

# Business Designers, Organizational Networks and ICT

Giorgio De Michelis

**Abstract** Within innovative companies competing in the globalized market we can observe two distinct phenomena characterizing their changes with respect to the past: the proliferation of organizational networks and the raise of a new profile of top manager/entrepreneur that has been called business designer. Scholars and practitioners are paying great attention to these two phenomena in order to characterize them and to improve their reproducibility. Since business designers are characterized mostly for their way to design and develop innovation at the level of products, services and customers relationships, while organizational networks are seen as transformers of the organization of innovative companies, there has been little or no attention to the mutual relations binding the two phenomena. In this paper I propose some first hints on how business designers promote or should promote networks and suggest that organizational networks are necessary for doing business design. The last sections discuss how Information and Communication Technology can support the effectiveness of networks and suggest the technological innovation that should accompany the raise of business designers.

**Keywords** Organizational network · Business designer · Design thinking · Situated computing

## 1 Introduction

Globalization, with its consequences on markets and societies, is provoking deep transformations in organizations, from every viewpoint: customer relations, marketing strategies, production's organization and product design are widely changing and only those companies that change trying to become flexible and proactive actors will survive and, sometimes, grow. This claim, for whose rough generalization I apologize with my readers, is particularly true for all enterprises

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G. De Michelis (✉)

Università degli Studi di Milano-Bicocca, Viale Sarca 336, 20126 Milan, Italy  
e-mail: gdemich@disco.unimib.it

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competing in markets where innovation is a major success factor, like high-tech, but not only there. Scholars and practitioners of several disciplines (work sociology, industrial economics, organizational science, information systems, etc.) are observing and studying from different viewpoints the changes undergoing in organizations. Two issues raised in those studies seem to me particularly important, since they offer two complementary views on new organizations.

On the one hand, the growing presence of *network* structures in organizations [5, 6, 15]: from enterprise networks and networked enterprises, to collaborative networks. Networks appear, as first, as new structures mitigating and circumventing the rigidity of hierarchical organizational systems: networks allow to negotiate forms of cooperation without being obliged to fix rules and roles, trespassing organizational boundaries and constituting flexible aggregates where people not only coordinate themselves but also co-create knowledge. This is the reason for which, in these years, we have seen the growth of two types of organizational networks: institutional, inter-organizational and intra-organizational, networks, on one side, and collaborative networks, on the other side. While the former aim at creating flexible settings for putting together resources and capabilities, the other let people, from different organizational units and/or with different expertise, work together in the design and/or development of new products/services. For its variety, the concept of organizational network has been occasion of a large set of studies and of some specific analytical tools like the Actor Network Theory (ANT; [25]), becoming one of the most relevant issues in the debate on organizations.

On the other hand, the emergence of a new entrepreneur/top manager profile, that has been called *business designer*, to indicate that, at the beginning of the third millennium, business needs not to be administered but designed. Business design has been studied and practiced by a growing number of scholars and managers/consultants/entrepreneurs, with the aim to understand how innovative companies operate in the global market being able to bring innovation to economic success and to create strong companies [9, 20, 21, 28]. Research on this subject has coupled direct observation of the behaviour of the leaders of radically innovative companies with the aim to understand their distinctive features, and the development of a conceptual framework capturing the main factors influencing the success of radical innovation and allowing its repeatability in time. At the basis of all the efforts along this perspective, there is the shared recognition that, like its name underlines, coupling business and design thinking is its first necessary step, since design allows to look at business from a viewpoint where innovation is not immediately subsumed to economic discourse and opens the minds to accepting multi-disciplinary collaboration. The outcomes of this research have been also highly influential in defining the programs of new courses aiming to educate those who want to become business designers (Rotman School of Business in Toronto [28], D-School at Stanford University [<http://dschool.stanford.edu>], Domus Academy in Milano [[www.landing.domusacademy.com/master-programs/business-design](http://www.landing.domusacademy.com/master-programs/business-design)] are some examples of schools moving along this direction).

