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Beyond the experience. In search of an operative paradigm for the industrialisation of services

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Summary

After many years, in which service design occupied some blurred areas in different disciplines, this activity is now creating its own ground and consolidating both practice and research. The increasing number of conferences and publications on service design, the growing number of cases and the emergence of new education programs are contributing to raise service design to the status of an independent disciplinary area.

The contributions to the definition of a *disciplinary corpus* for service design come from two main directions: the first concerns the definition of a methodological framework for service design. This area is developing methodological tools for analysing, designing and representing services. The second area focuses on real cases, developing projects that are advancing the practice of service design and making service design visible to private business and public administrations.

The two areas mentioned above are developed along different disciplinary traditions; the first area refers to studies in management, organisation and engineering (Bitner, Booms, & Tetreault, 1990; G. Hollins, Hollins, Bill, 1993; Ramaswamy, 1996; Zeithaml, Bitner, & Gremler, 2006). This area emphasised technical and organisational aspects in designing a service, looking at a service as a production system. The second area has been inspired by interaction design studies (Pacenti, 1998; Sangiorgi, 2004), however the specific theme of service design has been developed in some schools and teaching programs beyond the traditional domain of Interaction design, focusing on experiential issues related to a wide range of product-service systems. The focus of this area is the *service*

encounter, i.e. the physical or virtual space in which the service provider(s) come in contact with the customers.

The parallel and asymmetric development of the two areas led to separate methodological approaches. This paper will illustrate such a development with the aim of emphasising the gap between the two areas and exploring possibilities to develop a broader operative paradigm for the design of services

The earliest development of service design.

The evolutionary path of service design starts from the intersection between design disciplines, in particular industrial design, and management and engineering science.

For several decades, marketing, management and engineering disciplines have considered service development and management as an integral part of their discipline. Design disciplines instead, started focusing on service design with some contributions in the 90's (Erlhoff, 1997; Manzini, 1993a, 1993b; Morello, 1991). The debate among designers concerned the relevance of (immaterial) services for a discipline traditionally focused on material products, the role of designers in the development of new services (in relation to other professional roles) and the methodological tools designers can use to design services.

One of the corner stones for this debate is Shostack's work (Shostack, 1982, 1983, 1984). Although Shostack's contribution is well rooted in marketing studies on services, her call for a *blueprint* as a fundamental step in the activity of service design is the beginning of a range of new contributions in several disciplines, including engineering, industrial design and interaction design. However, given the variety of aspects involved in the development of a service, such studies have not generated any solid definition of a blueprinting technique.

The aim of Shostack was to suggest that service development can be treated as a production system and their design can be appropriately communicated across the production process by using a specific notation. Obviously Shostack was very aware about the characteristics of services and the differences from the traditional material production processes. Indeed she suggested that service blueprints should specify time dimensions, main functions and tolerances (Shostack, 1982).

Shostack's work was also the starting point for the area of service design studies referring to interaction design, where a blueprint is essential for defining the characteristics and qualities of service encounters.

From this starting point the studies on service design have been developed along two directions: a first direction has explored design issues in an area that was very close to management and engineering science, the second direction explored issues in an area influenced by interaction design. Although the two directions had several intersections,

the contributions coming from them are quite different in nature and content. For this reason this paper will illustrate them separately.

Services as production processes: the contribution from management and engineering

Management studies have included service design and management as a parameter to control the business quality and customer relationships (Bitner, B. H. Booms, & Tetreault, 1990; Gronroos, 2000; Levitt, 1976; Ramaswamy, 1996; Zeithaml et al., 2006). Engineering studies have also considered service design as an integral part of a *total* production process (G. Hollins, Hollins, Bill, 1993).

Ramaswamy borrowed methods from Total Quality Management; he used Quality Function Deployment (QFD) as a tool for the definition of services' components. The author used the *house of quality* to evaluate possible incongruence between different components, and to compare different perspectives (users, designers, service providers, competitors) (Ramaswamy, 1996). This approach gives the designer a chance to control the design process from the details to the systemic aspects.

