Università degli Studi di Pavia

Facoltà di Economia

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Design and Engineering of the Experience.

A new framework in the Operations and Technology Management.

PhD final thesis

Author: Vincenzo Baglieri

Supervisor: Ch.mo Prof. Sergio Cavalieri

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Vincenzo Baglieri, DREAMT, XXX Cycle, Università di Pavia, Facoltà di Economia

Contents

What this research is about

This work represents a summary of the path of my PhD research in the last 4 years. Summarizing quickly, I have tried to build a new framework to address the design and the engineering of a product-service combination keeping at the very centre the customer experience. This framework and the relational perspective it adopts contribute to fill a gap in the current discipline of the Operations and Technology Management.

The need for this contribution to the discipline is originated by the change in both the economic context and the companies' strategic approaches, where the separation between the goods manufacturing and the service production and delivery is progressively and rapidly disappearing. The progress in the discipline consists, in my opinion, in a shift from a traditional and old-fashioned highly quantitative approach and the emphasis on the rational side of Operations, to the understanding of the relational side of making and delivering products and services, whose customer is today more and more interested in their emotional contents.

The convergence of products into service and the growing dominance of the service economy is favored by the diffusion of the new digital technologies, which enables the so-called service industrialization.

In the current scenario, where products and services converge, Marketing and Operations become closer and closer as well. Hence, the customers are really at the very center of the overall operations and competences, and designing a product-service combination, which can meet their expectations and even exceeding them, means to adopt a totally different perspective in the companies' innovation process. It is essential, in short, to design the customer experience, because the tangible goods and the intangible service are, at the end of the day, its two main constituents.

Starting from this background, I first presented a framework for the industrialization of services and more generically of the product-service combination. This framework is based on the Input-Process Matrix and a dichotomy to represent the service operations, whose opposite models are either the service factory or the service theatre. The two opposites of any operational process in the today industrialized service context are progressively converging, thanks to the diffusion of new technologies and the less and less transactional perspective adopted. Furthermore I explained how these two different approaches may deliver experience.

The first contribution to theory is that experience is a very relative concept. It is not static, but dynamic. It is influenced by the context, in social, cultural, geographical and historical way. It is a continuum, not simply the peak of the "wow" effect, and frequently it is described. It is, first of all, the outcome of the capabilities of the company in reassuring people, replicating for them a comfortable emotion and reducing the risk they take anytime they get in touch with either a product or a service. It generates loyalty. Customers keep on shopping at the same mall and buying the same product first of all because the industrialization of both ensures the replication of a positive experience.

Consequently, service factories are not necessarily less experiential than service theaters. They simply adopt quite different ways to deliver experience. As showed in the first section, the adoption of some service industrialization strategies enable companies in delivering experience with two basically different focus, and some cross-model similarities.

In service factory, the customer involvement counterbalances the rigidity of the processes and contributes to engage them into the overall operations, that is actually what happened at Milano Ristorazione, experimenting a different design of the service. In service theater, the role and skills of the staff is crucial to handle the variety of customers' expectations, and the tangible components of the service (the product itself such as the servicescape) are vital for a positive and impressive experience.

The growing importance of both the management of information and the redesign of their process into a more modular structure is what the two opposite have in common, and made me sustain a partial convergence between factories and theaters is taking place.

Most of all, the initial research, based on the investigation of a large set of real cases, demonstrates that the customer experience is the outcome of the integrated design of the ingredients of the product-service combination with the characteristics of the production and delivery process. This is the consequence of changing the perspective. In an economy dominated by services, where products are parts of the service itself, and customers search for an experience, even if at different degrees of intensity, the output (i.e. the service) and the process are blurred together. Consequently, to design and engineer the customer experience is not simply to understand what components are more strategically crucial to improve the company's provision, but to focus on the production and delivery processes. It is another conceptually innovative consequence of this shift from product to service to product-service, eventually. And it is another interesting contribution of my work to the Operations and

Technology Management discipline, which has never considered the "operations" and the "logistics" as an essential part of the *customer journey* (Rawson, Duncan and Jones, 2013).

In the central stage of my research, I have adopted a more quantitative methodology, and - through an experiment run with a sample of more than 200 undergraduate students – I have tried to answer basically to two questions: 1) can technology deliver experience?; 2) given a complex sequence of stages and links which represent the service production and delivery process, which are the most relevant stages to focus on when designing a new customer experience?

Notwithstanding the all limitations of the experiment, the data provided two very interesting evidences. First of all, technology can deliver experience, even if the way it generates this outcome can be very different. Summarizing the main dominant definition, I have actually assumed that experience is a combination of skills and competences and emotions, which persist over time in the customers' memory. In short, experience consists of both functional and emotional elements, but it should be observed at the different encounters, because the customer gets into transformational process with a memory of contents and emotions (his/her *inventory* of experiences); gets in touch with our product-service, being "transformed"; then gets out and preserves the memory of the event. Emotions impact more on the memory than functional performance, and measuring the memory effect in the long run can be helpful to understand what and when contributed to the generation and delivery of the customer experience.

In my experiment, the grade was considered as a proxy of the incremental knowledge delivered by the two course I compared, a traditional, face to face style, and a MOOC-style one. The Net Promoter Score was adopted as a conceptual proxy of the memory of the all experience, and the motivations of the rating helped a lot in understanding the phenomenon. The evidence is clear: a more technological, industrialized approach is not necessarily detrimental of the customer experience, but the way it delivers is very different. Unexpectedly, the impact of the technology is appreciated by the customer more at the two extremes of the process than at the central stage. In the experiment, students marginally complained the loss of "emotional temperature" in a virtual class because of the loss of direct and physical interaction with the professor; nonetheless, they underlined the beneficial impact of technology in all the stages "before" and "after" the delivery. Socialization is enabled by technology, and they long remember in a positive way a social experience; technology changes

the flows of communication, and enables a many-to-many learning process, thus at the end they learn more (functionality) and in a collective way (emotional side).

Generalizing, I can say that technology (and service industrialization, more specifically) does not necessarily mean to deliver a poor experience. A deficient performance does not depend on the technology, but on how and where – along the all process - technology plays its role. It is a matter of proper design, and appropriate combination of the different ingredients at each stage. Furthermore, it looks like customers' involvement can be exploited more than expected, and even in services, like higher education, where traditionally the theater is the operational paradigm and the top skilled "performers" are considered essential for the overall experience.

Finally, the relevance of the design and the post-delivery stages is still undervalued! As said, experience is the combination of both the transformation in skills and competences and the memorability of the transformational event. Stabilizing this memory over time is equivalent to maintaining the functionalities of any equipment and machine. The longer they properly work, the better the customer satisfaction and the higher the customer loyalty to the provider. Similarly, in my experiment with students, the proper use of technology and the accurate design of the activities to retain the memory (of the contents we delivered in classes) and to facilitate a longer interaction (students to instructors and students to students) contributed to generate a better output in terms of learning (higher grades) and positive feelings towards the learning experience (higher NPS). Generalizing, it means that, as in an economy dominated by experience the post-delivery is part of the overall process, operations must be designed in cyclical way. The final stage of the past event is propaedeutic to the initial encounter of the next one. Better, they should progressively fade to each other, in a continuum of relations generating economical transactions because of an increased loyalty.

In the final stage of my research, I presented and discussed a recent case, where these principles have been applied and the original framework I conceived has been tested.

The main output of this long and complex research work can be summarized as follows:

1. There is no trade-off between Service Industrialization and Customer Experience. We can simultaneously design our processes and mix the ingredients of any product-service combination without frustrating the demand for experience. Yet, it is crucial to start defining the experience we want to deliver, as it is not an absolute concept, but a very relative one;

2. An experience-driven product-service combination requires the concurrent and balanced design of both the inputs and the processes which contributes to the delivery of the customer experience;

3. While historically we have paid a lot of attention to the moment of truths (i.e. the production and delivery of the service and consequently of the customer experience), my studies confirm the evidences of the most recent literature, inviting companies to focus on both the initial and the final encounter. In short, the higher the integration and consistency among the engagement of the customers, the delivery of the service and finally the maintenance of the relationship, the higher the memory of the experience, and the higher the loyalty to the provider of the experience;

4. The design of experience consists of the proper adoption of a sequence of rules, specifically related to the engineering of a cyclical and consistent three-stage process;

5. The involvement of customers and in general the emphasis on the co-creation of the product-service combination represent an effective (and cost effective) way to deliver experience and preserve its memory over time.

Suggestions for the readers

This is more than a PhD final thesis. This is the summary of the last four year of work, continuously looking for balancing between the day-by-day pressures and the long-term perspective of contributing to the scientific debate on the future of management, the management of the customer experience. It collects three main stages of my research activity: the focus on the need for reconsidering the all Service Operations Management discipline and including the service into the Manufacturing and Operations Management in general; then the focus on a deeper understanding of the dynamics of experience, to identify tools and practices to be adopted in the real field, as I always did in my research over time. I found particularly relevant and personally motivating to investigate these elements into the context I am specifically operating, i.e. higher education. Finally, to partially test the evidences of my research in the field, investigating a real case to both prove the robustness of my assumptions and hopefully build a portion of a new, wide theory of Operations Management. The outcome of this long project is a framework, to address and drive the design and the engineering of the customer experience. It is not yet exhaustive, but it provides a perspective to deepen and investigate, improve and enrich, even discuss and refute. It is a starting point to ask for the right questions, which exactly the goal each researcher should keep in mind. Once you have

the right question, then the answer is close. This is my wish: if reading these pages you get more questions than answers, I probably did my work appropriately.

Milan, 2018 March 8th

1. Literature review

1.1 What servitization and service industrialization are

The past twenty years have seen profound changes in the way business is conducted in the world's economic system. The advent of new technology that integrates communications and information has frequently led to the development of new business models which, although not bringing about the Copernican revolutions that many people perhaps prematurely predicted, have each sown the seeds of an inevitable and ongoing transformation in the world's economic and industrial landscape.

The effects of these radical changes have been manifold. For example, the banking system now carries out most of its transactions with the retail customer through online and mobile banking; advertising and communication investments are now channeled increasingly into the fledgling mass markets of the internet and the social networks, even the Public Administration has started dialoguing with its citizens through its own dedicated portals, and publishers have had to face the sorry fact that such a massive and constant stream of information has effectively deteriorated the value of newspapers as the primary means of informing the public about what's going on in the world.

However, if we stop short at these initial observations, we risk losing sight of the bigger picture painted by the changes underway. Indeed, the biggest parallel revolution is taking place in the traditional manufacturing industry, where it takes the name of *servitization*.

Manufacturing industries have seen exponential growth in productivity, due to both the introduction of flexible automation technologies in the Eighties and the introduction of the Lean Manufacturing principle in the Nineties along with, more recently, the arrival of the Far Eastern countries, China first and foremost, in the competitive arena. The convergence of these factors has led to unexpected growth in the supply of products in the so-called developed economies, creating a surplus not absorbed by the demand, given that the latter's tendency to remain stable also for reasons typically related to demographic stability. In economics, the effect of a surplus in supply against stable demand tends to depress product prices, leading the manufacturers to try and use the price elasticity of demand to place their goods on the market. However, this strategy has sparked consequences that the manufacturers themselves often failed to foresee. First and foremost, consumers, even against

drastic price reductions refuse to forgo the levels of quality they have become accustomed to as result of the improvements to quality made in all manufacturing sectors in the Eighties and Nineties, thanks to practices like Company Wide Quality Control and Total Quality Management. This market reaction has caused an initial 'skimming off' of all those manufacturers unable to offer a valid price/quality ratio. As we have clearly seen in several manufacturing sectors, excessive production capacity combined with an inability to radically rethink the product concepts has been the demise of numerous companies, which have either disappeared or been absorbed by or merged with the competition. In addition, it led to what we now define as the *commoditization* of products, even those with high technological content. The modern automobile, for example, is a concentrate of innovation and technology, not just in the high-end or luxury segments but also in the low-end or affordable segments. This level of content is so evident that traditional small cars, utilitarian vehicles more often than not targeted at a young or female market, have now become small luxury cars, since the small car manufacturers not just offer similar performance as products from higher market ranges, but at far lower prices. However, such high levels of performance and technology have effectively sterilized the quality factor, which no longer motivates the purchase. Indeed, today's consumers take high product performance for granted and, among other things, find it hard to distinguish the quality differences between the various manufacturers (more or less equal in terms of technology), and so tend to base their choices on price or the service package offered with the product. This "service" can take a variety of forms. For example, consumers' purchase decision of durable goods is strongly influenced by the financing, insurance, and technical service packages that accompany the product. In business-to-business, low content products that are difficult to differentiate, such as the supply of tissue paper or detergents, can be turned into innovation if the manufacturer offers services to guarantee the continuity of supply, regular customer stock checks and rapid replenishment, or logistics services, as in the case of the implementation of the Vendor Managed Inventory practices.

1.1.1. A shift in business

The service component has become such a determining factor in many industrial sectors that it has become critical for companies historically rooted solely in manufacturing. For example, consider cement a typical commodity for which logistics have a significant influence on price. The traits of industry's production processes have always led producers to pay more attention to filling production capacity and ensuring production continuity, subsequently managing variations in demand through inventories. But now logistics have become an increasingly

determining factor, to the point that in the industry today, the producer's capacity to manage the logistics side of the business, optimizing transport and delivery through booking services that reduce vehicle waiting times and costs, has become the major factor in the customer's choice. A good example for this would be the largest Italian cement producer, which insourced and partnered large part of the logistics of its product, including the shipping across the Mediterrean. Thus, great emphasis has to be placed also on the need to find the right balance between the expertise necessary for physically making goods and that necessary for producing services.

In the final analysis, we can certainly say that the effect of the phenomena briefly described above is the strong, inevitable convergence between industrial production and the production of services, which certainly does not preclude the need to make tangible products, but determine the capacity to achieve a competitive advantage, through the completeness of the value proposition

This revolution is already taking place. Consider, for example the commonly held belief that the Italian economic system is firmly set in manufacturing. In reality, this belief is greatly mistaken, probably due to the intangibility (and invisibility) of services. So we are only really aware of the approximately 160,000 people employed by Italy's automotive industry, whose factories and, above all, final products we can touch and see, and tend to overlook the fact that in 2010 the Italian IT sector employed around 320,000 people! Despite being practically twice the number of the automotive employees, they elude our grasp because they usually work in small businesses, as consultants, from home or in the offices all around us, and we never actually see them loading and loading goods onto lorries, or smoke belching out of the chimneys of their workplaces. Though we fail to see it has the industry has not only acquired an essential services component, but is already the dominant component of the Italian economy. This is confirmed by the Italian National Bureau of Statistics, namely ISTAT, whose data (Figure 1.1) show how services (including financial, commercial, logistics and "other" services, this category comprising health care and training) generated approximately 74% of Italy's GDP in 2016.

Figure 1.1. The supremacy of services in the Italian economy
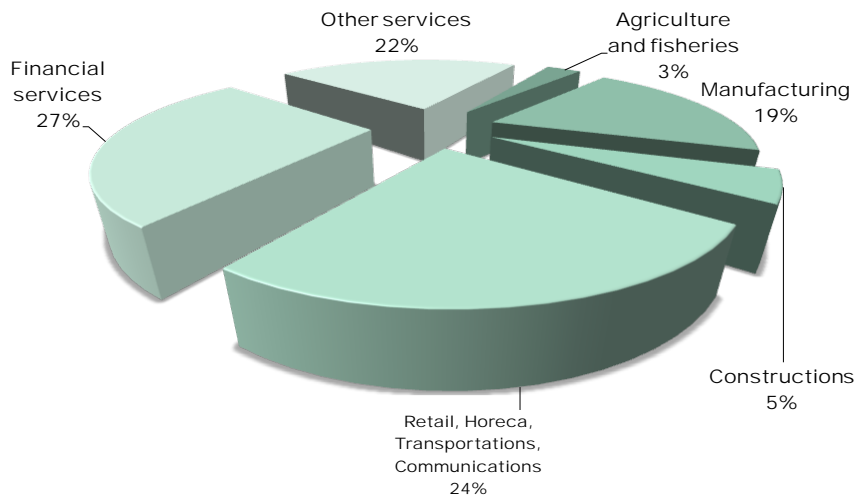
Nevertheless, as fate would have it, both the political debate and public opinion, as well as academic research and teaching in economics and management still tend to focus on the manufacturing industry, perhaps due to some kind of cultural legacy, but more likely because the tangible and solid aspects of manufacturing still have the power to fascinate and fire imaginations. The dynamic, however, is inescapable and is not only common to other developed economies but also blurs the traditional boundaries between sectors.

If you observe the following Table 1.1, only India's GDP in 2016 estimate, among the so called BRICs, presented a contribution of the Service economy to the whole one lower than 50%. Even Germany economy is largely dominated by service (more than double than the Industry), and the USA economy is today almost 80% a service economy.

Table 1.1. Sectors and GDPs

Country	Agriculture	Industry	Service
EU*	5,0%	21,9%	73,1%
USA	1,1%	19,4%	79,5%
China	8,6%	39,8%	51,6%
Italy	2,2%	23,9%	73,8%
France	1,7%	19,4%	78,8%
Germany	0,6%	30,3%	69,1%

UK	0,6%	19,2%	80,2%
Japan	1,2%	27,7%	71,1%
Russia	4,7%	33,1%	62,2%
India	16,5%	29,8%	45,4%
Brazil	5,2%	22,7%	72,0%

Source: CIA WORLDBOOK 2017, year 2016

* Estimated 2014

Such a relevance of service in our economies is largely undervalued. Even some important industrial policies, for example the tax exemptions in Italy, Germany and Japan for the so called Industry 4.0 and in the USA for the Advanced Manufacturing, which emphasize connectivity, integration of the value chains, and distributed manufacturing with proximity to customers, are transforming manufacturing into an added value service!

This phenomenon demands an adaptation of the managerial disciplines and, in particular, of the Operations & Technology Management theories, that inspired the origin of this work.

1.1.2. Service Industrialization (and back)

The term industrialization has conventionally referred to the process by which manufacturing sectors underwent a rapid increase in productivity in the period between 1760 and 1850. Some references argue that the trend started much earlier perhaps even by a century or more. This transformation of manufacturing is also referred to as the industrial revolution, because of the huge socio-economic changes that resulted from it.   The observable and measurable results of industrialization in manufacturing included higher productivity, lower costs and high production volumes at a reasonable level of quality.   Underlying these were several technological and conceptual developments, starting with the application of new forms of power. Human and animal power were replaced by wind and water power, then steam and electricity.

While power was a pre-requisite, a key factor in manufacturing industrialization was the standardization of products. Without such standardization, high volume production and mass markets would not be feasible. The standardization of products led eventually to the standardization of parts, with the important refinement of interchangeability (Alder 1997, Hounshell 1984). Assembly of standardized products from standardized interchangeable parts led to a host of developments including work specialization, specialized tooling, physical

separation of parts manufactured from final assembly, and the geographical dispersion of work culminating in today's global supply networks.