Even from this very short survey, it emerges that networks and business designers, share a focus on opening organizations to a greater flexibility in their

practice and in continuously reinventing themselves, but their originating factors are quite diverse, since networks are sustained by the growth of (ICT based) systems supporting them in always more effective and varied ways and by project orientation, while business designers are singular and, in some sense, exceptional outcomes of a combination of entrepreneurship and design thinking. Moreover, networks are emerging social aggregates and binds within and among organizations, integrating and/or substituting traditional organizational structures, while business design connotes a new entrepreneurial style adopted by people who are capable to play the business game innovating it from several diverse viewpoints. Finally, even if they are global phenomena, they have a particular relevance in the Italian industry [7, 10], connoting its (best) enterprises from decades. Their combination is, therefore, an interesting puzzle. The questions that arise from the above considerations are: do organizational networks and business designers have anything in common? If yes, can we study how business designers can improve their effectiveness curing their organizational networks? Can they develop the ICT infrastructure of their company as the main, or, at least, one of the main, supports of their business?

In order to give some preliminary answers to the above questions, it is necessary to survey, at the conceptual level -networks and business design- and to discover their mutual connections, taking into account that, on the one hand, there are diverse types of organizational networks, on the other, we have several examples but only a vague and incomplete definition of ‘business designers’. In trying to do what announced above, this paper, first, discusses the new managerial profile of ‘business designer’ and surveys two examples of business designers, then, resumes what we know about organizational networks. In this work, we try to find a good equilibrium between conceptual clarity and adhesion to what we see in the reality. The second part of the paper discusses how business designers and organizational networks are interrelated and how, discovering these interrelations, allows to define innovative plans for the development of ICT platforms. A short conclusion terminates the paper.

## 2 A New Managerial Profile

At the beginning of this century, I designed, with my friends of Domus Academy, the design school of Milano, a new Master for creative top managers and entrepreneurs (we were looking at the people leading Made in Italy companies). This Master was called Master in Business Design (MBD) to distinguish it from standard MBA (Masters in Business Administration) courses: it continues to be offered and delivered in these years, even if I don’t have anything to do with it from years [[www.landing.domusacademy.com/master-programs/business-design](http://www.landing.domusacademy.com/master-programs/business-design)]. Our MBD was a quite ambitious school willing to banish Business Administrators in the loft, substituting them with a new figure, having a culture strongly influenced by design thinking. The inspiration moving us had multiple and heterogeneous sources: on the

one hand, the multi-disciplinary experience we did collaborating (technologists and designers) in the design of innovative interactive systems; on the other hand, the observation of new entrepreneurs trying to invent simultaneously new products/services, new companies, and, even, new markets in the diverse sectors where Italian industry has a leading position, like mechanics, furniture and fashion [7, 10]; and, finally, the intuition that the crisis of the hierarchical model required also to reinvent the profile of the managers guiding the non-hierarchical companies, dismissing it.

We were not the only ones moving in that direction. As we have already mentioned in the Introduction, in the same years Roger Martin uses, at the Rotman School of Management of the Toronto University, ‘business design’ to give a name to the new perspective [28] on which he is addressing its courses, including MBA itself; similar experiences are ongoing at several other, often very prestigious, schools, like Stanford University, where D-School (formally, the ‘Hasso Plattner Institute for Design’) is created, as a center for experimenting new educational programs, where computer scientists, designers and business experts work together developing design thinking [<http://dschool.stanford.edu>]: innovative design studios transform themselves in a new type of strategic consultancy companies capable to help companies to use design thinking to become change makers (one name for all: IDEO [21]). And research and educational experience are still ongoing on the necessary meeting between management and design culture: few months ago, it has appeared a collective book on the subject [20].

The unrest characterizing all these experiences does not allow to fix the concepts characterizing the field. In order to make some clarity, we need, therefore, to characterize the meaning of the terms appearing in ‘business design’. We do it looking at their etymologies ‘business’ derives from ‘busy’. The business has not, originally, an economic connotation, but indicates something happening, that engages us. Even if its not difficult to explain why, quickly, it narrowed to characterize work and economic activities, it is useful in this context keeping in mind its original meaning, since, today, the distinction between work and ‘free’ time is always more fuzzy and we make, frequently, reference to things that we do out of our working context or for pleasure, as voluntary performances, as part of our business. In particular, it seems to me interesting that the separation between economic and non economic business is, essentially, impossible when the activity is ‘statu nascenti’: a group of friends, like the creators of the Noah Guitars, [[www.noahguitars.com](http://www.noahguitars.com)], can start an activity for purely pleasure reasons (creating a new innovative rock guitar), discovering later that it has become always more engaging, that it has a strong potential, needing therefore for a well defined business model (foreseeing also an economic return). Many start-ups follow the inverse path: they begin with the aim to make money, but they never reach their objective, even if their creators have fun working at them.