A similar approach is possible by using the IDEF0 (Integration definition for function modelling), a method designed to model the decisions, actions, and activities of an organization or system. Morelli (Morelli, 2006) proposes the use of this method for the progressive definition of a service system, from a general level to the details of the single operations. Hollins, (B. Hollins, 2006; G. Hollins, Hollins, Bill, 1993) stresses the need to present blueprinting on a time base, in order to show parallel phases, concurrencies and possible bottlenecks in the activities included in a service. For this reason he proposes the use of Just in Time (JiT) techniques to reduce waiting time for customers, thus improving the customers through-put; he also proposes the use of capability planning techniques to manage the variations in time for services demand and offer.

The analogy between service design and product manufacturing management was clearly a good inspiration to develop methodological insights concerning the organisation of service systems. However it was also very evident that this could not be the only source of inspiration. Indeed the intrinsic characteristics of services, such as the impossibility to store them (Eiglier, 1977), the relevance of time components (unlike products, service do not exist *before* nor *after* the moment in which the customer meets the service) and the high level of personal intensity of services (Normann, 1991) are elements of service design that are not present in traditional production processes.

Furthermore a new generation of services is emerging, in which the participation of customers is critical and represents a factor of big uncertainty. This characteristic has been emphasised by Richard Norman, who focused his studies on customers' involvement in services (Normann, 1991). In later publications (Ramirez, 1999) (Normann & Ramirez, 1994)

such an involvement was emphasised as a major breakthrough in the process of value production, in which the customer was no longer *consuming* the value created during the production process, but rather *co-producing* value. The contribution of Norman and Ramirez in this sense was in fact opening a new horizon and calling for a radical revision of the existing approach to service design: the question arising from such a new scenario is whether the existing systemic methods borrowed by production techniques are able to manage the large margin of uncertainty that customers' behaviour implies. Existing methods may prove very effective when the level of predictability of a product-service system is quite high; in this case the service can be described through a clear sequence of processes. When users become an integral part of the production system, though, a large number of qualitative and quantitative parameters should be considered, to evaluate the service quality (e.g. users' preferences) and service processes (e.g. sequences of events).

Furthermore the focus on customers' participation moves the centre of service processes much closer to the customers. The reduction of the gap between customers' expectations and the existing service offering is an issue that links the research on service design to the debate on mass customisation. The direct participation of customers in the definition of new solutions can support an extreme level of customisation, thus stretching the present capabilities of industrial systems beyond the existing limits of mass customisation (Morelli & Nielsen, 2007). This approach however, raises strategic and methodological questions: the strategic question concerns the adequacy of present management attitudes towards the new kind of offering¹; the methodological question concerns the existence of methods and tools that can really integrate users in the service design and development process.

Service design and the interaction paradigm, the contribution from Interaction design studies.

The definition of the specific nature of services, and therefore a specific and legitimate workspace for design in the development of new services, was the centre of service design research in the last decade (Sangiorgi, 2009). A perspective suggested by key studies in this area (Pacenti, 1998; Sangiorgi, 2004) was focusing on service as interactions. Pacenti (Pacenti, 1998) proposed that service design focus should be the interaction between service and users. Unlike the *traditional* view that defined services within the framework of normal production processes, this new perspective was suggesting that services be considered as complex interfaces. Sangiorgi (Sangiorgi, 2004) developed this perspective by connecting it to previous studies focusing on the *service*

¹ Von Hippel recently discussed this question in the MCPC07 conference (Eric Von Hippel, 2007) and in his book *Democratizing Innovation* (Eric Von Hippel, 2005). The topic was also discussed in the same conference by Tapscott, who was mainly referring to his book *Wikinomics* (Tapscott & Williams, 2006).

encounter (Czepiel, Solomon, & Surprenant, 1985) (Czepiel et al., ; 1985) and to *activity theory* (Kaptelinin & Nardi, 2006). She suggests the service encounter as the centre of service interaction and proposes a model for a systemic view of interactions in service design.

