stock exchange is the platform that coordinates buyers and sellers of shares, a newspaper allows the advertiser to display an announcement that will be seen by readers. Platforms emerge as the channel of coordination between both sides of the two-sided market when these are more efficient than the independent relations between members of both sides. For example, the Stock Exchange with its operating rules represents the most convenient way for buyers and sellers of shares of a company to agree on a transaction.

# Digitization is a facilitator for the creation of two-sided markets based on

**platforms**. A platform includes a set of components (hardware, software, services) and standards (technical standards, protocols for the exchange of information, operating principles and contracts governing operations) to be followed by users on both sides of their transactions. Each business model based on a platform determines that one side is subsidized (i.e. it does not pay to join or use the platform) while the other provides the subsidy (it is the side that generates the economic benefit).

The paradigmatic example of platform in two-sided business is Google, although we can also consider other cases (see *Table 2-5*).

The concept of marketplace is a specific case of the two-sided market facilitated by digitization. In this case, the online site operator provides a platform for multiple suppliers of goods and services to reach a market composed of individuals. Access by individual users is free, while suppliers must pay a commission for each product sold to access the platform (between 5% and 10% in the case of Amazon Marketplace). The benefit to the users is the possibility of obtaining a greater variety of offers and the possibility of acquiring a product at a more competitive price than through the site of a single retailer. A recent analysis of the price index of several goods sold in the United States indicates a significant reduction in TV sets, PCs, cellphones, toys, clothing and cars (see *Graph 2-2*).

# Table 2-5.

# **Two-sided Markets and Digital Platforms**

PLATFORM	SIDE 1 (Subsidizer)	SIDE 2 (Contributor)	
Google	Browsers	Advertisers	
Xbox	Video game players	Video game developers	
Linkedin	Members	Recruiters	
Windows	Application developers	PC Users	
Facebook	Members of the network	Advertisers	



An important driver of price reduction is the impact of two-sided platforms that enable the identification of lower prices by customers incurring much reduced search costs.

g**A** 

Source: New York Times, based on data provided by the United States Census Bureau



# 2.5. Conclusion

In conclusion, digitization plays a disruptive role at three levels: (1) the efficiency of production units, (2) radical changes in industrial production chains, and (3) the creation of new markets through the deployment of two-sided platforms. Each of these effects contains, in turn, other disruptive sub-effects (see *Figure 2-8*).

Disruption does not occur simultaneously in an industry. Every sector includes leaders who adopt the new production model in its first stage and then focus on actively expanding it into large-scale production. The benefit of innovative foresight implies that, once the new paradigm is established, those companies that adopted it initially become dominant. This is true because returns on economies of scale and network effects are so strong that once leveraged by a leading company they tend to result in a dominant position.

As has been discussed so far, digitization of production is a fundamental factor in increasing the efficiency of production processes, with the additional potential to generate disruptive effects that, despite the implied volatility that they entail in traditional chains, contribute to the creation of new business

**models**. With this framework of analysis, we can now examine the situation in Latin America. Our objective will be to analyze the cases of Latin American companies that can be considered leaders in digitization. The case studies will focus on understanding how these companies have created a competitive advantage derived from their digital transformation.



# DIGITAL DISRUPTION IN LATIN AMERICA

- 3.1. Disruption in the agricultural production chain: the case of Los Grobo
- 3.2. The creation of a two-sided platform: the case of Mercado Libre
- 3.3. Digitizing a production unit: the case of Copa Airlines
- 3.4. Competing in a market undergoing digital disruption: the case of Claro Video
- 3.5. Characteristics of Latin American digital innovators

# Chapter 3.

# DIGITAL DISRUPTION IN LATIN AMERICA

In "Change and the Entrepreneur" (1949), Schumpeter established that,

"...since entrepreneurship, as defined, essentially consists in doing things that are not generally done in the ordinary course of business routine, it is essentially a phenomenon that comes under the wider aspect of leadership."<sup>19</sup>

In this regard, Schumpeter associates the concept of entrepreneurship with that of innovation and industrial leadership. In fact, the author mentions further down in this essay that the entrepreneur does not necessarily have to be the inventor of a technology but the one who applies it to production. These concepts are valid for explaining the dichotomy observed in Latin America between the conclusions of the macro data presented in chapter 1 (lack of impact of digital technologies on productivity) and the activity of leading companies that have achieved substantial progress in terms of digital transformation. This chapter is focused on the study of four cases. Each one is presented to illustrate the disruptive mechanisms implicit in the digital transformation processes explained in Chapter 2:

- Disruption of a production chain
- Creation of a two-sided platform
- Streamlining of a production unit
- Disintermediation of a traditional production chain

<sup>19</sup> Schumpeter, J. A. *Essays on entrepreneurs, innovations, business cycles and the evolution of capitalism* (edited by Clemence, R.) New Brunswick: Transaction Publishers, 1997, p. 259.

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# 3.1. Disruption in the agricultural production chain: Los Grobo

The first transformative effect of digitization is the disruption of production chains, which includes both the automation of discrete functions and the reduction of transaction costs. Los Grobo is a paradigmatic case of this effect.

Los Grobo is an Argentine agribusiness company specializing in the production of cereals and oilseeds, which operates in Argentina, Brazil, Paraguay and Uruguay. The company grows 267,000 hectares and generates revenues of US\$1.727 billion (2014) from the sale of 2.701 billion tons of wheat, corn, soybeans and sunflower<sup>20</sup>. Los Grobo employs 660 professionals (193 of which are based in Argentina, whose function is to plan and monitor production, purchase of inputs (seeds and fertilizers) and sell of the final product.

However, the company does not own 90% of the land it cultivates nor does it employ most of its workers. In a streamlined fashion, the traditional agricultural production chain includes the acquisition and storage of agro-inputs, production, (including crop planning, planting and harvesting), and collection (including commercial and logistics operations). The vertically integrated traditional agricultural model is based on ownership of land and machinery, and the concentration of information with the landowner in the production processes. In contrast, Los Grobo's organizing principle is the capacity to coordinate a series of contracts with owners who lease their lands, contractors who carry out sowing and harvesting operations, and suppliers of agro-inputs (see *Figure 3-1*).

While the company's business model is constantly mentioned in terms of a "networked business", this refers to a vision that runs counter to the traditional hierarchical structures of agriculture business. On the one hand, Los Grobo leases land to carry out its own production. On the other hand, the concept of network refers to the contractual relationships established by the company with independent farmers<sup>21</sup>. The relationship with independent farmers is led by Responsible Technicians, company partners responsible for managing the production process in relevant areas. Furthermore, production planning and monitoring tasks are centrally coordinated and supported by a highly developed digital technology infrastructure<sup>22</sup>. It can therefore be understood that the network organization of Los Grobo constitutes an outsourcing of the production function<sup>23</sup>, according to the concept of the production chain in economic terms as

<sup>&</sup>lt;sup>20</sup> Artopoulos, A. *Desarrollo Informacional en América Latina. Casos de Pioneros de Buenos Aires* (1980-2014). Doctoral Thesis, Universitat Oberta de Catalunya Internet Interdisciplinary Institute Doctoral Program on the Information and Knowledge Society.

<sup>&</sup>lt;sup>21</sup> More than 90% of the area managed by Los Grobo corresponded to third-party fields under contract with different forms of association with landowners and investors.

<sup>&</sup>lt;sup>22</sup> Cabrini, S., Diaz Hermelo, F., Forteza, J. and Kosacoff, B. Los Grobo. Universidad de San Andres, 2007.

<sup>&</sup>lt;sup>23</sup> This is not necessarily the prevailing business model in the agricultural sector. In Argentina alone, Cresud, a large agricultural company, controlled 85% of cultivated land under a hierarchical structure.





# Los Grobo: Organization of a production unit

presented above, it is understood that the network organization of Los Grobo constitutes an outsourcing of the production stage. Additionally, Los Grobo has internalized the collection function, since it owns numerous storage facilities that enable the company to arbitrate local prices between departure points. When it comes to transportation and logistics, the company manages and coordinates a network of partners for the transportation of inputs and harvests, without owning any physical assets.

Although there is still a vertically integrated production model in the agricultural industry, the case of Los Grobo in the oilseeds business<sup>24</sup> demonstrates a radical change in the traditional production chain based on the assimilation of digital technologies in production, management and logistics processes. The vertically integrated traditional model is based on ownership of land and machinery and the processing of information in the production processes (Bisan et al., 2005). In contrast the organizing principle of Los Grobo is the capacity to refashion production chains and outsource land ownership, sowing and harvesting<sup>25</sup>. While

<sup>&</sup>lt;sup>24</sup> It is important to mention that in the case of wheat, Los Grobo has integrated backwards following the acquisition of flour mills and the deployment of its own marketing network in Brazil.

<sup>&</sup>lt;sup>25</sup> It is interesting to note that the theoretical concepts that inspired Los Grobo in its disruptive model were brought to the company by Héctor Ordoñez, the first director of the Masters in Agribusiness program at the School of Agronomy at the University of Buenos Aires, who introduced the company's leaders to readings of the authors mentioned above, such as Williamson and Coase (see Ordonez, H. and Nichols, J. Los Grobo Case. Universidad de Buenos Aires and Texas A&M University, 2003 and Ederer, P. Los Grobo: Creating value in the agribusiness of the future. University – EFAS, 2013.)

the Los Grobo model is not yet prevalent, its introduction has been associated with an increase in Argentina's agricultural productivity (see *Graph 3-1*).

The Los Grobo business model is based on an advanced technological infrastructure that includes an agricultural production system developed in-house (GroboSoft), integrated with a customer relationship system (CRM), a business management system complemented by a Business Processes Administrator, a geographic information system (GIS) and business intelligence tools. In addition, the decision-making and planning process is supported by agronomic simulation

#### Graph 3-1.





Source: Artopoulos (2015)

models aimed at quantifying risk in the portfolio of areas, crops and management. At the information management level for the production processes, applications based on satellite images have been developed in partnership with the Argentine company INVAP<sup>26</sup> for generating environmental maps and online monitoring of crop development.

In conclusion, digitization has been the key that has allowed Los Grobo to carry out a disruption of the agricultural production chain and to assume a leadership position in the agricultural business in the southern cone of Latin America.

# 3.2. The creation of a two-sided platform: Mercado Libre

Mercado Libre is an e-commerce platform operating in 12 countries in Latin America and Portugal. The company generates revenues of US \$651 million and employs 3,298 employees, 1,252 of which are based in Argentina. The site ranks first in terms of unique visitors to e-commerce sites in Argentina, Brazil, Chile, Colombia, Mexico, Peru and Venezuela<sup>27</sup>.

Mercado Libre's business model consists of three components: marketplace, payment platform, and digital advertising (see *Table 3-1*).

The marketplace model, typical of a two-sided platform, is leveraged by multiple network effects that feed back a dominant position in a market where "the winner takes all". As explained above, the network effect is defined as the feature that determines that the value of a service for a user depends on the number of other users who utilize the service. Therefore, network effects are economies of scale on the demand side, since the benefit to the user (and consequently his willingness to pay) increases with the number of members or users of the platform. Markets affected by high network effects are served by few competitors and, ultimately, tend to be markets where the winner takes all. In these markets, barriers to entry of new competitors are high and are determined by the platform's alreadyestablished user base. A market where the winner takes all is one in which a platform prevails over its competitors.

In the case of Mercado Libre, there are four network effects (see Figure 3-2).

<sup>&</sup>lt;sup>26</sup> INVAP is a state-run Argentine company (through the National Commission of Atomic Energy) that designs and builds complex technological systems, with a forty-year trajectory in the domestic market and thirty on the international stage. Its mission is the development of state-of-the-art technology in different fields of industry, science and applied research, creating "technological-packages" of high added value both to satisfy national needs and to enter external markets through export.

<sup>&</sup>lt;sup>27</sup> Source: ComScore, January 2015.

# Table 3-1. Mercado Libre: Business Model

Source of Revenue	Percentage of Revenue	Model for Monetization	Observations
MARKETPLACE	68%	Payment for position	Sellers pay an amount based on the positioning of their product
		Payment for transaction	Sellers pay a commission per product sold
	18%	Payment for processing	Sellers pay an amount for payment processed by the platform (equivalent to a percentage of the amount processed)
PAIMENT PLATFORM		Financing	Interest to be paid by the buyer for the financing of an acquisition
		Payment for shipment	Payments made by the seller
	14%	Payment for position	Sellers pay an amount based on the positioning of their product
Advertising, Classified Ads, And others		Announcement (banner)	Announcement linked to the customer site charged based on cost per impression
		Search notice	Customers pay per keyword on CPC
		Saas	Sellers pay an amount to prepare and maintain the site

Source: Mercado Libre

The effects on each side of the platform (1 and 3) are called "direct" and refer to the increase of value for users of each of the sides, depending on the number of affiliates. In this case, the most important direct effect is 1, in the sense that the greater the number of sellers, the greater the attractiveness of the platform and, therefore, the number of potential buyers becomes more important. The cross effects or "indirect" (2 and 4) represent the benefit received by one side of the platform because of an increase in members on the opposite side. In the case of Mercado Libre, the greater the number of sellers in the marketplace, the higher the number of offers, the greater the competitive intensity among sellers and, consequently, the greater benefit for buyers (effect 2). On the other hand, the higher the number of visitors, the greater the benefit for sellers (effect 4).

The multiple network effects tend to feed back, generating a scenario of growth in the number of unique visitors. Currently Mercado Libre tops the ranking in unique visitors in Argentina, Brazil, Chile, Colombia, Mexico, Peru and Venezuela. This in turn results in a dominant position in sales volume (see *Table 3-2*).

Mercado Libre's payment and delivery platform responds to a strategy of "nested bundling". Bundling of nested components implies that the use of one component provides access to the use of the second one. Therefore, if a seller uses the

# Figure 3-2. Mercado Libre: Network effects on the platform



platform to sell a product, it is very likely that he will acquire the platform's service to process the payment and guarantee the shipment. Accordingly, in addition to the link with the commercial transaction, the payment platform is also boosted by network effects.

Mercado Libre also has certain characteristics in common with Los Grobo in that digitization allows for outsourcing several functions in the retail chain to sellers

Company	Total number of unique visits per month	Gross Sales
Mercado Libre	47,227,000	\$7,150,800,000
B2W Digital	30,701,383	\$3,155,742,000
Nova Pontocom	15,055,686	\$2,285,112,708
Walmart	17,650,242	\$795,000,000
Amazon	27,135,173	\$750,624,000
Netshoes	20,195,129	\$741,565,136
Magazine Luisa	10,989,683	\$664,656,007
Máquina de Vendas	7,362,842	\$405,193,193

Table 3-2.

# E-commerce in Latin America (2015) (in US\$)

Sources: Internet Retailer; Mercado Libre Annual Report

and buyers while retaining the strategic control point of the transaction, which is the relationship with the seller. Buyers and sellers perform most of the functions associated with traditional retail operations. Sellers decide what products to offer, how much to charge, and how to market them. Similarly, sellers fulfill packaging and shipping or purchase that service from Mercado Libre. Finally, service quality is controlled by members on both sides of the two-sided platform: buyers and sellers.

# 3.3. Digitizing a production unit: Copa Airlines

Copa Airlines is a Panama-based passenger and cargo transportation company with 355 daily flights between the Panamanian hub and 69 destinations in 30 countries in the Americas. With revenues of US\$2.166 billion, the operating margin of the company is 12%<sup>28</sup> (2015). Copa Airlines' strategy is to continue to expand in the Americas and the Caribbean (particularly Colombia), reduce costs through efficient fleet utilization and reduced distribution costs, and provide a superior service experience to its passengers.

The company operates in an environment of high competitive intensity (see *Figure 3-3*).

As *Figure 3-3* depicts, Copa Airlines operates in a highly intense competitive environment, competing with either regional (TACA, and less so, Avianca) or global players such as Delta, American and Latam. The high level of vertical fragmentation raises the issue of supplier power. At the same time, excess capacity has resulted in increased buyer power. In the context of this situation, the two most important factors to be controlled for an airline are the bargaining power of suppliers (especially airports), and the power of buyers (especially global distribution systems such as Amadeus, Sabre, and Mercator, and Internet platforms like Despegar.com, Expedia, and Almundo.com).

As far as the first factor is concerned, since airports are typically in the hands of governments, they must respond to economic and financial constraints that require them to generate an adequate rate of return regardless of the economic situation, which imposes pressure on airlines. Copa Airlines is in a less problematic position regarding the power of airports. The airline has some degree of monopsonic power since 80% of Panamanian airport flights are generated by Copa, which increases its bargaining power vis-à-vis the airport. Moreover, the carrier has vertically integrated maintenance and service activities at Panama City airport, which reduces its economic risk.

<sup>28</sup> In 2014, it was 19.2%.





Source: adapted from Treetheway et al. (2003)

On the other hand, airlines compete directly with global distribution systems and travel agents who, because of their market power, can extract supra-competitive fees<sup>29</sup>. To deal with the erosion of profitability due to the market power of distributors, Copa Airlines has accelerated its digital transformation to increase sales volume through the direct Internet channel. Currently 66% of sales are generated by travel agents and OTAs (Open Travel Alliances), 12.7% by their offices, 3.0% by customer service centers and 18% by Internet through the Copa website. The airline's goal is to grow the percentage of sales generated by this last distribution channel.

In addition, airline profitability depends on three factors: yield (calculated as the sum of revenue divided by the number of passengers/km), load factor (calculated

<sup>&</sup>lt;sup>29</sup> The rate of return per invested capital for global distribution systems is 26% and 20% for travel agents while airlines return 4%, a rate below their capital cost of 7% to 10% (IATA, 2013).

as the ratio between number of passengers/km and available seats/mile available), and cost (calculated as all operating expenses divided by available seats/km) (see *Figure 3-4*).

# Figure 3-4. Formula for airline profitability

PROFITABILITY = (YIELD \* LOAD FACTOR) - COST

According to this formula, digital technologies play a key role in the strategic and operational management of airlines, enabling geographic coverage, economies of scale and scope. Digital applications allow the optimization of capacity and revenue generation. The industry value chain allows the identification of numerous areas where digitization plays a key role (see *Figure 3-5*).

## Figure 3-5.

# Input of digital technologies in the value chain

INFRASTRUCTURE, HUMAN RESOURCES, AND TECHNOLOGY	SUPPLY	OPERATIONS	DISTRIBUTION AND SERVICE
<ul> <li>Financial models</li> <li>Training systems</li> <li>Reservations systems</li> <li>Product development</li> <li>Market research</li> <li>Partner management</li> <li>Relationship with investors</li> <li>Operational policies</li> </ul>	<ul> <li>Yield and price management</li> <li>Route planning</li> <li>Fuel management</li> <li>Flight planning</li> <li>Crew planning</li> <li>Catering</li> <li>Passenger service</li> <li>Monitoring of competition</li> </ul>	<ul> <li>Coordination of hub</li> <li>Reservation and emission of tickets</li> <li>Screening, check-in, and gate operation</li> <li>Cargo management</li> <li>Aircraft operations</li> <li>Baggage systems</li> <li>Management of critical events</li> <li>Safety procedures</li> </ul>	<ul> <li>Market segmentation</li> <li>Distribution mechanisms</li> <li>Promotions and special offers</li> <li>Online sales</li> <li>Management of frequent fliers</li> <li>Programs for travel agents</li> <li>Group sales</li> <li>Billing</li> <li>CRM</li> <li>Complaint tracking</li> <li>Lost luggage</li> </ul>
ECONOMIC VALUE			

Copa Airlines has implemented several applications designed to streamline each of these functions, especially those relating to passenger service:

- Mobile application for providing customer service (billing, display map of seats, management of loyalty program, flight status, etc.)
- System for personalization of passenger service, operating in the cloud
- Virtual customer service agents (which handle 50% of Copa's interactions with passengers)

The digital transformation related to deployment of applications whose objective is to streamline sales and passenger services functions has resulted in a systematic improvement in performance metrics (see *Table 3-3*).

#### 2008 2009 2010 2011 2012 2013 Growth in capacity 12% 12% 10% 20% 24% 14% Growth in traffic 15% 10% 14% 21% 23%

Table 3-3.

Copa Airlines: Performance Metrics

16% 11% Load factor 75.9% 74.6% 76.9% 76.4% 75.4% 76.7% 76.7% 75.3% Revenues 1,415 1,256 1,415 1,831 2.249 2.608 2.705 2,250 Operating costs per seat mile 10 25 10.28 10.83 11.15 11.03 10.52 9.15

Source: Copa Holdings S.A. (2014); Copa Holdings 10K

2014

9.5%

2015

4.4%

As can be seen in Table 3-3, since 2013 Copa Airlines has experienced slowed growth in capacity (in terms of fleet growth) and, despite the impact of the Brazilian crisis on total revenues, the carrier has been able to maintain the load factor, continuing to reduce of operating costs. In other words, the digitization of operating and passenger-facing functions has allowed the company to cope with the traffic reduction of the last two years.

