The New Relations Among Things, Data and People: The Innovation Imperative

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Abstract In the first part of the book we argued that "people-centricity" must be a priority in the redesign of processes and operating models through digital technologies. A "people-centricity" approach, guided by the future CIO, is critical when a company digitally transforms people's daily experiences and approaches to business. In the following chapter, we present ways to leverage the human potential to structure internal relationships and manage external networks in order to drive the digital transformation. This chapter introduces the reader to the challenges posed by digital technologies as they design new relations among things, data and people. To fully exploit the digitally enabled opportunities, particularly process and business model innovation, we must consider the enabling factors such as capability design, digital innovation, environment design, internal organization design and digital IT governance.

1 Introduction

Today, digital technology enables the collection and analysis of data transmitted by multiple smart devices. Technology is creating entirely new ecosystems[1] with various stakeholders, including makers of tracking devices, security operation

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[1]An ecosystem is defined by Skilton (2015) as "a connected convergence of technologies in a market and business activity that enable new consumer, business, and market performance and user experience".

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centers, data analysts and other third parties providing value-added services. The ecosystems include new players as well as information-based items and information flows. Additionally, traditional players are also experiencing new roles and new challenges.

Let us look at a recent example from the insurance industry. In 2005, Unipol, one of Italy's largest insurance companies, worked with Octo Telematics, a large telematics provider in the insurance and automotive market. Together, they developed the first telematic policy in Europe (Unibox), installing devices in customer vehicles. Unibox included a 10% discount on premiums covering accident damage and a 50% discount on premiums covering theft (Vaia et al. 2012).

The system integrates OBU, GPS, and GSM technologies to capture and transmit location data, driving data, crash data and theft data. Many participants benefit from these information flows (trip data, policy data, cartographic data, crash data, theft data), as they can access data and reports online. The insurance company can collect data on millions of vehicle trips every 2 km.

Unipol and Octo have created a totally new ecosystem of services for different players: sales services to support new insurance policies; data entry of new contracts to initialize the service network; administrative services to charge and bill new policies; customer services for customer management and contract management (information and support on policies); road services to support end users during trips; behavior service to improve driving skills and car performance. Clearly, telematics has provided an important boost to service innovation and has had a significant impact on Unipol's business model (Vaia et al. 2012).

This ecosystem restructuring creates opportunities for new value innovation due to the realignment of data, function, and services. In Unipol's case, different stakeholders have joined forces to design the technology, share information and work as a dynamic meta-business system to build a valuable asset—without having to merge. But the full benefits of information-intensive technology investments have not been instantaneous. The timing of these enhancements is tied to extensive organizational learning and gradual consumer acceptance.

Thus, the availability of a vast amount of data pushes companies to **rethink how they create value for customers and how they capture that value**. Realizing new value depends on organizational learning and adaptation, involving many stakeholders, in a long **innovation journey within ecosystems**.

Incumbent firms in the automotive industry, for instance, are tackling the potential decrease of the market share due to the proliferation of new models, such as car sharing, and new competitors like Uber and Lyft. At the same time, big players outside traditional industry boundaries continue to show interest in the automotive business. Tech giants such as Google, Techstars and Amazon have set up research and innovation centers in Detroit to speed up this innovation process, without merging with car makers. Last year FCA and Alphabet signed an agreement to integrate self-driving capabilities with in-depth manufacturing capabilities, representing another key example of the collaboration between Detroit-Silicon Valley. General Motors has invested more than 500 million dollars on cruise automation technology by acquiring a San Francisco start up—Cruise Automation;

Ford invested 182 million dollars in Pivotal, a startup mobile application for cars and mobility. Others, like Mercedes-Benz, are creating new mobility services and business models: Mercedes Boots organizes transportation for children from home to school, sports or leisure activities. Therefore, the continuous knowledge exchange between engineers, designers, developers, and managers is creating a new industry.