Standardization of products and parts was closely followed by standardization of tools and processes and of measurement and the specification of outputs. Manufacturing processes saw refinements and innovations, including the work-study methods of Taylor and Gilbreth, and the Ford progressive assembly line. Automation of tooling and machine operations expanded to fully automated production lines and further into flexible manufacturing systems and robotic assembly (Jaikumar 2005). In addition to such "hard technologies", there have also been important advances in "soft technologies" such as planning and scheduling and statistical quality control, and in concepts like JIT and lean manufacturing which have all had substantial positive consequences for manufacturing productivity.

Supply chains and mass markets also required efficient logistics and distribution, the development of third party services, downstream channels and upstream sourcing networks. A visible consequence has been a high level of outsourcing, off-shoring, and modularization, with many concurrent innovations in process management, contracting and business relationships at the industry and sector level.

Industrialization in services does not follow exactly the same patterns, and there are significant differences across different service sectors. The industrialization of services is a complex topic, since services are very heterogeneous and different from most manufacturing goods and processes. The lack of a tangible output, in fact, creates basic issues around the entire question of productivity at least in the sense of measurement and quantification. The presence and participation of the customer in front office service processes creates challenges for managing process efficiency, as well as necessitating close attention to the implications for customer experience. So we hawe to look at "industrialization" of services with more than a single perspective.

Karmarkar (2004, 2008, 2010) suggests a dichotomy for understanding service industrialization: physical services vs. information services. The latter are services that are information intensive in the sense that the core processes deal with information rather than with physical objects. An important reality of these information intensive services is that information technologies play a large role in "industrialization". Physical services by contrast, are those, which necessarily have a physical or material component that is central to the core service processes.

Within the physical services super-sector, it is again useful to separate system intensive services, such as power and freight, from customer intensive services such as hospitality, and food service.   Of course, many services, such as traditional retailing, and transportation have aspects of both. In system intensive services, efficiency and productivity are achieved through scale, engineering and technical design.   With customer intensive services, access to the service becomes more important, resulting in the creation of networks of delivery facilities to get closer to customers. Such access networks are ubiquitous today in sectors such as fast food, and traditional retailing.

In information intensive sectors, similar forms of industrialization have been visible for a long while.   On the one hand, we have systems intensive information services such as mail, telecommunications, radio and TV. In customer intensive information services, there exist distributed access networks in banking, ticket sales, professional services, and education. In some cases, regulation and localization forced some of these networks to be fragmented in terms of ownership.

Today, technological innovations and the centrality of information in all these sectors have led to the most recent wave of technology driven industrialization in services.

1.1.2.1.   Systems Intensive Physical Services

This category includes large-scale networks for freight, distribution and warehousing, water, power and energy. These have all existed for centuries if not millennia, and the earliest examples include aqueducts, urban infrastructure and road networks from ancient civilizations. So even with relatively modest technological developments (such as brick making and the masonry arch) it was possible to build very effective systems, which lasted for centuries. Of course there have been very significant advancements in all these service sectors over the years, and the role of technology has increased. The modern electric distribution grid is very much a 20th century creation, based on sophisticated technology developments that permitted the generation and transmission of power over areas of continental scale.

Historically these sectors are very productive as far as the physical infrastructure is concerned. This physical infrastructure also tends to be very long lasting. After construction, the main ongoing labor inputs are for maintenance and repair. Labor inputs are also needed for the operation of vehicles in transportation, freight and warehousing.   Here, increases in productivity are not easy to obtain. The most common approach has been to increase the size

and/or speed of vehicles. This has been more effective for ships, barges, airplanes and rail; less so for road transport. But there are clearly limits in all these cases.

It appears that in the near future we might see a significant increase in the sophistication and productivity of some of these sectors, through the application of information technologies. For power, smart grids, new energy sources, local generation (e.g. solar) and energy efficient end appliances could create significant increases in aggregate efficiency and productivity. Intelligent roadways and robotic guided vehicles have the potential to improve productivity of road transport. But the rate of real improvement will probably be very gradual.   Automation, software tools and technologies such as RFID (to track material movement) are already being used in logistics and distribution and will continue to grow in application.

To summarize, efficiency and productivity in systems intensive services are historically high. They have come in large part from fixed investments often amortized over very long periods and from scale economies. For these reasons, many of these services are also in the public sector or are subsidized. Operating efficiencies are often less important; when they are important, as with freight and goods transport, productivity increases are more challenging to obtain, and again often have to do with scale at the level of equipment and operations.

1.1.2.2.   Customer Intensive Physical Services

This category includes food services, conventional retail, a major part of health care, some of leisure and entertainment (e.g. theme parks, cruises, live performances), hospitality, transportation (cabs, buses, planes), childcare, on-site services (e.g. janitorial) and personal services (beauty salons and spas). One important characteristic of these services is that the customer is present in some part of the service creation and delivery process, and may also participate in varying degrees. As a result, customer experience and satisfaction with that experience become an important part of service outcomes. And secondly, the presence and participation of the customer in the service process can significantly affect productivity, cost and quality.

These services are typically geographically distributed, and people intensive on the supplier side.   The former is for reasons of access or delivery, and the latter in order to interact with the client or customer. As a result, scale economies are often not present. It is possible to use replication of equipment and processes, to get some economies of scale.   Labor can sometimes be increased by narrowing and specializing the service, and designing processes with narrower highly scripted tasks that require lower levels of skill. Self-service may be

feasible as a way of reducing labor costs. Service back rooms can be made efficient by using modular services, inventories of materials, or variation based on content. All of these strategies can be seen in fast food chains and retailing.

In the front-office, customers can be a source of heterogeneity and inefficiency, but they can also be a resource. At present in the US, grocery stores and airline counters are in a period of transition to self-service and automation for operations such as checking out and checking in. However, many customers are still not familiar with these systems, and it will take time before all are "educated". For gas stations, that training period is already over, though one can still find the occasional full-service pump at a gas station. In food services, the salad bar model of self-service provides both customization, and customer labor inputs.

An important design tradeoff that must be achieved in the front office processes of these services is that between efficiency and superior experience. Incautious adoption of concepts such as "lean" operations from manufacturing, can lead to a depreciation of service value, especially for front office processes. So the design of those service processes must strike the right balance. What is more, different customer segments may require very different balance points, to differentiate premium levels of service from lower priced service classes.

Industrialization strategies applied to front office processes must be carefully designed and implemented, so as not to damage customer experience, especially for premium services. Self-service strategies can be very useful. Outsourcing is an option for back room processes, but can be risky for front office processes. Information technologies and automation can help especially when they support self-service, or when they have positive experiential value, as in the provision of information to reduce uncertainty or anxiety. But again, care must be taken not to depreciate experience and customer satisfaction.

1.1.2.3. Information Intensive Services

This is the largest super-sector of many developed economies in terms of GDP share. Eventually this is likely to be the case with all large economies though that point may be decades away. This is also the sector most subject to industrialization, especially driven by the continuing emergence of new information and communication technologies.

Once again, we can separate this sector into systems intensive and customer intensive sub-sectors. The former includes telecommunication and networks (including cable), server farms, broadcast TV and radio, and infrastructure related service platforms including markets and exchanges. The customer intensive part includes financial services, education, professional

services, business services, entertainment/media, social networking, sharing and exchange, ecommerce, and functional consumer services such as email, search and navigation. As in manufacturing and physical services, the systems intensive services often closely support the customer intensive sectors.

As with manufacturing, processing power is crucial to industrialization in information services and has risen enormously since the middle of the 20th century. However, this power has been achieved through technological efficiency and miniaturization, so that energy requirements are not rising along with processing. Similarly, logistics efficiency has also increased tremendously since the start of the 20th century. Again, much of the increase has come from technological advances such as optical fiber, radio and microwave transmission, especially in recent decades. Nevertheless, power consumption, scale economies, system investments, and high entry costs are all still factors in the systems intensive information sector, albeit to a decreasing extent over time. We can see that the level of concentra-tion in industries such as telecommunications and broadcasting is reducing, and competition is becoming more intense. The economics of information systems are quite distinct (Whinston et al. 1997; Shapiro and Varian 1998).

A big step forward in the information systems infrastructure, came with the development of data networks, TCP/IP protocols, the internet and the world-wide web. Essentially, these developments connected efficient logistics with high powered processing, something which had been missing till the latter part of the 20th century.

As with manufacturing, standardization is also playing a major role in information services. However, the path being followed is different. There has certainly been standardization of service design, especially with distributed physical services. However, the real impetus has come from process standardization. This first started at the basic technical level, with advances in processing hardware, infrastructure protocols, and the standardization of software especially in terms of object oriented programming. The end result has been the creation of modular systems with standard interfaces, which allow for easy development of information processes at the technical level. Process standardization and modularization has migrated upwards to business processes and systems, and further to firms and sectors (e.g. Jacobides 2005, Chowdhry et al. 2007). Low cost information transportation and logistics have enabled the geographical distribution of information processing and delivery systems, in a way very analogous to global supply chains.

The practical result of the technology driven industrialization in information intensive services is the emergence of a set of strategies being employed by companies (Karmarkar 2004, 2008), ranging from automation to self-service.

These strategies are significantly changing service processes (Karmarkar and Apte, 2007) and organizational structure in service firms. Employment patterns and jobs have changed with information intensive work now being the largest part of jobs and wages in the US (Apte et al. 2008) and other countries. On a larger scale, many industry sectors have seen significant disruptions and dramatic changes in structure (Machlup, 1962; Porat and Rubin, 1977; Apte et al.,2012). While in the past, the productivity in services was low (Baumol, 1967, 1985), there is increasing evidence of productivity increases, especially from the application of new technologies (Stiroh, 2001).

As said, service industrialization cannot be described with the same linear patterns of manufacturing industrialization. Yet, the above discussion is still adopting a traditional perspective and focusing on the operational impact of the industrialization. It is a matter of fact that service industrialization allows companies to recover efficiency and dedicate resources to the adding-value portion of their processes, which is the generation of a superior customer experience. Experience is, as known, an emerging concept in the management disciplines and it's following another relevant phenomenon of the current shift in paradigms, the so-called convergence between goods and services.

1.1.3. The product-service convergence

The growing importance of services, the ensuing need to focus on more appropriate management logics and the impact of servitization on the business models of manufacturing companies are not particularly new subjects in the academic and managerial debate, though the perspective taken have often been one-sided and sector-driven.

The concept of "servitization of products" was first proposed by Levitt in 1981, as a marketing approach taking into consideration both the tangible and intangible components of any product-service offering (Levitt, 1981) . The line between goods and services started to become increasingly blurry, and most offerings are now considered a bundle of product and service. The dichotomy between the two has been replaced by a product-service continuum, and Figure 1.2. graphically depicts the shift between the perception of services as "add-on" to a new paradigm in which tangible goods are the "add-on" to the service component.

Figure 1..2. The product-service continuum
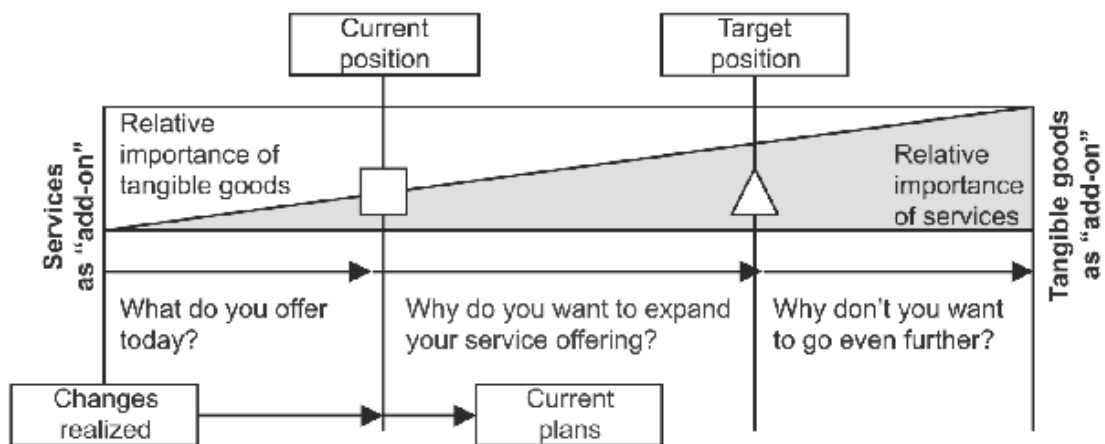
Source: Oliva and Kallenberg, 2003

In this scenario, Vandermerwe and Juan Rada (1988) first, and Oliva and Kallenberg (2003) later, have proposed managerial strategies for the "servitization of business", the process of transforming a product business into a bundle one. What is relevant for the purposes of this analysis is the rationale behind such a shift, which lies in the substantially higher revenue generated by services, a stream that is more resistant to economic cycles (Quinn et al., 1992) . In addition, the growing pressure on the side of customers for more services has to be taken into consideration, and the trend towards bundles is a way to address demand. Finally, services provide an edge for competitive advantage – given their intangibility and their higher difficulty of imitation (Heskett et al., 1997) .

On the other hand, it is quite evident that a backward flow is taking place, of service companies increasing the level of "tangibility" of their offerings in order to get two main benefits:

a) to reduce the barrier between them and non-traditional customers, used to interact with companies through a physical interface (i.e. the case of direct/online retail banks investing in branches, as ING Direct in Italy as well, see Baglieri-Zambolin, 2012);

b) to benefit from more direct and tangible distribution portal for their services (i.e. Google exploring projects like either the Google Glass or the Google Driverless Car, Microsoft investing in hardware and devices, like the Surface Family and the Hololens).

This phenomenon, one can define the "productization" of service, is massive and somehow contributes to reflect on the overcoming of the traditional separation between service and product (Baglieri and Karmarkar, 2014).

The implication of these phenomena are relevant from many different perspectives, at macro and micro-economical level, and push toward another crucial question: if products converge into services, and services into products, what do companies have to design in the near future? Companies usually manage the new product development process differentiating from the new service development process, for many technical and organizational motivations. Anyway, if this convergence is taking place, this separation of competences and processes does no longer make sense in an absolute term and a different approach would be developed. This emerging viewpoint would be grounded on the understanding of the determinants of the customers' experience, that is the intersectional factor of the convergence of products and services.

Yet, to design experience, we must first understand what are the determinants of the processes delivering experience to customers and then to create a framework which can help us, given an expected level of experience to be delivered, to engineer these processes in order to maximize the capabilities of the processes themselves.

The first step of this sequence is a comprehensive framework for the product-service operations, and then the investigation of the dynamics of the customer experience and their relations with the above processes.

1.1.4. The design characteristics of the product service operations

In the management of the new product development, we typically define the design characteristics as those features of the overall product system that can be measured, modified, redesigned, changed, and improved in order to get a new outcome to better meet the customers' expectations (Baglieri, 2013). In general, this definition evolves from the methodology usually known as Quality Function Deployment. It consists of prioritizing the customers' needs, identifying the relationships among them, their intensity and the characteristics of the product and the manufacturing process (Akao and Mizuno, 1978; Baglieri, 2013).

Moving from a manufacturing perspective towards a service one, as we do in such a work, we must partially reconsider this definition. As said, in a product-service context the output (equivalent of the product in the manufacturing context) can't be separated from the process. It means that the two variables are not independent, and a different process generates a different output. Similarly, different inputs transformed through the same process generate a different service. For example, the same food may produce a different experience if you enjoy it in a restaurant, at home and "on the go". Similarly, the same food, in the same restaurant, with a different partner at your table generates a different service experience! In short, in service operations, and in a product-service context as well, the attention must be paid on the combination between the inflow parts and components (the input) and the process.

A wide number of classification schemes and frameworks have been proposed to map and design the service operations, adopting a manufacturing perspective and starting from the well-known product-process matrix (Hayes and Wheel-wright, 1979). For example, till recently, Polito and Watson (2004) tried to apply the two variables of Hayes-Wheelwright's matrix to the service context.

Over time, the literature on service operations has gradually detached itself from the manufacturing perspective and from the Hayes-Wheelwright's matrix, and new approaches have been proposed to help mapping and designing the characteristics of the service processes. For example, Silvestro et al. (1992) match the number of customers processed over time to the combination of six descriptive dimensions: (1) the relative focus on people versus equipment in service provision; (2) the customer contact time per transaction; (3) the degree of customization in a process; (4) the degree of personnel discretion in service provision; (5)

the main value-adding activity locus – front office versus back office; and (6) the relative focus on product or process (see Figure 1.3).

Figure 1.3. The Silvestro's et al. classification scheme (1992)
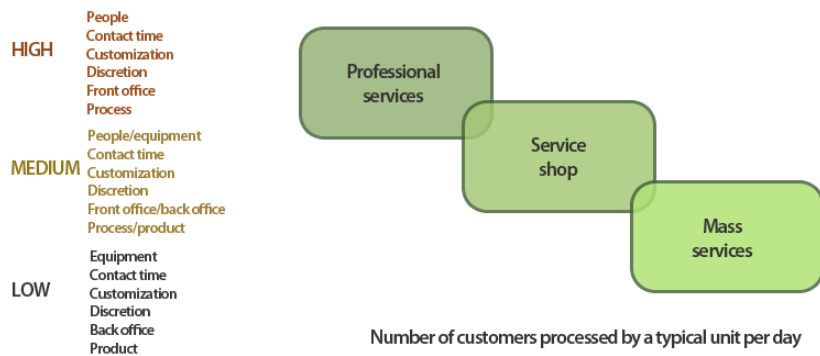
First of all, this model is particularly interesting because it adopts customers as a relevant variable, even if it focuses only on the quantitative aspects (how many customers processed) and neglects both the qualitative side and the other inputs in any service process. As aforementioned, productivity in service may dramatically improve if customers are qualitatively better, for example because of a precise customer tuning practice. Furthermore, customer is a relevant input of any service, but without other components, for example the competence of the service provider, there is no service at all.

Secondarily, the model portrays different degrees of the variability of the ser-vice production and delivery process. We can simplify this approach, suggesting only three degrees:

•   fixed process: displays a low (or even null) degree of customization and dis-cretion, high level of standardization of the production process and high em-phasis of efficiency and high rate of productivity;

•   modular process: refers instead to processes composed of different compo-nents (or modules, or process parts), that can be recombined with a certain degree of customization to generate a differently perceived output. The em-phasis in this process is on both efficiently run the single modules of the production process and effectively manage the interaction among the mod-ules, particularly during the service delivery;

- contingent process: it is characterized by a high degree of customization and discretion in the service provision, with customers pressing the service oper-ations to get high level of intrinsic performance of the output, even if not necessarily at a very high price.