Those contribution clearly distinguish the space for service design as an autonomous area from management/ engineering studies and from industrial design, furthermore the emphasis on the *interaction paradigm* (Sangiorgi, 2009) in service design introduces an area of service design studies that is strongly influenced by interaction design.

Although service design and interaction design still keep their own autonomous characteristics² the proximity to this area leads the design activity towards a stronger focus on the quality and intensity of the involvement of users in the service interaction. Since the success of a particular service rests on the quality of the customer's subjective experience, the nature of this experience is the critical determinant of the success of the service (Solomon; et al., 1985). The design of such experience can take inspirations from dramaturgical metaphors and use *scripts* to regulate the role customers are supposed to play. The analogy between those scripts and Shostack's blueprint is quite evident. Unlike shostack's blueprints and dramaturgic scripts though, the design intervention refers to a participatory story in which each users is given more space to move and behave according to his/her own individual needs, cultural background and behavioral attitudes. In this context service design consists of scripting a story that would result incomplete without customers' participation. (Pine & Gilmore, 1999).

The script is supposed to guide users through a journey of critical encounters that take place over time and across different interaction channels (face to face, word of mouth, telephone, internet, text messages, marketing). Each encounter is a touchpoint in which users interacts with the service in different forms and with different intensity. The interaction includes information/communication between the service and the user, as well as participation and different forms of value co-production. The concept of the service journey enables the design team to create a rich picture of how service experiences play out in the context of everyday life. The objective here is not to understand and optimise operational processes but to determine the best experiential journey for the users of a service.(Parker & Heapy, 2006).

It is worth noticing that, although this approach may prove to be very effective in designing new users' experiences and in encouraging user participation, it often focuses to the front office area, whereas the area beyond the line of visibility, the back office, where services are organised and produced, is often overlooked.

Interesting implementations of the perspective suggested by the interaction paradigm have been proposed by some design schools, such

² Holmild (Holmild, 2007), points out that those disciplines can still be clearly distinguished on the basis of the characteristics of their process, their nature (material) and deliverable.

as the Interaction Design Institute in Ivrea, Domus Academy and the recently open CIID in Copenhagen. Those schools have informed the work of some service design studios, mainly UK based, which consider service design as the activity of designing touch points that shape user experience and support users' participation in the interaction process. Finally, this approach has generated several design cases of public services in UK (Cottam & Leadbeater, 2004a; Parker & Heapy, 2006; Tackara, 2007). The common aim of those projects was to propose a new strategic direction for solving emerging problems, related to major social, demographic, economic and cultural changes that are challenging the public sector. This strategic direction is inspired to the emerging phenomenon of open innovation in many economic sectors (Tapscott & Williams, 2006) (Eric ; von Hippel & von Krogh, 2003) and proposes an active and direct participation of citizens to the definition of the new service (Cottam & Leadbeater, 2004a, 2004b; Vandenbroucke, 2003). The most known case studies privilege the direct contact with customers, rapid prototyping of services, and a sort of "designing by doing" process. Those projects, mainly developed by practitioners have generated a line of intervention in service design that proved to be quite effective in several cases, but has hardly been *codified* in any methodological framework. Yet the complexity of such cases is big enough to require a range of different skills, from ethnographic skills to technical knowledge and some methodological question inevitably raise: how can knowledge from other disciplines be integrated in this approach (e.g. can ethnographic or sociologic methods be slavishly imported, or they need a *designerly* adaptation to the tasks at hand?);

The gap

A comparison of the two approaches mentioned above clearly reveals a double asymmetry: the first approach focuses on processes, thus emphasizing the relevance of a proper organization of the back office, but it appears weaker when facing the need to *break* the line of visibility and introducing customers into the production process. The second approach, on the contrary, focuses on the logical space in front of the line of visibility, thus emphasizing user experience and participation, but the lack of a methodological framework reduces those cases to a taxonomy of *craftsmanship* cases.