In reshaping the boundaries of the business, digital leaders aim to govern innovation through a structured approach to the ICT Digital Transformation. This structured approach guarantees sustainable long term results, where people are at the core of innovation programs, **leveraging their creativity and innovation attitudes**, and **optimizing internal resources while facilitating external interactions**.

Naturally, the digital innovation journey needs to capitalize on the experiences of a multitude of actors, particularly those who are highly specialized in vertical solutions and who have the ability to rapidly adapt to changes, like small organizations/startups. **Orchestrating** data, ideas and technology becomes critical to managing the system of connected players.

Then, **contamination** is different from early engagement in that it is a true **co-design** and **co-development** and requires availability and willingness from all business partners that make up the ecosystem to play an active role during the overall digital transformation journey.

We present here three cases, ITALGAS, John Deere and Lago, that created and used new ecosystems to leverage company and market innovation potential.

Whilst ITALGAS improved their own capabilities on innovation just by integrating and balancing internal and external resources, John Deere and Lago respectively developed practices to orchestrate data, things and people in the system and co-design innovative solutions jointly with main stakeholders.

2 The Art of Balancing IN and OUT at ITALGAS

ITALGAS, a leading natural gas distribution operator in Italy and the third in Europe, is part of the Smart Energy & Utilities industry. Energy companies are constantly looking for ways to compete in this market, differentiating themselves from competitors, increasing the efficiency of their operations, and lowering costs for the consumer.

The world energy demand will increase by 40%, gas by 50%, while the trend will be reversed for coal and oil (International Energy Outlook 2016). Digital technologies will be critical for a more effective energy mix, in terms of low fuel consumption, optimization of resources, elimination of waste, less environmental impact, and the enabling of automatic and remote fine-tuning, for the purpose of transforming energy data into new services.

ITALGAS initiated a transformation journey (within the SNAM Group and in collaboration with the holding company) to benefit from IoT technologies and

connections. The process designed at ITALGAS is twofold: one unit focuses on internal actors and the latter focuses on external actors. They call the first unit "IN-OUT" because ideas are originated inside the organization and then challenged by the external ecosystem. The second is called "OUT-IN" and engages with external sources for idea gathering, while evaluating the fit with the company business strategy.

The IN-OUT stream leverages the creativity of people and their knowledge of the business. It is an informal filter on innovative ideas that create value for the company. Conversely, ITALGAS's OUT-IN stream continuously seeks to map open innovation sources in an attempt to identify opportunities that can bring value to the organizations.

Both units originate ideas and proposals that could potentially bring value to ITALGAS. Here, innovation is the result of a combination of creativity (that they define as structured), execution (ability to transform opportunities into real-life use, bringing value to the organization) and appeal.