# 3.4. Competing in a market in disruption: Claro Video

In its origin, the traditional value chain of video content distribution was composed of four types of participants (see *Figure 3-6*).

Historically, the value chain included only one type of vertically integrated player: the stations produced content, "packaged" it into channels (according to generic criteria of audience segmentation) for distribution, and distributed it by radio

## Figure 3-6.

# Traditional Value Chain for Video Content Distribution



signals to the audience who received the signal through devices purchased from equipment manufacturers. The affiliated channels were simply distribution companies for the signal produced by broadcasters. In parallel with the production of broadcast content, there were "specialists" (studios) producing only content.

With the emergence of cable television, initially developed to solve problems of signal distribution, a new type of player appeared. Cable TV operators initially did not participate in the production of content but dealt mainly with packaging and distribution. Given the technical capacity to transmit many more channels than those originally assigned to air stations, cable TV operators developed more refined audience segmentation and packaging strategies (channels for children, sports, news, etc.). Later, some cable TV operators integrated back into the content production business.

The first disruption of the traditional value chain was caused by the emergence of video stores that rented movies on VHS cassettes. Replicating the distribution model of the film industry, video stores (originally independent and later integrated horizontally into channels such as Blockbuster) represented a disruptive offer intended to disintermediate distribution operators. At the same time, the video stores offered content producers (studios) the possibility of capturing significant income from the distribution business (beyond the profits generated by film distribution and the rights paid by broadcasters and cable TV operators)<sup>30</sup>.

The original disruption of videocassette rentals paved the way for the release of Netflix in the United States, originally based on the distribution of DVDs and later video streaming. It is important to mention that this technology also facilitated

<sup>&</sup>lt;sup>30</sup> The studios charged US\$100 per copy of a new film, which was rented on average for US\$8 for a period of two days.

numerous movements along the value chain: device manufacturers integrating backwards (Apple, Boxee, Roku), content producers integrating forward (Hulu), as well as the entry of non-traditional players such as Amazon and Walmart (see *Figure 3-7*).

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In parallel with the vertical integration movements along the production chain, operators like Netflix and Apple TV sought to expand geographically beyond the original U.S. market.

In the case of Latin America, this expansion has been leveraged by progress in household digitization. One survey estimates that 84.5% of Latin American households with fixed broadband service access movies and series online. This behavior is more widespread in terms of adoption in Mexico (89% of households) and Peru (90%), while in Brazil this percentage reaches 78%<sup>31</sup> (see *Table 3-4*).

Similarly to industrialized countries, the number of subscribers who decide to cancel their pay-tv service at home, replacing it by downloading online video products, is growing. According to the same survey mentioned above, 10% of pay TV subscribers in Latin America say they have already interrupted pay-tv service to subscribe to video streaming sites (hereinafter referred to as Video On Demand Over-the-top or VOD OTT). The number of subscribers to this service has already exceeded 10 million (see *Table 3-5*).

# Figure 3-7.

# **Current Value Chain for Video Content Distribution**



<sup>31</sup> Business Bureau. *Manifiesto de Nuevos Medios 2014*. Buenos Aires, 2015.

Variety and personalization are two key variables in enhancing the indirect network effects of VOD OTT platforms.

# Variety & personalization


#### Table 3-4. Degree of Access to Video Content through Internet (2014)

	Unique Viewers ('000)	Average annual videos per view
Argentina	15,764	8.2
Brazil	64,812	163.1
Chile	5,183	119.4
Colombia	11,357	134.7
Mexico	21,416	102.9

Source: ComScore

Leveraging its U.S. streaming model, Netflix has managed to build a dominant position in Latin America<sup>32</sup> (see *Table 5-6*). In the case of Netflix, the subscribers (members according to the company's reports) total 27,438,000 worldwide. According to *Dataxis*, by mid-2014 Netflix had 2,455,000 subscribers in Latin America, while by the middle of 2015 it had reached 5,060,000<sup>33</sup> (see *Table 3-6*).

#### Table 3-5.

#### Latin America: Number of Subscribers to VOD OTT (June 2015)

	Suscribers
Mexico	4,794,000
Brazil	3,060,00
Argentina	643,000
Colombia	621,000
Chile	306,000
Others	776,000
TOTAL	10,200,000

Source: Dataxis (2016)

<sup>32</sup> According to usage statistics, the other OTT video-streaming operator with activity in Latin America is Google Play Movies, although its adoption is significantly lower than that of Netflix given that its launch has been recent. This service was first introduced in the markets of Mexico and Brazil, and because of its success, in March 2014 Colombia, Chile, Uruguay, Costa Rica, Ecuador, Bolivia and Paraguay joined. Finally, in June 2014 Argentina joined. Unlike Netflix, Google Play does not have a monthly subscription, since it offers the possibility of buying movies online (between US\$9.30 and US\$16.40) or the possibility of renting movies for a value that fluctuates US\$1.90 and US\$3.50. This last possibility allows unrestricted viewing for 48 hours from the moment of its first reproduction.

<sup>33</sup> Digital TV Research. *Counting Netflix by country*.

		Suscribers to web-streaming ('000)		
Year	Global Revenues (US\$ '000)	United States	International	Latin America
2009	1,670,270	11,892	0	0
2010	2,162,620	17,935	333	0
2011	3,204,580	21,671	1,858	309
2012	3,609,280	27,146	6,121	1,965
2013	3,463,765	31,712	9,722	1,965
2014	4,739,495	37,968	16,778	2,455
2015	6,133,774	43,401	27,438	5,060

#### Table 3-6. Web Streaming Revenues and Subscribers

Sources: Netflix Annual Reports. Digital TV Research; analysis by gA Center for Digital Business Transformation

Returning to the concept of platform presented above, Netflix depicts a similar business model (see *Figure 3-8*).

However, the nature of the Netflix platform is different from that of Mercado Libre in one fundamental aspect. Mercado Libre is what is called a matching platform where the value proposition is to link participants on both sides of the platform (sellers and buyers) who have a variety of needs (in other words, allow a buyer with specific needs to find their desired product). In this sense, the indirect



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network effects between the two sides are enhanced by the multiplicity of offers and buyers (the more sellers, the more buyers, and vice versa). In a different way, **Netflix's value proposition is based on the concept of a variety platform**. In this case, indirect network effects increase with the variety of content on one side of the platform. In other words, the more the videos offered by the platform are varied and tailored to the needs of the subscribers, the greater the possibility of growing the subscriber base. Variety and personalization are two key variables in enhancing the indirect network effects of VOD OTT platforms.

Due to the importance of these two variables, Latin American VOD OTT is highly fragmented in terms of the number of offers: there are generalist suppliers as well as niche players specialized in a single type of content<sup>34</sup>. At the same time, of the 94 platforms available, there are numerous providers related to the major telecommunication and media operators (see *Table 3-7*).

In this context of market fragmentation, América Móvil, one of two main telecommunications operators in Latin America, launched Claro Video in 15 Latin American countries<sup>36</sup> to compete directly with Netflix. (see *Table 3.8*)

Claro Video's objective has been to accelerate its growth in Latin America through a strategy that combines content growth and partnerships with studios (Castañares, 2016). While it accelerates its catalog growth, Claro Video focuses on competing with a lower price compared to Netflix. For example, in 2015, Netflix

#### Table 3-7.

#### Latin America: Providers of Video-Streaming Services (6/2015)

Providers	Corporate Relationship	Suscribers ('000)
Netflix		5,060 (57.5%)
Claro Video	América Móvil	2,550 (25%)
Sky Online	AT&T	N/D
Blim	Televisa	144 (1.5%) <sup>35</sup>
Terra TV	Telefónica	N/D

Source: Dataxis

<sup>&</sup>lt;sup>34</sup> For example, the website Conectate.gov.ar is a public website that offers only Argentine films.

<sup>&</sup>lt;sup>35</sup> Assumed to have 3% of the Mexican market, since 96% is between Netflix and Claro Video (Source: http://www.milenio.com/firmas/fernando\_mejia\_barquera/Blim-Televisa-obligada\_18\_690111019.html)
<sup>36</sup> Argentina, Brazil, Colombia, Chile, Dominican Republic, Ecuador, Peru, Costa Rica, El Salvador, Guatemala, Honduras, México, Nicaragua, Uruguay, and Panama.

#### Netflix versus Claro Video (2016)

	Netflix	Claro Video
Catalog (total)	8,589	3,729
Local catalog	281 (in Latin America)	634
International catalog	3,448 (in Latin America)	1,820
User Interface features	<ul> <li>Guide to movies by genre</li> <li>Movie description</li> <li>User reviews</li> <li>Recommendations</li> </ul>	Guide to movies by genre     Movie description
Accessibility	Android, iOS, Windows Phone, smart TVs, video consoles (PS3, PS4, Wii, Wii U, Xbox 360, Xbox One, decoders, Chromecast)	Windows 8, iOS, Android, certain smart TVs, Apple TV
Price (Mexico)	<ul> <li>Basic: 99 Mexican Pesos per month (1 SD device)</li> <li>Intermediate: 109 Mexican Pesos (two HD devices)</li> <li>Premium: 149 Mexican Pesos (four devices and UHD content)</li> </ul>	<ul> <li>69 Mexican Pesos per month (up to 5 devices)</li> <li>Promotion: Infinitum (free service for 1 year)</li> </ul>
Price (Argentina)	<ul> <li>Basic: US\$7.99 per month (1 SD device)</li> <li>Intermediate: US\$9.99 per month (two HD devices)</li> <li>Premium: US\$11.99 per month (four devices and UHD content UHD)</li> </ul>	US\$5.93 per month (2 devices)     Promotion: 6 monthe free for Claro's     postpaid subscribers
Price (Brazil)	<ul> <li>Basic: US\$7.99 per month (1 SD device)</li> <li>Intermediate: US\$9.99 per month (two HD devices)</li> <li>Premium: US\$11.99 per month (four devices and UHD content UHD)</li> </ul>	• US\$6.14 per month <sup>37</sup>

Sources: Dataxis, Netflix, Claro Video

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Mexico increased the price of its basic service from 99 to 100 pesos, while Claro Video kept it at 69 pesos. Beyond the pricing strategy, Claro Video took the initiative in the field of original content by offering free transmission of the Olympic Games in Rio de Janeiro in 2016.

Claro Video's strategy is a concrete example of classic entry into a platform market. In general terms, dominance in the digital products and services market is governed by two comparative advantages: classic economies of scale and network effects. Economies of scale represent the economic advantages that firms achieve based on their size, production volume or size of operations. Depending on these, the unit cost of the product tends to decrease with a volume increase to the extent that fixed costs can be distributed among a higher number of units produced. In so far as a firm has improved economies of scale, these can result in

<sup>&</sup>lt;sup>37</sup> http://zh.clicrbs.com.br/rs/entretenimento/tv/noticia/2016/07/saiba-como-economizar-em-netflix-spotifynet-now-e-outros-servicos-de-streaming-6402719.html

higher barriers to market entry given that competitors cannot offer products at comparable prices. In the case of VOD OTT, the costs of R&D, programming and infrastructure are important. Therefore, if a firm has the possibility of winning subscribers in a shorter period of time than its competitors, it has an advantage in terms of being able to achieve a positive return on investment before the rest of the industry. This was Netflix's position at the time Claro Video entered the market. Netflix's worldwide spending on technology and development related to the modernization of its video-streaming platform<sup>38</sup> in 2015 amounted to US\$651 million. To the extent that this investment benefited its global operations, it is reasonable to regard it as a barrier to entry.

Beyond economies of scale on the supply side, Netflix would also benefit from network effects. The network effects in digital services represent the fundamental barrier to the entry of new competitors. The power of network effects appears in many ways. For example, because of the costs a user must incur in adhering to more than one digital platform or the high cost of changing from one system to another, users tend to adhere to a single platform: a single social network, single search engine, operating system. While the cost of hosting more than one digital platform is relatively low for a user, operators are continually seeking to increase the content and applications associated with their product to dissuade consumers from joining more than one product. For example that is LinkedIn's strategy, acquired by Microsoft in June 2016, to continue positioning itself as the leading professional social network<sup>39</sup> with 433 million users worldwide.

As mentioned in the prior cases, markets that operate under the condition of high network effects tend to be served by few competitors. This is especially true if the needs of consumers are homogeneous (in other words, undifferentiated). In this case digital markets tend to concentrate on the high expectations regarding the size of the network. That is why if the network effects are high and the needs of consumers homogeneous, there is a market where "winner takes all". Under these conditions, a new entrant can only compete with the dominant platform if it offers a superior product, manages to segment demand in markets with idiosyncratic needs, or subsidizes the cost of switching<sup>40</sup>.

We can turn now to the case of Claro Video in its confrontation with Netflix (see *Figure 3-9*).

<sup>&</sup>lt;sup>38</sup> Including software maintenance, enhancement of the interface with the subscriber, system of recommendations, telecommunications infrastructure and streaming technology.

<sup>&</sup>lt;sup>39</sup> Multi-hosting costs are added to the cost of switching in order to cement the network effects and "lock in" the user (see Eisenman et at, 2006)

<sup>&</sup>lt;sup>40</sup> All of these observations do not imply a value judgment, but rather reflect the implicit characteristics and business models of digital markets.

Netflix's market share in Latin America has been declining since its launch in September 2011, while Claro Video is increasing its share by leaps and bounds.



#### Figure 3-9. Competition between platforms

Source: gA Center for Digital Business Transformation

In general terms, the entry of a challenger into a platform market is based on the offer of a product that represents a leap forward in terms of functionality: better features and/or greater technical capabilities. However, the VOD OTT market presents two particularities that can broaden the range of entry options for a challenger. First, because it is a market based on variety platforms, an entry strategy may not be based on a leap in technical functionality but on an increase in the variety of content. In fact, the Claro Video platform is less sophisticated than Netflix. Secondly, to the extent that subscriber needs are not homogeneous (the Latin American consumer requires a more targeted approach to linguistic idiosyncrasies and local programming), the challenge may be based on offering a greater wealth of local content. This advantage is even more important given the technical and strategic barriers that a global player faces to adapt his product to regional needs. Consequently, Claro Video's first axis of entry is the increase in content, especially local. An analysis of the catalog of both competitors (Netflix in Latin America and Claro Video) conducted in 2016 showed that while the global operator had 281 films and shows of Latin American origin, the Mexican player had 634, double the variety of local content. This is leveraged by a lower price strategy.

The third strategic element of Claro Video is the bundling of the VOD OTT with telecommunications service. In accordance with the concept of bundling, Claro Video enters Netflix's space by packaging the functionality and price of the

telecommunications product with that of VOD. This is seen in both the product positioning strategy, reciprocal discounts between broadband and VOD OTT, and in terms of sales channels. In all countries of the region, except for Mexico, Claro Video limits access only to subscribers of telephone, Internet or pay television. This gives access to the captive market of América Móvil's subscriber base of 239 million cellphones and 22 million fixed broadband in Latin America<sup>41</sup>, and on the other hand, a package that reinforces the loyalty of mobile subscribers.

The sum of these four components (greater content, adaptation to the needs of Latin American content, price, and bundling) forms the basis for Claro Video's successful entry into the VOD OTT platform.

Because of this combined strategy, Netflix's market share in Latin America has been declining since its launch in September 2011, while Claro Video is increasing its share by leaps and bounds. For example, Netflix's market share in the Mexican market has dropped to 51.1% in 2015 from 96.8% in 2012, while Claro Video has already reached 46.4%<sup>42</sup> (see *Table 3-9*).

#### Table 3-9.

#### Mexico: VOD-OTT Market

	12/2014	06/2015	12/2015
Netflix	(64%)	2,235,000 (55.7%)	2,500,000 (51.1%)
Claro Video	(32%)	1,603,000 (39.7%)	2,300,000 (46.4%)
Others	(4%)	(4.6%)	(2.5%)

Source: Next news

At a regional level, analysts predict that Netflix's market share in Latin America will decline from 51.1% at the end of 2015 to 45.1% in 2021<sup>43</sup>.

In short, platform markets with high network effects do not guarantee barriers to the entry of new participants. In fact, platform markets can evolve according to successive competitive struggles based on functionality or content richness. At each stage, we can find a dominant winner. This is nothing more than the innovative dynamic that characterized Schumpeterian creative destruction.

<sup>&</sup>lt;sup>41</sup> América Móvil. Institutional Presentation. 4Q2015, p. 11.

<sup>&</sup>lt;sup>42</sup> At the end of 2016, Claro Video's market share declined as a result of Televisa's entry in the market through Blim.

<sup>43</sup> Source Dataxis.

#### 3.5. Characteristics of Latin American digital innovators

The analysis of four cases of digital innovation in Latin America allows us to draw four conclusions:

**1) Digital transformation is permeating all industrial sectors.** In just these four cases we observe the deployment of digital transformation strategies in the agricultural, retail, transportation, and media and telecommunications industries. This leads to the conclusion that virtually all industries can creatively exploit the opportunities implicit in digitization of operations and strategies.

**2) Digital innovation can result in disruptive strategies.** In three cases – Los Grobo, Mercado Libre, and Claro Video – the business model is based on a reformulation of the traditional production chain of the respective industries. However, and this is important to point out, perhaps only the example of Los Grobo represents an innovative case in the sense that this firm assembles many technological innovations into a new business model. In the other two cases, both models had already been introduced in the region. Mercado Libre takes e-commerce to a more advanced stage of development, while Claro Video shows how it is possible to break the indirect network effects of a dominant platform.

**3)** As a corollary to the previous point, **digital transformation should not be limited to the launch of platform-based business models**. Copa Airlines bases its digital strategy on innovating in customer operations and activities to cope with the pressures that affect the airline business.

**4)** Each case demonstrates the economic value generated from the digital transformation. Los Grobo is a company that generates revenues of US\$1.727 billion (2014), while Mercado Libre's net revenues are US\$651 million and those of Claro Video are estimated at US\$160 million<sup>44</sup>. Furthermore, the digital transformation of Copa Airlines allowed the airline to cope with a reduction in traffic caused by the economic crisis in Brazil.

<sup>&</sup>lt;sup>44</sup> Lucotti, F. *Los OTT ya superaron las 10 millones de cuentas pagas en Latinoamerica segun Dataxis* (March 19, 2016).



# DIGITAL TRANSFORMATION AS A CORPORATE STRATEGY

- 4.1. Development of a digital transformation strategy
- 4.2. Building a digital operating model
- 4.3. Assessing resources and capabilities needed to tackle a digital transformation
- 4.4. The process of developing the digital transformation strategy
- 4.5. The end result: a digital business strategy
- 4.6. Estimating the rate of return of a digital transformation

#### Chapter 4.

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## DIGITAL TRANSFORMATION AS A CORPORATE STRATEGY

In the previous chapters, we defined digitization as a technological discontinuity that affects the competitive environment and restructures the organization of industries. In this context, digital transformation should not be interpreted as merely adopting digital technologies to automate processes and reduce labor costs. Were that the case, the digitization of production processes would be no more than the technological consequence of a predetermined strategic imperative: reduce cost, or grow sales. In other words, in paradigms that are today considered obsolete, technological strategies depended on the construction of corporate strategy. In this new environment, it is impossible to differentiate corporate strategy from digital transformation. In our view, **digital transformation is the strategy**.

The conceptual implication of this thinking is that the development of a corporate strategy based on digital transformation cannot be addressed in the same way as strategies were defined in the past. In that sense, the current challenge is how to consider strategic issues within a digital frame of reference. In Chapter 2 we argued that the disruptive nature of digitization manifested itself in three dimensions: (1) the enhanced efficiency of discrete production units, (2) radical changes in industrial production chains, and (3) the creation of new markets through the deployment of two-sided platforms. Influenced by these three

dimensions, a corporate digital transformation strategy must address five key questions:

- How can specific functions be streamlined?
- How can transaction costs between the stages of the value chain be reduced?
- Similarly, can these costs be reduced in relation to providers of outsourced functions? Recall from these first three questions the example of Copa Airlines presented in Chapter 3.
- Is it possible to leverage the digitization of processes to "virtualized" or disintermediate stages of the value chain? This was the question asked by the executives of Los Grobo in the redesign of the agricultural value chain.
- How can direct and/or indirect network effects be leveraged to create a competitive advantage in a platform business? This was how Mercado Libre defined its business model from an e-commerce platform and Claro Video became a successful competitor of Netflix.