In order to bridge the gap between the two asymmetric approaches a new *operative paradigm* needs to be developed, which links the practice of service design to a solid methodological approach provided by existing studies. According to Arbnor and Bjerke (Arbnor & Bjerke, 1997) an operative paradigm is developed by incorporating, develop and possibly modifying some previously existing techniques in order to adapt them to a specific study area. In other words an operative paradigm is a sort of methodological toolbox for operating in a specific study area, given a specific methodological approach.

When talking about service design, and more remarkably when dealing with an approach that privileges users' activation and participation, an operative paradigm should include methods and tools that allow the development team to:

- » **accurately study the social and human components of the service**, services are social constructions, this requires social skills to be a critical competence for service design: studies on user-driven innovation, user-centred design, participatory design, among others, become essential for the definition of methodologies for an *operative paradigm* for service design. The rationale for the introduction of such methods in the design process is to increase the level of users' involvement beyond the traditional marketing research.
- » **discover new methods for designing services**, the production of service is a complex process involving a network of heterogeneous actors, including customers. This requires design strategies to deal with such complexity and to accommodate the actors' different agendas and motivations.
- » **explore new communication techniques that allow customers to be an active part of the value co-production process**, if customers and new actors are becoming an integral part of the production process, the communication among the different actors must take into account the extreme diversity in languages, cultures and competences. Here below an overview of those tools will be provided

Methods and tools to understand and involve actors

Beside the traditional marketing research, new tools are being proposed, which aim at elicit qualitative data about users, possibly through their direct involvement in the analytical phase of data elicitation and interpretation.

The tradition of ethnographic and social studies offers very good insights on how qualitative data could be collected. However the short product realisation cycles often require ethnographic methods to be adapted to increase time efficiency, i.e. the capability to provide a reasonable understanding of users, while reducing the duration of ethnographic investigations. Interaction design studies have developed several methods in this regard. *rapid ethnography* methods tend to specify research questions before entering the field work, use multiple observation techniques and use computerised and collaborative methods to interpret data. (Millen, 2000)

The same need to increase time efficiency has been seen as crucial in service design. Some studies have focused on this problem, proposing a more operative approach to user analysis. Lindsay and Rocchi, for instance, propose a simplified method to analyse users' behaviour in their own context (Lindsay & Rocchi, 2003); Gaver, Dunne and Pacenti elicited users data and personal reflection upon the design theme; Buur proposed video observation of users' behaviour (Buur & Soendergaard, 2000),

whereas recent PhD studies are investigating strategies to support direct participation in workshops in the early phases of the design process³.

Although those methods are inspired social and ethnographic studies, their translation into the design discipline is sometimes quite distant from an orthodox application of such methods in the original disciplines. While ethnographers and sociologists aim at a deep understanding of the observed phenomenon, designers' ultimate aim is to bring about change in a certain reality. For this reason designers need to focus on specific issues, understand operative links and identify opportunities for change. While the ultimate aim of the original disciplines is to build a *logical map* of a reality, rendering the complexity of situations and conditions, the ultimate aim of a designer is to find *grips* in this reality to handle and manage change.

In order to emphasise such grips for design opportunities some studies have reconstructed customers routines or everyday life in narrative modes using timelines to emphasise relevant patterns (Morelli, 2009), other studies have been based on the direct involvement of users in the interpretation of video observation, through a *video-card* game, which supported the dialogue between users, designers and other relevant actors (Buur & Soendergaard, 2000).

New design methods

The perspective that integrates customers in the value co-production process requires that existing methods borrowed from system engineering and management be integrated with tools that consider the complexity of some emerging services. The limits of the existing management approach emerge when observing that its methods are considering users as the "receiver" of the service, thus confining them to a "passive" role.

Several service design practitioners, on the other hand, have organised design interventions on the basis of active users' participation. However the small scale of those projects represents the main limit to this approach. The need to generate larger scale projects instead, requires service design to be organised according to criteria that derive directly from the tradition of industrial production: the industrialisation of services would require designers to:

- » seek economy of scale (or economy of scope),
- » define the subdivision of work (roles, competences, knowledge holders and processes) and
- » find forms of communication of knowledge (from blueprinting to sketching).