Other models addressing the issue are the SPA matrix ("Service Process Analysis"), proposed by Tinnilä and Vepsäläinen (1995) and the SP/SP matrix developed by Collier and Meyer (1998). The relevance of the former lies in the innovativeness of its approach: their two axes represent respectively back-office operations and front-office operations and suggest us that both back-office and front-office industrialization strategies must be taken into consideration. The latter underlines the firms' relationships with their customers, who – as co-actors of the service experience – play an important role in the final offering.

Among the discussed models, no single one proved its robustness as the product-process matrix in the manufacturing literature (Hayes and Wheelwright, 1979). However, while in manufacturing the two concepts of output and process are easily and physically distinguished, in the realm of services they become blurred. Hence, any framework similar to the Hayes and Wheelwright product-process matrix, if developed for services, must be designed using variables or axes that are more distinct and uncorrelated. To bridge this gap, we combined the "process" with the "input" of the service, as the two key determinants of the de-sign of any service operations.

The relevance of the "input" in service management is not totally new, indeed it has been investigated in some previous streams of research (see Table 1.2.).

More recently, researchers in service management have focused on the customer's role as an active contributor of service operations. For example, in his seminal work Chase characterizes customer's role in terms of the degree of "customer contact" (1981). Furthermore, Fuchs and Leveson (1968), and Karmarkar and Pitbladdo (1995), investigate the implications of joint production in service strategy, underlining the contribution customers play in the service production process. In general, this category of input represents the main distinctive factor between manufacturing operations and service operations (Schmenner, 1993), as suggested by the scholars in the field of marketing (Schmitt, 1999). Customers are not only the buyers of a service product, but they actively contribute to the creation of the final output with their preferences, their behaviors, and the variability they introduce in the system. In a marketing perspective, this is what mainly distinguishes a Goods-Dominant Logic from a Service-Dominant Logic (Lusch et al., 2008). From an Operations Management perspective, the co-

production with customers introduces a high variability into both the service production and service delivery, and increases the dynamics of these processes, as the traditional customer-firm relationship takes place in a more pervasive way and the responsiveness to customer's feedback and request must take place in a very rapid time.

Customers can be definitely considered as an input of the service operations, but they are not the only ingredient of the process. First, because there are many services, even in the consumer sectors, in which it is quite hard to find an active contribution of the customers in the service production. For example, where is the co-production in watching the weather forecast on your smartphone? The purists of the customer involvement may sustain that downloading an application and authorizing the service provider localizing you through the GPS in your device is a form of coproduction. Honestly, it is like saying that buying a last generation flat screen tv means to co-produce the premiere movie you are watching at home, sitting on your sofa and drinking a glass of red wine! More relevant, in our opinion, is to underline, that, even if its owner is not aware, the smartphone itself is providing a flow of information to the service provider. This evidence makes us consider that "information" is a crucial input in any service process.

Table 1.2. Service inputs in a broad perspective

Stream of research	Input	Main Author(s) and Year
Political economy	Asset; Raw material	Ricardo (1817); Marx (1867); Solow (1956)
Service Operations Management	Information	Karmarkar (2004)
Social Science	Social capital	Bordieu (1986)
Human Resource Management	Human capital	Prahalad and Hamel (1990); Pfeffer (1994)
Service Dominant Logic	Knowledge; Skills	Lusch, Vargo, and Wessels (2008)
Experiential Marketing	Customer	Schmitt (1999)

Information can be considered as another crucial component of the service operations. Even if there are other intangible inputs, as suggested by Bordieu (1986), like social capital, brand, and reputation, information is the most critical in the current age. Such a perspective is shared by

the fields of service operations management, in particular by Karmarkar (2004), which underlines the impact that data and information (and related technologies) have had in contributing to the phenomenon of the service industrialization.

Similar attention must be paid to the tangible components of any service. First of all, even if we can say that food in a restaurant is only a part of the whole experience, we cannot forget that without food there is no restaurant service! Again, without the facility, the tables and the forks, there is no service. Finally, the quality of both the direct materials and the indirect materials (adopting a typical manufacturing lexicon) strongly affect the quality of the whole service.

The tangible components can be considered a traditional category of input, since Ricardo (1817), Marx (1867), and Solow (1956). They include all raw materials, semi-finished goods and finished goods that deliver the physical portion of the provision. In the age of product-service convergence, any product we manufacture and deliver is the tangible side of the whole relationship we build with our customers. The product-service combination, in such a perspective, is a wider integration of tangible, intangible and human factors, all contributing to generating an experience for the customer, who is simultaneously the input and the transformed output of the longitudinal processes.

Furthermore, differing from the pure manufacturing management, the facility, the equipment, and all the premises at both the back and the front office can be considered as a portion of this tangible elements of the service. In fact, in a pure manufacturing context we do not consider equipment, machines and facilities as inputs of the production process. They are not included in the bill of materials of the good, but determine the way we make it. In this broader perspective, the way we make and deliver the outcome is part of the service itself and thus it is necessarily a constituent of the ideal *bill of material* of the output. For example, customers do not care about either the layout of a factory or its degree of robotization, while they can be strongly influenced in their purchasing process by the characteristics of the retail store and the degree of technology inside.

The last and very traditional input of any service, in a scientific viewpoint, is the role of the contact people or, more generally, the human resource. Even the Human Resource Management theory and the Competence Based View have underlined the crucial role played by the staff and the contact people in the service context (among others, Prahalad and Hamel, 1990; Pfeffer, 1994). The Service-Dominant Logic perspective has underscored the relevant

contribution of this category of input, as well (Lusch, Vargo, and Wessels, 2008). It is quite common to consider in this category only the contact personnel, as they are the ones that mainly contribute to meet the customers' expectations during the service delivery.

Yet we cannot forget that in many service contexts the personnel in the back office directly contribute to the customer experience. Thus, it is appropriate in our opinion to adopt a larger definition.

The resulting outcome is the below scheme that I call simply the Input-Process Matrix. It was originally introduced by Baglieri *et alii* (2011) and then presented as a map to identify the proper component to leverage on when designing a service system (Baglieri and Karmarkar, 2014).

The Input-Process matrix does not identify optimal combinations for different strategic goals, as the Hayes-Wheelwright and the other matrixes which inspired to this latter did. This matrix simply suggests that emphasizing the role of a single component we can differentiate the output we deliver. Just to give an example, focusing on "customer" and "industrializing" its contribution, we transform the traditional airline companies in low-cost-like company. This is not necessarily a mistake, if customers perceive this change in beneficial process for their all experience. The implications are in terms of the management of the variability to handle with. If we leverage on the skills and competences of our staff, the related cost of personnel increases, and the wider the flexibility of the process we adopt, the higher they will be. On the opposite side, if the industrialize our customers, the cost of managing the variety may decrease. Yet, if the processes are not clearly defined and standardized, the risk of dealing with an excess of demand for variety is very high, because each customer brings his/her own needs into the system.

The Input-Process matrix represents a starting point for the designing of every product-service system. It allows to deal concurrently with both the different characteristics of the components of the inputs (tangible, intangible and human) and the different sources of the input (the staff vs the customer). Furthermore, it allows to relate the characteristics of the inputs with the characteristics of the processes, and consequently to match the proper process design with the distinctive feature of the inputs.

Figure 1.4. The input-process matrix
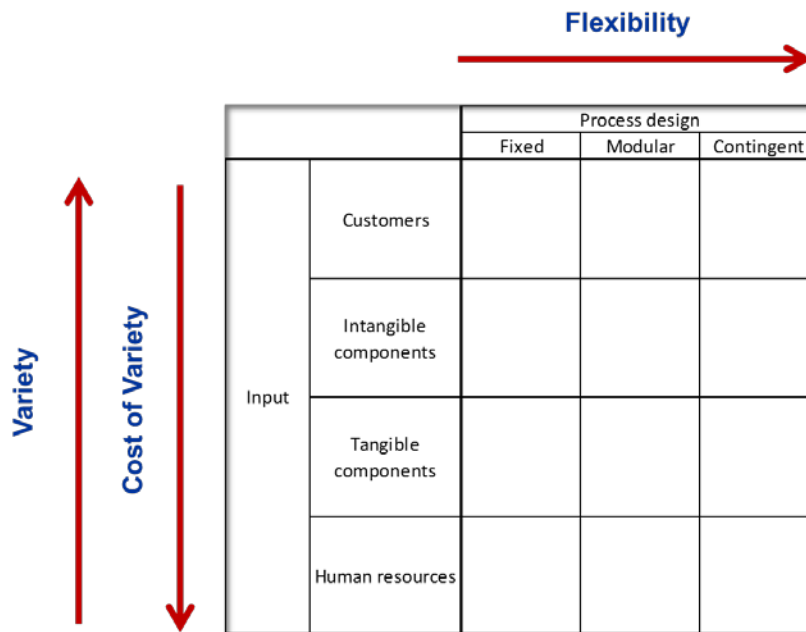
In the journey from a traditional approach to service operations to an original, and hopefully distinctive, contribution to the design of experience-driven product-service operations, this conceptual framework represents the first step to understand how servitization and customer experience may converge.

The next step is understanding why experience is so crucial in the future economic scenario and what customer experience is, according to extant literature.

1.2. What the experience economy is

Abbott (1955) first noted that *what people really desire are not products, but satisfying experiences* (cited in Holbrook, 2006). Dewey (1963) stated that experience involves progression over time, anticipation, emotional involvement, and uniqueness. In short, according to this Author, experience stands out from the ordinary, as later followed by by two American consultants, Joseph Pine and James Gilmore, whose book, "The Experience Economy. Work is theatre and every business a stage" (1999), described effective experiences as those ones a customer finds *unique, memorable and sustainable over time*.

Pine and Gilmore's thinking is based on the assumption that the categories of goods and services are no longer broad enough in scope to express the complexity of the economic scenario and that *servitization* is the only way for manufacturers to get out of the *commoditization* trap. Commoditization, as mentioned earlier, is the phenomenon by which the value perceived of a good is reduced to that of a commodity, whose price and quality are easily comparable to its competitor products, widely available in the market and so even easy to negotiate. A commodity is something that no producer wishes their own product to become, but is often the consequence of price wars and the loss of distinctive technological expertise. This is a problem that many companies are familiar with, and from which too many of them are unable to recover. Pine and Gilmore claim that servitization is merely the first step toward a new business model and even go as far as to say that the true revolution is that of transforming each and every business, not just services but tangible goods as well, into an emotional, memorable experience for consumers, transferring the kinds of feelings we want our important house guests to experience for every minute of their stay.

The metaphor suggested by Pine and Gilmore (and on which we also draw, later on) is that of the *theatre*, where the success of a performance basically relies on the relationship established between the audience and the actors, and the ability of the actor to improvise when faced with unexpected events or requests.

Some elements must be underlined. First, these changes underway should be approached optimistically. The commoditization of industrial products is rather like what happened previously to foodstuffs and agricultural produce, the production of which has grown significantly over the last 100 years, part due to the spread of the chemicals industry and part to the mechanization of farming. The advent of technological innovations in the food-processing industry has caused productivity to skyrocket, and reduced the agricultural product, above all in its unprocessed form, to a commodity. The consequence is that in the developed economies despite having one hundred times the production capacity of a hundred years ago, the value generated by this economic sector is now laughable, accounting for just 2% of world wealth.

Pine and Gilmore argue that it would be short-sighted to predict an inevitable crisis in the global employment system caused by the growth of services production and the passing of the classic division between physical and intangible goods. The authors argue that the advent of

the experience economy releases energy and offers the opportunity to generate new business and new employment.

I totally agree with such a statement. The convergence between physical goods and services is actually depicted as products moving toward services. There is, however the opposite, centripetal, motion, that of services-into-products, brought about by two distinct and tangible dynamics: management practices on the one hand, and technology on the other.

Management practices are moving ever more from the manufacturing world to that of services, because services have an increasing need to implement deep-reaching process rationalization in order to achieve increasing levels of reliability in the "production" and "delivery" of services, and guarantee consumers continuous quality improvements, which naturally include the experiential aspects. On the other hand, it is important to emphasize how a decisive injection of service management expertise is beginning to materialize in the traditional manufacturing world, precisely because servitization demands a significant reconfiguration of the manufacturing's traditional mix of core competences.

While, on one hand, industrializing services implies that services will follow the same course as previously explained for agriculture and manufacturing, on the other, it is potentially the most extraordinary source of innovation in the services themselves. The industrialization of services consists precisely of the convergence of the two factors we described: the transfer of manufacturing managerial practices to services and the widespread and heavy use of new information and communication technologies (ICT) in both sectors. The potential of this phenomenon is enormous, in my opinion, because industrialization represents an immense source of innovation for services due to the impact the phenomenon has on one particularly salient characteristic of services: the contextual affinity of production and consumption. In substance, since service is by nature intangible, and is only brought to fruition when provided to the consumer, it follows that there can be no "product" innovation without "process" innovation. This distinction has always been essential in the industrial world, and numerous technology management models of the past have paused to reflect on the dynamic between product innovation and process innovation. Of these, the best known is certainly the model proposed by Abernathy and Utterback (1976), whereby industrial sectors arise because a new product appears in the market and can survive for a long time without necessarily introducing innovations to the production method. In fact, the distinction between manufacturing process and output is so evident that no consumer (or only a very few experts, hardly representative of

overall demand) who buys a physical product would ever be able to understand, for example, whether it was produced through a highly automated process or a highly artisan one. Take the production of fresh pasta, for instance, most of which in Italy is dominated by the use of machines capable of producing ravioli and tortellini, even in tiny batches that let small businesses offer real "homemade" products at decidedly sustainable production times and costs[1].

On the other hand, the distinction between process and output cannot be made for services. There may be (and this is a question we will come back to) a part of the production process the consumer doesn't see, but the service only materializes when the "semi-finished" product is delivered: even so, the method used to deliver the service radically changes the nature of the output. Take catering as an example. Pasta, ravioli, tortellini and any other kind of international cuisine can be cooked and delivered to the client to take away and consume at home. This service is so important in the United States that almost 80% of the food consumed at home is bought from department and food stores. This is a totally different service to the one provided by a restaurant, where the consumer sits down to be served and consume their meal. The difference lies not in the physical product around which the service revolves (and that in its tangible component can be "stored"), but in the manner in which fruition of the product itself is offered.

In services, a different process always leads to a different output. This is the basis of our optimism about the industrialization of services phenomenon. The potential for innovation it offers in the production and provision of services is the key factor in determining innovation in the output of these processes. Since innovation is the only effective weapon to compete and grow in the longer term, whatever the industrial context, it follows that service industrialization today offers companies a unique opportunity for growth and competitive advantage.

However, such a centrality of the customer experience does not mean that there is no business without experience.

Apparently proof of this is Ryanair, Europe's first low-cost airline. Founded in 1985, Ryanair started to generate significant revenues and profits after it appointed a genius of a CEO, Michael O'Leary, who made 'basic' and 'efficient' the keywords of the company's business

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[1] Similarly, the diffusion of the 3D-printing technologies is suggesting a potential future for those "makers" that manufacture objects with the characteristics and complexities of a huge manufacturing system, but in single piece, with a small equipment and highly customized.

model. With the deregulation of the airport industry in 1997, Ryanair's pan-European services grew immensely, but it never put the "emotional experience" of flying on its planes anywhere near central to its value proposition. The experience is quite the denial of experience! In fact, any passenger arriving even just a few seconds late for check-in is politely but firmly invited to look forward the next flight. Once on board, the plane's seats don't recline and we've all read in the papers about O'Leary's dream of getting rid of the seats and replacing them with hammock things you stand up in, safe even on take-off and landing, so he can obviously cram more people into the planes! And worse, all the way through the flight you're bombarded by deafening music accompanying all the latest promos, and constantly pestered to buy a whole range of useless products. Defining Ryanair's operational model as a theatre, as intended by Pine and Gilmore, is, quite frankly, inappropriate.

In my opinion, two specificities of the customers' experience are still largely underestimated.

First, its *intensity*. Even if we can generically agree with the statement than customers do not demand for either products or service, but for a cognitive, affective or behavioral transformation (Palmer, 2010), what is the entity of such a transformation when we get a coffee from a vending machine or a DHL guy delivers us an Amazon pack? And, most of all, how could any low cost product and service survive if experience, as previously defined, is the only real customer expectation?

An explanation can come if we assume that "customer experience" comprises essentially non-utilitarian benefits. In this case, it could be expected that interest in customer experience advances during periods of prolonged economic prosperity. In the field of leisure and tourism, it has been suggested that the most significant and rapid developments analogous to "customer experience" occurred in the UK during periods of prosperity, notably the 1890s, 1930s, 1950s and more recently, the late 1990s (Urry, 2002). More recently, studies on world inequality shows that the gap between the richest and poorest segments in Western Economies is going to increase. According to Bourguignon (2017), while inequality *between countries* decreased in the last decades, inequality *within countries* is growing very fast. Twenty years ago the average standard of life in France and Germany was twenty times higher than in India. Today it has been cut in half. In the meanwhile, in the USA the income inequality has dramatically risen, as shown in the next picture.

As shown in Figure 1.5., 24 OECD countries are ranked by their level of disposable income inequality across the entire population – that is, including households with persons of all ages.

Considering disposable income (the darker bars), the US is the second most unequal country, just 1 Gini point below the most unequal Israel. The US Gini is almost one-quarter greater than the average Gini calculated across these 24 OECD countries. However, when we consider inequality of market income (the lighter bars), the situation looks a bit different. Inequality of market income, of course, is everywhere greater than inequality of disposable income, but US market income inequality is not exceptionally high. This is indicated by the fact that the US market income Gini is just slightly (5 percent) higher than the average market income Gini, across these countries. It is further confirmed when by the magnitude of government redistribution alone (where redistribution is captured as the differences between the lengths of the two sets of bars). In the US, transfers and taxes reduce market income inequality by 15.5 Gini points, or about 4.5 Gini points less than the average redistribution across this group of countries. So, we would conclude that lower redistribution is the dominant reason driving the exceptionally high inequality of disposable income reported in the US. (Gornick, Milanovic, Johnson 2017).