The process started back in 2012 (see Fig. 1). At the very beginning, the main direct factor pushing the digital transformation was "Innoseeking". Innoseekers scanned the main innovation sources represented by market analysts to spot promising ideas. All people inside the organization are potential innoseekers. They continually scout digital transformation opportunities and share their ideas and experiences with each other. In addition, they interact daily with the external actors of the innovation process, opinion leaders, vendors, consultants, in the overall open innovation ecosystem. Moreover, they interact daily with business stakeholders to
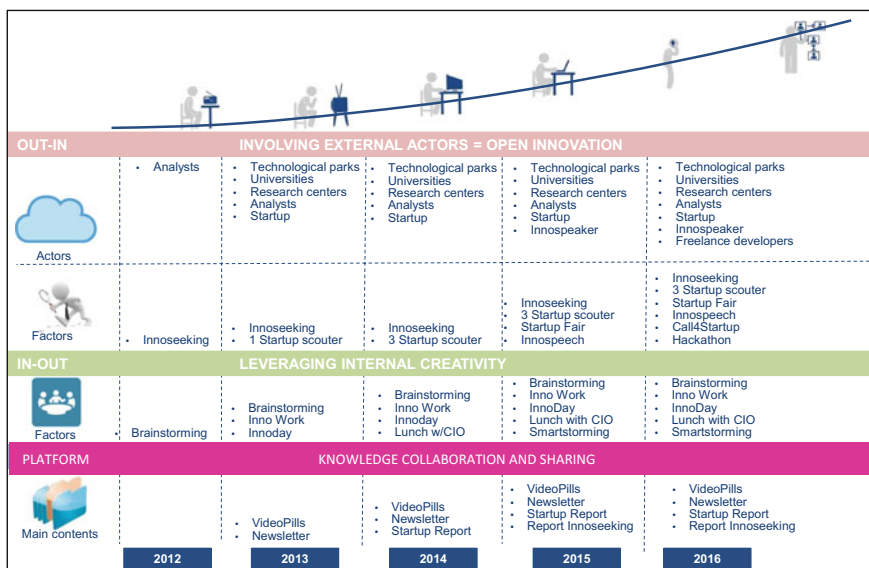
	2012	2013	2014	2015	2016
OUT-IN INVOLVING EXTERNAL ACTORS = OPEN INNOVATION					
Actors	• Analysts	• Technological parks • Universities • Research centers • Analysts • Startup	• Technological parks • Universities • Research centers • Analysts • Startup	• Technological parks • Universities • Research centers • Analysts • Startup • Innospeaker	• Technological parks • Universities • Research centers • Analysts • Startup • Innospeaker • Freelance developers
Factors	• Innoseeking	• Innoseeking • 1 Startup scouter	• Innoseeking • 3 Startup scouter	• Innoseeking • 3 Startup scouter • Startup Fair • Innospeech	• Innoseeking • 3 Startup scouter • Startup Fair • Innospeech • Call4Startup • Hackathon
IN-OUT LEVERAGING INTERNAL CREATIVITY					
Factors	Brainstorming	• Brainstorming • Inno Work • Innoday	• Brainstorming • Inno Work • Innoday • Lunch w/CIO	• Brainstorming • Inno Work • InnoDay • Lunch with CIO • Smartstorming	• Brainstorming • Inno Work • InnoDay • Lunch with CIO • Smartstorming
PLATFORM KNOWLEDGE COLLABORATION AND SHARING					
Main contents		• VideoPills • Newsletter	• VideoPills • Newsletter • Startup Report	• VideoPills • Newsletter • Startup Report • Report Innoseeking	• VideoPills • Newsletter • Startup Report • Report Innoseeking

Fig. 1 ITALGAS's IN-OUT-IN digital transformation journey

collect continuous feedback on what is really critical and valuable for the business within a portfolio of ideas. Innoseekers are the real digital transformation engines at ITALGAS.

The process was formalized and supported by an innovation digital platform that was used as a document repository and document-sharing tool. The collaboration system consisted of internal actors, the innoseekers, and external actors (market analysts). A year later, they increased the number of external actors, adding Universities, Research centers, Technological Parks and startups (they introduced a formal startup scouting process). This became, over the years, the most relevant enabling factor from a process point of view.

Startup scouting is performed today on a recurring basis, and startups are assessed through a matrix model that evaluates the innovation level of the proposition and the applicability to the business. Startups enter in a funnel that usually leads to the development of a Proof Of Concept and eventually to deployment.

This scenario remained stable for a couple of years, then a new source emerged: the "Innospeaker". Innospeakers are visionary, subject matter experts, recognized by their community, for being engines of disruption. They play a key role in stimulating internal resources with elements of lateral thinking, helping them to think outside of consolidated schema. For this reason, ITALGAS encourages the involvement of people with very different backgrounds, even those unrelated to the business.

In parallel, ITALGAS further developed ways to engage startups. Contamination with the external actors is key to increasing the creativity potential of resources. To foster contamination, they introduced Startup fairs—events where all the company employees can meet the most promising startups and be exposed to their visions, prototypes, and solutions. Moreover, they use hackathons consisting of hands-on sessions and/or demos of solutions developed by the open innovation network, which can evolve into real products.