The process of strategic reflection based on answering these questions necessarily leads to the definition of a new operating model. In our view, this raises two fundamental issues to be addressed in this chapter:

- What is the conceptual framework that we must follow to define the digital transformation strategy? Or put another way, what are the questions we should ask ourselves in the process of developing the strategy and how does the answer guide us in defining the new operating model? Can we understand this process of elaboration as highly structured-where the answers to a series of questions lead to predetermined conclusions? Or alternatively, should we prepare ourselves to manage a process guided by creativity, unstructured thinking, and counterintuitive conclusions?
- What kind of process should we follow to define the new digital transformation? Who should we involve in the process? What are the mechanics of involving individuals or functions that participate in this process? For example, should we seek a massive collective participation, where strategic reflection is shared at all levels? Or alternatively, do we design the new strategy through result of a thought process carried out by a small group of executives? How do we create a process that ensures that a company's creative and innovative energy constitutes an essential component of this thinking? How do we ensure that the process has an internal focus but at the same time analyzes the competitive environment and can identify the potential of new technologies? Do we just include the customer-facing functions (marketing, sales, customer service) in the strategic reflection process or do we also add the internal functions of logistics, technology, and operations?

These two questions will be tackled in this chapter. As will be seen, if the strategic thinking leading to the development of a digital transformation strategy requires unstructured creativity, an internal and external vision, as well as the involvement of all the functions of the company, this process is nothing but trivial. Moreover, in many cases this dynamic can go against the culture of the company. Many business organizations are characterized by a highly hierarchical culture, where strategic thinking on digital transformation can be extremely complex. This is the theme of this chapter: first it focuses on how to guide strategic thinking for digital transformation, and then presents a 'how-to' guide on the process we must follow to achieve positive results. The specifics in this chapter are based on experience generated over the course of having supported numerous Latin American companies in similar ways.

#### 4.1. Development of a digital transformation strategy

The development of a corporate strategy is based on making decisions about what to do (and what not to do) to achieve a competitive position leading to superior and sustainable financial performance. These decisions comprise a set of consistent goals and policies that impact all the functions of the firm, aligning internal strengths and weaknesses with opportunities and threats in the environment. In this context, the concept of competitive strategy is based on two complementary perspectives: the first, following Michael Porter, is conceptualized as a "strategy based on the environment<sup>45</sup>", and the second, following theorists such as Edith Penrose (1996), is a "strategy based on the internal capabilities of the company<sup>46</sup>".

According to the first view, a company's strategy must identify the industries in which it competes and how it does so, the target markets, its competitors and market defense mechanisms, as well as its value proposition. According to the second perspective, the strategy based on internal capabilities establishes that competitive advantage is the result of the use of the firm's resources (brand power, access to scarce raw materials) and capabilities (innovation, ability to react

<sup>&</sup>lt;sup>45</sup> The essence of formulating competitive strategy is relating a company to its environment. The key aspect of the firm's environment is the industry in which it competes. Competition in an industry continually works to drive down the ROIC toward the return that would be earned in a perfectly competitive industry. Therefore, the goal of competitive strategy is to find a position where the company can best defend itself against these competitive forces or can influence them in its favor.

<sup>&</sup>lt;sup>46</sup> "All the evidence we have indicates that the growth of firms is connected with the attempts of a particular group of human beings to do something (...) there are important administrative restraints on the speed of the firm's growth. Human resources required for the management of change are tied to the individual firm and so are internally scarce. Expansion requires the recruitment of more such resources. New recruits cannot become fully effective overnight. The growth process is, therefore, dynamically constrained." (Penrose, 996)

quickly to changes in the environment). To clarify, the first perspective suggests that success lies in finding attractive markets and environments (for example, with low entry barriers, low competitive intensity). The second perspective considers that strategy is based, as a priority, on leveraging the company's internal capabilities. Obviously, we do not consider both views mutually exclusive but complementary and necessary in the development of a digital transformation strategy. However, the starting point for each of one is different. According to the first perspective, we must define what will be the new digital model of the company focused on the disruption of traditional value chains. Per the second view, we must evaluate our internal capacities to determine our "degree of maturity" to carry out the digital transformation. Both dimensions influence the process of strategy formulation that should guide digital transformation.

#### 4.2. Building a digital operating model

The construction of a digital operating model begins by mapping the company's current situation in terms of the key competitive and economic forces in which the firm operates. In our consulting work, we use the analytical framework of "canvas"<sup>47</sup>. The starting point in our methodology is based on the original business canvas. In *Figure 4-1* we present, as an example, the original business canvas of an appliance manufacturer.

As can be seen in *Figure 4-1*, the original business model canvas includes the company's key activities, value proposition to the market, which segments are served and partnerships.

Once the original model of the company is conceptualized, the process of strategic thinking leading to defining digital transformation can begin. This process should be guided by the following four key questions:

**Incremental digitization:** How does digitization allow a company to be more competitive in the traditional business? For example: can incorporating digital technology make distribution channels more efficient, or change the cost structure?

**Disruptive digitization:** What new opportunities does digitization offer beyond the company's traditional business? What digital transformations can be introduced

<sup>&</sup>lt;sup>47</sup> The concept of canvas is a technique commonly used to show the architecture and business model of an organization. It was originally developed by Alex Osterwalder and Yves Pigneur. See Osterwalder, A. and Pigneur, Y. (2009). *Business Model Generation: a handbook for visionaries, game changes, and challengers.* New York: Wiley.

that result in market disruption and a displacement of competitors?

**Disruptive risk:** What are the obvious and not -so- obvious risks to my business arising from the digital transformation? What can competitors do to affect the traditional business model?

**Time horizon:** Once the answers to the first three questions are found, when can these take place? How long will it take to implement incremental or disruptive digitization? What is the window of opportunity that exists before competitors begin to disrupt the market?

Let's analyze each one of these questions in detail.

#### **INCREMENTAL DIGITIZATION**

Exploring changes in traditional business based on digitization must begin with a thorough understanding of the company's value chain. As described in Chapter 2, this includes both the functions executed within the company and those that are outsourced (see *Figure 4-2*).

Analysis of the value chain allows us to understand the economic decisions taken to outsource the acquisition of inputs or the performance of certain functions. At the same time, it allows us to quantify the transaction costs implicit in the interaction between internal or outsourced functions. This vision of the company generates a conceptual map that allows us to answer a series of questions based on a complete understanding of the possibilities of digitization:

- Are there functions that can be digitally transformed to reduce costs or increase the value proposition to the customer?
- Are there functions that can be outsourced through the interaction of digital platforms?
- Can we better integrate functions based on digital technologies to reduce transaction costs and stimulate collaboration?
- Similarly, is it possible to use digital technologies to decentralize and relocate functions to take advantage of lower costs?
- Can our company better integrate into global value chains based on digital technologies (e.g. implementing intelligent logistics models)?

#### Figure 4-1.

#### Original Canvas model of an appliance manufacturer



• Is it possible to redefine the relationship with the customer based on digital technologies (e.g. to allow better product customization, customer experience management, hyper-connectivity, etc.)?

To identify incremental digitization opportunities, the company must analyze certain key issues:

• Identification of enabling technologies (i.e. those digital technologies that have the potential to improve function performance).



Source: gA Center for Digital Business Transformation

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- Identification of digital assets within the company (some of these functions may already be implemented in a digitized framework within the company).
- Trends in other markets from which we can extrapolate lessons (what can be learned from other industries that are in a more advanced stage of digitization?).

As can be seen, "incremental digitization" comprises initiatives derived from the answers to these questions because our thinking seeks to optimize, rather than

radically change, the current business model. Let's look at some examples of opportunities that can be identified in an industry such as the commercialization of insurance policies (*Table 4-1*).

In this case, the identified opportunities consist of using digital technologies (artificial intelligence, the Internet of things (IoT), social networks, or digital channels) to improve the performance of functions within an insurance company.

In general terms, the goal of incremental digitization is to enhance the quality and productivity of the traditional business, automating and integrating processes internally and externally, implementing IoT solutions, mobility, advanced analytics, ensuring quality and fast availability of data for decisions, and facilitating execution at all points in the value chain. In this way, focusing on incremental digital transformation allows for adjusting the original model canvas, yielding an evolution of the current business based on digital technologies. Going back to the example of the appliance manufacturer, the new canvas shows numerous changes (see *Figure 4-3*).

For example, the scope of alliances has been extended to include social networks that enable us to increase the quality of our market intelligence. Similarly, the digitization of channels enables the deployment of virtual points of market entry. It should be noted, however, that this canvas displays progress over the traditional



#### Table 4-1.

#### Commercialization of insurance: Examples of incremental digitization

OPPORTUNITY	EFFECT OF DIGITAL TRANSFORMATION	ІМРАСТ	
Cost reduction	Commercialization of insurance: Examples of incremental digitization	e: Examples of Occupations susceptible to restructuring (placement agents, appraisers, adjusters, examiners, sales agents, claims processors)	
Cost reduction	Launching of "loT" systems for the prevention of accidents and better risk management		
Improvement of customer experience	Establishment of real-time mobile relationships with clients for holistic support commensurate with the lifestyle of each insured party	Increased client involvement and loyalty upon obtaining this personalized advice	
1			

Source: gA Center for Digital Business Transformation

model but continues to reflect the basic characteristics of the traditional model. This is the essence of its "incremental" character.

Once this model has been drawn up, the reflection process can be tackled based on disruptive digitization.

#### DISRUPTIVE DIGITIZATION

In this case, the strategic thinking aims to lead the company toward playing a disruptive role, which requires examining the industry in which it operates to identify new business opportunities. As defined in Chapter 2, disruption resulting from digitization includes three effects: 1) vertical integration or other structural change in the production chain of an industry to control strategic positions (as in the case of Los Grobo), 2) the disintermediation of stages in the production chain of an industry, based on function virtualization (as in the case of the music business), and 3) the creation of a two-sided market centered on a platform-based business (as in the case of Mercado Libre).

The guiding question for reflecting on disruptive digitization is identifying the new business opportunities offered by digitization that go beyond the traditional business. The analysis to answer this question begins by mapping the production chain in which the industry operates (not to be confused with the value chain of the company). For example, in Chapter 3 we presented the production chain of video content distribution (see *Figure 4-4*).



# ategic issues

The current challenge is how to think about strategic issues within a digital frame of reference.

#### Figure 4-3.

### Canvas of the incremental digital transformation model of a householdappliance manufacturer



As can be seen in *Figure 4-4*, the concept of production chain allows us to position players and evaluate them in terms of their strengths and weaknesses.

Once the production chain is conceptualized and analyzed in terms of economic and competitive aspects, the identification of disruptive digitization opportunities begins with a holistic analysis of the following factors:

• Evaluation of the business from a platform view



#### MMUDITT INFRASTRUCTURE COMMUNITUEVERT URGANIZATION

Source: gA Center for Digital Business Transformation

- Results of competitors' digital business strategy
- The appearance of new disruptive players
- The definition of potential benefits

Using this scheme, we can begin to formulate a hypothesis regarding the disruption of the production chain. Let's return to the example of the appliance manufacturing company discussed above (see *Table 4-2*).

#### Figure 4-4.

#### **Current Value Chain of Video Content Distribution**



As can be seen in *Table 4-2*, each of these opportunities introduces a change in the industry's production chain. The first eliminates a stage in the chain (after-sales service) and establishes the manufacturing company as a control point in the relationship with the customer. The second eliminates intermediaries in the supply

#### Table 4-2.

#### Appliance manufacturer: Example of digital disruption

OPPORTUNITY	EFFECT OF DIGITAL TRANSFORMATION	ІМРАСТ
Device connectivity (IoT)	Control different devices from a single point of control     Generation of automatic service for spare parts     Deliver products to self-service centers through automated and remote processes	New business models     Services prediction and product improvements     Maximize innovation in customer services
Supply chain	<ul> <li>Integration of entire supply chain</li> <li>Automated connection with suppliers</li> </ul>	Cost reduction in logistics and inventory management     Improvement in relationships with suppliers and customers
Migration to industry 4.0	Transformation of plants to automated mode     Adoption of Lot 1 production methodology     Customization of materials and flexibility at     the plant	<ul> <li>Improvement in the personalized offer</li> <li>Increase in brand loyalty</li> </ul>

Source: gA Center for Digital Business Transformation

chain, while in the third, by transforming production, the control point of the customer is reinforced through customization.

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In our view, there are four axes of disruptive digitization applicable to any business:

• Revolutionize the customer experience, ensuring an optimal and frictionless customer experience. This implies getting as close as possible to the customer's vision of the ideal experience.

• Transform data into intelligence: the digital revolution allows data to be collected and processed in volumes never seen before and transformed into intelligence. Data helps us generate predictive models of consumer behavior, identify when a deal can be closed, accurately measure transportation routes and optimize fuel consumption. With new artificial intelligence solutions based on data intelligence, solutions can be implemented that replace human behavior including learning new business rules. This allows implementing a vision based on information and ideal knowledge of market trends and customer needs.

• Generate new business models: One way to generate new business is to monetize digital assets and use them to build a new business, such as the Amazon Cloud. Based on the needs of its e-commerce business, Amazon developed key insight into managing a highly elastic, flexible and cost-effective infrastructure. Upon identifying the value of this knowledge, Amazon decided to launch Amazon Web Services as an independent business within a totally different market from the one that it had been serving originally.

• Search for application of platform-based business models: Digitization enables new business models, where the key value is based on generating a digital match between supply and demand. In many cases, this link does not require physical assets. Acting as a meeting point between bidders and applicants, the added value of "digital mediation" leverages the network effect as explained in Chapter 2 (the fact that multiple people contribute information about quality, use, and data improves the added value of the platform.) The platform-based business model has the following key features:

- A platform allows suppliers to connect with users intelligently way, facilitating value generation for all participants.
- The platform adds and uses external resources, which gives a much greater scalability than in the case of a traditional business;
- The community to which the platform is addressed is key in generating value, increasing the value created by the platform through information.

- The platform lowers or ideally eliminates costs based on innovative ways to generate information.
- The platform ideally seeks new mechanisms for service monetization. In a restricted version, it revolutionizes collaboration in the value chain<sup>48</sup>.

#### Figure 4-5.

#### Canvas of disruptive digital transformation model for an appliance manufacturer



#### COMMODITY INFRASTRUCTURE COMMON TO EVERY ORGANIZATION

<sup>48</sup> The case of Waze versus Garmin, the traditional provider of GPS devices, is a clear example of a business where the vision of the platform changed the paradigm of traffic and location management. Garmin is one of the pioneers of GPS business worldwide. In its traditional model, it produces its own maps with internal resources, monetizes the business through the sale of GPS devices and updated maps, and feeds on traffic information from antennas located at strategic points. In this model, business scalability

Thinking around these key dimensions yields a new digital canvas of the disruptive model. It shows a true transformation of the business, migrating the differentiators, from the capacity to efficiently manufacture products to generating intelligence for these products whether own or third-party brands. In this scenario, third-party brands, currently competitors, become platform customers (see *Figure 4-5*).

#### Intelligent Appliance

- · Monitor key usage data: temperature, vibrations, electric consumption
- · Alerts and automatic maintenance schedule triggering

#### PAY SPECIAL ATTENTION TO:

VALUE CREATED BY INTERCONNECTION WITH OTHER SERVICE PROVIDERS. FOR INSTANCE % SHARE OF ORDERS DELIVERED BY AMANZON.

#### PLATFORM INTELLIGENCE

#### **Cognitive Capabilites**

- · Energy and other consumables prediction
- Inventory Level Prediction capabilities
- Alarm Detection

#### Cognitive Capabilities in the extended ecosystem

· Consumer - Provider intelligent matching

#### MONETIZATION MECHANISMS

Home Appliance Rental Commissioning in ordering Advertisement "App Appliance" Developer Ecosystem

#### MARKET SEGMENTS

**Corporate Consumers** By Size, Geography

#### **End Consumer**

- Young single Adults
- Literacy

#### **Young Couples**

- Initial Home Ownership
- Children

#### Families

- · Couple Income
- · Support of close relatives

#### **Empty Nester Trends:**

- "Green"
- "Hyper-connection" aligned with "digital" "Customization"
- "Collaborative Consumption"
- "In-store mobile services"

PAY SPECIAL ATTENTION TO: INCENTIVES FOR VENDORS TO BE PART OF THE PLATFORM

#### COMMODITY INFRASTRUCTURE COMMON TO EVERY ORGANIZATION

Source: gA Center for Digital Business Transformation

depends on the sales capacity of new devices, and therefore, on the efficiency of the production and distribution chain. The business model has relatively high costs derived from the maintenance of antenna infrastructure and map-updating equipment. Waze's approach is totally different. Waze generates maps and traffic information based on crowdsourcing of information provided by the cellular devices of its users. Waze monetized the business based on the sale of geo-localized advertising.

The canvas of the appliance manufacturer's disruptive model now shows changes in the value chain, such as the emergence of platforms for the fulfillment of related functions, intelligence, and manufacturing, and delivery of product to the end user. Note that this model closely resembles the network concept used to describe the Los Grobo agricultural model. Located at the heart of the value chain, the appliance manufacturer is transformed into an information processor, enabling the possibility of virtualizing or outsourcing a series of traditional functions.

#### DISRUPTIVE RISK

Digitization is not just an opportunity for the company facing transformation. This revolution also involves the risk that a traditional or new competitor enters the industry, leveraging a digital business model, and commoditizes or eliminates the traditional company. Digitization creates risks that are often difficult to predict, since competitors may arise from unthinkable sectors. In the case of Amazon Cloud, traditional players like IBM and HP saw a competitor emerge on an e-commerce platform. Garmin saw Waze appear from the software industry. Today traditional banks feel threatened by new disruptive financial initiatives (Fintech). In all these cases, traditional barriers to entry lose value quickly, putting significant portions of the business at risk.

The paradigmatic example of this risk is the entry of e-commerce platforms into the retail business. Retail chains have generally been slow to address their digital transformation. In this regard, the digital distribution of e-commerce represents a radical change in the structure of the business: the costs of finding the product required for the consumer are significantly lower, delivery is mostly to a residence and free, while product information and recommendations are extensive. The response of traditional businesses to the strategic threat of e-commerce platforms has not been easy. Traditional "brick and mortar" distribution chains are not particularly adept at innovating since their performance metrics focus on traditional incentives such as hourly sales, compounded but the fact that they lack systems to support omnichannels.

To identify disruptive risks, we must analyze:

- The moves of competitors in their digital business strategy;
- The appearance of new disruptive players;
- The definition of risks (what are the value chain's stages in the industry's production chain where new disintermediation players could emerge?)

*Table 4-3* summarizes the potential risks that a digital operator may bring to physical distribution stores.

RISKS	EFFECT OF DIGITAL DISRUPTION	ІМРАСТ
Mobile Capacities (Shop on the go)	<ul> <li>Search and compare products through smartphone applications</li> <li>Decreased sense of belonging and loyalty to department store brands</li> </ul>	<ul> <li>Requirement for visualization of the in-store inventory by the client (prior to the physical visit)</li> <li>Reevaluation of the in-store purchase experience due to requirement for greater added value for price differential</li> </ul>
Easy comparability through e-commerce platforms	<ul> <li>Increased sensitivity to price and delivery times</li> <li>Greater attention to the differential of store experience</li> </ul>	<ul> <li>Use of e-commerce for primary purchase exploration</li> <li>Use of physical stores only for knowledge of the product (not purchase), the so-called "show-rooming" effect</li> <li>Requirement of efficiency in home delivery service (when applicable)</li> </ul>
Use of physical (vector) technologies	<ul> <li>Identification of feelings and behavior during the shopping experience</li> </ul>	<ul> <li>Identification of purchase moments during the visit to a store; rushed visitor, with time to explore, with erratic behavior, etc.</li> </ul>
Use of augmented reality	<ul> <li>Use of interactive games and promotions to significantly increase shopping experience (e.g. a Pokemon Go version with discounts instead of Pokemon)</li> </ul>	<ul> <li>Variabiliity of the shopping experience in a store according to the buyer's profile</li> <li>Incorporation of latest technology into the shopping experience: for example, mirrors that allow visualizing a garment in different colors or fitting rooms with screens that simulate ad-hoc scenarios for the garment being evaluated</li> </ul>

Table 4-3.