For what regards design, Klaus Krippendorff opens his paper *On the Essential Context of Artifacts or on the Proposition that “Design is Making Sense of (Things)”* [22, p. 9] with this claim: “The etymology of *design* goes back to the Latin *de + signare* and means making something, distinguishing it by a sign, giving

its significance, designating its relation to other things, owners, users, or gods. Based on this original meaning, one could say: design is making sense (of things)” ‘design’ originates, therefore, from the sign through which human beings make a thing distinguishable to become, progressively, the sign through which we make sense of it. Rather, design allows to reach the thing of which is made sense: in this way we can better understand its elongation in time.

Together with ‘business’, therefore, ‘design’ means ‘making sense of what is engaging us’. It has to do, not only with granting the optimal performance of an economic activity, like requested by the role of a business administrator, but also, and mostly, with doing anything may be necessary and/or possible for bringing what we do, with other people, to a temporary completion. It is clear that, for business designers, making sense means covering all the relevant dimensions of their business: from their different performances and practices to the objects and/or service performances deriving from them and to their aesthetic and functional qualities; from the conditions where the business is performed to those of its participants; from the communication with its stakeholders to the relationships with its potential customers and beneficiaries; from its environmental impact to its profitability. I call the innovation of the business designer ‘design driven innovation’ [9] to distinguish it from the more traditional ‘market pulled’ and ‘technology pushed’ innovations: while traditional innovation forms are centered on one principal element sustaining it (the market, the technology), design driven innovation has at its center the stakeholders and is, intrinsically multi-dimensional. Even if we should not imagine that the business designer must, perforce, bring again all of those issues into question, there is no aspect of his/her business that she cannot reinvent or redefine.

The emergence of business designers, in fact, is not due to their innovative education: rather it is grounded in the changes ongoing in the market. When the market is steady, business designers are needed only for pushing a new product/service in the market. All companies competing in steady markets may be satisfied with having a good administrator managing them. But when, as it happens now, the social and economic context is highly turbulent and unforeseeable, and breakdowns (both negative, menacing their position, or positive, opening new possibilities of business) are frequent inside and outside the organizations, undermining their conduct, their leader must be able to transform these breakdowns into occasions, rather than considering them as obstacles. This will be possible if their organizations will be able of reshaping themselves so that their efforts re-focus on new targets. In all these cases, in fact, administering is no more sufficient. Aligning activities to the planned objectives, absorbing the breakdowns, is not enough: rather it is necessary to redefine plans and, if needed, to re-design the business itself. There are several examples of companies, that have been able to perform radical changes in order to re-gain a strong economic profitability (for example, Nokia did it twice in these last thirty years), as well as there are also several examples of companies who have not been able to do it, and begun to decline (Yahoo and Benetton may be analyzed from this viewpoint).

For this reason, from the last years of the twentieth century, business design [9, 10, 20, 28] has become a widely discussed concept. This couple of words are used,

generally, to characterize the growing contamination of managerial with design culture and to outline how design thinking can strengthen those who lead innovative companies. Generally, business design is characterized for its way of approaching the market: from putting the emphasis on products and/or services to creating a dialogue with the customers and the stakeholders, from improving the reach of commercial channels, to caring customers and their needs and desires. The business designer has a radically different style in guiding a business with respect to the business administrator: while the second must grant the efficiency and effectiveness of the performances of the organization, whose nature is assumed to be almost stable and well known, the business designer is continuously redefining the business in all its components, without assuming anything as fixed, even the market where his/her organization will compete. When a car maker was searching, some years ago, a new manager, it looked for a profile capable to run at best an established business because it needed a business administrator (things are changing also in the automotive sector, today, and car makers are no more sure that their market is stable); quite differently, an entrepreneur like Steve Jobs [19], probably the ‘champion’ of business designers, has continuously reinvented the business, the market and the customer relationships of Apple, without paying too much attention to typical economic and financial indicators.

### 3 Examples of Business Designers

As I said in the Introduction, I want to outline the profile of business designers, taking into account that the concept has its roots in existing entrepreneurs and top managers who have been able to create and develop innovative companies. Moreover, I have also claimed that Italian successful companies, those that are frequently collected under the header of “Made in Italy”, have as their charismatic leaders, persons who can, generally, be considered business designers, or, more interestingly, who inspired the new profile of the business designer.