People's creativity coupled with their knowledge of the company business is the formula.

This formula is an important asset that needs to be developed as much as possible. To develop this asset, ITALGAS introduced three techniques:

Large Brainstorming: they decided to involve around 40% of the company's employees at each brainstorming round. The output of the brainstorming is a long list of themes to be submitted to the technical committee and to the Innoboard for evaluation. It is the responsibility of the Innoboard to convert this long list into a more actionable short list.

Smart Storming: Though similar to the Brainstorming, this technique is much more focused. It is guided by a facilitator that keeps the scope limited to a specific topic to be investigated and developed. It has been used as a sort of meta—methodology to define scope, priorities and tools associated with the innovation and digital transformation process.

Lunch with the CIO: These events are informal meetings where relevant topics from the scouting activities are shared with the CIO and other top managers of the IT organization. It can be considered an abridged version of the more structured

opportunities selection process described before. But it is also a way to short circuit the strategy defined by IT managers and the resources needed to execute it.

Through this approach, ITALGAS accelerates the digital literacy of its employees and evaluates what brings value to the business. By having the technical and functional teams working side by side, they facilitate cross-fertilization and heavily reduce design time. They also build an open innovation ecosystem and expose their business to external knowledge and vision. As a mobility project to transform field operations, ITALGAS activated a network of almost 40 external actors (startups, research centers, universities) and peers, through a joint team of technical and business resources. Using "agile-like" techniques, the company supported the design and development of digital solutions: "continuous delivery of small functionalities is the best way to continually adapt to an ever-changing business scenario".

Finally, technology infrastructure plays a fundamental role in this case. ITALGAS's infrastructure is flexible enough to support fast, innovative and low cost solutions.

Today, they use a private cloud that has allowed them to cut management costs by 50% and has offered a provisioning time of about 15 min compared to the 10 days of the traditional approach. Management cost reduction eliminates entry/exit barriers and the automation of provisioning remove bottlenecks. This development is a great support for experimentation and innovation. The next step will be the adoption of a Software Defined Data Center (SDDC) to boost even more automation and support configuration processes. With a SDDC, they will be able to automatically reconfigure the Data Center infrastructure to provide computer resources to the applications just in time. So, when the business dynamics push for a digital service, ITALGAS will provide the required computing power; if the demand for service decreases, computing power will be rerouted to other services.

3   Orchestrating Resources at John Deere

John Deere was founded in 1837 by a blacksmith with a passion for inventions. Today, it is one of the key market players producing heavy machines for agriculture and green areas, with a presence in more than 30 countries. The mission of the company is to provide a set of reliable and safe agricultural and industrial tools to its customers across multiple business segments (industrial, agricultural, marine, retail and distribution, consumers). Nowadays, the company is the largest agricultural machinery producer in the world with a workforce counting 57.000 employees worldwide, and with a market value of $26.43 billion.

"John Deere has long been dedicated to those who are linked to the land, and is always ready to embrace change that leads to new opportunities," said Cory Reed, senior vice president of John Deere's Intelligent Solutions Group.

For the company, the need to increase production to face the world's growing population represents the chance to bridge the gap between a traditional sector, such as agriculture, with the era of connected devices, partly through the development of solutions on Smart Farming, namely Precision Farming. The Smart Farm uses a number of technologies, including GPS services, sensors, and big data to optimize crop yield. It is based on decision support systems that collect and process data in real-time, with the goal of providing information regarding all aspects related to the farming.

Today, Internet of Things is the enabler of precision farming, aiming at optimizing the efficiency and productivity of agricultural land, using modern and sustainable machines to get the best products in terms of quality, quantity and financial return.