#### Retail stores: Examples of disruptive risks

Source: gA Center for Digital Business Transformation

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#### TIME HORIZON

So far, we've identified the opportunities and risks of digital transformation; now it is appropriate to put them into a time perspective. What is the window of opportunity for capitalizing on opportunities? This concept is fundamental because it has an impact on the resources to be invested and the ability of the company to manage change. From a risk perspective, this means estimating how much time the company must respond to the threat. Once the digital vision of the company has been built, the timeframe in which each initiative must be executed should also be defined. To do this, one can draw on the concept of strategic horizons popularized by McKinsey<sup>49</sup>. Horizon 1 is associated with traditional business and defines improvements that can be quickly obtained, while when we start looking at Horizons 2 and 3, the possibility of new business models begins to appear (see *Figure 4-6*).



#### **Diagram of time horizons**



Source: gA Center for Digital Business Transformation

<sup>49</sup> The methodology of strategic planning by horizons consists of grouping the decisions of strategy according to the associated time frame. The strategy of a company must include and manage decisions concurrently in all time horizons.

- Horizon 1: These are the most easily identifiable and actionable decisions in the most immediate period of time.
- Horizon 2: Associated mainly with emerging opportunities that must have a roadmap and concrete actions.
- Horizon 3: They represent the future of the company, although it usually includes several ideas and projects that may not work or that are not necessarily actionable today.

Therefore, the digital strategy must define visions for the different horizons, and in turn draw potential routes to reach each one of them. The following diagram illustrates alternatives, each requiring different levels of investment, risk, and potential benefit. As part of the work to define digital strategy, these should be evaluated:

- Benefits of each digital route
- Risks of each digital route
- Key learning in each alternative
- Development of digital capabilities in each alternative.

The digital strategy must then define the broad outlines of how to follow the road to transformation, from the current situation to an evolutionary and changing vision of the future (see *Figure 4-7*).





Strategic Understanding of technology investment objectives- Example

Source: gA Center for Digital Business Transformation

So far, the digital transformation strategy has been defined based on an in-depth understanding of the competitive dynamics of the industry. Now it is time to focus on the company's internal situation and its level of preparedness to face the changes required.

4.3. Assessing resources and capacities needed to tackle a digital transformation

At the beginning of this chapter it was established that the definition of a corporate strategy is based not only on the identification of markets and business models but also on the availability of resources (brand strength, access to scarce raw materials) and capabilities (innovation, ability to react quickly to changes in the environment). The successful implementation of a digital transformation strategy is determined, in large part, by the existence of digital assets that the company has or may generate in the future.

First, it is necessary to evaluate the culture and values of the organization. Is there a culture of innovation or traditionalism? Is it a culture of learning and accepting mistakes? Are there structured and established innovation processes? Digital transformation requires cultural models inclined toward innovation. The culture should promote creativity and learning, and have models that allow trial and error. Are methods and processes different from traditional linear thinking patterns to match this culture of innovation?

The available team of professionals will be directly aligned with the organizational culture. But even in companies with little stomach for innovation, highly innovative niches can be found, which can be leveraged for digital transformation. In general, three staff profiles are required for a successful transformation:

- Business visionaries, who can visualize the future or alternative scenarios, and have the power to convey those ideas clearly.
- Sponsors, who commit themselves to the vision and can align the organization for execution
- Digital architects, who can analyze the feasibility of ideas and define how to execute the vision

Finally, it is necessary to identify the digital assets the company has. In our view, a digital asset is defined as a resource the company has that can be monetized through digitization. For example, there may be software components developed for internal use that could be used to generate value<sup>50</sup>.

Another large part of digital assets comes from the data available to the company as well as the data that it could collect based on its regular commercial activity, which might constitute a strong source of future monetization. A typical case is consumer information, which can be analyzed to make customized offerings with a greater probability of success than any massive campaign<sup>51</sup>. In the same way, a business process can represent a digital asset. If a company has highly efficient processes, supported or not by software, it can evaluate whether to digitize them and open them to the market to generate value from them.

To summarize, digital assets can take various forms, and can be categorized in terms of resources and capabilities (see *Table 4-4*).

Given its critical nature, the management and generation of digital assets must, in our view, be considered one of the fundamental processes supporting digital transformation. A study completed by the *g*A Center for Digital Business

#### Table 4-4.

#### Digital Assets needed for a Successful Transformation

RESOURCES	CAPACITIES
<ul> <li>Information on customers, their behavior and use of products, i.e. data that can be transformed into intelligence</li> <li>Proprietary software components</li> <li>Human resources capable of understanding the dynamics of the new digital markets</li> <li>Flexible infrastructure to accommodate new platforms</li> <li>Management and professionals familiar with the dynamics of digital markets and willing to lead the transformation process</li> </ul>	<ul> <li>Differentiating processes that can be opened to other markets or monetized in a different way</li> <li>Internal capabilities for innovation or development of solutions</li> <li>Technology capable of responding with techniques updated for the development needs of new digital platforms</li> </ul>

#### Source: gA Center for Digital Business Transformation

<sup>&</sup>lt;sup>50</sup> An interesting case in this respect is Credit Agricole, which in 2013 made its internal systems (credit, current accounts) available to developers so that they could create Fintechs (financial technology) taking advantage of the bank's infrastructure. In conjunction with its incubator accelator Village by CA, it created 90 innovation companies in 18 months around these and other services.

<sup>&</sup>lt;sup>51</sup> Waze's intelligence is based on using crowdsourcing to measure traffic in a city: collecting information from millions of motorists in the city to infer traffic conditions and then using this data to optimize the route. A logistics company with heavy penetration of vehicles could do something similar, perhaps opening this capacity to other logistics operators so as to have accurate information on traffic for public or goods transportation. By adding granularity and segmentation, data could be more valuable than an overall average, such as in the case of Waze.

Transformation on the readiness of Latin American companies to deal with digital transformation concluded that there were serious shortcomings in most of the companies surveyed<sup>52</sup>.

An analysis of an degree of the organization's preparation and maturity to face digital transformation can be made using a maturity model. These models measure an organization's preparedness to face a radical change in the performance of certain business practices<sup>53</sup>. A maturity model is structured based on a series of descriptive levels related to an organization's performance, which allows for generating quantitative assessments. Typical models are built on five maturity levels where value 5 indicates high performance and 1 indicates serious shortfalls. The usefulness of these models is that they not only assess the state in which an organization finds itself in relation to a certain business practice, but also help determine the capacities required to achieve better performance (a prescriptive dimension).

When evaluating the degree of maturity for undertaking a digital transformation, the model developed by gA analyzes the company's performance and preparation according to four aspects (see *Figure 4-8*).

#### LEVEL OF DIGITIZATION DIGITIZATION STRATEGY BY STAGE IN THE AND IMPACT VALUE CHAIN What is the company's level of digitization · In what state is the company regarding in terms of technological adoption and in development of a digital strategy? each of the three stages of the value chain · What is the expected impact of such (procurement, operations, and distribution)? LEVEL OF MATURITY strategy on the business? **TO UNDERTAKE DIGITAL** TRANSFORMATION What is the level of organizational maturity to What is the level of digitization to carry out undertake a digital transformation (culture, analysis of customers and support all readiness of employees and management, points of contact with the user? governance mechanism)? DIGITIZATION AND **ORGANIZATIONAL MATURITY** CENTRICITY IN THE **TO UNDERTAKE DIGITAL CUSTOMER RELATIONSHIP** TRANSFORMATION

#### Figure 4-8.

#### Dimensions of the Maturity Model for Undertaking Digital Transformation

Source: gA Center for Digital Business Transformation

<sup>&</sup>lt;sup>52</sup> See *g*A Center for Digital Business Transformation. *Latin America 4.0. The Digital Transformation in the Value Chain. The upcoming challenge for Latin American business.* December 2015.

<sup>&</sup>lt;sup>53</sup> Although maturity models were originally developed to evaluate best practices in software development (Neuhauser, 2004; Paulk, 2009), they have been extended to other areas such as processes and business management.
The model is structured in a hierarchical way, whereby each aspect is composed of several indicators that allow a value (from 1 to 5) to be defined for each one as well as an overall value for the company in terms of its multi-dimensional preparation (see *Table 4-5*).

Table 4-5.

Specific aspects for assessment of maturity to undertake digital transformation

Digitization by stage in the value chain	Digitization strategy and impact	Organizational maturity for undertaking the transformation	Digitization and centricity in the customer relationship
<ul> <li>Adoption of digital technologies</li> <li>Digitization of the supply chain</li> <li>Digitization of operations</li> <li>Digitization of distribution channels</li> </ul>	Status of implementation of digital strategy     Prioritization of digital strategies     Expected impact of digitization	<ul> <li>Preparation of employees and culture</li> <li>Digitization governance</li> <li>Existence of digital transformation KPIs</li> <li>Facilitators of digital transformation</li> </ul>	Proactive customer support     Reactive customer support     Self-care     Creation of user profiles     Social media management

Source: gA Center for Digital Business Transformation

So, for each aspect, the company must be evaluated in terms of components such as those included in *Table 4-6*.

By completing the process of evaluating the level of preparedness and internal maturity to undertake digital transformation, the company not only has a model for transformation but also an analysis of areas to focus on when undertaking implementation.

Table 4-6.

Level of maturity of the organizational culture and employees to undertake digital transformation

LEVEL 1 -	LEVEL 2	LEVEL 3 -	LEVEL 4 -	LEVEL 5 -
Serious Shortfalls		Mid-level	High Level	Excellent
The company is not	There are some	Digital transformation	Although digitization	Digital transformation
ready to undertake	specialists in	initiatives are being	is part of the company	is part of the company
digital transformation     Has no human	digitization but digital	implemented in silos	culture, it is being	culture     Employees are
resources with	transformation is not	by certain areas but	carried out and	committed to a vision
experience in	part of the company	are not part of the	managed by a reduced	and contribute to
digitization	culture	company culture	number of functions	making it a reality

Source: gA Center for Digital Business Transformation

4.4. The process of developing the digital transformation strategy

Over the course of this chapter, the reader may have asked how to approach the process of developing the transformation strategy. Although it is clear what should be done, what is still unresolved is who will be in charge and what work dynamics to undertake. To address this issue, it is useful to look at studies on planning models. Research literature indicates that companies approach strategic planning according to four possible models<sup>54</sup>:

• **Symbolic Planning:** articulates the shared vision and the strategic intention to motivate employees and stakeholders;

• Formal Planning: links the strategic objectives with specific action plans, programs and budgets to facilitate implementation and control;

• **Transaction Planning:** plans are defined iteratively and permanently by various actors and instances to facilitate learning and gradual refinement;

• Innovative Planning: plans for each product/service are developed by the organization as a whole.

**Symbolic planning** is based on the aspirations of top management, tending to articulate a long-term vision for the company (hence its name). Its main objective is to motivate the organization and communicate with customers and competitors, but it is defined based on a limited consensus (i.e. it is formulated by a small group of the company's management executives).

**Formal planning** is based on a structured effort that includes the whole company. It is an annual or multi-year process generated by strategic guidelines, where action plans and programs are prepared and consolidated by the business units and centralized functions, and then compiled at the corporate level. This process represents an effort to integrate the company into a system according to two levels: 1) an articulation of the strategic plan with those of the business units, and 2) the cross-functional integration of business unit plans.

**Transactional planning** is not based on explicit guidance. The basic premise of this model is that the company cannot develop formal plans in turbulent business environments. Consequently, the transactional model combines planning with adaptive processes that can modify long-term decisions. The result is a set of decisions that represent a plan, developed interactively, but incorporating continuous adaption. In fact, the end product of this process is not only a plan but also a process of organizational learning, stability, and control combined with flexibility.

<sup>&</sup>lt;sup>54</sup> This typology is based on Brews and Purohit (2007). "Strategic Planning in Unstable Environments", *Long Range Planning* 40, pp. 64-83

Experience indicates that the dynamics of the formal planning model is not the most appropriate for the development of a digital strategy.

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Finally, **innovative planning** is based on a context where the competitive dynamic is so intense that it requires a permanent redefinition of products, processes, and value chains. Therefore, innovative planning represents a permanent adaptation implemented in a decentralized way.

In short, symbolic planning and innovative planning foster creativity and vision. Formal planning emphasizes organizational integration, stability and control, while transactional planning is based on learning and adaptability. What is the most appropriate model for developing a strategy of digital transformation?

Experience indicates that the dynamics of the formal planning model are not the most appropriate for the development of a digital strategy. This process takes a lot of time, involves the entire organization from the bottom up, and does not act as a stimulus for creativity. Also, symbolic planning, while adequate in terms of articulating a vision, is not enough to guide a process of digital transformation (no company was transformed simply by defining that it wanted to be "digital"). At the same time, transactional and innovation planning present appropriate dynamics for coping with business change in times of volatility and radical transformation (as does the current environment of accelerated digitization).

However, while it is important to boost the creativity and initiative of the whole company (characteristic of transactional planning and innovation), direction from the top of the organization is needed. To this end, we consider it useful to organize a workshop that gathers together all the executives of the organization to quickly define and properly map their digital strategy and to activate the road to digital transformation. This workshop is similar to the one that would guide the definition of a symbolic strategy, but it requires a much deeper analysis. In fact, the workshop should be preceded by preparation that includes the development of the current organizational canvas (as described above), the analysis of organizational preparedness to undertake digital transformation (according to the maturity model) and an analysis of competitive dynamics. These materials are presented in the workshop in which the key aspects of the canvas of incremental and disruptive digital models are decided on as well as a prioritization of initiatives coupled with their time horizons. The workshop should be executed and led by a multidisciplinary team, which allows for a broad outlook and the presentation of multiple alternatives.

4.5. The result: a digital business strategy

The result of this process will be a digital business strategy. This should set out objectives and plans in four main business areas in a digital operating model

(customer relationship, operational excellence, knowledge, and platform business models). These four **business levers** must be enabled by **digital transformation levers** (digitization of customer experience, digital fulfillment, digitization of workforce experience, and digital intelligence). Finally, to implement the transformation effectively, the digital strategy must provide definitions in terms of **five enablers** (digital technologies, digital transformation office, innovative culture and processes, digital ecosystem, and omnichannel experience). Each of these components must be considered in terms of their interrelationships (see *Figure 4-9*).

The content of each of the components will be described below. Let's start with the business levers:

• **Customer centricity:** this lever represents the transformation of the customercentric value chain, involving the design and management of the Customer Experience and all points of interaction with the brand and with products and services throughout the lifecycle. To do this, we must aim toward achieving a

Figure 4-9.



Source: gA Center for Digital Business Transformation

value chain that responds with quality and time to customer expectations and which in turn is flexible to constant changes in the environment.

• **Operational excellence:** to maximize customer experience, it is necessary to optimize internal processes. In some cases, this results in a restructuring of the operational processes, leading to a radical business change. In others, there are opportunities to significantly improve efficiency and allow costs to be minimized and utilization of assets to be maximized.

• **Knowledge:** to achieve the successful assimilation of digital technologies in the company value chain, it is necessary to promote the generation of ideas and knowledge and transform them into actionable knowledge. This requires, on the one hand, adequate talent management and knowledge, and processes of collaboration and teamwork. On the other hand, the process of generating digital assets plays a fundamental role in generating this value. This should be in conjunction with a strategy to protect intellectual property and patents to the extent that they are the basis of comparative advantages.

• **Platform business model:** in some cases, the platform model has the potential to revolutionize the business, prioritizing the differential and value of intelligence and aligning the strengths of multiple players in relation to incremental growth. Not all businesses have the potential to develop platforms, but it is necessary to review possible alternatives as part of the strategic exercise.

The business levers are managed through four digital levers:

• Digital customer experience: this lever must define how different customer segments interact with the brand and products. Better understanding of customers allows for surgically precise investment in cost optimization, achieving greater operational efficiencies in the points of interaction between customer and company. In certain industries, such as consumer products, the customer, until recently, was viewed as part of a market segment and not as an individual who should be served based on personalized experience. Currently, digitization allows a company to know individual consumers and to generate experiences customized for each person. The development strategy of this lever must be defined in detail.

• **Digital fulfillment:** this lever includes optimizing the delivery of the product and service that is part of the value proposition in time and form, by digitizing the supply chain or by providing a service through the automation of processes and information. In some instances, as in the case of tangible products, the

interrelations of certain stages of the value chain are reversed. This means that it is the consumer who determines the behavior of the supply chain and not the other way around. For services, delivery can be made more flexible by segmenting models or delivery formats. Several leading companies are already beginning to include digital technologies, either at the IoT level (temperature sensors to ensure the cold chain, soil meteorology at the agro level, among others), in mobile applications, use of social networks or advanced analytics for example.

• Digital workforce experience: the human capital of a company has long been highlighted as a key aspect of the company's sustainability. However, in the digital world the idea transcends mere sustainability and occupies a central place. Just as customer experience can be optimized and revolutionized through digitization, employee experience is also key. The way in which the employee interacts, how they generate value, collaborate, and innovate is key to success in the digital age. In the same way that other frontiers become diffused, the employee's vision starts to look towards talents, whether employees or not, who collaborate in the value generation, where digitization plays a role.

• **Digital intelligence:** the concept of digital intelligence is closely associated with Artificial Intelligence, Data Science and mass data use. Increasingly this intelligence will be a market differential that will generate unique experiences and effective compliance at a fraction of the current cost.

Digital strategy also includes decisions that enable and achieve goals. Here digital enablers come into play. A company must have specific transformation capabilities, as well as a culture of innovation and governance mechanisms to be able to drive and manage transformation. In this way, the main enabling elements of a digital transformation are the following:

• **Digital technologies:** these technologies enable digital transformation and include social networks, mobility systems, analytic platforms, cloud systems, and IoT, and Data Science, among others. Likewise, the key back office components and orchestration elements that allow the digital company to become reality should be considered.

• **Digital Transformation Office:** the area that acts as the engine of digital transformation. The next chapter describes its structure in detail.

• Innovation Culture and Processes: for digital transformation to work, the company's cultural environment is key. This requires a constant search for improvement and transformation. Taking risks and executing innovation must be rewarded internally and lateral thinking should be stimulated to visualize a

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different and challenging future. In turn, there must be a solid understanding of processes and how these can be transformed based on digitization.

• **Digital Ecosystem:** finally, the company must rely on a support ecosystem that enables digital transformation. Software and knowledge providers enter here to complement the internal capabilities of the company. gA aims to be a key player in this ecosystem as a long-term partner helping clients digitally transform their business, where the benefits of digitization are effectively captured by all ecosystem participants.

• Omnichannel Everywhere: the company's processes, whatever they may be, must be available and accessed by any channel in a synchronized and coherent way. This vision is difficult to realize without the proper platforms and architecture for this to happen. The digital strategy should define how to achieve it transparently.

#### 4.6. Estimating the rate of return of a digital transformation

An essential component of overall strategy development is estimating rate of return. Obviously, it is not enough to justify a strategic change solely based on subjective formulations such as "quality enhancement in the customer experience". Ultimately, if, as defined at the beginning of this chapter, the basis of a competitive strategy is the assurance of sustainable financial results, the expected impact resulting from it should be quantified. This point should be emphasized particularly because, especially in the universe of "start-ups", it is common to find formulations such as "our digital objective is to firstly increase the user base, and we will worry about monetizing them in a second stage"<sup>55</sup>. In our opinion, the monetization of a digital transformation is a fundamental objective at the time of designing the strategy-not only to justify the decision to implement it, but also because it will allow results to be monitored through implementation.

The estimate of the rate of return on a digital transformation includes three aspects. First, one needs to quantify the economic value to be generated because of its implementation. Second, and conceptually linked to the first aspect, is the measurement of the risk of implementing a transformation as radical as the one implied by choosing this path. Third, departing from the measurement of risk, can risk be managed to minimize it and improve the risk and reward equation? Each of these three aspects will be presented below.

<sup>&</sup>lt;sup>55</sup> See Piskorski, M., Eisenmann, T., Bussbang, J. y Chen, D. *foursquare*. Boston, MA: Harvard Business School case 9-711-418. March 2013.

#### 4.6.1. Estimating the economic value of the digital transformation

The economic value of a digital transformation strategy must be conceptualized based on financial results. However, its measurement is not insignificant. The economic value of the transformation is not measured in terms of accounting metrics such as operating margins or EBITDA. Accounting profitability measures the generic situation of the company but does not isolate the specific impact of digital transformation. That is why economic value must be estimated based on the aggregate profitability of the company to which the opportunity cost of the capital employed is subtracted. The opportunity cost of the invested capital represents the return to be generated by an equivalent value of investment associated with another undertaking. In other words, the return on the digital strategy must be measured in terms of counterfactual analysis: what will be the return if that capital, or the transformation that it implies, is invested in another undertaking (e.g. diversification into another business)? We begin by describing the methodologies for estimating the economic value of digital transformation. The basis of the estimate is a series of models (or mechanisms) that allow for improving the efficiency of the value chain.