It is not possible, within the limits of a conference paper, to survey adequately an adequate number of ‘business designer’ candidates, but we can try, surveying some well chosen examples, to let emerge, in few lines, some elements characterizing them and some problems that their analysis currently leaves open.

First of all, even if business design is something that became of topical interest in the last twenty years, we can find even in the previous century, some precursors who were adopting an entrepreneurial style anticipating many of its characteristic features. A name comes to my mind with this respect: Adriano Olivetti [4, 30], who led Olivetti, but for a short period during the fascism, in the years between 1932 and 1960, when he died unexpectedly at the age of 59. Olivetti, founded by Adriano’s father Camillo at the beginning of the twentieth century, was, when Adriano became its CEO, a mechanical manufacturer specialized in typewriters and selling them mostly in Italy. During Adriano’s leadership, Olivetti added mechanical computing machines to typewriters, entered in the electronic sector,

with a Laboratory designing computers, and became a multi-national company selling its systems all over the world, and buying, one year before the death of Adriano, an important American maker of typewriters, Underwood.

In the years when Adriano lead Olivetti, in particular between 1945 and 1960, companies were facing completely different problems with respect to today. At a planetary level, Taylorism was just beginning its diffusion; globalization was not yet a real problem; instruments were mostly mechanical and only from the end of the fifties electronics became a real industrial opportunity; ... At the national level, Italy was a dramatically poor country trying to recover from the second world war that left it defeated and destroyed; it was mostly an agricultural country with few industrial companies and almost no multi-nationals; there were few laureates; the reconstruction of the cities was going on slowly. In those years, when most of the Italian entrepreneurs were dealing with the problems of re-launching production, looking almost exclusively to the Italian market and to mature non-technological products, Adriano transformed Olivetti in a completely new type of company changing it from many viewpoints: he innovated its products from the technological and aesthetic viewpoints, calling some of the best Italian industrial designers to collaborate with Olivetti and having some of its products exhibited in Museums like New York's Museum of Modern Art; he adopted a new communication style, from journals, books, diaries and calendars, etc. to shops, advertising and packaging, of a unique level of quality; he innovated the production processes adopting Taylorism, without loosing attention of the working conditions, selecting the best students of the Italian Universities for its management, promoting cultural programs from sociology and psychology to planning and architecture; he developed innovative social services for his workers and created a special relationship between Olivetti and its territory (Canavese; he was also elected Major of its main city, Ivrea); he commissioned the buildings of Olivetti (factories, offices and services) to the best Italian (and to some foreign) architects; he established a laboratory for the design of computers at their dawning, that brought Olivetti in the most innovative sector of electronic technology. The complexity of the figure of Adriano Olivetti is too high for trying to capture him in a simple formula: let me recall that he was also a prominent political figure in Italy (he created the "Movimento Comunità" with which he was not only elected major of Ivrea but also a member of the Italian Parliament), but we can not avoid to underline that the mixture of the interests he expressed in the years when he was managing Olivetti prefigure some of the characteristics of the business designer. It is not, therefore, by chance, that several observers have associated to Adriano Olivetti the figure of Steve Jobs, who can be considered its prototype.

Steve Jobs, in fact, has been a unique case among the CEOs of the High-Tech companies emerging, between the sixties and today, in the United States of America [11, 19]. Both during his first period leading Apple, and even more during the second one, as well as when he acted as CEO of Pixar, the famous computer animation film studio, he acted quite differently from the large majority of the managers of High-Tech companies. His companies were focused in creating new unique products/services offering to their customers new unique experiences rather than in improving their position in the market; he was directly involved in the design of new

products and services, like the Mac, the iPod, the iPhone and the iPad, in the creation and design of the Apple Stores and of the Pixar and Apple Campuses, in the design of the communication of his companies; he was neither a technologist nor a designer, but he played a major role in defining the new products/services that made Apple the leading innovative company in the last thirty years. With respect to this last theme, iPod was a tremendous success because it was a beautiful, perfectly working, tool for managing and listening digital music, but also and mainly because it was accompanied by iTunes, that revolutionized the music market; iPhone not only was a better smart phone than those offered by its competitors, but also it redefined, once for all, what a Smart phone was, and all competitors had to modify their products in order to adhere to the new standard. Every new Apple product aims to be unique and final. In particular, Steve Jobs played a major role in designing this combination of new systems with new services.