Since 2011, John Deere has been developing a platform where customers can share data produced by their connected machineries, and then benchmark with other farmers and gain mutual benefits. The ExactMerge Intelligent Planter, for instance, is a tractor that places seeds at an exact space and depth, raising productivity and ensuring short planting. This 30 ton equipment system is guided by the Autotrac system, reaching an accuracy of roughly three inches. The same technology installed on sprayers permits a more efficient use of chemicals to protect from illnesses. Accordingly, sustainability of commercial farming can be increased and costs due to their excessive use can be reduced. The accuracy of the system allows reducing production costs in terms of labor, seed, fertilizer and fuel, with a significant improvement in operating efficiency and productivity per hectare. Furthermore, many other sensors augment the intelligence of these machines (the biggest possess 77 processors). JD Link remotely connects the machine with the office of the farm and mobile devices. Due to installed GPS sensors, the operator or farm manager can keep track of their fleet, monitor work progress, correctly manage logistics to avoid wasting time, and access important information like machine performance, speed, gas consumption, and early diagnostics. When smartphones, tablets and applications became more popular, the company upgraded its technology with the Mobile Farm Manager. More connected sensors were added to machines to enrich the monitoring capabilities accessible by those devices.

John Deere's vision for connected agriculture goes well beyond the individual farm. The final aim is to transform the agricultural industry by using data to push for collaboration between farmers and the entire ecosystem; a platform in which the grower can maintain close relationships with his trusted community of advisors, his equipment dealer, agronomic partners and also other farmers. Farmers and contractors rely on many partners and suppliers to carry out their activities (including manufacturers and distributors of fertilizers, software and agronomic services, consultants, etc.). Anyone can be a John Deere partner, just by adopting an "open system," and creating an interface for data communication from the Web portal to the backend of MyJohnDeere.com. The only requirement is to fulfill shared standards and integrity levels.

John Deere developed a new work management tool, which is integrated into the operations center and helps contractors as well as farmers to organize and do their

job in an orderly manner and without using paper. Managers can access this function in two ways: from the office, as an integrated tool in the Action menu of the Operations Centre; or "on the go" using the appropriate app for tablets and smartphones. Machine operators will have their own version of the app "MyJobs," designed specifically to meet their needs.

A work management tool is valuable for contractors and farmers, as it integrates the whole process (work planning, organization of priorities, data logging, billing and reporting) and makes it much easier. They can share the type of operation, the customer name/field, information on the product use (for instance seeds/fertilizers), and the combination of required equipment. The presence of clear instructions eliminates the risk of misunderstandings. Furthermore, reliable and secure documentation substitute confused work reports drafted by operators. With a real-time overview of the machines and fields, the contractor/owner of the farm has a good level of flexibility that allows him to accept, plan and assign new orders. A calendar displays all the machines and the related tasks, to allow an effective planning several days, or a week, in advance.

Thanks to crowdsourced big data, coming from thousands of farms integrated with datasets on weather and other information, farmers can define the optimum levels of production. By connecting with retailers and buyers in real time, it is possible to optimize product delivery and transportation (Fig. 2).
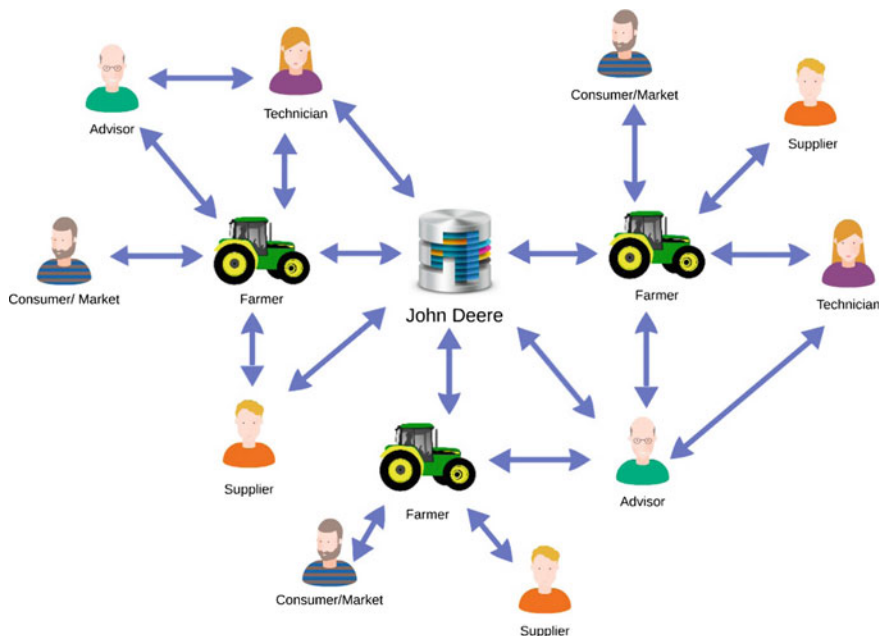