First, the digitization of distribution channels allows the company to expand access to new markets beyond those that reach physical channels. If a business faces economies of scale in the production of goods, the expansion of the market leads to a reduction of fixed costs and to an improvement of efficiency, at the same time as it results in company growth.

At the other end of the value chain, the digitization of the supply chain (as well as its linkage with digital channels allowing market signals to be simultaneously incorporated into inventory management) reduces the costs of storing raw materials. This occurs both in the management of the optimal levels of inventory ("safety stock"), as well as in the possibility of eliminating emergency purchases to satisfy unpredicted needs. At the same time, supply chain digitization allows the cost of searching for raw materials and parts to be reduced, resulting in a lower cost of supplies. If commodity prices are distributed independently and uniformly, the possibility of contacting a larger number of suppliers tends to reduce the purchase price of products. Finally, the inverse effect on the supply chain can impact the distribution channel. Better access to markets can allow the sale of products at higher prices, increasing margins. This may be the result of price discrimination or increased willingness to pay due to increased added value and/ or differentiation. Along these lines, the estimate of economic value of digital transformation can be reflected in three mechanisms through which a company's performance improves:

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- The cost reduction effect
- The price increase effect
- The market expansion effect

These three effects are conceptualized in *Figure 4-10*.

According to *Figure 4-10*, the economic value to be generated by the transformation will include the three effects (areas A, B, and C). Its calculation must be made based on the sum of disaggregated effects, taking care not to estimate the effects resulting from the combination of impacts ("double counting").

Figure 4-10.

Components of incremental economic value associated with digital transformation



Source: adapted from a microeconomic analysis by Tyler, M. & Jonscher, C. (1982).

In the introduction to this section we refer to the opportunity cost of the invested capital. This defines whether the return on investment made to implement the digital transformation is superior to that invested in another area of the business, such as diversification. According to this concept, economic value in the strict sense, calculated according to the previous model, must be estimated based on the difference between the return on digital transformation (*Figure 4-10*) and the return derived from a different investment (e.g. diversification).

#### 4.6.2. Risk and competitive pressure

A complementary aspect of opportunity cost is the inverse of what is mentioned above: what would happen if the company decides not to undertake the transformation? This could lead to its disappearance, as was the case with so many retail distribution chains that did not deal with the entry of Amazon (e.g. Borders). The opportunity cost, in this case, is associated with the survival of the company. Its estimate is directly related to the competitive risk analysis of digital competitors. Unfortunately, there is no predetermined methodology to address this analysis. However, as described by the methodology of competitive analysis of industries, popularized by Michael Porter, it is important to evaluate the situation of digital competitors:

- Their cost structures
- The deployment of digital channels
- The usual metrics of consumer behavior on the site of digital competitors (visits, length of stay, volume of purchases, etc.)

The second risk component that can modify the results of the microeconomic analysis recommended above is related to the risk of not being able to maximize prices. The experience of digital platforms indicates that competitive intensity and customers expectations might constrain price realization. This would modify at least one of the three economic value-generating effects described above.

#### 4.6.3. Technological risk

Finally, the estimate of economic value to be generated by digital transformation must include the risk analysis in the selection of suitable technologies to leverage the transformation. Considering the wide availability of technological options, it is important to examine the risk between hyper-innovation (which positions the company on the innovative frontier but involves a high risk of implementation) and "luddism" (being extremely conservative about the options for technological

transformation). Both extremes can lead to a significant reduction in the economic value associated with transformation.

In conclusion, we have described in this chapter the key components of the digital strategy and how to define them. Digitization presents the opportunity to be a disruptor in a company's own industry or other related or unrelated ones. Digitization can also contribute to render the firm a victim of the disruption produced by others. This why we believe that a digital corporate strategy represents a non-discretionary option. The digital strategy is not simply an option for growth, but a key component in the sustainability of the company. The next step is strategy execution, which we detail in the following chapter.



## DIGITAL TRANSFORMATION AS A JOURNEY

- 5.1. The path to digital transformation
- 5.2. Models of digital transformation
- 5.3. Innovate or streamline? The answer is innovate and streamline
- 5.4. The framework for tackling a digital transformation
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#### Chapter 5.

### DIGITAL TRANSFORMATION AS A JOURNEY

The previous chapter outlined the basic strategic concepts of digital transformation, the key components of a digital transformation strategy, and how a company should proceed in the process of analysis and thinking that leads to its formulation. If the transformation strategy defines a goal, the road that a company must take to reach it is fraught with risks. That is why we must now address the implications that such a radical change has for a company operating in the "real world". Some of the aspects to reflect on are the following:

- How to define the path to follow to implement digital transformation?
- Is it necessary to digitize the processes of a company that was not born digital? Should we embark on or delve into that path immediately or is it a decision that can be deferred?
- Should we start by innovating with new processes and information technologies? Or first solidify and improve the current operation?
- How to protect or strengthen competitive differentials?
- What dimensions should a framework encompass to manage all aspects and impacts of a digital transformation? Are they initiatives that should be organized by a method or by their dynamic nature, or should they not be structured?

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- What should be the path for achieving digital transformation, the so-called "Digital Journey<sup>56</sup>"? What aspects, stages, and phases should be followed? Should they be organized sequentially or in parallel?
- What skills and knowledge are required to plan, execute, and achieve the results of a digital transformation? How can these disciplines be organized in a coordinated way?

Undoubtedly, these are the questions that every executive in charge of managing a company immersed in this convulsive environment asks. This chapter begins to clarify these issues, as well as share some answers based on experiences of real companies (generally not born digital, who have incorporated and developed a digital path). In turn, each of the issues and possible responses raised in this chapter serves to introduce the models and concrete techniques to traverse digital transformation.

#### 5.1. The path to digital transformation

The digitization of production processes is not an option. The need to tackle radical changes in value chains and factors of production is driven by economic trends, leveraging shifts in consumer habits and based on interaction between firms within a production chain. Ultimately, digitization is a force that is changing the framework and competitive intensity of industries.

In this regard, the digitization of processes and value chain is a journey that cannot be stopped, either by the company's own decision or by competitive pressure. This is true both for new "fully digital" entrants and for non-digital organizations that are adopting new strategies and business models. Although we believe that companies have no other option, digital transformation is also an opportunity for companies to increase their competitive effectiveness, as well as establish new rules for operating and interacting with organizations that are part of their value chain.

Many companies have already embarked on a digitization path, focused mainly on the channels with which they interact with their customers or their digital marketing strategies and campaigns. Although this is a positive first step, it is not enough, for two reasons. First, the digitization of distribution channels affects the rest of the company's processes and systems, impacting back through the entire value chain up to the supply of raw materials. Second, the digitization of

<sup>&</sup>lt;sup>56</sup> The term "journey" denotes a gradual process of discovery of options and deviations where, although the destination is clearly marked, the transit requires constant adjustments.

distribution is only one of the transformation opportunities. Each of the value chain stages can be digitized with a resulting impact on the company's competitive position.

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The approach required to carry out a company's digital transformation has been formalized by *g*A. Its objective is to:

- Establish or strengthen a comprehensive digital strategy, considering the positions of regular competitors and new entrants;
- Identify all transformation opportunities that generate value for the customer and/or operational excellence and efficiency;
- Design and implement digital transformation in all processes that make sense;
- Continuously refine the model, including adjusting strategy based on actual business results and customer feedback;
- Combine agile cycles and quick results with deep and sustainable transformations; and
- Obtain a business benefit by traveling this path.

The method of digital business transformation presented in this chapter applies especially to those companies that were not originally created from a digital vision and platform, but which need to be active participants in this opportunity while at the same time manage high competitive risks and sustainability due to lack of a solid position in the new environment.

#### 5.2. Models of digital transformation

The definition of the transformation model is essentially the formalization of the path based on a comparison between a company's current situation (conceptualized in the canvas of the original model described in Chapter 4) and an "ideal" model to be achieved (the canvas of the digital model) (see *Figure 5-1*).

The design of this path should be based on an assessment of the company's digital position and maturity (using the maturity model presented in Chapter 4), complemented by a comparative analysis with other regular competitors and new entrants and establishing positions to be reached in the short -and medium- term. Therefore, the construction of the road to digital transformation is composed of the following steps:

#### 1. An ideal company

Imagine an ideal company digitally leveraged in all the specific processes of the vertical market in which it operates. To visualize the ideal situation, models are used



for each specific vertical market, presenting a company that has boosted all the processes in its value chain including the omnichannel relationship with its customers and partners in the production chain, enhances collaboration and effectiveness with employees, and manages information and knowledge as key digital assets. This conceptualization is based on the digital model canvas developed over the course of strategy definition (see *Figure 5-2*).

An example of a digitally leveraged business model highlights the following features:

- A comprehensive and differentiated customer experience at each point of contact; products and services that exceed expectations; measurement and control of "customer reaction", both digital and physical.
- An omnichannel operation, continuous (24/7/365) for customers and consistent with other agents in the value chain (customer service centers, service centers, logistics operators, and additional financial services).
- Deep understanding of their target market in general, as well as the behavior and needs of each customer.
- Agile, effective, reconfigurable dynamic that complements or exceeds the promise of customer value, and generates benefits for all participants (including employees and third parties), enabling the opportunities for digital transformation that make sense along the value chain.

- Ecosystem of digitally leveraged partner companies, collaboratively sharing information, knowledge, planning and execution in a synchronized manner, to the benefit of all agents in the production chain.
- High quality data, managed to generate information and knowledge, available in real time, which constitutes a key part of the company's value.
- Technological platforms that enable these transformations, empowering employees and third parties; provide information, differentiation and support to operations; continuous improvement in the company's human resources experience, optimizing its mindset and collaboration, the reuse of knowledge, productivity and efficiency.
- A clear strategy, executive commitment, and disciplines, mechanisms and methods to follow the strategy, make it a reality and improve it.

Having defined the digital company, the main aspects of the current situation can begin to be formalized.

#### 2. Map out a depiction of the company's current situation.

A depiction of the current situation includes an analysis of the internal capabilities and resources (operating model, business processes, physical and intangible



#### The ideal digitally leveraged company



Source: gA Center for Digital Business Transformation

assets, and human resources), and the company's relationship with the market (value proposition, customer experience, etc.). The current design must include all components that have been analyzed in the ideal design, enabling the visualization of the gap that separates the current company from a digital one. This design is essentially the formalization of the current operating model, based on the original model canvas.

#### 3. Identify the position of current competitors and potential entrants.

The objective of this stage is, in principle, to analyze the competitive position of the company in relation to other traditional players, as well as potential players (including new entrants and suppliers of substitute goods). This stage is important to understanding the disruptive risks to which the company would be exposed from new entrants.

#### 4. Determine the transformation process.

Once the two extremes in the migration (current state and target model) has been formalized, its evolution can be projected. The projection must recognize two aspects: 1) transformation is an integral process that involves the company's set of systems (not only distribution channels or the supply chain). The topic of how to harmonize the different functional areas for this transformation will be addressed later. 2) The road to transformation cannot be defined in all its dimensions in advance. This will include deviations and occurrences that should eventually be dealt with.

#### 5. Design a digital representation.

This representation is based on the first three components, including the evolution of the company from the current situation to planned stages in different periods. This representation should consider the competitive position and its possible evolution, considering key business levers, digital levers for the transformation and a set of digital enablers. This establishes the strategy and the specific "digitized company" design for each organization and its evolution over time, starting from the current situation and designing the future digitized vision. The objective is to plan, design and execute the digital transformation effective and sustainably to reach, at each milestone, a level of "digital maturity" and a concrete stage in the evolution process.

As mentioned above, the transition to an "ideal company" or the point of evolution that a company wants to achieve at any given time requires dealing with some key dilemmas: Should we focus solely on innovation, postponing improvement of the current operating model? Or, alternatively, should the current operation be improved and expected to lead to the ideal stage? Where to begin and how to continue? Which is the best route? These are some of the questions addressed in the next section.

The digitization of a company's processes and value chain is a journey that cannot be stopped.

#### 5.3. Innovate or streamline? The answer: innovate and streamline

It is often the case that, when designing an innovation strategy for a company, energy is spent on the creation of new business models without considering the optimization of current operations and processes. Conversely, there are companies that focus on optimizing their current operations and decide to defer innovation. The dilemma – to innovate the business looking towards the future versus to optimize the current operative model – must be solved. An approach that only looks to the future underestimates the need to respond to current market needs (those that guarantee the company's financial sustainability). Alternatively, concentrating on optimizing the current operating model does not allow for developing the strategic vision that guarantees the future evolution of the business. The latter concept is fundamental in terms of designing of a digital transformation strategy. A focus on optimizing the current business underestimates the potential of digitization. On the other hand, exclusively considering the future does not allow for determining the way to move from the current model to the digitized.

To solve this dilemma, we propose an approach, adapted from the concept of "pace-layered architecture" developed by Gartner analysts and briefly described in Chapter 1 (see *Figure 5-3*).



Source: adapted from the article "Measuring the Impact of a Pace-Layered Application Strategy" Gartner, August 2012 and subsequent According to this model, every company houses three types of systems<sup>57</sup>, organized in layers. The name of the layer is based on the dynamics and its velocity or rate (pace) of change. The systems of records include those that support a company's core operations. These generally include central and integrated information systems, with a low pace of change, with lifecycles measured between two and ten years (from implementation and evolution to replacement or redesign). In the middle layer are the systems of differentiation, those that usually generate a differentiated proposal in products, services, and points of contact with the customer. In this layer, development initiatives (business, new processes and associated systems) may require several months and up to two years, with a more vigorous pace of change than the previous layer. Finally, the upper layer, composed of systems of innovation, follows even more rapid cycles, that can be developed in periods of a few months or even weeks. This is the layer of more "unstable" systems in the sense of a greater tendency to "test and fit" than in the lower layers. This top layer not only represents the center of innovation in the company -it is where competitive threats appear: new entrants to the market, with innovative proposals, can constitute a threat to the organization that does not have a well-grounded digital strategy<sup>58</sup>.

The systems of innovation layer is where the company must focus on new ideas, which not only protect it from threats but also enable it to establish a competitive leadership position. The intermediate systems of the differentiation layer is those with processes unique to the company, which make it distinct and differentiated in its market value proposition. Finally, the lower layer (composed of systems of record) must have optimized and standardized processes, based on so-called "best practices". It is interesting to note that there is a process of transfer between layers as maturity evolves. A system of innovation that proves successful from a business point of view evolves toward a system of differentiation - and, once commodified in the market, these systems of differentiation evolve into systems of record.

As shown in *Figure 5-3*, these layers behave like a pyramid: the bottom layer supports and allows the upper layers to "reach the heights" providing the sustenance for the next layers. By its very name, it can be erroneously inferred that innovation is only located in the innovation layer, or differentiation in its namesake, or that they are separate, isolated layers. The model works through what is called "connective tissue", which establishes the need for a set of integrative elements between the layers, to provide sustainability and not create more risks than benefits. The strong interrelationship that must exist between

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<sup>&</sup>lt;sup>57</sup> The term system is applied in a broad systemic sense, as the set of processes, information systems, organization, roles and capabilities of people and data.

<sup>&</sup>lt;sup>58</sup> Classic examples of these are Amazon in Retail and Uber in Transportation.

layers is fundamental for all of them to function as a whole. For example, aspects such as information security must cover all layers, especially in cases as sensitive as personal and company data and financial information. The integration of business processes between the layers is another example of key "connective tissue": if an electronic shopping experience for the purchase of goods or services is offered, delivery, billing and support must be prepared in accordance with the original value proposition.

The following figure shows a few connected processes and information systems in a model applied to telecommunications companies.

In the upper layer of *Figure 5-4*, specialized mobile applications are located to provide services to customers, aimed at knowing their preferences and customizing package offerings or plans, which are complemented by digital marketing applications and Data Science to better understand behavior patterns



Source: gA Center for Digital Business Transformation

and reduce churn or increase the effectiveness of campaigns. In the middle layer are the e-BPP systems, (electronic Bill Payment & Presentment) or omnichannel CRM, if they are configured and implemented to generate differentiation and value for the customer. At the base of the pyramid are the systems of provisioning, traditional billing, ERP; portals for tenders with suppliers or others such as payroll or human resource management.

The position of a specific "system" or component within a layer depends on how it is being used. For example, a human resources system could be used to recruit and develop talents required to provide differentiated services and create real innovation, in which case that component (recruitment, career plans, Knowledge Management tools) could be placed in the differentiation layer.

The Pace-Layered model is particularly useful for understanding a digital transformation strategy. First, it helps to recognize that the transformation cannot be focused only on the top layer. To the extent that there is an interrelation between layers, innovation is effective only if it is accompanied by changes in the lower layers. Consequently, recognizing the different transformation rates of each layer, digital transformation must articulate the processes of change in each, recognizing that the implementation of some in the upper layer depends on changes in the base. Second, recognizing the interdependence of levels, one can begin to design migratory paths from the original model to the digitized model that accommodate the changes in each layer.

This model is not complete without considering five types of digital technologies that act as facilitators of connective tissues between the three layers:

- **CLOUD:** the possibility of using and integrating with information from the cloud, and of processing applications in it;
- **IoT:** technology that allows remote connection with sensors in devices, machines, vehicles, continuously connected by Internet;
- ADVANCED ANALYTICS AND BIG DATA: real-time processing of high volumes of information, including with intelligent algorithms, to make decisions and other highly-personalized services, optimize marketing and sales campaigns and logistics planning and service;
- **MOBILITY:** the paradigm shift, from operating on computers to interacting permanently on mobile equipment such as cell phones and tablets, offers true innovation and differentiation to customers;
- **SOCIAL PLATFORMS:** applications of social interaction, whether general purpose, professional or specialized.

Beyond the value of technologies, the pace layer allows us to conceptualize the digital transformation map of a company. As each layer functions in its interrelations with the others, the digital transformation must operate at all three levels, recognizing that the rhythms of change and implementation of initiatives differ between systems.

#### 5.4. The framework for tackling a digital transformation

In gA's opinion, the core platforms and applications of companies, and the architectures and tools of integration and orchestration among them must be added to the five digital technologies mentioned above, to integrate the "connective tissue" of processes, systems and data between systems of innovation, differentiation and records. This connective tissue is composed of:

- Process integration
- Transaction integration
- Security
- Master data
- Governance
- Regulation & Compliance
- Program management

Connective tissue is key to the success of different digital transformation initiatives. Let's look at examples of these connections in two vertical markets. *Figure 5-5* illustrates information components and systems associated with a company operating in the life sciences industry. It specifically refers to companies that provide medical equipment, devices, supplies and services.

An application of the innovation layer could provide a personalized and high-value patient experience. This could, for example, have a mobile application that, using geo-localization, refers the patient and reserves a shift for a required treatment. The differentiation layer should reflect this shift, make the appointment in the hospital management system, or even consider the availability of equipment and supplies that could be in the lower layer (system of records). All cases will require synchronization of data and transactions (in this example, booking the shift with certain equipment, technicians and inputs), using the correct data and at the same time protecting patient confidentiality under international standards such as HIPPA Title II (Health Insurance Portability and Accountability Act, which defines policies, rules and protocols to protect the confidentiality and security of patient information).



Figure 5-5. Processes and Systems in a medical supply and services company

In this example, if the data are contained in the system of records, they should be encrypted and disguised for processing, as well as in the upper layers and transmission of data and interfaces between three-layer systems. Therefore, one of the "connective elements" is the management of master data and security. In the model exemplified, confidential, regulated data such as the patient's personal data, clinical history, diagnosis, treatments and evolution can be handled.

Similarly, we could imagine three layers in a financial organization: applications for mobile phones or tablets for financial services clients, connected to customer care systems (such as omnichannel CRM and call centers) and the financial entity's core systems. In this case, if the privacy and security of this data were not integrally protected in all three layers and in the communications between them, it could produce leaks that could lead to fraud and losses greater than the benefit to the customer or the possible incremental sale of financial packages.

Connective tissue is key to the success of different digital transformation initiatives.

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The model not only protects security but also assures other aspects like service delivery: in what way is the value proposition to the client completed with effective execution? How do you "fulfill the digital promise"-with the delivery of the agreed-to product or service and/or in the time, place and means established. Furthermore, how can all the ways in which this operation must be fulfilled be processed in order to provide a true customer experience (e.g., processing of exchanges, returns, after-sales support subsequent offers, customer confidentiality, non-invasive marketing, services customization and follow-up)?