With the above claims, I don't want to say that what Jobs did is unquestionable: there are many aspects of how Apple works that merit to be discussed like its refusal to adopt open source technology, its remaining a close system where everything is done internally, its outsourcing production to large, slavist factories in the Far East, etc. What I want to stress is that Jobs managed Apple quite differently from its competitors in the digital sector, guiding it to create new products and services aiming to change the markets where they were placed and, also, to change the lives of its customers.

As I mentioned in the previous sections, Italian industry has several hundreds of entrepreneurs that can be considered business designers, whose companies compete for the leadership in global market sectors of various dimensions (sometimes very small), creating products combining aesthetic and functional excellence, augmenting them with services enriching customer experience, enhancing their roots in the territory and contributing to increase its quality, and distributing their products in a growing number of countries [7, 10]. Also Italian business designers are not, up to now, the outcome of schools, capable to educate people aspiring to become entrepreneurs towards an effective management of innovation, and, therefore, they correspond only partially and incompletely to the profile of business designers, but their relevance in the Italian industry qualifies them as a reference for all those who want to deepen their knowledge about business design. Moreover, if we compare the Italian case with the loneliness of Steve Jobs in the ICT industry, it appears quite clearly that business design fits at best with innovation but not specifically with technological innovation.

## 4 Organizational Networks

What is a *network*? The etymology of the term can be helpful, since its meaning had a strong evolution, accompanying the transformations of our means of moving and communicating. Network, is the combination of *net* + *work* and its sense has moved from any “any complex, interlocking system”, that reflected the growth of transport

systems, to “a broadcasting system of multiple transmitters” and “interconnected group of people” taking into account the emergence and evolution of mass-media. It is more interesting to look, at a more detailed level, at the etymology of *net*: it derives from the high-German verb *najan*, whose meaning is “to sew”. In the same vein, the Italian word *rete*, in accordance with the German glottologist and philologist Georg Curtius, stays for SRET-E, formed, through metathesis, on SERT-US, the past of SERERE, “to weave”.

A ‘net’ is, in brief, something that has been sewed or weaved: as any sewed or weaved artefact, it connects with threads several points/knots, leaving empty spaces between knot and knot, as well as between thread and thread. The term has been used, for example, to give a name to a widely used fishing tool, that is constituted by a, more or less, thick texture of, knotted each-other, strings. In the metaphorical use we do in this context, a net is any structure, constituted by knots and connections.

Finally, a network is something made as a net and, therefore, its use has grown to name nets that have been built by human beings. We have, therefore, computer-, organizational-, human-, institutional networks. In all these cases, knots are entities (humans or human aggregates, with or without a juridical personality), while connections may be of different types: signals, communications, commitments, but also, economic transactions, material or human exchanges, etc.

Networks of this type are always more frequent in several situations and their conceptualization allows to analyze and understand the behaviour of collective subjects, whose members have complex mutual interrelationships, and how networked relations influence the behaviour of individual actors. We can claim, without fear of exaggerating, that the network concept is today inescapable by any person who wants to analyze and understand any type of social phenomena, and not only those.

It is not surprising, therefore, that, within sociological and anthropological disciplines, Bruno Latour and colleagues developed Actor Network Theory (ANT; [24, 25]) where any object or individual is observed within the social networks it is part of. ANT is widely used in situated studies of social aggregates and, always more, in the analysis of dynamic changing socio-technical systems.

If we give a closer look at *organizational networks*, we see that there are, both, networks of organizational units, inside one organization or connecting several organizations [5, 6, 15], and networks of people, who collaborate on a common endeavour [12, 13, 16, 31, 32]. In the first case, network links are, generally, service relations or shared resources, so that hierarchical structures are substituted by light, focalized, mutual relationships, suiting better the evolving nature of the interplay between the involved organizational units, since they can be continuously re-negotiated with a clear responsibility distribution. In the second case, links define forms of collaboration, whose main texture is knowledge [13, 16, 29]: collaborative networks, in fact, constitute social aggregates, from work-teams to communities of practice [13, 33] allowing people with different experiences and competencies to understand each-other and make things together, and this is impossible without they create and share the necessary knowledge. It is interesting that networks of organizational units and networks of people are always more often emerging together

within innovative companies, since, on the one hand, collaborative networks are a necessary mean to make effective enterprise networks and network enterprises, and on the other hand, collaborative networks need to be supported by adequate resources, in particular repositories and data bases where explicit knowledge generated within the collaboration can be easily stored and accessed. Beyond the complexity that any network has, due to its need to put together different subjects, organizational networks exhibit also (and this has not been remarked adequately, in my opinion) the need to harmonize institutional and collaborative networks.