Figure 1.5. Income inequality
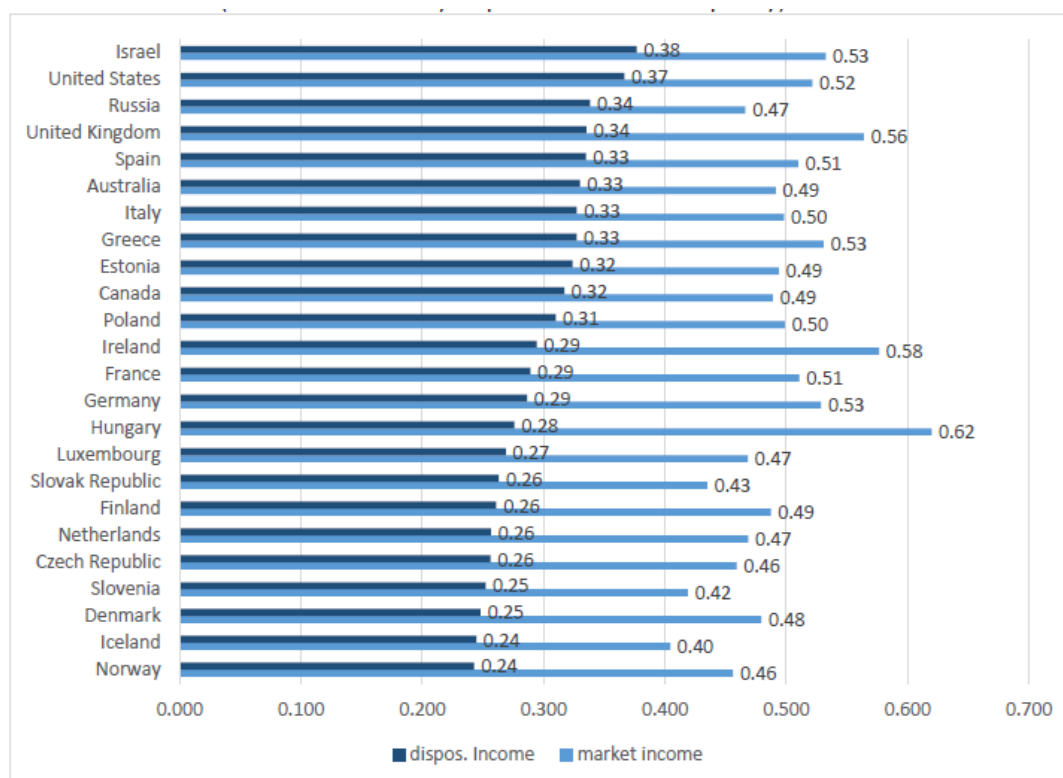
Note: Ginis based on equivalized incomes, disposable and market, respectively.

This widening disparity may explain the apparent anomaly of rapid growth in "low cost" operators in sectors as diverse as retailing, hotels and airlines. Superficially, one could argue

the growth of "no frills" sectors is evidence of the consultants' hype and the limited applicability of "customer experience" as a concept. However, given a growing income inequality, *experience driven* and *price driven* business models can co-exist, even within one individual's willingness to pay. Any individual may use a "no frills" airline service when travelling in a one day trip and search for a higher order experience at the holiday trip with family and friends. The concept of "rocketing" explains how customers may use both very expensive and very cheap brands simultaneously (Silverstein and Fiske, 2004).

Summarizing, we could affirm that we must expect not only for different customers segmenting their demand for different intensity of experience, but even the same customer who, in a specific context and for peculiar items, shows interest for a low intensity experience, and in a changed context (time and space) is attracted only by non-utilitarian features.

The second underestimate characteristics of the experience is its *culture-specificity*. For example, large part of the emphasis Pine and Gilmore put on the key role played by experience is most probably due to their cultural bias, given that the cases cited are all American and, what's more, are based on a specific American culture, that of the big East and West coast cities and this, in our view, is of no minor relevance. An exemplary case is Starbucks, the Seattle-based company founded in 1971 whose coffee shop model has made it the global leader in its market. The USP (ultimate selling point) of Starbucks is the great attention its personnel place on the needs of its customers, its willingness to let its customers use their premises freely, in terms of space and time, and, more generally, to make them feel like the coffee shop is an extension of their own homes. For instance, by offering free Wi-Fi, Starbucks effectively gives its customers the chance to take a great coffee break while staying productive, which is no small revolution for a country whose people are on the go for most of the day. But then again, anyone who's ever been to a coffee bar in Italy, but France and Spain too, knows that the first rule drilled into the apprentice barista is to remember the names of their customers and, above all, to remember how they like their coffee served. No mean feat when you think of the hundreds of different ways there are of serving an espresso – *lungo, ristretto, doppio,* large or small, cup or glass, *macchiato freddo* or *caldo*, and so on. Even though a cup of espresso takes only a minute to drink, everyone in Italy knows that no bar would ask them to leave as soon as they are finished. On the contrary, traditional bars often keep a pack of playing cards handy for their customers, and, always offer the customers newspapers to read in the morning. For an Italian, to get first time into a Starbucks shop is not a positive experience: a list of very few options, a line to place an order, crazy questions ("For

here or to go", folks, it's an espresso "solo", 30 ml. of hot water and caffeine, to go where?), long waiting to be served, called by name to get the serving, carton cups. For an American, an Italian bar is confusing: no line to place the order, a lot of people standing to the bar, no list of products, it's not clear where and when to pay. Basically, what I am saying is that the impact of experience on revolutionizing a business must always be evaluated in relation to the "baseline" quality of the business-client relationship in the cultural setting of reference. Through my personal and direct observation, I can say that the Starbucks model was certainly an innovation in the great US cities, those vast and feverish urban settings where frenetic working rhythms, cross-city travel, and the complex management of both professional and personal relationships are the order of the day. Nonetheless, I can also attest to the customer sensitivity of certain coffee shops in the America's Midwest, where both the bar staff and the waitresses have no trouble remembering the name of a customer, even if they've only seen them once.

Lastly, a point that Pine and Gilmore insist on particularly is the need to learn to treat the customer as the real product of the service because, in their opinion, the customer should be so enraptured by the experience we offer as to entrust themselves entirely to our company to the point of wanting to be modeled and transformed by the experience itself. This is a fascinating perspective, and is not too far in the future. Indeed, aren't there already customers who just to live the experience, along with a few hundred million others in the world, of owning an Apple device, switch to a new operating system and buy 'apps', that aren't really as "plug and play" as we are led to believe?

Yet that leads us to raise another important point. In the perspective I am adopting here, that of the industrialization of the product-service experience, which above all looks into how the methods of producing services change, the consumer, far from being the result of transformation processes, is one of the essential inputs that businesses can effectively leverage. More generally, I believe that the greatest weakness of the underlying philosophy of the experience economy is that it focuses the company's entire strategic project on the moment of contact between business and customer, underestimating the impact that operations have on the company's overall performance. In short, as experience is the outcome of a transformational process, we must take care in designing those processes which mainly affects the uniqueness and memorability of the experience itself.

1.2.1. Understanding "experience"

According to Berry, Carbone, and Haeckel (2002) "customers always have an experience—good, bad or indifferent—whenever they purchase a product or service from a company."

Experience has been defined in different ways, according to the disciplinary perspectives. Services marketing literature has defined the customer experience taking into consideration where experience takes place, when it is produced and who contributes to generating it.

The first area in which service experience has been considered is related to the service encounter. The relationship between a service firm and its customers is at the heart of service literature (Solomon et al., 1985) and has therefore been explored in depth (Goodwin and Gremler, 1996; Gwinner, Gremler and Bitner, 1998; Price and Arnould, 1999; Gremler and Gwinner, 2000), especially because customers are a part of the service delivery process and play an important role as co-producers of the experience itself (prosumer). For this reason, many scholars have focused on that part of the service experience which is linked to the service encounter and on how it affects customers' experience and perceptions as a whole, particularly examining topics such:

- the contact personnel's friendliness (Ostrom and Iacobucci, 1995);
- commercial friendship (Price and Arnould, 1999);
- customer satisfaction and evaluation of the service provider (Meuter et al., 2000);
- the role of each party in the interaction (Ligar and Coulter, 2001);
- the importance of non-verbal communication (Sundram and Webster, 2000; Gabbott and Hogg, 2001).

In short, if the encounter is well developed and managed by the company, it has positive implications both for the firm and for customers. Indeed, the service encounter between customers and the company's contact personnel has been seen to be one of the most crucial aspects of the overall service experience, as it encourages many consumers to choose a "traditional" and "personal" experience, preferring to online, virtual or unconventional channels (Harris, Baron and Parker, 2000). The reason is that personal interactions with the sales staff or even with other customers who share the service setting create value for the individual (Harris, Baron and Parker, 2000). Aubert-Gamet and Cova (1999) state that postmodern consumers do not patronize the service setting primarily for its "use-value" (which can be functional or symbolic), but rather for its "linking value" (that is, for instance, with the contact personnel or other customers), in order to feel part of a community and to

satisfy social needs (i.e. conversations or exchanges of opinion, Helkkula and Kelleher, 2010). Service experiences and exchanges that have been found to be individually and socially constructed deserve further attention within the services marketing literature (Helkkula, 2011).

Another area that presents a strong reference to service experience is the servicescape. In the literature, the concept of servicescape has been defined as "the context surrounding the service" (Bitner, 1992), first in an essentially physical sense, then taking a wider view of the social environment (Baker et al., 1994) and including aspects linked to the roles played by staff and customers. The servicescape is the "physical and social environment that immediately surrounds the experience of a service, transaction or event" (Bitner, 2000, p. 38).

The importance attributed to the servicescape is based on the fact that a well-designed and functional structure can transform a service into a pleasant experience, both for potential customers and for staff. If this is not the case, there is a frustrating atmosphere for both parties. An important element for the context is the aesthetic value that a positive experience can have for customers (Wagner, 2000).

The metaphor of the theatre (Grove et al., 2000) is frequently used to describe the complexity of the setting in which the service experience takes place. Why do we willingly spend time at one point-of-sale, while we cannot wait to leave another? Comparing the service experience with the theatre is helpful, because each actor plays a role in a given setting and within a set of particular relational dynamics which, taken together, can produce a positive or negative impression as a result of the alchemy of those interactions.

Many scholars and researchers have looked at different elements of the service process and how they affect the individual's service experience. An aspect which has received special attention is queuing, since the time customers have to wait to be served and the way the company has designed this waiting time is crucial in shaping the experience positively (when service is quick and efficient) or negatively ("when consumers have to wait, the service delivery process is frequently compromised", Voorhees et al., 2009, p. 138). Moreover, perceptions of the experience may change in relation to what happens while customers stand in line (Ramaswamy, 2010). For instance, the activity of queuing with other customers has a strong impact on customers' decisions and evaluations of the service setting and experience (Rafaeli, Barron and Haber, 2002; Voorhees et al., 2009). Apart from queuing, which has deserved greater attention, other elements of the service delivery process also affect

customers' experiential sphere, e.g. service design issues. If the service is designed to be delivered in a fluent and efficient way, if customers understand how to move within the point-of-sale, if it is easy for them to understand what they are supposed to do and when, etc., then the process will be smooth, and the experience is also going to benefit from this efficiency (Tombs and McColl-Kennedy, 2010; Xu, Shen and Wyer, 2011). Servicescape and spatial layout design are important tools which can make the service process pleasant, fluent and efficient in the eyes of customers (Bitner, 1992; Aubert-Gamet and Cova, 1999; Reimer and Kuhen, 2005), so facilitating positive and memorable experiences.

The service delivery process can take place offline (as in the cases depicted above) or online, where the servicescape is a virtual space and the counterpart is automated. Bugg, Holloway and Beatty (2008) explore satisfiers and dissatisfiers in the online environment, stating that the "weaknesses" of virtual contexts (as well as of self-service technologies - SST) are technical, structural and organizational issues, as well as the lack of interpersonal interactions which could act as process facilitators and experience amplifiers.

Finally, reference to the service experience is also common in research on service quality and value. Parasuraman et al. (1985) defined service quality as a gap between customer expectations and customer perceptions. In particular, customers' experiences - both past and present - have a strong impact on quality perceptions, since customers will "use" these to evaluate the delivered service (Edvardsson, 2005). A direct experience with a service has a strong impact on customer expectations and it is more important than company communication (Schneider and Bowen, 1995; Grönroos, 2000).

Furthermore, the intensity of the customer experience is a very relative concept. Gupta and Vajic demonstrated that experience should be studied in relation to the activities and the social context where it takes place (2000). More recently, for example, Baglieri and Zambolini confirmed, in a research on the retail store experience, that the same layouts and processes the customers are exposed to can generate a totally different experience, depending on the surroundings and customers' previous experiences (2012). In short we can say that experience must, in some sense, be interpreted taking into account many more factors and variables, starting from sociological and psychological ones.

These psychometric properties of the customer experience have been particularly investigated by Chang and Horng and related to what these Authors call the "experience quality" (Chang and Horng, 2010).

1.2.1.1. The psychology of experience

The deep study of human perception and experience goes back to the earliest philosophers and thinkers. Similarly, the formal empirical and scientific literature spans centuries and is vast and diverse. Thus, I restricted my review to a basic survey of some of the most important and recent empirical, conceptual, and analytical contributions. Research on experience can take several forms.

The most basic is the development of new concepts and paradigms. For example, Weber proposed that the perception of change in an external stimulus is proportional to a measure of the intensity of the stimulus (Ross and Murray 1966). Going further, the concept can be used to analytically deduce a "law" of perception. In this case, the Weber-Fechner law stated that the perceived level of a stimulus is proportional to the logarithm of a measure of the stimulus. A practical insight that follows from this law is that to double the perceived intensity of a stimulus, the signal itself would have to be quadrupled. When studying service processes where the outputs are intangible, not observable, and without a good independent measure of intensity, it may not be even be feasible to apply the law directly. However, the concept might still apply qualitatively, and provide useful insights.

In understanding and designing experiences, casting a wide net across these levels of representation and abstraction can be of value. For example, quantitative models can be used to set levels of ambient light and sound. Even when an analytical relationship is not known or does not quite hold, the basic idea may still inform the design process. As an example, Weber's Law suggests that to increase the perceived value of an experience at the margin, may require progressively greater (multiplicative) increases in the intensity of the experience. In short there are likely to be diminishing returns from allocating more resources to improving the level of an experience.

In considering the psychology of experience, Karmarkar and Karmarkar suggest employing three broad categories of experience and perception as descriptive phrases: sensory, cognitive, and affective or emotional (2014). These categories are not perfect either in terms of definition or clear separation. They all overlap to some extent, and one type of experience may spill over into another. One of the few discussions to be found on this topic is by Camerer and Loewenstein (2004).

In short, the psychological phenomena and behavioral effects related to experiences that have been hypothesized, observed, studied empirically, and in some cases modeled analytically can be summarized as follows:

- the experience of the moment and its valuation: utility and value functions have usually had a product orientation, and they are typically defined analytically as functions of product attributes. This is a static perspective, in that products don't change from moment to moment. In the case of process experience, the intensity of the process can change continuously, and can also change in terms of the attributes and characteristics involved from stage to stage. Thus experience can be investigated in a dynamic and time dependant function (Kahneman et al. 1997, Ariely 1998);

- the dynamic memory of experience, forgetting and memory decay. It is a truism that what customers take away from an experience is not the momentary experience itself, but its memory. Now if memory were perfect, this would not be an issue of much significance. However, individuals' memories are malleable over time. Relatively recent research (e.g. Nader 2003) suggests that when someone is in the act of remembering, the memory itself becomes labile, and can be altered, or "rewritten." Of course, a very common aspect of change is that individuals simply forget experiences, over time. Overall, understanding memory and forgetting is critical for service design as much of the "product" that a customer takes home after a service experience is the memory. It is thus also important to understand what process elements will shape this memory, and how the natural progression of remembering and forgetting processes can be leveraged during the service encounter to enhance its value.

- Sequence and order in processing experience. A concrete implication of memory and decay for service design is that the end of a service encounter will be remembered better, and will be given more weight in the overall perception of the service experience than earlier parts of the service process. However, there are many works that suggest biases towards the earliest part of an experience. Recent research (e.g. Ambady 2010, Weisbuch and Ambady 2010) suggests that initial perceptions over a very short time interval can have a very significant effect on ex post evaluations. In other words, as with primacy, first impressions matter. The composite result of all of these effects can be complex. Lowenstein and Prelec (1997) present empirical evidence about the relationships between sequence and preferences.

- Expectation and satisfaction. There is a large body of literature on the relation-ship between expectations and customer satisfaction (e.g. Oliver 1980). The basic concept is that when a product or service performs better than expected, satisfaction increases, and when the performance is worse than expected, satisfaction decreases. Such gap models have been proposed as approaches to quality measurement for services (Parasuraman et al. 1985).

- Interest, engagement and co-creation. These terms can be thought of as descriptive of the level of a customer's mental attachment or connection with a service experience. These levels are more related to affective (emotional) and cognitive factors, rather than sensory experience. In the domain of consumer products, investing one's own labor in the product, recently described as the "IKEA effect" has been shown to increase satisfaction and even create attachment for the resulting outcome (Norton et al. 2012). Similarly, the so-called Service-Dominant Logic (Lusch and Vargo, 2006) sustain that the economic action is based on the exchange of services: value is not produced by and does not end with the financial transaction, but lies in the use of the good and, therefore, the use of the functions it delivers (value-in-use). The transaction itself can be a source of value generation because use in many cases derives from the customer-vendor relationship and, as such, relationship and trust are two important dimensions for SD Logic. Finally, the value of the product is embedded not only in the activities carried out by the producer but also in the contribution of the customer, who, according to Vargo and Lusch, is always the co-creator of value.

1.2.2. Can we design the experience?

According to the so-called Service Dominant Logic, an experience can't be designed, simply takes place because of the co-production between the customer and the provider. The school of thought known as Service-Dominant Logic is originally the fruit of the study by two authors, Robert Lusch (University of Arizona) and Stephen Vargo (University of Haway). Lusch and Vargo's ideas (2006) have attracted many followers in recent years, in both the United States and Europe, but also many opponents, mainly due to the sometimes radical and dogmatic line of the basic principles of their theory.

In short, according to Service Dominant Logic (SD-Logic), economic action is based on the exchange of services. Moreover, products, in reality, are also a service, implicit in the fact that the purchaser buys and consumes a good for the functionalities it delivers. This initial idea is widely accepted. The discipline of management has sustained for some time that product categories are an obsolete and erroneous way of analyzing and positioning a product in the market, seeing that, in practice, different products in the same product category often compete against each other more than technically similar goods. A convinced asserter of this principle is the American marketing guru Philippe Kotler, even though he openly criticizes the theories behind SD Logic. Ferrata (1989), one of the many Italian authors that had implicitly adopted this perspective many years ago, argued that the product redesign and innovation processes must be based on the functional analysis of the product, i.e., the benefits offered and the performance expected of each feature by the consumer, in a service perspective. This same approach, despite being anchored in the concrete dimension of continuous product improvement, is fundamental to methodologies such as Quality Function Deployment (Akao, 1990; Baglieri, 2003), which are capable of supporting the company's capacity to innovate. They do not limit the competitive analysis behind any innovation process to the simple comparison between competitors in the same goods category, but to all those providing the customers with their expected performance and functionalities.