³ This is part of a PhD study being developed by Louise Møller Nielsen, at Aalborg University, the study investigate the use of basic prototypes (such as lego bricks) to stimulate the development of personal and shared meanings which should be the ground of a design process.

Platforms could also regulate physical, information and money flows, specifying the logical sequences of the interactions between the actors as in Figure 2.

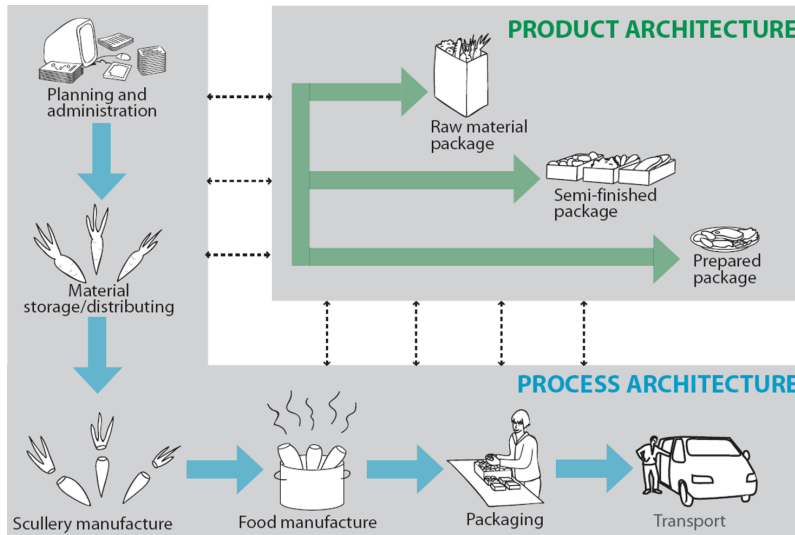


Figure 2 *Delight Assist*, information, physical and money flows.

Finally a solution platform may describe the architecture of a service system, specifying the main functional modules, as in Figure 3.