Innovative organizations create networks precisely to improve collaboration, so that they can get the resources and competencies they need, whenever they need them. Collaboration, in fact, is beneficial for its putting together subjects with different competencies and resources so that better and more effective performances are possible or, even, new performances individual participants are not capable of. On the other side, collaboration is not easy: first, it needs specific artefacts for coordination aiding the integration of individual performances [33]; second, it requires knowledge sharing and understanding each-other, that can be aided by mechanisms for collective knowledge [16]; finally, interests of all the involved stakeholders must be taken into account, avoiding to forget or penalize any of them [17], and harmonized solving conflicts in a positive sum game approach [2].

It is well known that cooperation problems become more acute when participants are not co-located, when they have diverse cultures and/or competencies, and, finally, when the objective of the cooperation is radically innovative so that it can not be related with any previously existing experience, thing or concept.

The context within which organizations live today is, for all its observers and protagonists, one of the most heavy crisis the industrial world has faced. For many of them, therefore, what companies do, is a response to it. Also the growth of organizational networks is part of this response. It is reasonable, therefore, to ask what will happen, when the crisis will finish. There are several reasons, inside and outside companies, that the hope that things will return to the order preceding the crisis will not come true. The current crisis is not a transitory turbulence, rather, it is the new order that emerges. On the one hand, globalization has nothing of transient, rather we start to see today some of the elements characterizing it (new forms of economic exchange, like sharing economy [18], redefinition of market sectors, under the pressure of technological innovation, social changes all over the globe); and the list could continue); on the other, most of the companies where networks have become an important organizational arrangement, can not divest themselves of networks: the latter have become an integral part of their organization.

## 5 Organizational Networks and Business Designers

As Isaacson recalls, Steve Jobs claimed frequently that he wanted to “build a real company, which is the hardest work in business [...]. That’s how you really make a contribution and add to the legacy of those who went before. You build a company

that will still stand for something a generation or two from now". That's what Walt Disney did, and Hewlett and Packard, and the people who built Intel. They created a company to last, not just to make money. That's what I want Apple to be" [19, p. 279]. In the same vein, Adriano Olivetti wanted to innovate the company that he inherited from his father, without affecting its robustness as well as its being a good place to work. So, even if it seems that business designers do not pay great attention to the organizational level, its champions contradict this belief. Surely, they deal with the organization of their companies, in a peculiar way: they are not aiming to build a new type of rational organization, rather, they want only to grant that the management of innovation is effective, without losing the capability of administering the business. Their companies, therefore, are frequently strange combinations of old-fashioned organizational structures and innovative ways of designing the business.

The relationship between institutional and collaborative networks merits some more words. Collaborative networks are where things are done within organizations: they are not social aggregates that organizations promote or create in order to improve the performances of their organizational units and to facilitate their integration; rather, organizational units are created to grant to networks the best conditions for their action and interaction. The fact that, always more frequently, networks capable of complex performances involve people of different units and, sometimes, of different organizations, requires not only that their organizational units support them but also that they establish among each other institutional links so that their diversities remain a richness without becoming an obstacle.

The collaboration between designers, engineers (sometimes engineers with different specializations), marketing professionals and communicators, that is needed in order to create new products in industries like furniture and mechanics, etc., is made possible by the collaborative networks they create in order to work together, and by the support they get by the network links that are established between their organizational units. Design departments (and sometimes independent design agencies) are needed in order to grow teams of designers who share a work practice, a style and the capability to invent new things that not only have aesthetic qualities but are capable to give form to products and/or services enriching the experience of their users, but, within any project, they need to create network where they can share their experience and co-create those products and/or services. We can interpret what happens within a collaborative network as the intertwining of several, diverse service relations, but these service relations are not standardized and their quality depends strongly on the knowledge co-created and shared by participants. Collaboration, therefore, is mainly grounded on knowledge creation and sharing: and this involves both tacit and explicit knowledge [29]. While collaborative networks are where participants socialize co-creating and sharing tacit knowledge, sharing explicit knowledge, internalizing and externalizing it require trespassing organizational boundaries and therefore collaboration must be supported by institutional links among the involved organizational units. Effective organizational networks are well-managed and well-behaving combinations of collaborative and institutional networks. This is not something organizations can achieve defining

good rules, neither it is something that can be administered: whenever networks become something where rules play an important role, then they are at risk of being annihilated by bureaucracy. Organizational networks require that the management of the organization takes responsibility of avoiding that rules inhibit collaboration and of granting that institutional and collaborative networks are coherently ruled towards their objective. This requires a careful design of the business.