The SDL go even further by saying that the entire discipline of marketing, from which Vargo and Lusch draw their inspiration, needs to be reworked, to go beyond the limits of the goods dominant logic as the anchor of value-in-exchange and embedded-value principles.

According to the critical stance taken by the authors on the historical development of the entire theory of marketing, value is not produced by and does not end with the financial transaction, but lies in the use of the good and, therefore, the use of the functions it delivers (value-in-use). The transaction itself can be a source of value generation because use in many cases derives from the customer-vendor relationship and, as such, relationship and trust are two important dimensions for SD Logic. Moreover, the value of the product is embedded not only in the activities carried out by the producer but also in the contribution of the customer, who, according to Vargo and Lusch, is always the co-creator of value.

Although the phenomenon of co-creation is certainly ever more pervasive and a key feature of certain services, for example professional services, it can only be considered as a phenomenon capable of becoming generalized since the advent of the digital technologies. Indeed, it derives

from the possibility, often guided by the companies themselves and offered by Information Technology to customers in the most diverse product sectors, of bypassing spatial, temporal and cognitive filters and entering into contact with the vendor's production and distribution processes. Through the possibility offered by IT, now and only now, customers previously considered the mere users of a product with features determined by producers (whether of cars or pasta) can now actually take part in the selection of the projects, features, formats and distribution systems, and contribute to creating value for both themselves and the producers.

From a marketing standpoint, SD Logic theory well adapts to explain the phenomena we have illustrated so far, and inevitably incorporates the principle of convergence between goods and services. The two authors affirm that their logic is founded on the dominance of production and delivery processes (of goods and services) and that the economy is driven by these processes and not by the outputs they generate (Lusch, Vargo, 2011). This affirmation effectively consolidates the concordance between SD Logic, as the marketing side, and the perspective we are adopting, of the crucial role of processes and the need for "industrializing" them in any context.

Anyway, while the last one is a point of convergence, I cannot totally agree with the basic SDL assumption. The output of any interaction between the customer and the product-service combination, is not the customer itself: it is a transformed customer. It means that value co-creation takes place because there is a variation in both the customer's knowledge and memory. This variation (incremental or detrimental) is the outcome of the initial customer's knowledge and memory then influenced and modified by the other human, tangible and intangible determinants which, melted together, represent the context where the product-service combination is used and consumed, and the activities all these determinants pass through and are processed and irreversibly transformed. Thus, we can sustain that the final experience can't be designed with the same precision of a physical good, because of too many variabilities introduced by any single determinants, the customer as well. Yet, the determinants and the transformational processes can be designed and engineered, with the specific goal of limiting the range of variability of the final outcome and driving it towards an expected intensity. Which, in short, means that in such a new scenario of product-service convergence and demand for experience, Operations are more crucial than one can usually guess.

2. Research questions

Although there is an effective need, felt particularly by managers in the field, the discipline of Operations and Technology Management has long treated the specific subject of the production of services as a secondary aspect. Though the production of services has not been completely neglected, more often than not we only see attempts to adapt typical manufacturing methods without considering the specific nature of the determinants of the processes inherent in the product of the services. Even if scholars have devoted the last five decades to the analysis of how services differ from their tangible counterpart, a significant gap still exists in the Service Operations Management literature (Johnston, 2005; Metters, 2010; Chase and Apte, 2007; Heineke and Davis, 2007; Metters and Marucheck, 2007).

As I will discuss in more detail in the next sections, an error in the interpretation of the concept of *servuction* (a neologism derived from the words service and production), is that of focusing specifically on the relationship between service (intended as the output of the process) and process itself. As we have already said, in services these two variables are not independent, in the way they can be, on the other hand, in manufacturing. As a result, doctrine has often found itself tackling subjects mainly related to managing the quantitative aspects of processes, like those related to production capacity sizing and leveling strategies. Another very common stream in the study of the operations of services concerns Queuing Theory, a subject that has fascinated dozens of academics studying the impossibility of storing services (as outputs) and the consequent need to create "queues" of clients, ideally inventories of customers. Although the studies on these subjects of services operations have gone into depth in terms of the decision making on volumes, layout, efficiency and costs, they have frequently neglected the relational dimension, which, on the other hand and with great emphasis, marketing has been able to grasp. This is most probably because most of the academics involved in the field of Operations Management (OM) have a fairly strict background in engineering, which obviously prefers rational and quantitative aspects to relational and qualitative ones in the development of managerial models.

My research aims to bridge a few of these gaps. The main issue I am concerned with is the move from servitization to experience and the need to define first a conceptual framework for service industrialization and then to evolve it in an experience based framework.

In such a sense, my all research cannot simply be positioned within the discipline of the Operations and Technology Management. In world of convergence, of product into service and vice versa, of co-creation among customers and providers, of production into delivery, traditional disciplines represent an old-fashioned approach to the study of economics and management. To simplify, I would state this is a work on Management. Different perspectives will be combined together, and particularly the marketing one, which clearly complements my Operations and Technology Management biases.

The starting point of this work is the definition of a general framework to design the service operations in this new economic and managerial context and to address the strategies for service industrialization in order to better deliver customer experience. In short, I can state that my first research question is:

RQ1: HOW CAN WE COMBINE SERVICE INDUSTRIALIZATION WITH CUSTOMER EXPERIENCE?

To clarify, can we simultaneously get any improvement in terms of efficiency and productivity, as pushed by the Operations Management perspective, and deliver experience to our customers as well?

As discussed in the previous section (1. Literature Review), the production of services inevitably consists of their delivery to the consumer, and so both the back-office and the front-office have to be carefully developed and calibrated. In definitive terms, the management of service operations therefore cannot prescind from the efficient management of the service "distribution" phase and its quality, or from the quantity of interactions created. The delivery of the process generates value for the customers but if inadequately designed may produce inefficiencies for the company. The ideal separation we typically observe in the manufacturing field between the production process and the logistics and distribution does not make sense any more in a holistic perspective of service operations. Furthermore, the client is one of the fundamental inputs of the services production and delivery process. As such, it is crucial to include the customer among the determining factors for the efficiency and effectiveness of the servicing system.

I do believe that the design and production of services must be observed and studied in light of the relationship that is established between the mixture and the variety of the inputs necessary for configuring the service and the methods for producing and delivering the service, that is to say, the process. This aspect is very central to my line of thought and I will be

giving ample space to it in the course of this work because it introduces an innovative and, in my opinion, highly effective approach to the design of the customer experience.

The widespread adoption of new technology and the appropriate transfer of manufacturing managerial practices can contribute to dramatically increasing the productivity of services and, through what I call service industrialization, greatly stimulate the process of services innovation. However, to make these transfers demands greater awareness not only of the soft aspects of services production, but also the awareness that the boundaries of operations in this sector are far less defined than those we can observe in a production process operating within the four walls of a factory.

The above elements define the scope of the subjects I intend to discuss in the pages that follow. I will be analyzing services and, in particular, operations choices made in this context. I will focus in particular on service industrialization strategies and their impact on a complex system of service production and delivery, and on the determinants of the production and delivery of a service, that is to say, the input (the make-up of the service ideal "bill of materials"), and the methods used to "transform" and "assemble" these inputs. My goal is to connect the characteristics of the service operations with the expected output, which is ultimately the customer experience. One can argue that some characteristics may have a more relevant effect on this final goal, and this is what I would like to investigate. In short, my second research question can be summarized as follows:

RQ2: WHAT CHARACTERISTICS OF THE SERVICE OPERATIONS CAN INFLUENCE THE CAPABILITY OF DELIVERING THE CUSTOMER EXPERIENCE?

The ultimate purpose of this analysis and the conclusions I offer in each portion of the work are to answer to my third research question:

RQ3: HOW CAN WE ENGINEER THE SERVICE OPERATIONS IN ORDER TO MAXIMIZE THE CUSTOMER EXPERIENCE?

To answer these question, a three-stage methodological approach has been designed, which I describe in the next section.

3. Methodology

In the following section, the three-stage methodological approach designed to answer the research question is described. To simplify the understanding of the methodological sequence, the three steps are presented listing the three research questions.

3.1. Can we industrialize service and deliver customer experience?

The industrialization of services is a technology-driven phenomenon, whose main goal is to increase quality and productivity in the service (and product-service) operations. As said, yet, companies must compete in an economic context where customers demand for a more relational approach and the pure transactions drive towards the commoditization of the product-service combination.

Therefore, the need for a convergence of the operational issues with the marketing ones is strongly perceived and companies are adopting original solutions to cope with.

To answer the RQ1 I will present the outcome of the analysis of a large sample of cases, which originally was presented, in its seminal structure, in a book chapter in 2014 (Baglieri, 2014) and during the last three years I have refined.

This analysis is methodologically based on an inductive study and a multi-case analysis. Case research is very important for the OM field (Voss et al., 2002), since "… *the explanation of quantitative findings and the construction of theory based on those findings will ultimately have to be based on qualitative understanding*" (Meredith, 1998). Each investigated case represents an instance in itself. For each case, I have observed the main characteristics of its service operations approach, identified the main practices of service industrialization and positioned it in terms of intensity of delivered experience. The rationale behind this methodology is to generate a sample that consists of a wide variety of instances, in order to generate relevant and meaningful theory from observations[2].

A sample of 46 cases was analyzed. 27 cases were chosen among the large sample of the case histories published in the main clearing houses (mainly Harvard Business Cases), and meeting the following requirements:

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[2] Apte and Ferrer (2010) adopted a similar methodology and argued that according to Yin (2009), a multi case research with a unique unit of analysis can be considered a holistic study. Our unit of analysis is the design of the service operations adopting the industrialization strategies.

- focusing on some operations issues;
- teaching notes available, describing in depth the approach to the operations issues;
- companies competing in the healthcare services, retail banking and hotels;
- business is still running at the date of publication of this work.

19 cases have been collected among 2015 and 2017, thanks to my continuous research on this issue and the large network of companies I can interact with at the SDA Bocconi School of Management.

The analysis of each single case consisted in a longitudinal observation and classification of their service industrialization strategies from the original date of the primary source to July 2017. Websites, magazines, journals and other official sources were searched for an appropriate application of the principle of "iterative triangulation" (Lewis 1988), that involves exploiting previously published case studies to learn from them. The longitudinal observation of these cases ranges in average for the last 10 years, in some cases longer.

For the 19 cases I have collected from real time investigations, interviews with top executives and annual reports of the last 5 five years have been collected.

The sample of cases involved in the research is non-randomly selected. In fact, according to Eisenhardt (1989) and Yin (2004), theoretical sampling can be more effective in order to have a sample that represents different types of instances. The sample includes both large and small/medium size firms, selected to cover different industries and different market segments within each industry, and to show significant operational differences. In order to analyze different contexts, a broad variety of geographical locations was considered. The choice of a heterogeneous sample is consistent with the purpose of exploring different choices in terms of operations strategies and management in all market segments. The replication technique was used in the selection phase (Yin, 2004) to obtain contrasting results but for anticipated reasons (theoretical replication). In particular, for each industry and market segment, some case studies have a confirmatory value and represent "common practices"; and others are purposely chosen to have an exploratory value and highlight less common situations.

3.2. What characteristics of the service operations can influence the capability of delivering the customer experience?

In order to answer the RQ2, I needed to quantitatively investigate the relations among the characteristics of the service operations and the customer experience. Research of market orientation run by Kohli and Jaworski (1990), and some authors' contribution (De Vellis, 1991; Gerbing and Anderson, 1988) addressed the methodological approach to the measurement scale.

A specific context was selected, the higher education, where I can collect more data. As far as the procedures of investigating the concept of customer experience in the higher education context, I refer to Parasuraman, Zeithaml, Berry et al. (1985, 1988), unless those studies were focused only on the service quality.

The literature review provided insights into the experience construct. Moreover a qualitative research, run in 2015, helped in finally identifying it.

My initial qualitative research was set within a context of experienced learners, undergraduate students at both Bocconi University. These students are not novices per se but have extensive familiarity with learning through study, interaction and life experience. They are adults and consequently the notion of andragogy (adult learning) rather than pedagogy (the learning and development of children) informs our evaluation of their learning process. Andragogy, a term coined by Knowles (Knowles, 1970, 1973), recognizes the significant difference between how children and adults learn, most significantly the prior knowledge, learning experiences, the influence of one's own context, and the contribution of peers to a learner's motivation to learn. Thus, a constructivist approach to the psychology of learning in this context provides considerable value to our understanding of higher education service design and performance.

Constructivism, founded in the works of developmental psychologists including Piaget, Bandura, Vygotsky, Seligman and Dweck (Bandura, 1977; Dweck, 2006; Dweck, 2009; Piaget & Cook, 1952; Seligman, 1972; Vygotsky, 1930, 2004), considers that learning takes place within a social context. One cannot divorce the learning content from the learning context. In practice, constructivist theories and research have helped inform many of the practices involved in effective instructional design, including 'scaffolding' (breaking learning into discrete blocks or chunks), feedback and reinforcement, direction and evaluation/assessment. However, constructivist practices have benefited from the works of Edward Ryan and Richard Deci (Deci, 1975; Deci & Ryan, 1985; Ryan & Deci, 2000; Ryan & Deci, 2001) self-determination theory, which underlines the vital importance of learner engagement in their own learning and the role played by relatedness. Their contribution to the learning practice has thus been to

focus our understanding of the importance of reinforcement of student's development, to ensure that clear direction is provided in any learning activity and particularly to incorporate social learning into the curriculum.

First step was to translate into a clear set of measurable variables. In depth interviews were undertaken with 42 students. Students were invited to contribute to the research because of three main criteria: being at the last year of their undergraduate program (as an indicator of their maturity as students); with personal score higher than the average of their program (as an indicator of the effectiveness of their learning process); experienced, at least once, with a MOOC or similar (as an indicator of their ability in comparing different learning processes).

Each interview began with the question, 'Please recall a time when you had a particularly impressive experience with the learning process'. The purpose of this initial question was to focus the interview on descriptions of specific experiences. From the responses, critical incidents could be identified and thematic descriptions of learning experiences would emerge. Additional probing questions were developed from the ensuing dialogue. These questions were mostly driven by the respondents' answers to ensure first-person descriptions (Thompson, Locander, & Pollio, 1989). The format of the interview was designed to be very flexible, to allow the respondents to describe their own experiences fully, including their attitudes and behaviors. Each interview was conducted by myself and lasted for 30 to 45 min. The interviews were recorded and then transcribed verbatim by a pool of research assistants. The focus of data analysis was on the dimensions of experience, which students have emotionally evaluated. We unfolded thematic descriptions of customer experiences through an interpretive process (Thompson et al., 1989; Thompson, Locander, & Pollio, 1990). The findings of the in-depth interviews demonstrated that the concept of experience, in the learning process as well, is the outcome of a memorable event which modifies one's knowledge and skills. The students' answers confirm that the most impressive learning experience is for them the one were the all dimensions of the learning process dramatically contributed to the effectiveness of their learning. Even if it is not a direct and univocal indicator, in their opinions, the more effective the learning experience, the higher their grade.

The qualitative first step of this research demonstrated that the concept of the customer (student, in this case) experience is composed of five dimensions and underlined the need for emphasizing the end-to-end emotional side of the learning experience.

Referring to the literature review and results of the qualitative study, I conceptualize the concept of customer experience as students' emotional judgment about their entire experience, which include the students themselves, their interaction with the tangible components (facility, classrooms and technologies), other students and the service providers (instructors and teaching assistants), and eventually the all emotional atmosphere and the quality of relationships among all people involved in (students and faculty). Unfortunately, the data set I am going to present cannot fully catch all the five dimensions above described, as it focuses only on few items and adopts a specific "process" perspective. Anyway, as it can potentially provide data on a large scale, with a longitudinal perspective and in different contexts, it is still a reliable starting point for the validation of the second, quantitative, stage of my research project.

3.3. How can we engineer the service operations in order to maximize the customer experience?

The second portion of the research allowed to identify the relations among the characteristics of the service design and operations and the capability of delivering a memorable customer experience.

In order to get to the expected final output of my work (a new framework for the experience-driven industrialization of service), in the final stage of my research I made the decision of dedicating a longer time to the observation and investigation of a single case, where the new framework has been adopted and tested.

According to several authors, the analysis of business cases is a good method to develop a theory through the deep understanding of empirical phenomena and their environment (Dubois, Gadde 2002; Easton 1995; Yin 1994). After the definition of the theoretical background and the development of the framework (Meredith, 1998), I started selecting several case studies, as suggested by the so-called iterative triangulation approach (Lewis, 1998). However, once I realized the need for a more experimental approach and lack of case studies in the investigated area within the usual sources (magazines, books, working papers, unpublished teaching cases), I re-addressed my methodological approach focusing our work on the in-depth analysis of a single case study. After looking for several potential case studies, I have chosen a project, currently still in progress, that seems to be value adding for both the current theory and practice on this theme.

On one hand, the selected project meets the required characteristics: it is a complex combination of product and service; the context is very challenging, because the strategic goal is to simultaneously meet and exceed the expectations of a long chain of stakeholders; for the service provider, the management of the relationship with all these categories of stakeholders is more crucial than the profitability in the short; there are unprecedented elements of originality and newness; it is not an occasional experimentation, but it is part of a continuous innovation process, combining different strategies of industrialization of the whole service.

The case study is the result of interviews carried out with the top management of Milano Ristorazione. Additional information come from public printed sources.

Moreover:

- some Operations, Quality Management and Logistics staff were also interviewed;
- schools and canteens where the service is provided have been visited and observations have been run before, during and after the lunch time, when the service takes place. These meetings were discussed afterwards with one or several individuals who had participated in them;
- for about six months in the last year, I attended monthly cross-functional internal meetings dealing with the problems related to the ongoing development of the project under investigation;
- interviews were carried out with staff members of partners and suppliers involved in the described project;
- printed sources of information, such as product calculations, cost estimates, quotations, records of meetings, drawings, and firm presentations, were also used.

The use of different sources of information was necessary in order to guarantee the respect of the principles of iterative triangulation (Yin, 1994; Eisenhardt, 1989).

I compared my opinions about the emerging evidence with the ideas of the managers of the company. Also thanks to their availability and openness, I reached the final formulation of my work and the specifications for the future development (Lewis, 1998). The data collection took about 6 months, but it was the final step of a long collaboration started in 2012. No confidential data have been included in the current article.

4.   A framework for service industrialization

As said, for a long time a relevant gap in the Technology and Operations Management discipline has been the lack of the relational perspective in the majority of the models conceived to address the design and the improvement of the service operations.

An interesting and promising attempt to fill this gap recently comes from the dichotomic approach suggested by Baglieri and Karmarkar (2014) first defined as the *service factory* and the *service theatre*. In this section I present the evidences of the analysis of my pilot cases (see Paragraph 3.1. in the Section 3. Methodology), whose goal is, in the end, to answer this question: can we expect either "theatres" or "factories" to deliver customer experience? And, more generally: can we industrialize our service operations, addressing either toward a service factory or a service theatre, and simultaneously deliver customer experience?