Fig. 2 John Deere agricultural ecosystem

John Deere's operating model has shifted from making 'big' machines to making 'smart' machines, through the creation of an information-sharing network made of equipment, sensors, satellites, and farmers. Over time, the characteristics of an ecosystem change. The keystone company should learn how to monitor the changes that the ecosystem undergoes over time. What gives the tractor an added value is the technology built on it, thanks to which the farmer becomes part of an agricultural ecosystem supporting his operative decisions.

The firm progressively redefined its boundaries, moving from a strategy focused on increasing production, to one aimed at the creation of a platform bringing together all the players of the sector.

In the future, John Deere will be able to act as an inspector of the performance of each company inside the ecosystem, an observer in critical changes and potential risks, offering reasonable suggestions and solutions to increase the effectiveness of a farmer's work. The business ecosystem becomes a surveillance network in which the IoT becomes the intelligent service platform that regulates the responses deriving from internal and external stimulation. The existence of such a rich community favors not only farmers but also John Deere itself, which will maintain close contact with customers and receive their feedback on a tractor's efficiency and usability, thusly leading to continuous improvements.

4 Lago as a Co-design Laboratory

LAGO S.p.a. is a company with a century-old tradition. It was set-up in the late 1800s by Policarpo Lago, who started his craft activities as a woodworker in noble villas and Venetian churches. His sons continued their father's activities and launched the production of design furniture.

During the eighties, the third generation expanded the firm and focused on furniture for living rooms and bedrooms. Since 2006, the company has continued growth in the high-quality design furniture sector under the guidance of Daniele Lago (today Chief Executive Office & Head of Design of LAGO). Under Daniele's leadership, the company revenue went from 5 million to 30 million euros in just 6 years (from 2004 to 2010), and it continues to grow year after year. LAGO is now present worldwide with more than 400 stores, both mono-brand and multi-brand, in big cities such as Rome, Milan, London, Paris, Madrid, Berlin and Prague. Moreover, LAGO furniture is present in many structures called "discovered," such as Bed and Breakfasts, resorts, hotels, offices, bars, restaurants etc.

The connection between products innovation, digital innovation and design is the secret to success at LAGO. "Interior life network" is the strategy that connects design and technology. It is related to LAGO's places (such as stores and public places) where the products can be bought or seen. Also, digital tools allow for the connections between the company and its customers and other stakeholders.

By employing the Interior life network strategy, LAGO has increased its turn-over in the last five years from €24,23 million in 2012 to roughly €31,22 million in

2016. At the same time, the webpage sessions (index of users' interests in the company), the number of Facebook fans (index of users' engagement and brand awareness), and the customer contacts registered on the CRM (index of potential customers) have increased significantly.

Talking Furniture, an Internet of Things (IoT) project based on the NFC technology, is a great example of this approach that merges products, strategy and digital innovation. Indeed, this digital application is strictly connected with product and design development processes, and it is based on the growth of brand awareness, reputation and the deep involvement of customers. It is a highly innovative digital application that allows LAGO's furniture to be connected to people. The innovation commitment in the *Talking Furniture* development process can be considered very high; many development process tools have been used, such as a stage-gate process, to harmonize all activities across internal and external actors.