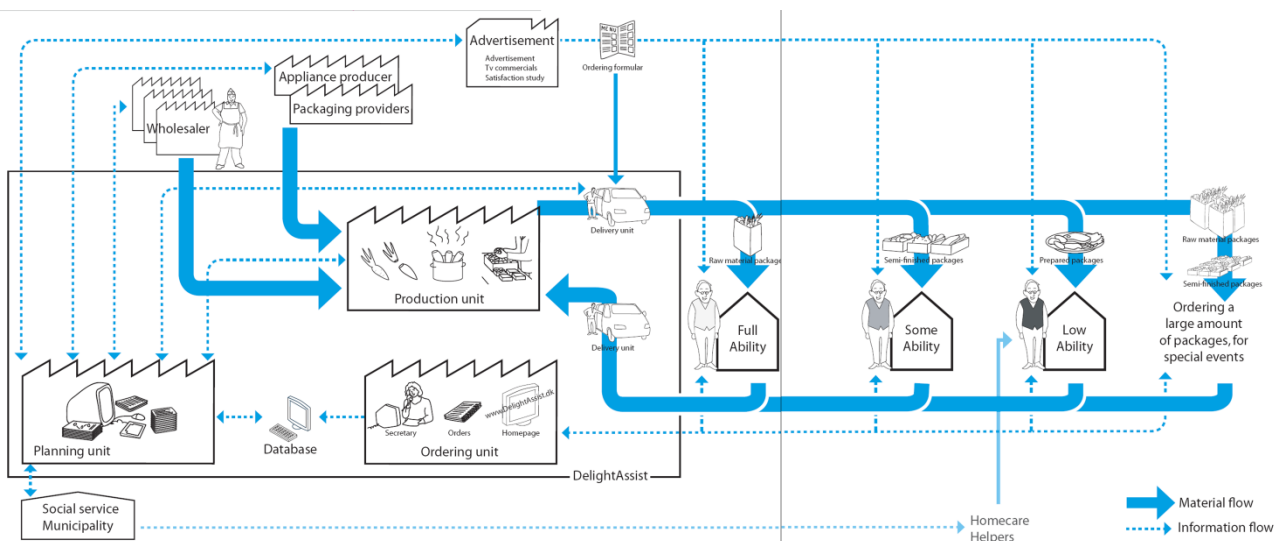


Figure 3 *Delight Assist*: the architecture of the service system

Solution platforms allow for an *open* definition of the system, which can be used as a mediation tool for local actors to negotiate their role and responsibility. Furthermore the possibility to identify specific modules (food providers, logistic companies, packaging units, meal preparation, in the case in Figure 1, Figure 2 and Figure 3) in the architecture of solution platforms would make the system reproducible in different local contexts, and for specific target groups, provided that the essential modules could

be created by local actors. By doing this, an economy of scope⁴ can be created. Furthermore such a distributed system would reduce the financial commitment of larger companies (i.e. IT providers, large service organisations) and public organisations (i.e. regional and national administrations) which are working across different local contexts. At the same time the modular architecture would allow for local actors to be directly involved in the production process. This approach would also identify and valorise local resources, create a higher sense of ownership of the service and bring about the most adequate solutions for each local context.

Because of their complexity and the high number of actors and competences involved, solution platforms require specific tools to support a negotiation process, such as the *motivation matrix* (Manzini et al., 2004), which lists the actors mutual interests and expectations from the collaboration in a local project.

The micro scale: use cases.

At the micro-level the method of use cases, used in software engineering to elicit software requirements, have been borrowed and adapted to analyse interactions in the services. While use cases in information science are only emphasising sequences of events and logical links, the same technique can be used in service design to work out a broader amount of service specification, concerning physical or virtual spaces in which the interaction is developed, physical movements and the specification of actors working in the front and back office. Use cases emphasise the correspondence between the user experience in the interaction with the service, described in timelines or in form of storyboards (front office), and the *mechanism* that allows service systems to support such interaction (Back office).

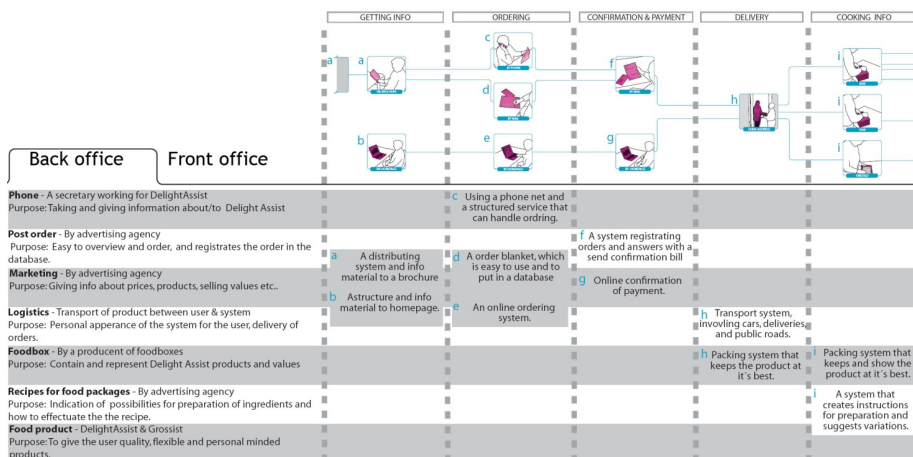


Figure 4 Use Case in service design, the storyboard in the upper part describes the interaction in the front office, the lower part of the diagram describes the working *mechanism* in the back office

⁴ While *economies of scale* focus on the *supply-side*, seeking the highest target group for a certain product, *economies of scope* work on the demand-side, thus offering the highest value (in terms of product and services) to a specific target group or individual.

New communication techniques for service design

Services do not exist before the customers come into play (Eiglier, 1977; Ramirez, 1999), therefore if the communication is not appropriate to reach and instruct customers, the service does not exist at all. An appropriate communication strategy is particularly relevant in services in which customers are actively involved in the co-production of value.