Despite the fact that business designers are generally characterized for what they do changing the way their company presents itself to its stakeholders (customers, suppliers, investors, public authorities, etc.), it appears clear that they need to reinvent their organization, building it around their organizational networks. It is not by chance, therefore, that the pioneer of business design, Adriano Olivetti, and its champion, Steve Jobs, shared during their lives not only the passion for the aesthetic and functional qualities of their products and of their packaging, for the elegance of the communication of their company, but also the care for the spaces where their collaborators did their job and for the way their company was organized.

If, as Krippendorff claims [22], design is ‘giving sense’ (to things), then a business designer is constantly renovating the sense of his/her business, or better of the businesses of his/her collaborators. This means that his/her care is dedicated to the fact that collaboration works well giving raise to well designed products and services, i.e. that they listen and understand each-other, that they co-create new products/services and new knowledge. If you try to orchestrate specialized departments and collaborative networks by means of rules and roles, then it is probable that, despite your intentions, the outcome will be frictions and conflicts; business designers do it through conversations, knowledge flows and repositories, so that any network manages the knowledge wrapping its activities, that is the glue allowing to its participants to collaborate effectively, and any department updates the specialized knowledge characterizing the professional practice of its members, and explicit knowledge continuously flows from departments to networks for being internalized, and from networks to departments for being externalized [29].

## 6 ICT and Business Designers

As I have sketched above, knowledge is a key concept in the interplay between business designers and organizational networks, it is natural therefore to investigate how this fact may impact the design of information systems. The design of information repositories and data bases is not neutral with respect to organizational structures: abandoning monolithic corporate information systems networked organizations need for distributed systems, managed with great autonomy by networks and departments and for effective information flows among them. Networks, in fact, need explicit knowledge (digitalized information) mostly as a support for internalizing it within their practice, while departments need it for granting its accessibility to any interested party, within the company and its partners.

Business designers, therefore, should pay always more attention to provide to their collaborators the access to the knowledge they need as well as ways for creating repositories where they can store all what they do collaborating in the networks they participate in. The standard functions of corporate information systems, should not be neglected, but they should be considered some of the services that knowledge basis is able to provide efficiently. Current information systems like ERPs are not ready for this change of perspective, but they are moving to create better ‘business intelligence’ services [23].

But something more relevant is moving in the ICT sector. I make reference to the growing attention that scholars and professionals, vendors and users, are paying to data. Open data [3], as well as big data [26, 27], together with cloud computing infrastructures [1], bring to the attention of the public the relevance that data stored in the net may have for the knowledge of people and organizations and make possible to build adequate and efficient services for the access to knowledge. For what regards us, moreover, it supports the move from the traditional concept of information system, to a new idea, where data are taken first, as basis for the knowledge of the organization. So the emergence of data as crucial issue for ICT applications, may be supportive to the development of systems for the innovative organizations, for the organizational networks and for the business designers.

Innovative organizations, therefore, should make one step further, going beyond the mere idea of adopting the ICT services offered in the market augmenting their efficiency and increasing their business intelligence, to become exigent customers requesting the technology capable of making their networks effective. This will become, I think, one of the most relevant duties of business designers.

## 7 Conclusion

As said in the previous section, innovative companies lead by business designers and including several, frequently changing, organizational networks need systems allowing to each of its networks, and to each of its collaborators, an easy access to the knowledge they need as well as a repository where what they generate day by day is stored and organized. Open and big data, together with cloud computing infrastructures, constitute the necessary basis for services of this type and make them possible today. But open and big data, with the sophisticated algorithms they use, are not sufficient: what innovative companies need is a system providing knowledge access to its users on the basis of the knowledge creation processes engaging them [8]: every network has its own continuously changing context, every person participates in several networks and transfers knowledge among the networks in which she participates, and the list of the elements characterizing the intrinsic complexity of the knowledge creation process supporting innovation could continue. A static idea of data and of their relations with knowledge cannot give adequate answers to it. The construction of systems of this type, requires a radical paradigm shift in information system design: I call the new paradigm ‘situated

computing' [14], to indicate that, in this new perspective, ICT applications need to reflect the situatedness of human condition in the way they process data. But this is a different story.

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