This effort in digital innovation has helped LAGO to also achieve high innovation performance, bringing it between "Stars" and "World Class" innovators.

LAGO establishes a special conversation with those interested in its design, and is enriched by the experiences and opinions of all participants. LAGO community counts more than 750.000 Facebook fans and 30.000 Instagram followers. The company is always seeking a mutually beneficial relationship with partners, such as architects/designers, the press, and customers.

LAGO knows its customers very well in terms of their preferences, passions, ages, economic situations, and geography. Social networks and Google are a paramount source of data for the company. By collecting and analyzing customer feedback, complaints, and recommendations, LAGO has been able to pinpoint a wide spectrum of customer desires, but also for fixing problems, developing complementary goods, and beginning to develop new products. This leads to a short development cycle period with lower development costs (Schilling 2010).

To reduce its development costs LAGO has adopted a parallel development process. With this method, some stages partially overlap, to encourage collaborations and interactions between internal departments and other actors. LAGO uses this method to minimize the length of the process and to align different people from different stages.

The management of new projects is in the hands of the digital marketing coordinator, who promotes collaborations and integrates all opinions (CEO included). He manages the projects from concept to launch, with the support of those responsible for each step (such as the graphic designer, web designer, developers, Information and Communication Technology managers, etc.).

During the innovation process, external people are principally required in two stages: scoping and brainstorming. Indeed, to generate more ideas and perspectives, LAGO organizes workshops dedicated to the creation of new product concepts. Product designers, selected from the best schools or architectural firms, generally take part in these workshops. Moreover, shop owners and Discovers' owners also participate, because they are always in contact with LAGO's consumers and can explain the design and development needs based on the customers' feedback. Workshops can take few hours, one day, or two or three days. All the ideas from

the workshops are evaluated and screened, with only two or three of them moving into development.

To make use of all opportunities, efficiently exploit all available resources, and avoid wasting time, concept development and opportunity identification work together. It is very important that the collaboration involve decision-makers responsible for content, design, and development processes, due to the connection between customer usability and technical feasibility. For example, if a particular feature could dramatically improve the application but is too complicated or too costly to develop, two options are available: stop developing of that feature, or improve technical abilities to reduce the costs. Finally, the market launch starts with the product design stage, so that all communication activities are adequately prepared. Stage by stage, the strategy is refined. After the launch, the cycle restarts with new information provided by feedback and with new ideas to implement.

With *Talking Furniture*, the importance of relationships has been developed and extended even further. The company is developing its own social network, Memento, in which all LAGO customers can share experiences and moments of life around the furniture.

Memento is a function in *Talking Furniture* that allows people to record ideas, pictures, videos and texts in the NFC chip. In this way, all the activities and moments of life can be kept as memories in the furniture where they happened.

All these memories have three sharing levels. The first sharing system is the easiest one; contents are visible only to the person who recorded, so they are "private contents". The second level of sharing content is "at home," which means that the contents are visible to all those who activate the NFC on the product in which the contents have been uploaded. This level is useful for those who want to keep the pictures or texts only for a close circle of people. Finally, the third one allows sharing the contents with all LAGO customers. In this case, Memento gives two possibilities: sharing contents with people that have bought the same product or sharing contents with people that have bought any LAGO furniture. This is the starting point for the development of a real social network. People can review the products, can comment on pictures of other users and see in which city the furniture is.

5   Conclusions

Managing digital transformation requires a structured approach that involves an ecosystem of highly interconnected stakeholders. Our three powerful cases provide insight on how internal innovation is supported by a network of stakeholders (ITALGAS), how the IoT and collective data generation and exchange are used for better decision-making (John Deere), and finally how to crowdsource the new furniture concepts and the co-creation of content with social media users (customers) (LAGO).