The relationship between layers is not only about data exchange but also about the flow of processes, roles and responsibilities among participants in that process. In the example of the medical service, the flow of processes and roles determines how the shift reservation data is handled at the medical treatment center, how the patient is received reusing the information on his clinical history effectively and confidentially, how service is provided if changes or adjustments are required, how additional information is provided to the attending physician to improve patient follow-up and treatment prognosis.

The conclusions from the analysis of this model and from examples of client companies in various industries are clear: the components of innovation, differentiation and records cannot be treated separately but quite the opposite: for their success, sustainability and "fulfilling the promise" requires a simultaneous framework that considers interactions, data, security, processes, organization, roles, skills and abilities, along with all related processes in the value chain.

A digital transformation, generating innovation, differentiation and supported by a platform of operational excellence, is enabled by all these technologies being integrated with the system of records. This requires a systemic and convergent vision: to innovate and optimize processes; empower people; prepare the organization; generate real value for clients; and improve company results. It also requires the management of transformation projects (in all three layers) to "look at the required connective tissue", integrating all the necessary disciplines. This is the core of the work method we have developed in collaboration with clients in actual transformation experiences, under the methodological framework of digital transformation. It is important to mention, however, as demonstrated previously by business transformation, the mere acquisition or lease of technology does not generate economic value<sup>59</sup>.

<sup>&</sup>lt;sup>59</sup> See Center for Digital Business Transformation. Latam 4.0. Miami, FL: 2014.

The framework for digital transformation is based on the convergence of a series of disciplines, methods and tools presented in *Figure 5-6*.

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The formulation of a **digital strategy** or its strengthening and alignment establishes a competitive position to be achieved, considering the levers of businesses and their enablers. The **customer experience** design of the must be made not only from the systems perspective but in terms of the entire interaction route, with customers through all points of physical and digital contact with the brand and with its products, services and staff. This work can be done with Design Thinking methods.

Analysis, dynamic monitoring, redesign, **reformulation of processes** and their relationship with the organization, roles and technology are a key part of the digital innovation approach. Process reengineering must be carried out simultaneously with organizational redesign and must consider the impact of digital technologies on new processes or legacy processes that have been redesigned. Finally, new technologies and methods make it possible to measure actual processes and analyze their performance based on actual execution, redesign them and control the effective improvement of their key indicators.

The **alignment of the organization** to new processes and expected results should focus on roles, incentives and capacities of the people assigned to optimize processes. This task should also consider enhancing the capabilities of people,



Disciplines needed to achieve a sustainable digital business transformation



Source: gA Center for Digital Business Transformation

both individually and as part of a team that provides services. This includes communication management, training (not only tools or systems but in processes, in skills required to digitally enhance their role), the management of incumbents or stakeholders in the transformation program and a key aspect for transformation continuity: the formation of change agents within the organization, with the aim support continuous evolution and future transformation initiatives.

**Data management**, related to issues such as master data management to ensure quality, update, integrity, security and consistency across all systems layers is considered a key element of "connective tissue". In the new digital models, data and their exploitation using advanced analytical tools and Data Science methods are part of the "digital asset" and company value, so data is a key aspect of the model. Real-time data management technologies (e.g. in analytical and in-memory transactional models) make it possible to process high volumes of data and make real-time decisions to understand a customer's behavior pattern and recommend a promotion or to detect the condition of a machine in an industrial process and trigger a preventive maintenance action. The data and its processing in high volume (Big Data) at speeds unimagined a few years ago allow changes in operation processes and even in business models themselves.

The **definition of architectures**, design, implementation, updating, support and evolution of applications, tools and information technologies, relating them to the processes and the organization is a central component of the connective tissue. Again, the design and concurrent implementation of new technologies with new processes is key in this area. Considering the different speeds that initiatives must have in each layer of the pace-layered model, agile methods should be applied for higher-speed initiatives and cascade or combined cycles (hybrid methods), for example for projects and programs to transform operating systems.

The methods and tools to calculate **economic/financial benefits** to be obtained represent a key component to guide project designs, optimizing the efforts and resources invested in the transformation. A key factor of value management is to have post-implementation methods and tools for the transformations, to ensure value capture and validate acquisition and to take corrective actions if benefits and improvements are not reached. This discipline also makes it possible to close the loop with strategic planning: to learn from each initiative regarding the real benefit achieved, using the new knowledge in quick cycles to adjust the digital strategy and its roadmap.

#### 5.5. The Digital Transformation Office as a vehicle for implementation

Digital transformation must usually handle a set of projects of different durations and speed. It should therefore be able to combine more structured techniques in agile cycles for shorter projects<sup>60</sup>. The convergence of these disciplines and methods can be executed as part of a transformation project, or in a more continuous form in a specialized entity that is partially organized and developed around clients and/or outsourcing, which we call **Digital Transformation Office**. A key aspect to discuss about this entity is the structure that it should have. Based on the catalog of services, we recognize that it must provide methodological guidelines, but this does not mean that it must only have internal teams. For example, it can be maintained in an internal process office for a given project or choose to seek support in external consulting while ensuring consistency in the methodology (see *Figure 5-7*).

The structure has three areas supervised by management. The management of the office, in addition to the leadership and coordination role, is the bridge to the governance of the digital transformation (e.g., with a Program Steering Committee, the main sponsor and other executives involved in the transformation). From the



#### Figure 5-7.

#### **Components of the Digital Transformation Office**

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<sup>60</sup> These techniques include the PMBOK guidelines from the PMI and methods such as Scrum.

Source: gA Center for Digital Business Transformation

formulation of the digital strategy to the conceptual design of initiatives and monitoring of their execution, this governance and communication scheme is required to ensure alignment between strategy and execution, and the improvement of the strategy based on implementation results. The three responsibility areas of the digital transformation office include:

- Partners of the office, aligned with digital transformation levers, acting as a bridge to the company's needs and opportunities, and as the proactive generators of new ideas and opportunities by promoting digital concepts and technologies within the company.
- The digital visionary team provides digital technology expertise, based on the digital technologies laboratory and support for rapid evolution cycles through Screening and Analytics teams.
- The team of facilitators enables management and effective execution of the different transformation and evolution initiatives of the company. This includes three functions:
  - \* The project management office, managing the projects, programs, the relationship with other projects, plans, resources, times, scope, budgets for the initiatives and interacting with the company's other PMOs or Project Offices.
  - \* The Value Management Office is the function that interacts, for example, with Finance and with the sponsors and managers of business processes, to establish business cases, perform investment analysis, determine expected returns and cash flows, guide the project to obtain associated economic and operating benefits and manage the post-implementation cycle of the transformation to monitor and ensure the capture of value.
  - The function of Technological Architecture and Integration, interacting with other IT areas to integrate visions, technologies, functions in the project and in the subsequent operation, in the stages for compiling information, prototyping, and designing.

It is important to note that the functions of the digital transformation office do not replace but complement and integrate the roles of other areas involved in the transformation. For example, the company's process area can typically work on continuous improvement of processes, standards and procedures, and other functions such as providing services for quality, audit, and control plans. However, it does not typically have specialists in process innovation and process transformation using digital technologies, or has staff to assign to transformation programs on an ongoing basis. That is why there is a complementary relationship between the digital transformation office and the traditional process area. As such, the business process reengineering function within the digital transformation office provides that specialty, resources and methods, and interacts with the process area when the defined processes are formalized, to give them subsequent sustainability, train the organization and align documentation of procedures and other functions in which they complement each other in their roles. Likewise, the Change Management area (complementing the Human Resources area) specializes in the impact of change from the digital transformation. The value creation function interacts, for example, with Finance and with the sponsors and owners of the business, to establish business cases, perform investment analysis, determine expected returns and cash flows, guide the project toward obtaining economic and operating benefits, and manage the post-implementation cycle of the transformation to monitor and ensure value capture.

In this regard, the functions of the digital transformation office do not replace but complement and integrate the roles of other areas involved in a process of digital transformation. A business process function within the digital transformation office provides specialty, resources, and methods, and interacts with the corporate process area at the time of formalizing the defined processes and giving them subsequent sustainability, training the organization, and aligning the documentation of procedures.

The project management function oversees the management of programs, relationships with other projects, plans, resources, times, scope, and budgets of the initiatives and interacts with the company's other Project Offices. The function of Technological Architecture and Data, interacting with other IT areas is to integrate visions, technologies, functions in the project and the subsequent operation, particularly in the stages of discovery, prototyping and design (see *Figure 5-8*).

The Digital Transformation Office is conceived as an enabler. In other words, it is a vehicle to discover the best opportunities, help organize and design them, support their implementation and their subsequent improvements. The office can be integrated with three types of functions, as described above and in more detail in Chapter 6.

Our vision is that the digital transformation office acts as a bridge and as a "translator". On the one hand, the office is a bridge to the business, its needs, results to be delivered, current situation, limitations, and differential capacities. On the other hand, the office is a "translator" for other areas of the organization involved in a digital transformation, such as IT, Audit, Process, Human Resources,

#### Figure 5-8.

Complementation of the Digital Transformation Office with other areas of the company



Source: gA Center for Digital Business Transformation

Investment Management, and Finance. As such, the office's functions do not replace but complement and integrate the roles of other areas involved in a digital transformation.

Finally, the design of the road to digital transformation requires the establishment of a **Digital Route Map**, which organizes and prioritizes the initiatives in three
layers according to the digital strategy. This requires a method that discovers the best transformation opportunities, those that generate greater value, differentiation and are aligned with the company's business strategies and its digital strategy. Also, a complete life cycle method is required to travel the digital transformation road. This will be detailed in the following section.

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A clear definition of governance mechanisms is needed –both for innovation and managing transformation. This includes having clearly defined roles and responsibilities in terms of the decisions to be taken and the budget line items that will be earmarked throughout the life cycle.

The digital transformation office must have a clear organizational mandate that will lead to the breaking up of internal silos within the company. The highest governing body, however, must be a committee that has participation from the highest executive level. It is recommended to use an existing technology committee for two reasons: first, to avoid creating an additional committee to overload organizational complexity; and secondly, there should not be a technology area separate from innovation, particularly in managing the transformation path to include all layers of business architecture.

From the formulation of the Digital Strategy, through the conceptual designs of the initiatives and the monitoring of their execution, the governance and communication scheme is required to ensure alignment between strategy and execution, and improvement of the strategy itself based on the results of the implementation. In an example of implementation: an automotive industry client created the Transformation Office, which initially directed a group of transformation projects of its central systems, CRM, ERP, and vertical industry systems. The office quickly participated in discovery processes to improve methods, collaborate on customer loyalty and retention, cross-selling of physical and financial products and general improvement of customer experience and brand perception. The specialties of the office, such as PMO and BPM, were also applied on projects to improve facilities and industrial processes, even in cases that did not incorporate digital technology.

### 5.6. The road toward the digital transformation of business operations

The convergent disciplines presented in the previous section, transformation initiatives and alignment with the digital strategy, are some of the key elements that must be reflected in the path to digital transformation. *Figure 5-9* represents a continuous improvement process, although its components may have other sequences according to the transformation need and the organization's.



#### Figure 5-9. Road toward digital transformation

The details of each of the stages of this transformation cycle are presented below.

## Digital Strategy

The Digital Strategy stage generates the company's future vision of the company, visualizing where the company thinks it will be in the future and outlining how to execute this vision. It considers possible platform models, innovative ways of interacting with the customer, how to transform data into business intelligence and generate maximum operational efficiency. The digital strategy values each alternative and sets execution priorities. It is important to emphasize that it is an exercise that should be revisited frequently, evaluating the results achieved and the position of current competitors and new entrants who are "born digitally". Unlike more conventional strategic formulations, where the definition is followed

by long periods of implementation until it is reviewed or confirmed, in a digital strategy the cycles should be shorter, and, to a degree, open to adjustments and reformulations enriched by the implementation experience.

As mentioned above, a common mistake in digital strategies is to focus only on the innovation layer, for example in the use of mobility and social networks to communicate with customers differently or establish a new channel of communication. However, the customer experience is based not only on digital interaction, but also on the effective fulfillment of the promise of delivery and receipt of the product or service at the agreed time and place. The review and alignment of the differentiation and operation systems are the "base of the pyramid", the foundation for sustaining innovation, so consequently these adjustments or changes must be part of a digital strategy.

A company's digital strategy triggers two cycles:

- A rapid innovation cycle, which allows rapid testing of the effectiveness of certain digital initiatives. This cycle is typically associated with the innovation layer of the Pace-Layered model; and
- A cycle of evolution and maturity, which allows innovation to be activated through solid operational systems and for successful innovative ideas that emerged from the first cycle to evolve pragmatically.

Again, as mentioned before, these cycles are not tied together but are often combined in terms of sequence of activities and use of techniques and methodologies.

#### Cycle of Innovation

The innovation cycle enables progress on the specification of the digital canvas model. It is triggered by multidisciplinary workshops, which generate ideas around innovation levers such as customer experience, smart business, operational excellence or new business models. The ideas that emerge from these sessions generally require further examination to understand the business opportunity and its possible solution. Through the Design-Thinking approach these ideas are debugged and stages are established for their pilots in the market. They are built quickly using agile prototyping techniques that allow the swift launch of a viable basic product, ahead of potential competitors and evolving the idea based on the results obtained, measured through advanced analytics on use and value.

### Cycle of Evolution

The **digital transformation roadmap** structures the opportunities for digital transformation across the entire value chain of an organization or into specific functions or process cycles that are subject to digital transformation. The roadmap takes the ongoing digital initiatives arising from the innovation cycle as input and identifies new transformation opportunities.

A key input for this stage comes from the workshops, where a catalog of digital transformation opportunities is identified, weighing the benefits, complexity, effort, and risks inherent in each digital transformation initiative or set of initiatives. The roadmap should help prioritize and sequence the initiatives, aligned with the Digital Strategy. It should also consider "connective tissue" in the sense of key interactions between innovation initiatives, differentiation, and improvements in operations, to establish a consistent and integral framework in digital transformation.

In the **implementation** stage, new business systems (systems, processes, roles, capabilities) and/or required adjustments to existing ones are built and deployed. At this stage, there must be a high level of coordination between the roadmap and the point of detailed design and construction in which the initiatives are deployed. It requires a transmission of the business objectives established in the transformation roadmap and a validation of the designs, in the sense of orienting themselves to cover transformation objectives, allowing the investment and the transformation effort to be guided toward the expected results. Especially in agile development cycles, where detailed specification cannot be expected, it is essential to maintain clarity about objectives, the results to be obtained from the customer's experience and/or from internal processes. Also, as important as building digital systems aligned with the transformation objectives, is supporting and evolving them over time.

A digital initiative by nature will mutate faster than other more traditional initiatives. Incorporating this speed and continuous learning into the digital transformation cycle must be part of the dynamics of change. This "closing the loop" not only aims to improve processes and systems with the feedback of reality, but also ensure the capture of economic benefits and refinement of the digital strategy itself. In a world of Big Data, where you can analyze business operation data combined with your customers' behavior on social networks, advanced analytical tools allow you to measure transformation results with granularity and a customer contact level that has never been possible before. These methods of measurement allow us to more quickly understand the true behavior of an innovative idea and to refine strategies based on results.

In a digital strategy, the cycles should be shorter, and the strategy and its corresponding roadmap should remain, to some extent, open to adjustments and reformulations enriched by the implementation experience. A central focus of the transformation framework is to provide and ensure the evolution of the "connective tissue" between initiatives and systems of innovation, differentiation and operation, as shown in *Figure 5-10*. state of digital maturity.

Therefore, the digital transformation cycle considers the design, work stages, implementation and subsequent improvements, and the components of connective tissue between the initiatives of digital transformation in each layer. This involves applying tools and techniques to model, analyze, redesign, and monitor the actual behavior of the different components of enterprise architecture and their interrelationship. This means determining how the components of an application and the different digital technologies relate to each process and role in the organization. These models are key to identifying relationships and managing change, not only during projects but also in subsequent developments.

By having enterprise architecture models, we can answer questions such as:

- What processes can be enhanced if an application or technology is modified?
- What roles should be empowered for the effective transformation of that process?

#### Figure 5-10.

Components of the business system and elements of digital transformation for the "connective tissue" of enterprise architecture



Source: gA Center for Digital Business Transformation

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- What business process is affected if an application or technology is modified or fails?
- What controls should be established on processes, data, systems to ensure compliance with standards, security, audit, or other protocols?

Answering these questions requires the creation of a vehicle to manage this convergence of knowledge and disciplines, and enable digital transformation. Its operation is detailed in the following section.

### 5.7.Conclusion

Digitization generates disruption of market rules across multiple industries. It is a reality for consumers and for companies that are undergoing a digital transformation. Its effect and benefit is not only in the contact point with the customer but in all internal and external processes along the value chain. The redesign must start from the integral experience of the consumer/customer and run the entire chain to identify the best transformation opportunities.

To not participate is not an option. Taking a clear "digital" position is an opportunity; not to do so, is a risk. It requires a digital strategy, specific and adapted to the company, its market and considering current and future competitors. The changes affect all layers, including the "operating system" of the company, as they are and must be connected and related. The transformation itself is multi-disciplinary and convergent. It is necessary to articulate various disciplines to discover, plan, design and execute the transformation. The obtaining of benefits throughout the transformation cycle should be systematized, with a guiding initiative to achieve them, and to measure the results, compare and adjust.

Given the different speeds or rates required in the transformation layers, agile methods must be combined with other more structured methods to design and implement sustainable change. There is a social transformation value in the digital revolution, not only to increase the profitability of companies, but also to positively impact economies and quality of life. In the next chapters, these concepts will be examined, with real examples of successful organizations on the road to transformation, as well as methods and techniques for designing and traversing the digital transformation.



# DIGITAL TRANSFORMATION AND CHANGE MANAGEMENT

- 6.1. The difference between native digital companies and those that have to conduct a digital transformation
- 6.2. How should a traditional company organize for the digital transformation?
- 6.3. Organization challenges of a digital start up

# Chapter 6.

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# DIGITAL TRANSFORMATION AND CHANGE MANAGEMENT

Our emphasis so far has been on how to define digital transformation strategy, without acknowledging that one of the most important challenges is how to manage that change in terms of organization and culture. As we all know, the success of a strategy depends on the ability to implement it. It is in this area that changes are not easy –both for the digital start-up that must make its transition to a developed company, and for the traditional company that must be refounded. The next chapter focuses on organizational and change management issues. For this, it is important to start by differentiating the company that is born digital from one that must be transformed.

6.1. The difference between native digital companies and those that must conduct a digital transformation

In the discussion of digitization, it is common not to differentiate between companies that are born "digital" like Google, Mercado Libre, or Despegar.com and those that must be transformed from a physical environment (conventionally referred to as "brick and mortar"). And yet the challenges in terms of change management are different. The digital start-up that has validated its business model through prototypes and accesses funds for financing faces the challenge of scalability. This is defined as the transition from being a small team of entrepreneurs to a conventional company, which implies acquiring resources to support growth, modify communication and decision-making processes, establish operating roles and, consequently, build multi-functional teams and formalize business processes. All these tasks are interrelated and may become temporary depending on scalability. This is a fundamental factor. The digital start-up is in a race against time to increase its customer base and solidify network effects, which represents the only barrier to imitation. In this way, any organization or process that slows the pace of scalability can be dangerous.

Let's now turn to organizations that have been born and raised in "physical" environments, characterized by manual or automated processes based on legacy technologies, and that must rethink the fundamental elements of value creation from digitization. New business processes, value chains, organizational and cultural characteristics are some of the parameters that define the new company. The key issues to be addressed in this case are also extremely complex: retention of human resources within a transformation framework, attracting of resources familiar with digitization, changing of business processes and organization. All these issues must be considered in the context of the transition: how to get from the current organization (the one mapped on the original canvas) to the digitized one?

### 6.2. How should a traditional company organize for the digital transformation?

One of the most important challenges a traditional company faces is how to deal with its digital transformation. The fundamental problem of the "traditional", non-digitized company is how to traverse the path of transformation towards the new environment. Quite simply, we can consider two options.

The first option is to create a "digital" business unit, independent of the physical business. This new business unit operates in parallel with the original organization. However, it has radically different characteristics: different market strategy; value chain; organizational culture;human resources; and information systems. This "digital" unit could be considered a "spin-off". Although this option is the least conflictive from the point of view of launching a digital business, the challenge of the transition continues to be present: how do you operate a transition from this configuration of two parallel businesses to a single digitized company? The migration would occur gradually, with the pace dictated by the success that the digital unit achieves in the market. Simply put, to the extent that the digital unit achieves a higher sales volume than the traditional physical division, the migration would progress until the original business unit disappears and the digital unit emerges as the new digital company. It is important to

mention that we rarely find companies that have achieved this integrated digital organization. This is partly because the migration process is still in an embryonic stage.