When involved in the design of co-produced services, designers have to face two kinds of challenges concerning representation and communication techniques

The first challenge concerns the representation of some core features in service processes. Although designers are very familiar with representation techniques, the design discipline's focus on product design does not provide enough valid tools to deal with features such as time and interaction.

The second challenge concerns the communication between designers and industrial companies and the actors that are actually producing the service. In the most usual form of cooperation between design and industrial companies, communication channels can use highly codified and specialised languages, that work very well among experts. When service production involves local actors and final users, instead, those languages cannot be given for granted. New representation tools are needed for designers to communicate the new systemic solutions to a broader audience of actors. The clarity of those tools is critical: likewise engineers and technical people in the production departments, all the other actors, including customers must understand what their role is in the system and what they are expected to do. At the same time, each individual actor should be able to contribute to the value creation system by proposing her/his ideas, solution strategies and tacit knowledge. If communication is not effective, there will be no final solution.

In using the design tools outlined in the previous sections designers have to find adequate representation and communication strategies to address the following questions:

Who are designers communicating with? Different actors talk different languages and use different communication techniques. For example IDEF0 may be a very effective technique to describe a service to organisation experts, but it may prove to be very hard to understand for local actors or final customers. Scenarios, scripts, storytelling techniques can be used to communicate to those actors in a service design process (Morelli & Tollestrup, 2007) .

What is the content of the communication? An overall description of the system or a detailed description of products, events and infrastructures? A prescriptive procedure or a scenario? TQM and just-in-time techniques, for instance may be the most effective communication tool for automated services or for processes in which the role of the actor is very well defined, whereas co-produced services could be better supported by use cases, because they generate realistic pictures.

What is the level of definition in the representation? The earliest concepts and the final solutions require different communication tools. Mapping techniques and motivation matrix, for instance, are very useful in the early project phase, whereas system platforms are a good organisational tool for design phases.

Finally new representation techniques are becoming more user-friendly and can be used to generate lifelike sketches of the service. Nowadays, for instance, the presence of a camera even in mobile phones and the availability of user-friendly video editing software allow designers to create video or photo-sketches and prototypes. Sketches and prototypes can be used as an integral component of scenarios or use cases, in order to integrate tacit knowledge and users' solution strategies⁵. Those techniques can be supported by commonly used media, such as computers presentations or web pages.

The development of a methodical procedure to integrate such techniques into the design discipline is still in its earliest phases (Lahlou, Jegou, & Jeune, ; Morelli & Tollestrup, 2006), but few interesting examples have already been developed in design education and research projects⁶.

Conclusions

Although service design is a relatively young disciplinary area, there are several contributions to the definition of a disciplinary corpus and an operative paradigm. However the gap between management and engineering contributions, that are mainly theoretical and methodological, and contributions from design practice, that have hardly been codified in a methodological perspective emphasizes the need for a comprehensive methodological framework. The two existing perspectives present a double asymmetry: one of them focuses on back office operations, proposing methods that may not support emerging cases of services based on user's participation and value co-production. The other perspective is based on interesting and innovative insights from design practice. This perspective emphasises the need for design strategies that enable users' participation, but sometimes do not offer solid links with the organizational machine in the back office, that would support new forms of interaction.

⁵ Some examples of using those techniques for integrating users' knowledge has been proposed in the *Ludinno* research project. The project focused on user-driven innovation. In one of the workshops video sketching was used to generate scenarios in cooperation with users. Some of the video-sketches are now available at the URL <http://ludinno.wikispaces.com>. (last visited 01.11.2009)

⁶ Education institutions that have worked on new representation techniques for service design include, among others Politecnico di Milano (Italy), Domus Academy and Interaction design Institute (Italy) and Aalborg University (Denmark), some research projects have also discussed this techniques, such as the above mentioned HiCS , Ludinno, and the Sustainable Everyday Project (info on both project is available at <http://www.sustainable-everyday.net/>).

This paper emphasizes the need for a new toolbox for service designers, including three categories of tools: analytical, design and representation methods and techniques. As any other young discipline, service design is still an open ground for theoretical and methodological confrontation. The toolbox proposed in this paper can be a framework to organise such confrontation.

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