4.1.   What is a service factory?

In an article dated 1988, Chase and Erikson were the first to introduce the concept of service factory. Chase and Garvin took up it again one year later (1989), stating that traditional factories must acquire the practises and competences typical of the services sector. Consequently they have to shift their business models away from an approach based simply on sales toward a more customer and services-oriented approach. In short, they anticipate the concepts of both *servitization* and some fundamental principles of the SD Logic. However, the semantic perspective adopted by Chase and his co-authors still focuses on the factory, so in a nutshell we can interpret their concept as a manufacturing factory transformed into a provider of services. This perspective again puts manufacturing at the center of OM discipline, whereas our perspective is strictly interested in the production and distribution activities related to real and proper services or better to the future of product-service combinations.

The service factory is the concept of the production of services applying a factory-like approach, with all that the factory transmits in terms of values, such as efficiency and standardization above all (Baglieri, 2014).

To give an idea of what I mean, let's give the example of what at first glance, especially for the inexpert consumer, *appears* to all effects like a gigantic theatre: a theme park. In 2012 I started investigating, with the kind cooperation of the local management, the case of Sea World Parks & Entertainment (for simplicity's sake, Sea World from here on), and particularly their location in San Diego, CA, USA. During my last recent stay in California, hosted by the University of San

Diego, July-August 2016, I refined this investigation, moving from the analysis of San Diego Sea World operations, to the understanding of the dynamics of customer experience in such a huge theme park.

4.1.1. San Diego Sea World

Sea World is a business that operates 11 parks distributed throughout the United States, with the two major ones located in San Diego (CA) and Orlando (FL). It is listed at the New York Stock Exchange.

During the year 2016, Sea World parks hosted approximately 22.0 million guests, including approximately 2.9 million international guests. In 2016, we had total revenues of $1.34 billion. They generate revenue primarily from selling admission to theme parks and from purchases of food, merchandise and other spending. For 2016, theme park admissions accounted for approximately 61% of our total revenue, and food, merchandise and other revenue accounted for approximately 39% of total revenue. Over the same period of time, they reported $37.17 in admission per capita (calculated as admissions revenue divided by total attendance) and $23.93 in-park per capita spending (calculated as food, merchandise and other revenue divided by total attendance)[3]. The theme of the parks is the relationship of man with the sea and the aim is to instill deep respect for the sea and encourage the conservation of the marine environment. The San Diego theme park, which I studied first hand, is spread over an area of around 81 hectares. Its visitors each year include an average 85 thousand students from Californian schools who attend environmental education programs, another 12 thousand students attending daily camps and work groups, and a further 33 thousand students taking part in behind the scenes initiatives.

On first impression visitors are awestruck by the park. Visitors are free to choose their favorite route through the attractions, which are numerous and continually being added to, and each individual attraction is designed to give visitors a truly memorable experience. The park is so big that it is practically impossible to try all the experiences offered in just one day, so naturally the main entry ticket (the Annual Pass) is also valid for free access all year round, except for a few specific dates.

As we said, at first glance Sea World looks like an enormous maritime version of an open-air theatre, where one can meet penguins, manta rays and marine turtles. The stars are the killer

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[3] Sea World Annual Report 2016,
http://s1.q4cdn.com/392447382/files/doc_financials/Annual%20Reports/Annual/359096_012_web_bmk11.pdf

whales, Shamu and Baby Shamu, which the main attractions, even if Sea World made recently the decision of stopping its traditional shows with the orcas, to meet the pressures of the animalists organizations.

Nevertheless, theatricality and improvisation are only the most superficial aspects of the park's operations model. A closer look at the service production methods reveals a different picture.

Timings, delivery methods and users' characteristics of each single attraction are fixed and the level of flexibility of the "workstations" is extremely low. For example, the attraction called Shipwreck Rapids (a complex system of channels, cascades and water jets that visitors ride down in a circular rubber dinghy, in a simulation of rafting the rapids of a canyon) requires that users are disembarked from the dinghies and new ones embarked approximately every 180 seconds, with a total of 9 passengers per boat, which is actually longer than the time of the ride itself, that lasts no longer than 120 seconds. The number of dinghies can be varied (increased or decreased) depending to the length of the queues of visitors, but since the loading/unloading time is tied to the safety of the embarkation/disembarkation operations, the twofold effect is to inevitably create queues of dinghies full of soaked visitors: despite the warnings, most of them don't wear the right clothing, but that's probably part of the experience! They wait to disembark while mile-long queues of other visitors are anxious to get on board. Incidentally, since the attraction is close by the pool where Shamu (the star of the park) performs almost every two hours, after its big show crowds of visitors inevitably move toward the rapids. Secondly, the users of the attraction have to meet a very precise criteria, height and weight, otherwise they are excluded, for obvious safety reasons, from this particular experience.

Since the individual attractions have practically zero flexibility, there are only two ways to direct visitors' flows to less saturated attractions. First, thanks to the download of the San Diego Sea World application, which provides a free wi-fi connection, the Park can address notifications to the visitors about the lines and visitors can check the length of the queues and optimize their route. Second, to increase the production capacity of the entire process. The first way is elementary and consists of placing the main attractions in more remote locations, so that the more inexpert visitors disperse initially among the various other minor attractions, like the aquariums and encounters with reptiles, narwhals and penguins. Naturally, this just delays the problem, because sooner or later even the less experienced visitors will join the queues for the most spectacular and exciting attractions. Therefore the queues to the main

attractions tend to form at fixed times during the arc of the day, which just happen to coincide with the heaviest visitor traffic (opening time, end of the big shows, etc.). The second solution is more expensive and consists of gradually increasing the number of attractions, and placing particularly exciting experiences close to each other. From the second half of 2012, as visitors exit Shamu's pool, they can choose to either head for the rapids we described above or to the new and, to say the least, breathtaking rollercoaster, thus splitting the flow.

The staff is extremely professional and well distributed, but rather than interacting spontaneously with visitors they keep to a well-developed and fully rehearsed script that teaches them what to say, what to do, and how they should behave. Special or "non-standard" requests made by visitors are an anomaly, which usually leave the staff at a loss and result in the standard response of "Sorry, we can't make exceptions to the rules" or, after a quick word with a colleague, a call to the higher management level in the organization (their supervisors),who in turn don't have any particular instructions and usually tend to limit any variations to the established process. Frankly, "non-standard" requests are a pretty remote possibility. Throughout the entire park and at every single attraction, visitors are bombarded with a host of instructions as to what they can or can't do, the waiting time of the queue they're in, the risks of each particular activity, and so on. The spaces visitors can move around in have rigid and strictly controlled boundaries. Each "emotion" is designed to be "experienced" within the predetermined setting. For example, on the rapids ride there used to be a number of water cannons that, for 50 cents, let spectators watching the ride squirt water at the riders. Now the cannons have been replaced by blocks of concrete with a big button to press on top, after putting in your 50 cents, to automatically spray the riders. The cannons were removed because in the past what used to happen was that people by mistake didn't squirt the rafters (who were already soaked) but turned the cannons on the passers-by around the attraction.

Every single attraction is always designed and physically structured to end in a gift store, and the entire area of the park is disseminated with restaurants, coffee shops and kiosks offering every kind of food and beverage, and little souvenir stores. We couldn't get a precise figure, but the impression is that the area covered by retail activities is more or less the same as that dedicated to the attractions, at least in terms of the visible part. In essence, Sea World is more like a huge, specialized open-air mall than a water park!

4.2. Experience in a service factory

Sea World is a very good example of what I mean for service factory. Generalizing the Sea World experience, the principle factors that characterize a service factory can be summed up as follows:

- Mass production and high volumes, which the company seeks to continually increase.
- High level of standardization of the operations.
- High efficiency production system,
- Focus on reducing costs, generally low, at least in terms of front office personnel, the most numerous but not particularly specialized.
- Low level of flexibility, of both plant and human resources.
- Constant quality, not necessarily low, but conforming to consumer expectations.
- Low variability of the process output.
- Great attention to selecting the process input, in particular in terms of consumer expectations and characteristics.

If we apply the same check list to Starbucks, it is easy to define its stores, which base themselves substantially on the experiential aspects of the service they offer, as service factories.

Nonetheless, while a factory (in a traditional sense) has never been considered as a pleasant place, San Diego Sea World visitors, when subscribing the Annual Pass, get back to the theme park on average four times a year. I interviewed many of them, particularly those ones sitting down deliberately at the first rows of the Shamu Stadium, where the probability of the orcas splashing them is 100%! Their answers where converging: they all seat down there, they all go back to the Sea World San Diego because they know exactly what they are going to pass through. They do want to live again an initial, positive experience. They do not want to take any risk, *replication* is exactly what they look for!

Generalizing, we could say that:

1. Service factory can be a very experiential production and delivery system.
2. The demand for experience at a service factory leverages more on the replicability of a memorable event than the incremental transformation of customers through new and unexpected features.

3. The strength of a service factory is the high level of *dependability*, i.e. the reliability of the production system and the continuity of the quality generated.

4. A service factory mitigates the uncertainties: customers know what they are going to experience and this reduces their anxieties towards the service provision.

Thus, as you read many times the same book to feel again the sensations you felt first time or you watch the same horror movie to be scared exactly as the first time, Americans search for a Starbucks' store in Italy to overcome their initial disorientation when into an Italian bar. And they are, still today, frustrated, because of Starbucks long postponement of its entry strategy in Italy[4].

4.3.   What makes a service theatre?

When asked to associate some key words to the concept of theatre, people are used to refer to emotions and improvisation, even if a theatre can sometimes be a disquieting place. Some pieces of theatre can embarrass the spectator, others offend their sense of taste or decency, and others still can simply be unpleasant. If theatre is improvised, it can happen that the spectator becomes involved in the performance and discovers that there's no script, no scenery and no story, just a flow of collective consciousness that develops from an idea offered by the players on the stage. Some improvised theatre doesn't even have a stage, and in some ways this augments the audience's unease. And yet, it's from this concept of participation in the occurrence that the principles of the experience economy have progressed, and there is no question that involvement and emotion are two elements highly sought-after by a portion of the demand. With respect to the theatre, it has to be said that some spectators are extremely attracted to improvised theatre. Yet, is improvisation the "pure" model of theatre?

Improvisation is actually only a very small part of an actor's career. Apart from a few specialists, after finishing the training that all good actors undergo and regardless of the school they belong to, theatre translates into the performance of scripts that have existed for a long time, and are extremely well coded. For example, theatres are still, and successfully, performing ancient Greek drama from the fifth century B.C. . Then again every performance and the interpretation of the characters are always different, based on the skill of the directors

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[4] Howard Schultz, Starbucks founder and CEO, recently announced the opening of a huge Starbucks Coffee store in the very center of Milan. It will be totally different from the dominant design of their stores around the world, to underline his respect for the Italian tradition of espresso coffee. http://www.ansa.it/lombardia/notizie/2017/02/28/schultz-starbucks-conquistera-fiducia_c44db95a-5cbf-4037-b8bb-9c2675c36be0.html

and the individual talent of the artists, but the differences are not due to improvisation, but due to detailed planning and disciplined, coordinated staging. Roles, scene changes, even audience interaction, if envisaged, are always the result of previous preparation. The space for improvisation is somewhat limited, except to manage contingencies (the actor who forgets the lines, technical problems with a scene that doesn't change, or an audience that doesn't respond to the actor's question the way they're supposed to), which are left to the performer's intuition. The actor nevertheless reacts to contingent events by combining his innate creative aptitude, which can be stimulated and improved but is always a highly personal component of his/her character, skills and experience that enable him/her to react "intuitively" and thus turn the unexpected event to advantage. Charles Bennet, the famous English playwright, referring to the Sir Lawrence Olivier's extraordinary capacity for memory combined with his acting abilities, said: "He could speak Shakespeare's lines as naturally as if he were actually thinking them!"? Nobody expected actually this great British actor to create verse, but even if he had, very few would have been able to recognize the improvisation.

Intuition and improvisation are in any case the result of the capacity of "real time processing" the knowledge the actor has acquired through his/her professional experience, and which makes an actor a great performer. What 'weight' does improvisation has in the world of theatre? A great deal, if we consider the skills of an actor, very little if we count how many Broadway and Off Broadway shows are inspired by this particular branch of theatre.

We have many service theatres around us. For example, top-luxury hotels, like The Four Seasons Hotel, can be considered an example to investigate. I run my first analysis of the operations at the Four Seasons in Milan in 2012 (Baglieri, Zambolin 2012). During the last years, their approach has continuously evolved, as recently confirmed by their recent investment (see below) in enriching the whole offering.

4.3.1. The Four Seasons Hotel in Milan

The Four Seasons Hotel in Milan belongs to the high-end, full-service, luxury hotel segment. Four Seasons provides its customers with year-round opulence. Most of the luxury hotel and resort operator's properties are operated under the Four Seasons name, but some are Regent hotels. It has ownership interests in only about half of its properties, having shifted from a hotel owner to a hotel operator in the 1990s. In 2007 Four Seasons Hotels board members took the company private in a deal worth nearly $4 billion. Microsoft founder Bill Gates (through his private holding company Cascade Investment) and Saudi Prince Alwaleed Bin

Talal's Kingdom Hotels together own 95% of the company, in equal shares. Company founder and chairman Isadore Sharp owns the rest[5]. Its annual turnover is around $ 50 billion.

The story of Four Seasons Hotels and Resorts, which opened its first hotel in 1961, is a tale of continual innovation, remarkable expansion and a single-minded dedication to the highest of standards. The Canadian-based company has, for nearly 50 years, transformed the hospitality industry by combining friendliness and efficiency with the finest traditions of international hotel keeping. In the process, Four Seasons has redefined luxury for the modern travellers. The continuous innovation culminated In 2014, the company introduced the first-ever Four Seasons Jet, providing a complete Four Seasons experience in the sky. Featuring signature design standards, staff and service, this private jet offers round-the-world journeys to Four Seasons hotels and resorts – creating a seamless Four Seasons travel experience.

The positioning and the competitive strategy are supported by high end operations, and highly tailored accommodation service. In particular, emphasis is placed on the choice of location and on careful management of the building; while added value is provided by luxury furniture and environment, as well as by the supporting restoration services. Property of the building and real estate management is not considered a core competence into their specific business model.

Key features are data and information gathered in a Customer Relationship Management (CRM) tool, and standards are enforced through routines and procedures. For example, customers do not perceive that the Four Seasons hotels around the world share the information on their V.I.P. guests through a CRM technology that is not radically different from the one used by the budget hotels. Yet they enjoy the experience of meeting a contact person at the concierge who speaks their language; or listening to the music they like when they for the first time get into their suite; and finding the wall colors they prefer in any room of their apartment (re-painted ad hoc by a special, external team of painters in a very quick time, before the guest gets into one of the Four Seasons hotels). Marketing provides a significant contribution to operational activities through the careful management of both the brand name and the customers' expectations. In terms of relative dominance, the most crucial aspect sustaining the Four Seasons' strategic model is represented by their internal human resources.

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[5]   Source: http://www.hoovers.com/company-information/cs/revenue-financial.four_seasons_holdings_inc.b99482c7d32832db.html

Personnel are carefully selected according to their personal traits and behavioral inclinations, and subsequently formed via ongoing continual training.

Customers are on one hand self-selected thanks to the high rates of the Four Seasons Hotels that have been preserved even in the hardest phase of the last economic crisis. On the other hand, the company asks its customers for behaviours both respectful towards its top class personnel and in line with the hotel standards and policies. It is not very frequent, of course, but it happened in Milan and in many other hotels of the same chain that "non-compliant" customers have been refused, in spite of their purchasing power. Processes at the Four Seasons are designed to better serve the customers and fully meet their requirements. Yet, the contingency of the processes is lower than usually expected. Process reengineering aimed at reducing the variability of their processes, and increasing the control on every single process. The modularity of the process is enabled by the new ICTs and complemented through the high level of skills of the staff. Thanks to the synergy between the new technologies and the quality and competences of staff, soon after checking in, a customer gets into a room furnished with his/her preferred linens (colors and fabrics); surrounded by his/her favorite music in the room; and the menu will include food which takes into consideration his/her preferences, allergies and intolerances. To deliver such a high service level, the Four Seasons provides human resources with distributed technologies, which spread all the information over all facilities around the world. The same technologies can be used to collect and file all information and feedbacks customers provide, explicitly and implicitly, on their needs and expectations, in order to increase the ability to perform how customers cannot expect.

The unexpected is what characterizes The Four Seasons. As a rule, customers may ask for almost everything, excluding what may offend the staff's dignity. Thus, for example, one can ask for a fresh hand-made fruit juice in any moment of the day. You can argue that a fresh made orange juice is a common practice even in many Days Inn, a budget motel chain, in the USA. The difference is that at The Four Seasons you can order any fruit ever fresh made juice, from red Sicilian orange to *maracuja* (i.e. the passion fruit)! If you don't expect they may make it for you, you'll be surprised: they can! This capability is not, once again, because of improvisation, but the consequence of a huge stock of fresh fruit, from all over the world, in big fridges located in the Milan kitchens, which, to preserve the freshness of the produces, must be replenished and turned over any 3-4 days!

The Four Seasons is my archetype of service theatre. Generally speaking, the factors that characterize this model can be summed up as follows

1. Low volume production. No specific emphasis on growth in client numbers, profitability per customer is more important than large scale.

2. Combination of both low standardization for those activities with greater experiential impact, and high standardization for revenue generating ones.

3. Efficiency derives from the focus on a few operations.

4. Low emphasis on costs, which in relative terms tend to be higher.

5. High flexibility of production factors.

6. Very high quality and above all high level of personalization, whatever expectations may be.

7. High variability of the process output, as a consequence of the above.

8. High level of inventory, both tangible (for those physical components which are crucial for a high end product-service offering) and intangible (competences and skills of the staff, hired because of the expertise and background; information, stored without constraints in order to leverage on a wide range of data, when needed to solve an expected issue or meeting an original request).

4.4. Experience in a service theatre

A theatre (in a traditional sense) has always been considered as a very pleasant place, and any The Four Seasons Hotel does confirm this common believe. Anyway, it is not enough to justify the loyalty of The Four Seasons' customers to this world hotel chain. Interviewing to many executives and international travelers, used to stop by these hotels, they motivate their devotion with the ability of the whole service system to fix any issue, to meet any demand, to handle complex situations, to manage the unmanageable! They do not simply want to feel good, they want to feel there's always someone taking care of them and helping them managing risks. While customers of the service do not want to take any risk, these customers know risk is part of their business an daily lives and they feel more relaxed being aware of the competences and capabilities of The Four Seasons people and processes. They do not want to necessarily take any risk, but they know the service theatre can deliver them the unexpected, if needed!