The second option is to undertake the digital transformation from "inside" the original business. In this case, the refounding of the company occurs in a similar way to process reengineering of the 1990s. Instead of launching an independent business unit, the transformation occurs within the original company. To control the risk implicit in such a transformation, many companies approach this process sequentially, beginning at the ends of the value chain, either by digitizing the supply chain or by transforming distribution channels.

Our experience working in the digital transformation of large companies shows that both options carry risks to consider before embarking on one path or the other. The first option – the creation of an independent digital business unit – has a logical advantage: it preserves the independence of the new digital unit, which allows it to define its operating model without facing the limits of the original model. Without the restrictions and constraints of the original organization, the new business unit is "born" digital, somehow reflecting the star-up model. At the same time, the organizational independence of the new entity enables the recruitment human resources attracted by the challenge of digital incubation. On the other hand, this road also carries numerous risks. Initially, the founding of the digital unit raises the need to coordinate both units ("physical" and "digital") in their access to the market. Confusion by customers can be one of the problems. Another challenge might be in terms of conflicts with intermediaries and agents in the distribution chain. For example, the digital business may cause a disruption in the original value-added division between business and distributors. This can lead to rejection by agents in the distribution chain.

Beyond these problems at the beginning of this path to transformation, there is the problem of how to get the entire organization to the new digitized environment. This phenomenon has been studied in the framework of how large companies innovate in general and create new businesses<sup>61</sup>. The autonomy of business units tends to create "corporate orphans", since, being isolated from the original organization, the digital unit lacks the support it needs to develop. In the long run, it may face difficulty in finding a permanent place in the organization.

<sup>&</sup>lt;sup>61</sup> See "Processes of New Business Creation in Different Organizational Settings," in Van de Ven et al., eds., *Research on the Management of Innovation*, New York: Harper & Row, 1989, pp. 221-297; and S. Venkataraman, Ian C. MacMillan, and Rita Gunther McGrath, "Progress in Research on Corporate Venturing," in Donald L. Sexton and John D. Kasarda, eds., *The State of the Art of Entrepreneurship*, Boston: PWS-Kent, 1992, pp. 487-519.

The fundamental problem of the "traditional", non-digitized company is how to traverse the path of transformation towards the new environment. The second option – facing the digital transformation "within" the original organization of the company – also carries risks. One of our clients has called it "open heart surgery". We find the analogy very appropriate. Beyond the implicit risk of integral transformation, one of the challenges is that we cannot stop the transformative process halfway. In the same way that the surgical operation is concluded only when the heart works inside the patient, the digital transformation ends only with the company is digitized. An additional risk of this path is that the very close link between the digital model and the original business tends to limit creativity and constrain entrepreneurship. At the same time, being incubated within the original business, the company will have more difficulty attracting the ideal type of human resource.

The dilemma raised here is clear. The independent "digital" unit can lead to the creation of a corporate "orphan" with the implicit difficulties of coordination and transition to a single model. A transformation within the company can lead to the situation where the benefits of digitization are not achieved simply because the internal organizational dynamics limits the refoundation effort. These considerations are summarized in *Table 6-1*.

Given this dilemma, what can be done? In our view, the key is to maintain a balance between independence and integration. In the first place, the initial creation of independent units allows the creation of laboratory incubator conditions without the natural restrictions of the original business. However, this

#### Table 6-1.

	Create a new "digital" unit	Transformation "within" the original business
GENERAL Characteristics	<ul> <li>Independent from the original business</li> <li>Characteristics radically different (HR, market strategy, value chain, organizational culture, etc.)</li> <li>Gradual transition from traditional company to digital</li> </ul>	<ul> <li>Transformation within the original company</li> <li>Process reengineering similar to the 1990s</li> <li>Sequential process, beginning at the ends of the value chain (supply chain or distribution channels)</li> </ul>
CONSIDERATIONS	<ul> <li>Coordination of both units (the "physical" and the "digital")</li> <li>Customer confusions</li> <li>Rejection by agents in the distribution chain</li> <li>Migration of the entire organization to the new digitized environment</li> <li>Difficulty finding a permanent place in the organization</li> </ul>	<ul> <li>Limited creativity and low level of entrepreneurship</li> <li>Difficulty attracting the ideal type of human resource for the transformation</li> <li>Dynamic internal organization limits the refounding effort</li> </ul>

#### Options to address the management of digital transformation

Source: gA Center for Digital Business Transformation

new unit generates resistance and natural conflicts. Secondly, in this context, is it essential that senior management provides the support and protection to allow the new unit to continue to develop. The commitment of the company's management to the digital transformation sends the appropriate signal to the whole organization that the new business unit represents the future of the organization. Third, when creating the new unit, the natural conflict and disruption areas to be controlled must be identified (problems in distribution channels, different cultural characteristics of human resources). Each area requires the identification of mechanisms that allow conflict to be limited (e.g., confusion in distribution channels could require channel and market segmentation). Fourth, the strategy of migration from independent units to the integrated digital company requires a gradual process of implementation by markets or geographies. This process cannot be extended over much time to limit the disruptive potential of operating two parallel businesses.

Closely related to the teams available for digital transformation is how to organize for this transformation. In our experience, we can differentiate the following five models, which are not necessarily exclusive:

- Multidisciplinary team embedded in the current organization
- Independent group as a separate business unit
- New company separated from the traditional business
- Funding innovative start-ups
- Innovation and incubation ecosystem

The first case involves setting up a Digital Transformation Committee dedicated to promoting and driving the transformation. This model has the advantage of being the least disruptive, but it risks generating inaction or giving low priority to digital transformation. Its members are governed by day-to-day priorities and the digitization aspects can be relegated to the background. On the other hand, the Committee has all the power to generate synergies with the traditional business and make change happen. In turn, the digital business is naturally embedded as an extension of the traditional business, generating less risk of future integration.

Another approach is to create the digital unit within the company. This unit's mission is digital business, which focuses efforts and avoids dispersion. But often the traditional business sees it as a threat, which makes it difficult to achieve synergies. In addition, there is a risk of generating an isolated laboratory, such as PARC in Xerox, whose ideas do not translate into improvements of the company. One variation of this scheme, or probably an evolution, is the setting up of a new

company dedicated to digital transformation. This allows strategic partners to be incorporated into the initiative and complement capabilities<sup>62</sup>.

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The case of funding innovative initiatives applies to companies with strong financial capacity. The scheme is based on putting together a small team dedicated to identifying digitization investment opportunities and deciding whether to invest in these offshoots which are related to the traditional business. This enables the company to capitalize on innovation opportunities, which do not necessarily transform it. There are several cases to mention, starting with Google Ventures. A typical case could be Yahoo and its investment in Alibaba. Their bid was worth more than Yahoo itself, but did not end up transforming Yahoo.

An interesting variant is co-innovation, or the funding of innovation by creating an area that generates synergies with the parent company. The creation of this ecosystem, for companies with market power, allows the generation of innovation regarding the renewal of the traditional business, accessing digital capabilities external to the company and allowing the implementation of a cycle of constant innovation, where ideas that work can get incorporated into the company's core.

#### 6.3. The organizational challenges of a digital start up

In the same way organization developed in a physical environment face significant digital transformation challenges, start-ups also has face many obstacles related to the transition from a group of entrepreneurs to a conventional company. For example, the typical start-up is made up of a small group of organized entrepreneurs without a functional distribution of responsibilities beyond the basic (Founder, CTO, Business Development), with few formal relationships of responsibility. At the other extreme, a developed company requires formal functional units, specialized roles, control mechanisms to ensure cross-functional coordination, and business processes that enable customer responsiveness.

Furthermore, start-up governance is guided by a small (3-5 member) steering committee organized following the first round of financing. Over time, the governing board grows as new investors from each round of financing are incorporated and require a position. In this context, conflicts between the first and subsequent investors may arise in terms of their risk and reward vision as well as consideration of exit strategies.

<sup>&</sup>lt;sup>62</sup> See the examples of Iberdrola for the development of technologies for sustainable energy or Axa, for the development of digital innovation in the insurance industry.

In terms of organizational culture, start-ups are created by a team motivated by the vision of the founders, where the first human resources recruited replicate the image of the founders, strengthening cultural ties and displaying a strong work ethic. The organization is characterized by operating through informal communication channels and consensus decision-making (sometimes led by the founder but not "politically" oriented). In contrast, the developed company can be characterized by formal communication channels combined with "political" channels and informal alliances. Human resources may be less motivated than members of the founding team, leading to friction between the "old guard" and newcomers to standards of behavior.

How to manage this dramatic transition? The first development to be carried out by start-ups in a process of growth is to specialize into functional groups, where each subgroup requires a functional leader. In this context, decisions about where to locate functions are critical when it comes to the optimization of communications and decision-making rights (e.g. product management and interface with production).

As might be expected, specialization will generate conflicts due to different management priorities. The solution to limit escalation of conflict between functions is to increase the regulators, which may lead to the need to recruit a Chief Operating Officer. Marketing also plays a role in reducing the conflict between functions by combining internal and external viewpoints to handle management priorities. Product managers can also handle conflict by understanding market requirements and development imperatives.

In summary, the digital transformation of a traditional company is not without risks. The refounding strategy must be carefully defined a priori to avoid risks. At the same time, obstacles also exist in the case of start-ups that are in the growth process.



# DIGITAL TRANSFORMATION AND ITS IMPLEMENTATION

7.1. Methodology for conducting a digital transformation

# Chapter 7.

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# DIGITAL TRANSFORMATION AND ITS IMPLEMENTATION

Once the strategy and the path to transformation have been defined, implementation must begin. As already mentioned in the previous chapters, digital transformation is a paradigm of refounding the company in all layers of its enterprise architecture. This must be embodied in a program with a deployment timeline, but at the same time must be conceived as a continuous change process. Continuing with the metaphor of "open-heart surgery", digital transformation must reach a finished stage, but it must be recognized that the care and continuous examination of the organization in search of new business models will be permanent. In this context, the development of the transformation program must be guided by two types implementation approaches:

• A lateral-thinking approach, suitable for unpredictable environments, where you try to prove what works in practice, learn and quickly discard what does not work. In uncertain environments, where there may be many theories with little data to validate them in practice, this method allows for faster advancement and to avoid strong failures.

• A linear approach, suitable for predictable environments where relatively few large wagers are made. This implies a deep scenario analysis to define a linear path for implementation that has a predictability of outcomes.

Each approach is applicable to different types of problems. Lateral thinking is what should guide the execution of the most innovative components of the strategy, and therefore, in the spaces where there is more uncertainty (this is in the systems of innovation layer of the Pace-Layered model, mentioned in Chapter 5). The linear approach is suitable for scenarios associated with the systems of record layer from the same model. To solve problems in the differentiation layer of the model, it is advisable use a combination of both approaches. And this statement leads us to the next section, with the following questions:

- How to establish a framework for planning, execution and improvement to simultaneously transform the processes along the value chain, starting from the core at the customer's overall experience?
- How to coordinate the different disciplines required to achieve these transformations and their benefits?
- How to combine rapid innovations, protect differentiation and at the same time improve operational efficiency and quality?

## 7.1. Methodology for conducting a digital transformation

The pace-layered model presented in Chapter 5 allows mapping the layers to the innovation cycles described above:

- Layer of Innovation: implemented through the innovation cycle
- Layer of Differentiation: adopts a hybrid innovation-evolution cycle where certain aspects of both cycles can be mixed. For example, use Design Thinking to strengthen development of the solution and then define a Roadmap for maturity and roll out near the cycles of evolution.
- Layer of Records: typically executed across cycles of evolution.

Both cycles are described below:

### 7.1.1. Cycle of Innovation

The innovation cycle begins with Discovery Jams. These events are relatively short activities that generate ideas for innovation. In *g*A, we look to structure them geared towards one of the four digital transformation levers, namely customer experience, digital fulfillment, employee experience, and smart enterprise. *Figure 7-1* summarizes the main steps and activities.

Depending on the area in which the Jam is focused and the maturity of the company, this dynamic may have variations. In the case of customer experience

#### Figure 7-1. Cycle of Innovation

Jam Preparation	DAY 1 Trends & Digital Technologies	DAY 2 Brainstorming & Draft Designs	DAY 3 Priorization			
MAIN ACTIVITIES						
Current Business Canvas     Digital Canvas & Strategy	<ul> <li>Review industry trends</li> <li>Build Customer Journey</li> <li>Discuss the company's main competitive advantages and areas of improvement</li> <li>Identify key issues to be solved</li> </ul>	Generate ideas, consolidate and build draft designs	<ul> <li>Priorize ideas</li> <li>Define which ones should be further refined through a Design Thinking approach</li> </ul>			
Source: gA Center for Digital Business Transforma						

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sessions, focus is placed on all customer contact points with the company, with emphasis on relevant technologies such as Customer Analytics, Mobility and m-Commerce. For digital delivery Jams, the focus can be on aspects such as the IoT and Industry 4.0. For Data Science Jams, the focus can be on data and how to transform it into business intelligence.

#### 7.1.2. Design Thinking

The ideas generated in Jams in general have low levels of depth and many degrees of uncertainty. To deepen the understanding of the problem and reduce uncertainty, we use the Design Thinking methodology developed at the Darden Business School, University of Virginia. This approach provides a series of tools oriented to the application of Design Thinking ideas to the business. It includes four key stages:

- What is?
- What if?
- What wows?
- What works?

#### Figure 7-2 summarizes the methodology.

In the first stage, the *What is?:* an in-depth analysis of the problem that is actually being addressed, from the customer's point of view. This stage is about understanding the problem to be solved and redefining it to develop an integral solution approach. It avoids assuming pre-made answers or preconceptions and



Figure 7-2. Design Thinking Methodology

focuses on validating, in the field and from a multidisciplinary point of view, the diagnosis of the problem in question. This includes reformulating the problem in a way that broadens the range of problems to be solved or restricts it to make the solution more efficient and focused.

In the second stage, the *What if?*: once the problem is properly defined, possible solutions are designed. It is the stage of creativity without limits, where all ideas are valid and the team is stimulated in the search for innovation.

In the third stage, *What Wows?*: the ideas are purged, retraining only those that really "wow" for their potential for success and refining the ones that are better qualified. Prototypes can be built to improve these definitions, reach agreement among the team and validate assumptions.

It is in the fourth stage, *What Works?*: where ideas are market-tested. These tests can be of multiple types, from a survey about a simple prototype to operating pilots with a target population. These tests are multiple and allow confirming or discarding key assumptions made during the "what wows" stage. The important thing is to be able to identify the key assumptions that support the idea and design tests that enable learning, quickly and at low cost, about what works and what does not, and with this information refine the process.

### 7.1.3. Agile Deployment and usage analytics

Once the ideas are refined, and often coinciding with the What works stage in the Design Thinking approach, it is necessary to establish a rapid development and implementation cycle. Agile methodologies are optimal for the rapid implementation of innovation solutions. Instead of focusing development on long cycles of analysis and design, sprints or short cycles are established, where development evolves. This has several benefits:

- Allows having actual products earlier, minimizing interpretation errors and enabling easier adjustments to deviations;
- By shortening development cycles, the accuracy of estimates is greatly increased. It is easier to predict an evolution or refinement than to visualize the full complexity from the beginning;
- Allows decisions to be made during the development cycle that ensure deadlines are met with viable products.

At the same time, it is important to have analytics to measure how much the solutions are being used and sections are most used, to strengthen the development of successful areas and to discard or freeze those that have no impact. An optimized innovation cycle is diagrammed in *Figure 7-3*.

This cycle enables innovation to be embedded in the traditional business, with optimized methods of execution. In our view, this cycle is enabled by the Digital Transformation Office.

#### 7.1.4. Cycle of Evolution

The evolution cycle corresponds to the execution of projects with greater predictability. It begins with the construction of an implementation roadmap. Usually the roadmap takes between two and six months to build, depending on the complexity involved, considering processes, geographies and mapping of applications. *Figure 7-4* summarizes the sub-phases of the roadmap methodology.



#### Figure 7-3. Agile Deployment Methodology

During strategic alignment, the main business objectives of the project are reviewed, establishing the basis for work and objectives. In the process design stages, the current situation is analyzed at a high level, identifying areas of opportunity and building a vision of future processes, still at high level of definition. In the gap analysis stage, the areas of opportunity are analyzed to affirm root causes and are later analyzed with two filters:

- Business objectives: how relevant are they to the established objectives
- Technical difficulty: what technical difficulties appear when solving gaps

In the Solution Architecture stage, the future operation model is constructed considering three key aspects:

• Process Architecture, considering the unification and simplification of the company's operational model



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- Organizational Architecture, referring to the organization chart and post-implementation functions. In many cases new processes are generated that require a person responsible for their execution. In others, the nature of positions changes, generating training needs or redefining roles.
- Application Architecture, considering the platforms that will support future processes, their components and the map for interaction with the rest of the business environment.

The final stage is the construction of the Roadmap, that is, how to phase the implementation to optimize results and minimize risks. In addition, a business case is built that estimates the benefits to be generated and return on investment.

One important value from executing a Roadmap is the alignment of the main areas affected by the project with the vision and the prioritization of its execution. Thus all parties involved are convinced of the scope, priorities and business reasons behind the different phases of the project.

Once the Roadmap is completed, each of the defined phases is executed. This is the stage where process details are defined and developed using the equipment



chosen, and the solution is implemented and deployed in the company. Finally, the expected value is captured in the business case, generally over the next three to six months after the solution is implemented (see *Figure 7-5*).

Once implemented, it is important to be able to operate it effectively and to establish a continuous improvement cycle. This focuses on the Sustain-and-Improve stage of the evolution cycle. The primary objective is to operate the new processes and the IT solution efficiently, keep it alive over time and integrate it with the components of innovation that are added in the future.

# LATIN AMERICA 4.0: THE CHALLENGE AND THE OPPORTUNITY

- 8.1. Investment in digital technologies in Latin America's economy
- 8.2. The relationship between digitization and productivity
- 8.3. The Latin American reality

# Chapter 8.

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# LATIN AMERICA 4.0: THE CHALLENGE AND THE OPPORTUNITY

This book has so far focused on the importance of digital transformation to increase the competitiveness of Latin American companies. The analysis has taken us from the conceptualization of what digital strategies are, to examples of Latin American companies that are already leading the digital transformation process, to the prescription of how to develop a digital strategy and structure a path toward a digitized company, emphasizing the need to manage cultural change, and the implementation of concrete initiatives. However, this book would be incomplete if it did not state that digitization is imperative-not only for Latin American companies, but also for the future economic development of the region.

The short-term outlook for Latin American economic growth is not very attractive. In 2015, the Latin America economies contracted -0.4%, and grew only 0.2% in 2016. This was due in large part to the decrease in world commodity prices<sup>63</sup>. Only by the end of 2017 is the Latin American GDP growth rate expected to reach levels recorded in 2011 (see *Figure 8-1*).

<sup>&</sup>lt;sup>63</sup> Economic Commission for Latin America and the Caribbean. *Economías de América Latina y el Caribe crecerán solo 0.2% en 2016 en complejo escenario global.* Santiago: December 17, 2015.



# Figure 8-1.

According to projections from the International Monetary Fund in Figure 8-1, the volume of Latin American exports resumed its 2011 growth level by 2016; it is expected that, by 2021 at the earliest, GDP will be growing at rates close to 2013.

In this context, to stimulate economic growth, Latin America faces a fundamental challenge: it needs to increase the contribution of productivity and competitiveness. The analysis of how much productivity has contributed to economic growth of the largest Latin American countries for the last fifteen years shows that, although labor productivity has contributed to gross product growth, the impact of the knowledge economy (which includes human capital, ICT capital and multifactor productivity) has been very low or directly negative (see Table 8-1).

Except for Chile, case where labor productivity has grown at twice rate of worked, analyzed the explanatory variable of product growth in the other Latin American countries lies in hours worked. In other words, except for Chile, gross product growth is determined by the number of hours worked and not by productivity per hour. Even so, the growth of Chilean labor productivity is significantly lower than that of an industrialized country, such as South Korea (which is 4.4).