These ecosystems perform well if external and internal contributions are organized and governed by a digital innovation leadership (other enabling factors,

discussed in the next chapters, are needed such as a flexible infrastructure, the massive use of mobile devices, and a bimodal, that combines stability vs. rapid change, delivery mode). Hence, consumers evolve into "engines of innovation," increasing the innovation sources and innovation opportunities at a rate that is not manageable by a single organization.

These forces are changing the way organizations do business; they call the ICT function and its leader, the CIO, to action, to take command of this revolution. Indeed, complex relationships involve stakeholders in multiple business areas, and the "ecosystem" mode of work requires developing a new methodology. To change the methodology, one should be familiar with the "point of departure" and with the way ICT used to work prior to the transformation. Furthermore, some of the relationships within the ecosystem are interpersonal but others involve relationships between connected devices. To make this work, the knowledge of technology is indispensable and this knowledge typically resides within ICT.

We believe there are three main reasons for appointing the CIO as the leader of this Digital Transformation process:

1. The digital transformation is pervasive in nature and usually impacts multiple business processes and multiple organizational lines. ICT, by its own nature, is equally pervasive inside the organization and, in many cases, acts as "guardian" or documented source of business processes. ICT knows which processes can be impacted by the digital transformation (and how) and thus exploits opportunities; in this process, issues are evaluated and risks are eventually mitigated;
2. Most "Digital transformation initiatives" once mature, move to an implementation stage. Indeed, ICT must master the tools and methodologies for managing different types of projects for scale, costs, timing, and risks. Traditional methodologies need to be integrated with agile IT methods, usually held within the ICT function;
3. The third reason is of course the technology per se. We are dealing with a technology-enabled transformation: each new product and service, or business model, is supported by software or hardware. Any new model of a vehicle, for instance, embeds much more software than the previous model, and the additional software often enables the reconfiguration of the functionalities of the product. ICT is now a strategic partner inside any organization. Moreover, IT consumerization and the wide diffusion of digital technologies call for a critical integration with traditional legacy technologies in organizations. The CIO has an understanding about the "big picture," and how to make different technology components work together.

The CIO has the knowledge and the right connections to design an organization that encourages the participation of all our resources (business lines, other CXOs, technology vendors, …). The CIO role is to facilitate and manage these interconnections.

At ITALGAS, the CIO and its first line of managers, within the INNOBOARD team, are responsible for defining the IT driven digital transformation strategy and

represents the first gate for approval of IT digital initiatives. Here, the INNOMANAGER reports directly to the CIO and s/he is responsible for all operational activities related to the digital transformation program. S/he is usually a member of the Application Development department, because a good knowledge of business processes and services is a requirement. S/he is the orchestrator of the innovation processes inside ITALGAS.

The CIO can actually drive the Digital Transformation, through a structured approach to innovation management, introducing the right methodologies and tools, leveraging the open innovation ecosystem and putting people, both users and designers, at the core of the process.

We have in mind a multi-faceted role to drive and govern this transformation:

1. CIO as evangelist, to achieve a general awareness about digital transformation opportunities
2. CIO as digital planner, to design and lead a roadmap for the digital transformation
3. CIO as facilitator, to establish productive links between ICT, the business and other critical sources
4. CIO as integration lead, to facilitate integration of technology in business strategy.

S/he needs to search, support and develop to effectively exploit the potential of digital technologies, internally or externally. This nurturing should be practiced in a changed environment, where the organization has endorsed a flexible, semi-autonomous, horizontal ability to foster the agility and deep knowledge of small teams. In the end, a new environment should be created with new ways of thinking and new ways of dealing with customers, an environment where CIOs must orchestrate innovation across functions and external networks to reinvent and structure new value delivery models, combining and harmonizing physical and digital. Finally, digital initiatives must be well integrated into a unique digital company, where the implementation of a Digital Governance plays a critical role by supporting the change of behaviors and a decision-making culture.

The next chapters provide practices, cases, experiences and knowledge about the design and organization of a digital transformation journey.

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