Generalizing, we could say that:

1. Service theatre is a highly experiential, unique, unreplicable production and delivery system.

2. The demand for experience at a service factory leverages more on the capabilities for generating unexpected solutions than the replication of an already experienced event.

3. The strength of a service theatre is the high level of *inventory*, i.e. the stock of the tangible and intangible components of the production and delivery system.

4. A service theatre is dedicated to managing the uncertainties: customers don't know what they are going to experience, but they want to be astonished. Even when entering the service theatre, they expect for the unexpected. Let's think about an emergency room: none goes purposely, yet – when there – everybody expects for the ability to make them feel better, as soon as possible and in a definitive way.

It is quite common to believe that all service theatres have a common denominator: they are niches and above all positioned in the top end of their particular segment. So we could argue that service theatres are only typical of the premium segments of the market and therefore service factories of the low end segments. This assumption is wrong. Starbucks, which we discussed earlier on, is to all effects a service factory, but can't be said not to want to emphasize its theatricality and, above all, serve coffee cheaply. The average price of a cup is around $3.50. If you consider the quantity of both water and blend of coffee per serving, the cost of the disposable cup, the energy used, and the process time of each single order, a rough estimate of the production cost to price ratio comes out at between 1/7 and even as high as 1/10 for the most expensive drink. A factor of 1/7 between direct production costs and retail price is worthy of the top end of the fashion business, and the management consulting fees of long time ago! Then if the customer, especially in off-peak times, decides to stay a while and surf the internet at the tables provided, it's no great loss as the tables would have been empty anyway and if staying around spurs the customer either directly or indirectly to have another coffee, that also helps to further covering the fixed costs. In short, Starbucks is a service factory, but this does not mean necessarily cheap service.

In education, whose characteristics I will better deploy in a next section, we can find a widespread form of theatricality in the operational model at all levels. With some distinguishing elements that make the low cost (for the users) service far more theatrical than the premium one.

In the world of top executive education, for example, the most highly appreciated instructors base their classes on the delivery of a well-constructed script that they have refined over time. Their interpretation is frequently so codified that, if we attend a lecture by the same gurus twice, we can see how in the same difficult passages of the content for the audience, they will always introduce the same "joke" or example, to focus on a crucial point, to attract the audience's attention and underscore a central concept. Their service is in reality extremely standardized and it is so for an elementary reason: the audience is extremely standardized as well. It is self-selecting even at the outset, starting from the tuition fee. It accepts the elementary rules of group behavior (questions only at the end, for example), and is governed by the social control that is established between peers (the majority of the participants tend to agree with the opinions of the teacher, whoever dissents is often isolated and tends not to manifest the dissent again, at least openly). The participants have very precise expectations, filtered by what is promised in the invitation to the event and above all by the instructors themselves in their initial speech, when they set the goals of the class and the rules of the game. We don't deny that these professionals have exceptional skills in both their subjects and in terms of communicational ability; we simply want to underline the fact that they operate in a context that (paradoxically) has precisely the expectations that they are capable of meeting.

On the other hand, the daily toil of a primary school teacher, in any part of the world, is much closer to the theatricality of The Four Seasons. To be more precise, that of a first-year teacher at a public school in the majority of the Europe, where it is highly unlikely that social extraction and status have any influence on the terms of selection at the entry level, as it is instead the case in many of the best private primary schools. In a similar context there is such a variety of personal and family backgrounds and such variability of expectations, attitudes and capacities in the children that, given the curriculum that has to be followed, the level of flexibility in the conduction of it, and the level of improvisation, required every day to respond to the reactions and demands of the class, are extremely high. Precisely because it is the first step on the children's educational pathway, the school system has applied yet no form of selection to the audience the teacher has to relate to, and this makes the process far more complex and indeterminable *a priori*. The capacity to find the right chords to play to attract the children toward school subjects is what makes our first teachers so memorable. Or, on the other hand, guilty of causing the suffering that for some children negatively conditions their future attitude toward school. Paradoxically, in many educational systems, professionals like these, with sometimes more theatrical talent than the best instructors of the Ivy League, are widely

underappreciated and certainly underpaid for the job they actually do. In short, this example was aimed to demonstrate that, even if it is highly correlated, there is no identity between the service theatre and the high end, high price market segment in any industry.

4.5.   Industrialization drives to convergence

The following Table 4.1. reports the list of the all cases investigated. At this first level, we can observe that apparently the two archetypes are clearly distinguished. Moreover, based on a simple count of the recurrence of keywords, service factory looks more common than service theatre. It seems, and it is quite evident, that the adoption of any of the two archetypes is not strictly related to the industry: in each sector, factory and theatre may compete and live concurrently. A loose relation with the market positioning emerges, even if cases arose of companies apparently running an inconsistent operational model.

Table 4.1. Which archetype dominates?

Case	Industry	Short description	Archetype	Primary source
Four Seasons	HoReCa	Deluxe resort-hotel chain, considered to be one of the most high-end resorts by travel guides such as Five Diamond, Travel+Leisure, and Zagat. Hotels are often located in historical buildings; they offer comprehensive services to a client target population mainly from the management world.	Theatre	HBS Case Study 9-800-385
Orient-Express	HoReCa	The company runs high-end hotels, train and cruise transport services, all within the luxury sector. It owns famous exemplars of the sector such as the Hotel Cipriani in Venice, and is renowned for the experience offered to clients.	Theatre	HBS Case Study 9-603-024
Ritz-Carlton	HoReCa	The brand includes a chain of 77 luxury hotels and resorts in 25 countries. It is a famous high-quality brand offering personalized stays. Traditionally the company invests on staff training and has developed specific training centres to teach the principles of its service.	Theatre	HBS Case Study 9-601-163
Canyon Ranch	HoReCa	Canyon Ranch SPA is a U.S. leading company in the wellness sector. For more than 30 years it has offered luxury relaxing holidays, putting the accent on healthy life styles, elegance and the peculiarity of optional services, such as catering.	Theatre	HBS Case Study 9-805-027
Club Med	HoReCa	Club Méditerranée, or Club Med, is a French company dealing mainly with tourism in exotic destinations with the holiday resort model, and since the 50s has introduced to the market the all-inclusive package.	Theatre	HBS Case Study 9-687-047
Hostelling International	HoReCa	Originally an IYHF, it has become a federation of over 90 youth hostels. It was historically founded on the concept of offering basic accommodation at extremely low tariffs, to foster the interaction of youngsters from all over the world.	Factory	www.hihostels.com
Omena	HoReCa	Omena Hotels is a Finnish chain of low-cost automatic hotels. Its main feature is the extreme simplification of the process, through online booking and payment, and with a great reduction of reception staff.	Factory	www.omenahotels.com
Yotel	HoReCa	Yotel is a brand of the YO! Company, providing accommodation services inside airports. It stands for a very innovative concept of Hotel, with automatic check-in and check-out procedures.	Factory	www.yotel.com

Starbucks Coffee	HoReCa	Starbucks is a world chain of coffee shops and restoration in general, which started up introducing into the USA an innovative approach to the world of coffee, replicating and adapting to the American culture the coffee experience of the Italian bar. Nonetheless, its stores cannot be considered as a clone of the Italian bar, because of the high level of standardization of practices and low variety of the offerings.	Factory	Direct interviews and official website, public data
Dahlia Bar	HoReCa	Dahlia Bar is a new concept of Italian bar, located in Milan, close to big universities, owned by three startuppers and supported by Lavazza. Its goal is to create an international, Starbucks-like experience while preserving all the peculiarities of the Italian espresso bar.	Theatre	Direct interviews and official website, public data
Panini Durini	HoReCa	Panini Durini is a chain of restaurants, in Milan and Northern Italy, whose business model is based on investing in small, fashionable locations and serving "paninis" (Italian sandwiches), freshly made with top quality ingredients.	Theatre	Direct interviews and official website, public data
The Ould Sod	HoReCa	See the description in this Section	Factory	Direct interviews and official website, public data
Milano Ristorazione	HoReCa	See the last chapter of this work	Factory	Direct interviews and official website, public data
TD Canada Trust	Banking	TD Canada Trust is a commercial bank for individuals and small businesses operating in Toronto, Canada. The bank offers its services through capillary branching and ATMs.	Theatre	HBS Case Study, 9-108-005, HBS, 9-108-043, HBS, 9-108-055
Bank of America	Banking	Bank of America is the largest U.S. commercial bank in terms of deposits. It is the leader in the more traditional retail banking sector.	Theatre	HBS Case Study, 9-603-022
Commerce Bank	Banking	Commerce Bank is one of the main players in the U.S. banking sector. The company represents a good example of a traditional bank for retail customers, with a focus on individual account holders.	Theatre	HBS Case Study, 9-603-080
First Direct	Banking	First Direct was created as a telephone and internet bank in England, with more than 1 million users. Its innovative business model represents a landmark for phone banking.	Factory	HBS Case Study, 9-897-079
Capital One	Banking	Capital One is an American bank specialized in retail services (credit-lines, mortgages, loans and products for account holders). Currently it is the sixth bank in the United States in terms of deposit portfolio.	Factory	HBS Case Study, 9-700-124
Boston Corp.	Banking	Bank of Boston Corporation was created through the acquisition of American Bank by the Flee Financial Group. Its operational areas are financial, banking and trust services.	Factory	HBS Case Study, 9-195-135
ING Direct	Banking	ING Direct is the largest online bank worldwide; it belongs to the Dutch insurance and banking group ING. It is famous for introducing an account service in Europe, which is fully manageable by phone and online.	Factory	Ivey Management Services Case Study– 902D11
PostBank	Banking	Deutsche Postbank AG is a German retail bank created from the spin off of the division of financial deposits of the German Postal service in 1999. It offers a variety of services both at branches, through the phone and on the internet.	Factory	Tiwari, R. S. Buse, C. Herstat (2007)
Credit Suisse	Banking	The Swiss group Credit Suisse is a financial services company operating at the global level, also involved in the retail banking sector, offering multi-channel bank services.	Factory	HBS Case Study, 9-800-155
Wells	Banking	Wells Fargo & Company is a U.S multinational specialized in a number of diversified financial services worldwide. It is the fourth	Factory	Choi, D. (1998)

Fargo		bank in the United States in terms of assets and first capitalization.		
CheBanca	Banking	CheBanca is the direct, online bank of the Mediobanca Group, the top quality Italian merchant bank. It adopts an innovative approach to the online banking, which merges the characteristics of other online banks to the specificities of a highly customized, physical interaction with customers.	Factory	Direct interviews and official website, public data
Unicredit	Banking	Unicredit is the largest Italian bank. It is redesigning the whole operational system. Digitalization of the processes and focus on the customer experience, throughout the all categories of customers and markets, is the priority of this new strategy.	Factory	Direct interviews and official website, public data
Cleveland Clinic	Healthcare	Cleveland Clinic is a multi-specialized clinics centre in Ohio, USA, and it is one of the largest medical centres worldwide. Currently it is considered to be one of the four best hospitals in the United States.	Factory	HBS Case Study, 9-607-143
Massachusetts General Hospital	Healthcare	MGH, founded in 1811, is one of the three oldest hospitals in the United States. It is the hospital of reference for Harvard Medical School and is especially renowned in the research field.	Factory	HBS Case Study, 9-696-015
Virginia Mason MC	Healthcare	VMMC, founded in 1920, is a private non-profit medical organization, in Seattle, USA. The facility offers an integrated system of healthcare, spanning from primary care to specialized excellence departments.	Factory	HBS Case Study, 9-606-044
Care Group	Healthcare	Care Group is an organization from Massachusetts, USA, created to provide high-quality medical care to patients in an extremely personalized manner.	Theatre	HBS Case Study, 9-303-097
Beth Israel Deaconess MC	Healthcare	The centre is one of Harvard Medical School's teaching hospitals, in the USA. It is a medical centre for care and research, and according to US news & World Report statistics, it is one of the best healthcare centres.	Theatre	HBS Case Study, 9-899-213
Dana Farber Cancer Institute	Healthcare	The Dana Farber Cancer Institute is part of a specialized centre for the treatment of cancer, coordinated by the American National Cancer Institute. It is internationally renowned for quality of treatment and research, and for its extreme specialization.	Theatre	HBS Case Study, 9-699-025
Duke Heart Failure Program	Healthcare	This case-study refers to the specialized program for the treatment of heart-attacks and cardiovascular diseases developed by Duke University. The organization is famous in the U.S for its world-leading approach to heart failure.	Factory	HBS Case Study, 9-604-033
Shouldice Hospital Limited	Healthcare	The abdominal hernia treatment centre Shouldice Hospital, in Canada, is renowned for its specialization in the treatment of this specific pathology. The facility includes a hospital sector and a rehabilitation sector, and operates according to a strategic approach for the standardization of the patient.	Factory	HBS Case Study, 9-683-068
Transitional Infant Care	Healthcare	TIC, in Pittsburgh, United States, is one of the therapy programs offered by the Children's Home of Pittsburgh, an independent, non-profit organization, working in the field of medical care for children and newborns.	Factory	HBS Case Study, 9-898-070
Kaiser Permanente	Healthcare	Kaiser Permanente is an American integrated managed care consortium, based in Oakland, California, United States Kaiser Permanente is made up of three distinct but interdependent groups of entities: the Kaiser Foundation Health Plan, Inc. (KFHP) and its regional operating subsidiaries; Kaiser Foundation Hospitals; and the regional Permanente Medical Groups. As of 2017, Kaiser Permanente operates in eight states (Hawaii, Washington, Oregon, California, Colorado, Maryland, Virginia, Georgia) and the District of Columbia, and is the largest managed care organization in the United States. It is massively investing in a pervasive process of digitalization and is starting cooperation with large retailers and other distribution channel to provide	Theatre	Direct interviews and official website, public data

		healthcare almost "everywhere"		
Sea World San Diego	Entertainment	See the paragraph in this chapter	Factory	Direct interviews and official website, public data
Cinépolis Luxury Cinema	Entertainment	Cinépolis (Spanish for 'City of Cinema') is the biggest cineplex chain in Mexico with 205 theaters in 65 cities, and have become the largest chain in Latin America and the fourth largest in the world with 230 theaters, 2,160 screens, with a total installed capacity of 298,801 seats and over 13,000 employees throughout Mexico, Guatemala, El Salvador, Costa Rica, Panama, Columbia, Brazil, Peru, India and the US. It is an example of misdesign of a theatrical experience.	Theatre	Direct interviews and official website, public data
Universal Studios	Entertainment	Large theme park, based in Los Angeles, providing a top "movie" experience with a high level of standardization of processes and practices.	Factory	Direct interviews and official website, public data
Mexico Cinema Milan	Entertainment	Mexico Cinema is an "essay" movie theatre in Milan, whose main characteristics is to replicate every Wednesday the musical The Rocky Horror Picture Show.	Theatre	Direct interviews and official website, public data
Esselunga	Retail/Distribution	The largest Italian retailers, mainly based in the North of Italy, whose ability is to generate the highest customers' loyalty with a highly convenient and easily replicable standard service.	Factory	Direct interviews and official website, public data
Carrefour	Retail/Distribution	The largest France retailers, operating worldwide, competing in Italy against Esselunga, now leveraging on the customer proximity, additional services and operating extra-time and finally digital solutions.	Factory	Direct interviews and official website, public data
Peck	Retail/Distribution	Peck is a luxury food store and restaurant, located a few steps away from the Duomo of Milan, in one of the oldest streets of the city centre. In the past few years, the company has embarked on a global reach project, aimed at being present in the major international capitals.	Theatre	Direct interviews and official website, public data
IVS	Retail/Distribution	IVS (International Vending Services) Group is one of the leading foodservice operators in Italy, the leader in the Italian Vending Machines (VM) sector approximately 12% market share in Italy in the automatic vending machines, and less than 10% including the segment OCS-semiautomatic vending machines and internet sales) and the third largest in Europe. IVS is highly oriented to innovation. Continuous development in VM technology, in product range and category management, in logistic and software systems, bolster its top line and margin performance.	Factory	Direct interviews and official website, public data
Sapio Life	Manufacturing	Sapio Life is the healthcare services division of the SAPIO GROUP, the largest Italian company operating in the production and distribution of technical gases. It is an amazing case of servitization and radical change of culture and perspective.	Theatre	Direct interviews and official website, public data
Irinox	Manufacturing	Irinox is a company founded by three entrepreneurs, pioneering the vision of top quality blast chillers and food preservation systems for professional use, as well as stainless steel electrical enclosures. It is now moving from the professional to the home market segment, experiencing the need for a more service oriented mindsetting.	Theatre	Direct interviews and official website, public data
N&W Global Vending (since January 2018 EVOCA)	Manufacturing	Evoca (formerly N&W Global Vending) is the largest world manufacturer of vending machines. Its headquarters are in Italy, but its market presence is worldwide. Evoca is focusing on the out-of-home coffee experience, investing massively on the digital technologies, moving towards more service-driven business model and designing products to provide unique emotions to users.	Theatre	Direct interviews and official website, public data

On one hand, we can argue that some strategic dissonance may emerge in the short term, but it should be unlikely in a long term observation. Some counter-intuitive fit between the strategic positioning and the operational models can confirm the trend towards a convergence between the factory and the theatre and can show the benefits of such a hybridization of the operational models. In the reality, it is highly probable that a "pure" implementation of these alternative operational models does not exist, while many intermediate configurations can be likely the most common practice. As a consequence, it is worthier to investigate the mix of the service industrialization strategies adopted in each case. Theoretically we should expect that, being a service factory different from a service theatre, at least the emphasis on the strategies is different between the two archetypes.

4.5.1. Convergence *ante litteram*: The Ould Sod

In the reality, we can already touch base with some example of this convergence. An example I can give is once again the outcome of my last visiting scholar period in California, during last summer 2016: The Ould Sod Irish pub in San Diego.

The Ould Sod is one of the oldest pubs in San Diego[6]. It was established in 1940 by an Irishman who originally called it "Ryan's Bar". In all these years, despite having changed ownership and name twice, it has always remained faithful to the spirit of a pure, traditional Irish pub. Located in one of the city's oldest suburbs, the Normal Heights district, it consists of a large saloon with the classic long bar, from behind which a couple of very able barkeepers serve rivers of beer, most of which strictly Irish, to an exceptionally diverse clientele. The pub has very few tables, serves only beers and doesn't serve food. It is in essence a service factory. Anyone who wants to eat simply goes out to one of the two or three eateries or take aways next door to The Ould Sod, orders a meal and then returns to the pub. A few minutes later the order is delivered into The Ould Sod, where customers can happily consume it, obviously washed down with a couple of pints of great Irish *nectar*.