#### Table 8-1.

#### Contributions to product growth (1995-2012)

(average annual growth in percentage points)

		Argentina	Brazil	Chile	Colombia	Mexico
1	Production	3.2	2.8	3.9	3.2	2.0
2	Hours worked	2.1	2.0	1.3	1.6	1.0
	Labor productivity (1/2)	1.1	0.8	2.6	1.6	1.0
	CONTRIBUTIONS FROM:					
4	Composition of labor (education level, age and gender)	-0.1	1.1	0.7	0.4	0.3
5	ICT capital per hour	0.4	0.7	0.4	0.5	0.4
6	Multifactorial productivity64	-0.8	-1.6	-0.8	-2.2	-0.9
	Contribution of knowledge economy to labor productivity (4) + (5) + (6)	-0.5	0.2	0.3	-1.3	-0.2

Source: Economic Commission for Latin American and the Caribbean (ECLAC), based on data from LA KLEMS.

In sum, in a context where productivity growth rates are far removed from what would be necessary to reach a healthy economic growth rate, it is observed that most of the productivity increase is determined by labor productivity, and that the contribution of investment in information and communication technologies is seriously behind. Herein lies the great Latin American challenge. Against a backdrop of falling commodity prices, one of the most important levers to stimulate economic growth is productivity growth. For it to increase, the digitization of production processes must be increased. An idea of the scale of the challenge is given by the contribution of the knowledge economy to the growth of labor productivity: in a country of advanced digitization such as South Korea, this reached 3.1 between 1995 and 2012; the average of the five largest countries in Latin America is -0.3.

#### 8.1. Investment in digital technologies in Latin America's economy

As discussed in our report Latin America 4.0. The Digital Transformation in the Value Chain. The upcoming challenge for Latin American business, the digitization of digital infrastructure by country and productive sector in Latin America shows a high level of adoption of digital technologies (see *Table 8-2*).

<sup>&</sup>lt;sup>64</sup> In its basic formulation, productivity is measured in terms of labor productivity (production divided by the number of hours worked). The productivity of all factors is measured in terms of inputs of capital, labor and raw materiales. This measure provides a better guide to the efficiency of an economy as it checks for changes in inputs.

#### Table 8-2.

#### Latin America: Infrastructure Digitization

(100-65: Advanced; 65-45: Transitional; <45: Constrained)

	Argentina	Brazil	Chile	Colombia	Mexico	Latin America
Agriculture, livestock, hunting, forestry			86.34		53.42	58.89
Exploitation of mines and quarries		78.23	86.60		50.29	69.51
Manufacturing industries	82.19	81.68	88.34	88.54	71.86	80.16
Electricity, gas and water supply			88.34		66.59	70.22
Construction		79.43	88.42		88.53	83.05
Commerce		83.05	88.28	85.52	74.35	80.95
Hotels and restaurants		75.02	86.35	91.68	74.35	74.82
Transport and storage		83.59	87.99	93.57	63.21	77.95
Communications				93.37	70.52	83.90
Financial intermediation		89.65	88.66	94.05	72.19	74.96
Real estate, business activities		86.03	88.51	127.86	74.42	86.36
Education		79.26		96.67	74.61	79.40
Health		72.35		93.81	69.41	73.42
TOTAL		81.71	88.06	88.34	72.03	80.20

Sources: EIT-INDEC (Argentina); CETIC (Brazil); Instituto Nacional de Estadísticas (Chile), Tercera Encuesta Longitudinal de Empresas); INEGI (Mexico), Censo Industrial Nacional; DANE (Colombia), Basic Indicators of ICT in Companies; analysis by the authors

As can been seen in *Table 8-2*, in all five countries studied, the digitization of business infrastructure is high, indicating an advanced level of adoption of digital technologies. In fact, in comparison, the level of digitization in the infrastructure of companies in Latin America is not significantly different from that of mid-developed countries like Spain and Portugal (see *Table 8-3*).

However, despite the high assimilation of digital technologies in the infrastructure of the Latin American production sector, the contribution of ICT capital to economic growth is still small.

#### 8.2. The relationship between digitization and productivity

In a short article in the New York Times published in 1987, economist Robert Solow argued that the automation of production processes in the United States had not resulted in increased productivity. This statement – that manufacturing automation had not increased productivity but had decreased it – triggered numerous attempts to explain this paradox. Among these, MIT's Eric Brynjolfsson (1993), argued that the paradox raised by Solow could be explained by four factors: 1) inadequate methodologies for measuring inputs and output (particularly in industries that rely heavily on information), 2) a lag between investment in information technologies and profit-making, caused by the learning curve and necessary adjustments in organization and processes, 3) information technologies are especially effective in the redistribution of income between companies, which does not imply an increase in total production, and 4) errors in the management of information technologies resulting from the lack of explicit measures to determine the value of information<sup>65</sup>.

In fact, numerous studies have also shown that, in general, the impact of ICT on productivity occurs with a temporary lag effect. These studies have shown that investment in digital technologies does not have an automatic and simultaneous impact on the productivity index, but this must be accompanied by other

Table 8-3.

Spain Portugal Latin America Agriculture, livestock, hunting, forestry 58.89 Exploitation of mines and guarries 69 51 Manufacturing industries 81.44 79.00 80.16 Electricity, gas and water supply 84.44 85.71 70.22 Construction 79.10 78.69 83.05 84.06 80.95 Commerce 83.59 74.91 Hotels and restaurants 78.71 74.82 84.15 Transport and storage 82.90 77.95 Communications 90.06 92.14 83.90 Financial intermediation 94.45 95.49 74.96 Real estate, business activities 84.29 90.07 86.36 Education 79.40 Health 73.42 TOTAL 81.43 80.41 80.20

**Iberian Peninsula versus Latin America: Infrastructure Digitization** (100-65: Advanced; 65-45: Transitional; <45: Constrained)

Sources: Katz, R., Callorda, F., Lef, M. (2016). Iniciativas empresariales y políticas públicas para acelerar el desarrollo de un ecosistema digital iberoamericano. Report to the Ibero-American Council for Productivity and Competitiveness. Madrid: Fundación COTEC para la Innovación.

<sup>65</sup> Brynjolfsson, E. "The productivity paradox of Information Technology", Communications of the ACM, vol. 36, No. 1, pp. 67-77.

structural changes to materialize. Robert Gordon of Northwestern University was the first to show this effect in the case of the U.S. economy, stating the need to carry out organizational readjustments and human resources training to take advantage of ICT investment. Quantitatively, Dale Jorgeson showed how, in the years 2000-2004, despite the slowdown in ICT investment, productivity in ICT user and non-user industries accelerated with respect to previous years. Productivity in ICT industries increased by .33 percentage points over 1995-2000, while productivity in non-user industries increased by 0.87 percentage points over the previous period. Explaining the lag and permanence of the impact of digital technologies, Jorgenson regarded the impact of ICTs on productivity as materializing once the production sector of the economy carried out changes in processes and production methods because of the introduction of IT infrastructure. This type of effect can be visualized in the following figure, extracted from one of the writings of Jorgenson et al (see *Figure 8-3*).

In fact, Figure 8-3 shows that, despite the decline in ICT capital investment between 2000 and 2004, its contribution to productivity growth increased with respect to the previous five-year period, with a lagging effect.

Basu et al. (2004) formalized Jorgeson's explanation using another variable to explain the lag: they called it the effect of intangible capital (defined as the

# Figure 8-3.

#### Gap effect between investment in ICT and Productivity



Source: Jorgenson (2008)

investment required to implement ICT, including adjustments in production and organizational processes, as well as employee training and R&D). The benefits of ICT lag behind because the accumulation of intangible capital is slow. In addition, in the process of the accumulation of intangible capital, a capillary effect is generated as new knowledge spreads to other industries, including non-ICT users.

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In 1998, Brynjolfsson and Hitt presented an estimate that for every \$1 investment in information technology, the stock market valued at \$10. They explained that the \$9 value assignment represented an intangible investment. Cummins (2005) defined intangible capital as the difference between the acquisition price of information technologies and the value created once these have been assimilated productively by a company. Cummins<sup>66</sup> (2005) provided an example:

"Suppose a company purchases database software. By itself, database software does not generate any value. At a minimum, the software must be combined with a database and, perhaps, a sales force" (p. 50)

The author believed that this intangible capital should not be thought of in the same way as a factor of production that can be acquired in the market like a computer is bought. He considers that intangible capital should be thought of as the way in which a company combines its factors of production to generate value and that, therefore, must be developed within the company through an internal transformation effort.

It is also important to mention that, in addition to the need to accumulate intangible capital, the impact of technology investment on productivity tends to be mediated by institutional factors and the specific context of each country. The results of the research that aims to replicate Jorgenson's analysis in other countries show only partial matches. For example Gulton and Srinivasan's research for the United Kingdom shows that investment in ICT capital goods in 1995-2000 contributed to half of the productivity increase in the economy, with a major impact on administrative, electronic, communication, transportation and financial services. On the other hand, research from the Conference Board's Van Ark, Inklaar and McGuckin (2003) shows the increase in ICT investment in certain countries but fails to prove a proportional improvement in productivity. Jorgeson came to the same conclusion by noting the comparative contribution of ICT to the economic growth of the Group of Seven countries.

This has led us to consider that ICT impact models on productivity are more complex than those that capture simple causal relationships or production

<sup>&</sup>lt;sup>66</sup> Cummins, J. (2005). "A new approach to the valuation of intangible capital", in Corrado, C., Haltiwanger,

J., and Sichel, D. *Measuring capital in the New Economy*. National Bureau of Economic Research. Studies in Income and Wealth, Volume 65. Chicago: University of Chicago Press.

functions such as Cobb-Douglas<sup>67</sup>. Therefore, in addition to intangible capital, intermediate variables should include specific national factors such as:

- Limitation on working hours
- Transportation regulations
- Restrictions on hiring and dismissal
- Barriers to entry of new companies
- Sectoral composition of the economy

Finally, the impact of ICT on total factor productivity materializes once the diffusion of technologies follows a three-stage process. The first refers to those companies at the forefront of adopting technologies. This stage does not necessarily result in a significant ICT impact except on those leading companies. The second stage includes the adoption of technologies not by companies but by industrial sectors with high transactions or network structure such as transportation, finance and distribution. The aggregate impact on total factor productivity begins to materialize once major sectors of the economy adopt ICT. This sequence is particularly important for emerging countries as ICT tends to be adopted by limited sectors of the economy, leading to a contradictory view: companies with a high technological component combined with low productivity rates.

In conclusion, the state of the art in the study of the ICT-productivity relationship today includes a reflection on a causality operating at three levels, moving from the microeconomic level (company) to industrial sectors, finally achieving a macroeconomic impact. This sequence is relevant for Latin America at various levels. First, while the region already has leading companies in the digital transformation process (such as Arcor, Copa, Bimbo, Banco Galicia, and Codelco), these examples represent only the first stage in the impact of digitization on productivity at the macroeconomic level. That is why, despite these examples, total factor productivity does not increase. In fact, for this to happen, the digitization process must proceed along the productive matrix, affecting industries first and then the entire productive system. Second, the transformation process will tend to occur first in those industries whose structure and value chain are more apt to incorporate disruptive digitization. In this sense, regional leaders lead the way where we can expect structural changes at the industrial level. A disruptive leader pushes their competitors to transform or disappear. That is why the "invisible hand" of competitive dynamics will guide the transition from the

<sup>&</sup>lt;sup>67</sup> These conceptual problems go beyond the merely methodological issues that have established that the difficulty in identifying the impact of ICT on productivity would be related to measurement issues. For example, Triplett et al. (1994) showed that some positive impacts of ICT (e.g. in the services sector) were not adequately identified by national productivity statistics. Another methodological problem could be related to the fact that the first ICT and productivity studies and productivity were based on very limited samples of companies based on private information and not from national accounts (Pilat, 2004).
first to second stage. Third, the transition to the third stage is where the impact of digitization on the production matrix is more complex. The Latin American matrix has about 60% of its companies in the SME sector; the barriers to the digitization of this sector are more important (e.g. absence of human capital, lack of entrepreneurial capacity, or simply lack of investment capital). This problem is not uniquely Latin American. Industrialized countries face the same obstacle (see the case of the "Mittelstand" sector in Germany<sup>68</sup>). In this case, the role of the state as a facilitating mechanism will be relevant in enabling SME access to those factors necessary to proceed with its transformation.

# 8.3. The Latin American reality

Having put forward the argument that explains the lack of direct and simultaneous causality between the adoption of digital technologies and the impact on productivity, we show how this effect manifests itself in Latin America. To do this, the level of digitization must be analyzed not only in terms of the adoption of infrastructure (see Section 2.1) but also from its incorporation into productive processes.

The digitization study by function considers three classic stages of the value chain:

• **Inputs:** this set of processes includes the acquisition of raw materials and components from procurement and supply chain management and logistics processes. The degree of digitization studies the assimilation of platforms and information transmission systems to reduce transaction costs (in purchasing, inventory management, and logistics).

• **Processing:** internal processes used by industrial sectors within their own ecosystem to transform inputs into products to be offered to the market. The automation levels of internal processes are studied as well as the interaction with firms that provide services and/or components to the raw material transformation process. In this case, digitization includes the assimilation of business to business platforms as well as the adoption of internal production planning systems such as ERP.

• **Distribution:** sale and delivery (including logistics) of products to the market. Digitization has a positive impact resulting from the adoption of new platforms for price signaling (digital advertising), distribution costs, and logistics (transportation, storage, etc.). On one hand, the prices of the product to be offered to market may

<sup>&</sup>lt;sup>68</sup> Thoemmes, P. (2015). Is the German Mittelstand going to prevail in a disruptively digital world?

increase because of better signaling to the potential market. On the other hand, distribution costs can be reduced through sales channel optimization.

The digitization of these three basic production processes is facilitated by the incorporation of technology in a company's transmission and storage infrastructure. Based on the essential components of computing, high-speed fixed broadband and mobile voice and data communications, infrastructure digitization includes cloud-based infrastructure, applications for analyzing customer behavior, deploying sensors in the production processes (Internet of things), and the monitoring of operations. The digitization of productive processes (inputs, processing, and distribution) in Latin America is smaller than the infrastructure presented above (see Table 8-4).

According to the data in *Table 8-4*, the digitization in the three vertical stages of the value chain is significantly lower than in the case of infrastructure. This is the confirmation that the acquisition of digital technologies has not yet translated into a process of assimilation at the level of production processes. As might be expected, this conclusion is not homogeneous in terms of countries or economic sectors.

The comparison of the digitization indexes of productive processes between the countries of the Iberian Peninsula and Latin America shows three levels of development (see Table 8-5).

#### Table 8-4.

Latin America: Average Digitization of Production Processes in the Value Chain by Country (2013-14) (100-65: Advanced; 65-45: Transitional; <45: Constrained)

	Infrastructure	Inputs	Processing	Distribution
Argentina	83.76	62.29	37.73	45.70
Brazil	81.71	71.42	46.62	41.55
Chile	88.06	73.11	50.21	60.25
Colombia	88.34	70.51	59.18	52.28
Mexico	72.03	41.62	30.13	37.51
TOTAL	80.20	62.41	42.37	42.77

#### Index of Advanced Digitization of Infrastructure

Sources: EIT-INDEC (Argentina); CETIC (Brazil); Instituto Nacional de Estadísticas (Chile), Tercera Encuesta Longitudinal de Empresas); INEGI (Mexico), Censo Industrial Nacional; DANE (Colombia), Key ICT Indicators in Companies; analysis from the authors

Table 8-5.

#### Latin America versus the Iberian Peninsula: Average Digitization of Production Processes in the Value Chain by Country (2013-14)

(100-65: Advanced; 65-45: Transitional; <45: Constrained)

		Infrastructure	Inputs	Processing	Distribution
lberian Peninsula	Spain	81.43	66.63	77.87	47.81
	Portugal	80.41	62.14	67.32	41.85
	TOTAL	81.28	65.98	79.36	46.96
Latin America	Argentina	83.28	62.29	31.73	45.70
	Brazil	83.76	71.42	46.62	41.55
	Chile	88.06	73.11	50.21	60.25
	Colombia	88.34	70.51	59.18	52.28
	Mexico	72.03	41.62	30.13	37.51
	TOTAL	80.20	62.41	42.37	42.77

Index of Advanced Digitization of Infrastructure

Sources: Unctad (Spain and Portugal); EIT-INDEC (Argentina); CETIC (Brazil); Instituto Nacional de Estadísticas (Chile), Tercera Encuesta Longitudinal de Empresas); INEGI (Mexico), Censo Industrial Nacional; DANE (Colombia), Key ICT Indicators in Companies; analysis of the authors

As shown in *Table 8-5*, although Latin America is far from the Iberian Peninsula, neither sub-region has a homogeneous profile. In terms of the most advanced nations, Spain and Chile are leaders: both countries register relatively steady progress in terms of their digitization of production. Similarly, Spain and Chile are advanced in terms of infrastructure digitization and inputs supply, and show delays in distribution digitization.

Portugal and Colombia are at the intermediate level of development with a similar aggregate index (Portugal: 62.18 and Colombia: 64.48). Both countries show high infrastructure digitization, although there are differences between the two countries in terms of progress in vertical stages of the value chain (Portugal is more advanced in processing, while Colombia leads in inputs supply). Finally, the remaining Latin American countries (Argentina, Brazil, and Mexico) have yet to make significant progress in all vertical stages of the value chain.

Furthermore, the analysis by process for Latin America reveals important progress along the value chain for communications companies. At the same time, there is progress in the input supply stage in several industries (see *Figure 8-5*).

The analysis by industrial sector consistently shows that infrastructure digitization (i.e. the adoption rate of digital technologies) is the most advanced stage of the

Figure 8-5.

### Latin America: Digitization by Stage in the Value Chain (2013-14)

(100-65: Advanced; 65-45: Transitional; <45: Constrained)

INFRASTRUCTURE	SUPPLY	PROCESSING	DISTRIBUTION				
Agriculture and others 58.89	Agriculture	Agriculture	Agriculture				
	40.00	32.55	33.33				
Mining	Mining	Mining	Mining				
69.51	53.49	30.95	27.69				
Manufacturing	Manufacturing	Manufacturing	Manufacturing				
80.16	63.75	37.23	45.31				
Electricity, gas and water 70.22	Electricity, gas and water 68.95	Electricity, gas and water 45.31	Electricity, gas and water 22.06				
Construction	Construction	Construction	Construction				
83.05	65.60	36.85	41.70				
Commerce	Commerce	Commerce	Commerce				
80.95	62.67	45.19	40.01				
Hotels and restaurants 74.82	Hotels and restaurants 53.83	Hotels and restaurants 32.73	Lodgin and restaurants 45.51				
Transportation and storage 77.95	Transportation	Transportation	Transportation				
	60.97	42.89	36.26				
Communications	Communications	Communications	Communications				
83.90	73.45	69.89	58.91				
Financial intermediation 74.96	Finance	Finance	Finance				
	49.67	57.33	50.12				

Sectors with an advanced rate of digitization

Sources: EIT-INDEC (Argentina); CETIC (Brazil); Instituto Nacional de Estadísticas (Chile), Tercera Encuesta Longitudinal de Empresas); INEGI (Mexico), Censo Industrial Nacional; DANE (Colombia), Key ICT Indicators in Companies; analysis by the authors

value chain in terms of the assimilation of technologies in other productive processes (inputs, processing and distribution). Moreover, the only stage of the chain that shows a high digitization rate is the supply of inputs (i.e., the supply chain), especially in utilities, construction, communications, real estate, business and rental activities. Again, the reduced impact of digital technologies on productivity is explained by the low digitization of the other three production processes: inputs, processing and distribution.

The estimates in Figure 8-5 demonstrate a high index of infrastructure digitization, combined with delays in the adoption of digital technologies in vertical production processes (input supply, processing, and distribution). For the digitization of production processes to improve productivity, companies must restructure their

operations, change their organization, and attract talent. The adoption of digital technologies does not have an automatic and simultaneous impact on the improvement of productivity. Initially, digital technologies are used for applications that have a reduced impact on productivity. Beyond this, there are significant inefficiencies resulting from operating manual and automated processes in parallel, resulting in two operational flows. In many cases, the adoption of digital technologies has been driven by technological progress (e.g. processing capacity and memory, bandwidth) and not by the ability to productively assimilate digitization.

To conclude, digital transformation is not only mandatory because of competitive strategies. It is a requirement for Latin American countries that want to grow economically and position themselves in parity with the leaders in the world economy. We hope that the prescriptions contained in this book contribute to the dialogue that must be held regionally among managers, policy makers and academics to meet this challenge. We hope that the prescriptions contained in this book contribute to the dialogue that must be held regionally among managers, policy makers and academics in order to meet this challenge.

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