As for the rest, the pub itself looks just like any normal pub adapted to American needs: giant flat screens for watching big sport events, like the Super Bowl; support and events associated with the big national celebrations, from the July 4th to Thanksgiving Day, not forgetting (how could we) the countdown to Saint Patrick's Day, that even in the United States has become a widely acknowledged annual event, as well as a great chance for another beer party.

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[6] http://www.theouldsod.com/

What makes The Ould Sod so special, and for any new customer, so theatrical? The answer lies in the music you can hear at the pub. Over the years, the pub has become the favorite hangout for lovers of Irish music whose roots are sunk in the Celtic traditions of the island. Californians and tourists from all over the world come to The Ould Sod, bringing their own instruments to play the music they love. The Ould Sod's clientele isn't particularly internet-connected. If you go to the pub's website there are no specific references to the traditions of the place. Word of mouth is still mightier than word of mouse, and has been around far longer than IT.

During an apparently flat evening the pub, which on first impression looks completely nondescript (and where to eat something you've got to go somewhere else), gradually livens up as all kinds of characters start set-ting up in the music corner, tuning their instruments and agreeing on a song before striking the notes of the first tune. From there on in, and for the rest of the night, the music goes on as the first group of musicians changes and makes way for new ones before joining in again, with no regard for continuity. The music they play is strictly Irish, alternating between instrumentals and songs, and – according to how good the guest players are – can range from the traditional old-style "sean nòs" to more recent folk, religious and, obviously, love songs. No-one knows what's going to be played, not just the clients of the pub listening, but the musicians them-selves, because the playlist develops randomly with frequent moments of pure improvisation, until a single player takes the group in hand and gradually leads into the next piece. Even the instruments used are totally random, since the pub only has a sound system that in reality is never used by the clients, but only by the professional artists who occasionally play at The Ould Sod. Thereby, according to the visitors who decide to spend their evening in this little pocket of Ireland on American soil, you could be lucky enough to hear some truly traditional instruments, like the uilleann pipe, the fiddle, the harp, the whistle and the banjo, with the bodhràn drumming the beat.

The revenues of the pub come from the sale of beverages, and the type of beverages it sells is highly traditional. The pub management concentrates on few activities that are so focused that, as we have said, the pub doesn't need a kitchen or a collection system for sending out orders to the neighboring restaurants. If the customers want to eat, they produce the service themselves, in total autonomy. They're not there for that, because they go to The Ould Sod to drink a good beer, enjoy the company, listen to Irish music, and perhaps contribute to the entertainment.

As many as three out of four of the above listed value proposition components are up to the customers themselves. Co-production is the key element of the experience offered at The Ould Sod. In effect, the pub offers what today we would define as a physical social-networking platform, in which the factor of aggregation is the passion for a style of music and the ability to interpret the songs. The role of the staff in contact, from the barkeepers to the waiters and waitresses, is absolutely irrelevant. They neither help nor hinder any performance of the customers, who are free to play, sing and dance to their heart's content. Customers themselves are the main production factor in this service operations model.

The quality of the music, the entertainment, and of the evening as a whole is entirely not standardized, except in terms of the quantity and characteristics of the beverages served, which on the other hand are constant and regulated. The variety of the songs played is totally casual, just like the number of songs. The distinctive elements of each evening are the talent and the artistic ability of the customers, on which depends the flexibility of the performance itself.

The Ould Sod model is not easily transferrable, based as it is on a combination of place, history, memory and socio-cultural character. It sets out to produce services for fairly small volumes, but guarantees high levels of personalization and variety thanks to the fact that the customers themselves produce a large portion of the service. In a few words, it is a service factory which delivers the unexpected because of the customers themselves!

4.6. Generalizing the analysis

What we can argue from The Ould Sod case is that self-servicing can be a very effective strategy to industrialize the customer experience in a service factory, even if it is not the only one. This investigation of the 46 cases reinforced the previous study where I have demonstrated that there at least six main categories of practices for service industrialization (Baglieri and Zambolin, 2012 and 2014). I can briefly summarize them in the following Table 4.2.

Table 4.2. Categories of industrialization strategies in our sample

Industrialization strategy	Definition
Automation	Automation refers to the use of machinery, systems and process technologies as a substitute for human labor required in service delivery. It is the direct equivalent of automation as defined in the manufacturing sector (Dunlop, 1962)
Digitalization	It refers to the increasing importance, emphasis and use of information in companies and management processes (Porat and Rubin 1977, Zuboff, 1989). As a service strategy, it includes the trend from physical to information-based support, which acts as a facilitator to increase the service component of the bundle and its deliverability. One of the key emerging trends in the service industries is the adoption of technology to improve the service encounter, to facilitate customization of the service offering and to increase customer satisfaction. Examples are widespread across the industries, and they all show how ICT can enable higher human resources performance and efficiency.
Outsourcing and off-shoring	Off-shoring in some cases achieves cost reductions by moving operations to low-cost labor locations. In other cases, off-shoring can provide access to previously unavailable expertise. Off-shoring has also been used to enable round-the-clock service operations. By outsourcing, firms generally achieve cost savings (Williamson, 1981), are able to focus on their core business and capabilities (Quinn and Hilmer, 1994), and get access to external competencies and expertise (Quinn, 1999). For service providers, outsourcing can enable cost reductions through specialization and economies of scale.
Customer tuning	We define *customer tuning* as "standardizing" and educating the customer prior to the service transaction (Zeithaml et al.,1990). This is backed by an important consideration: in service transactions, customer satisfaction is the result of the difference between prior expectations and real outcomes. Therefore, the authors suggest a different way to improve satisfaction – namely, managing expectations in advance. This is done, for example, through the use of marketing strategies, the active management of word-of-mouth, and deep investigation of the customer through questionnaires and surveys.
Self-service	Self-service is based on having clients perform some or all aspects of a process without help from the employees. It is a combination of "customer industrialization", as it requires customer to become part of the industrial process of the service provider, and "outsourcing", because in some sense the provider outsources a portion of its operations to a co-producer, the customer exactly. Self-service is a specific form of joint production (Fuchs and Leveson 1968, Karmarkar and Pitbladdo 1995) and has been studied by Meuter et al. (2000).
Re-engineering	Reengineering the service production process mainly consists of decomposing the existing process into value adding and non-value adding activities, and aggregating and disaggregating them in a different, new, more productive design. This practice can originate from two situations; either the decision to decrease the level of contingency to fewer processes, relevant for more customers, or from a decision to decompose a single fixed process to allow for greater customization.

Connecting these strategies to the main industrial sectors I have investigated through more than 46 different cases in the last 4 years, I can say that:

- the service industrialization strategies of the Ho.Re.Ca. industry are very scattered, suggesting a clear connection to market positioning. Indeed, the luxury segment

emphasizes the role of IT, whilst process automation is scarcely considered. At the opposite, low-end market segments consistently emphasize the use of automation technologies, and the tuning of the customer into their production process, through self-service solutions. For all-inclusive contexts, the main industrialization options are related to the immediate and reliable availability of data, the optimization of data use, and the pervasiveness of information management systems;

- in the retail banking sector, the polarization of results is much more evi-dent. The most traditional banks increase their productivity by developing and strengthening the human capital with the support of computerized systems. The most innovative banks, delivering their services through non-conventional channels, emphasize the role of the ICTs, and move larger portions of their work towards their customers, through self-servicing. Finally, operators in the "mixed" segment show a very different approach: some of them concentrate on automation; some others focus on the interaction with the customer and on training. These choices seem to be driven by the alignment with the values of the brand and, more generally, by the mission of the company itself;

- the healthcare is particularly interesting due to the fact that the American healthcare system received very little or no funding, and the sector was thus influenced by the policies and strategies of large insurance companies, which invested since the very beginning in research on industrial excellence for service delivery. During the Obama's administration, hospitals were increasingly concerned with enhancing surgical patient experience, given that Medicare reimbursements were tied in part to patient satisfaction. Surgical patients' experience might be influenced by several factors (e.g., integration of care, technical aspects of care), which were ranked differently in importance by clinicians and patients. During this period, many Authors suggested to pay attention to the most important factors in the patient experience, namely interdisciplinary relationships, technical infrastructure, and staffing. As a consequence, the polarization of the operational models in this sector was progressively being reduced in the USA: both factory-oriented contexts and theatre-oriented ones were actually adopting similar strategies. First, increased investments on the training of the staff; second, strong focus on the information sharing and increasing adoption of digital technologies, specifically to increase effectiveness of the non-core processes; third, emphasis on the *industrialization of the patient*, including him/her within some operational procedures through self-service,

training and self-selection. Finally, emphasizing patient's involvement (i.e. what we defined customer tuning) in relevant portions of the healthcare processes;

- in entertainment, the size of the business strongly influences the approach to the production and delivery system. In large business, hard and soft technologies are largely adopted to cost-effectively interact with customers and reduce the demand for variety, tuning them to the characteristics of the operational model. In small business, the search for efficiency pass through an increasing modularity of the processes, while strong attention is still paid to the staff;

- in Retail and Distribution, particularly in the large food retail, self servicing is becoming a common practice, particularly to facilitate the self check out and the online ordering. In peculiar context, as the automatic distribution, usually called vending, the path is accelerating the adoption of technological solutions (digitalization) in order to reduce the aseptic interaction between customers and machines and to introduce a richer customer experience;

- Manufacturing companies, in the portion of their servitized business, are becoming aware of the need for transforming services from a peripheral *complementor*, even if highly profitable, of the product, to the core factor of their offering. Services play as drivers for products and products enable services and solutions for customers, in the B2B and in the B2C as well. This awareness is forcing the reengineering of many processes and the outsourcing of those ones which are no longer functional to a more intangible business model.

Some more interesting evidences emerge if we relate the practices for industrialization with the operational model, which means, in short, if we look at the dynamic of their service operations.

Even if there are many similarities in the practices the two main business models adopt, other differences make us argue that a convergence is in place, even if it is not yet a dominant trend.

Service factories mainly tune customers to their operations and primarily shift stages of their processes onto them. Furthermore, they relevantly invest in hardware technologies, and trust the digitalization as a way to reduce the distance from customers.

Theatres adopt a more focused strategy, whose practices are digitalization, process reengineering and outsourcing. Apparently, the service theatres in my sample are becoming more and more like factories. One could find this evidence conflicting with the increasing

leverage on the emotional side of the interaction with customers. Thus, we would have to find factories playing as theatres, not the opposite.

Observing these cases, anyway, evidences sound clear. Service theatres in the sample are not denying their vocation and their strategy, but they are aiming to increasing the efficiency of their whole operational systems. This search leads them to redesign their processes, improve the digitalization of their procedures and practices and finally to outsource to specialized suppliers the non-core activities. Most relevant is to notice that these industrialization projects mainly deal with the back-office of our service theatre. For example, customers do not perceive that the Four Seasons hotels around the world share the information on their V.I.P. guests through a CRM technology that is not radically different from the one used by the budget hotels. Yet they enjoy the experience of meeting a contact person at the concierge who speaks their language; or listening to the music they like when they for the first time get into their suite; and finding the wall colors they prefer in any room of their apartment (re-painted ad hoc by a special, external team of painters in a very quick time, before the guest gets into one of the Four Seasons hotels). We can argue that service industrialization strategies have to be investigated taking into consideration not only their scope, but how they affect the whole service production process as well. While in goods manufacturing customers do not perceive what happens in a plant, in service operations customers are always involved in the production process and in touch at least with the front office. Service theatre, as said, still emphasize a lot the human touch and preserve a clear separation between their back and front side. It is quite evident, therefore, they search for a superior efficiency in their back offices while qualifying more and more their front offices to deliver a stellar experience. In general, even if my sample is too small to provide any significance, it looks like service theatre moving towards a more factory-driven approach are implementing a strategy for their growth which aims at increasing the volume of their business replicating on larger scale the initial model.

Paradoxically, service factories should take more care of the impact of any back office industrialization practices, because the increasing customers' involvement they are going to implement reduce dramatically the distance between back and front office. In short, I am stating that the more the customers are co-producing a large part of the service, the more the blueprinted separation among different activities in a service factory is going to disappear.

As said before, convergence seems really to be taking place, at least according to our observations. More generally, I may say that the combinations of technologies and managerial

practices fosters the evolution of the service operations in both the archetypes we defined and pulls, on one hand, factories into the search for increasing their experiential attitude, and, on the other, theatres into the recovery of efficiency and standardization.

From a scientific perspective, this phenomenon is quite interesting. In some sense it demonstrates that there is a large room for investigation around the service management. It requires a more cross-disciplinary approach, merging together the marketing viewpoint with the operations and technology management.

From a managerial perspective, these trajectories sound challenging, but they can't be immediately translated in real practice and executed on the operational playground without the understanding of the design characteristics of the service to focus on. Summing up, goods and services are converging into a complex bundle of product-service offering. In such a dynamic, the demand is evolving from a traditional focus on utilitarian to non-utilitarian expectations. Even if with relevant differences in terms of intensity among industries, value chains and market positioning, in general we agree on a growing demand for experience. To meet such expectations, operations must make a strategic decision: focusing on a factory-driven operational model whether on a theatre-driven one. As said, practices for the industrialization of the service enable the attempt of delivering experience at the level the customers may require, and it looks like, while there is no mandatory or normative reasoning to sustain that convergence among these two archetypes must take place, some companies, particularly those ones with a vibrant strategy for growth, are pursuing such a goal.

4.7. Design characteristics and service operations: the framework applied

In order to find out the appropriate combinations of input and process with the service factory vs service theatre model, a comparative analysis of the recurrence of the priorities of the design characteristics in my sample of 46 case studies was carried out. I classified the priorities in a three-value range: high priority (with value 3), low priority (value 1) and no priority (value 0, to be related also to those situations where the case shows that the design characteristic was not contemplated). The "prioritized" category of design characteristics (input and process) were then cross-checked with the operational models (factory and theatre), and subsequently a correspondence analysis was carried out. Correspondence analysis is used to indicate the relationships of interdependence between variables, and is mainly used for the analysis of multidimensional data (Gokhale e Kullback, 1978).

Considering that every company simultaneously implements more than one industrialization strategy, and that each of these interacts with more than a category of design characteristics, the correspondence analysis presented some interesting results. The information I collected on the all sample are not enough to categorize each case in an univocal way. As a consequence, I run the convergence analysis on a sub sample of 27 cases, those cases whose sources (primarily HBS cases or other public and official documents) can be analyzed with software dedicated to textual and content analysis, like MonoconcPro 3, which is the one adopted..

The first part of the analysis focused on the connections between the operational models (factory vs. theatre) and the primary process configurations. Statistical significance tests aimed to clearly identify whether the differences between processes affect the models themselves.
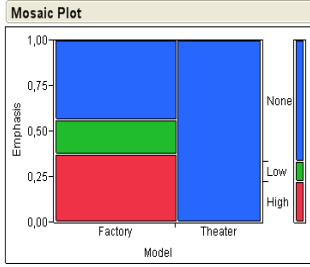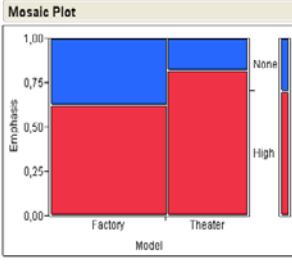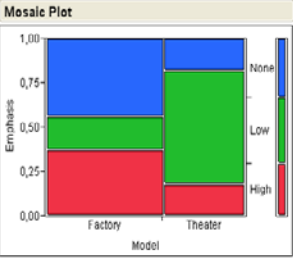
Apparently, whilst fixed processes are exclusively distinctive for the factory model, modular and contingent processes seem to be implemented in an undifferentiated manner in both the service factory and the theatre (see Figure 4.1.).

It is important to stress that none of the investigated cases represented a static combination between the operational model and the process characteristics. Cases were observed on a long time range and they all undertook long and complex changes to react to any shift of the competing scenario. Therefore, a portion of these "incoherencies" (for instance service factories unexpectedly adopting a very contingent process) derive from the momentary inadequacy of the configuration of the operations with the corporate strategy.

Figure 4.1. Connection analysis: the process variable

Contingency analysis of emphasis by model determinant		
Fixed process	**Modular process**	**Contingent process**
Significant difference, factory dominates	Non significant-difference	Non significant difference

The second part of the analysis focused on the connections between the operational model and the mix and variety of the inputs.

Figure 4.2. clearly shows that the tangible components dominate in the service factory driven operations, whereas intangible components are a priority in both the operational models.

Not surprisingly, there is a scenario where all services are progressively moving towards the digitalization of knowledge, implementing it at back and front office level.

As far as the managerial implications of these evidences, we can argue that factories need to emphasize the tangible side of their business, whilst theatres can benefit of a wider range of options. Nevertheless, neither of the two archetypes can neglect paying attention to the intangible dimension of their business. Similarly, I can say that theatres that want to run like factories should emphasize the tangible components of their operations.

Figure 4.2. Connection analysis: tangible and intangible inputs.

Tangible inputs	Intangible inputs

Mosaic Plot (Tangible inputs)

Contingency Table

Emphasis

Count Col %	High	Low	None	
Factory	6	1	9	16
	85,71	14,29	69,23	
Theater	1	6	4	11
	14,29	85,71	30,77	
	7	7	13	27

Tests

N	DF	-LogLike	RSquare (U)
27	2	4,4835564	0,1579

Test	ChiSquare	Prob>ChiSq
Likelihood Ratio	8,967	0,0113*
Pearson	8,429	0,0148*

Mosaic Plot (Intangible inputs)

Contingency Table

Emphasis

Count Col %	High	Low	None	
Factory	4	4	8	16
	57,14	50,00	66,67	
Theater	3	4	4	11
	42,86	50,00	33,33	
	7	8	12	27

Tests

N	DF	-LogLike	RSquare (U)
27	2	0,28562363	0,0099

Test	ChiSquare	Prob>ChiSq
Likelihood Ratio	0,571	0,7515
Pearson	0,570	0,7521

Significant difference: factory dominates	Non significant difference.

Figure 4.3. shows the relationship between the operational models and the human side of the services.

As one can expect, theatres use a productive mix that involves a larger use of human resources. The excellence and differentiation of services is traditionally achieved with the dedication and the *savoir faire* that only qualified people can offer, and that cannot be replaced by machines.

Less expected is the dominance of the customer as a critical input for the service factories. At first glance, one may guess that this emphasis exclusively confirms the tendency to reduce costs by replacing the work of the staff with the customers' "work-force". This is particularly confirmed by those cases where this strategy of *customer industrialization* is matched with a strong focus on automation and hardware technologies, which, as previously mentioned, represent the portion of tangible component that usually characterize a factory-oriented business model.

Figure 4.3. Connection analysis: human resources and customer

Human Resources	Customer
Significant difference: theatre dominates	Significant difference: factory dominates
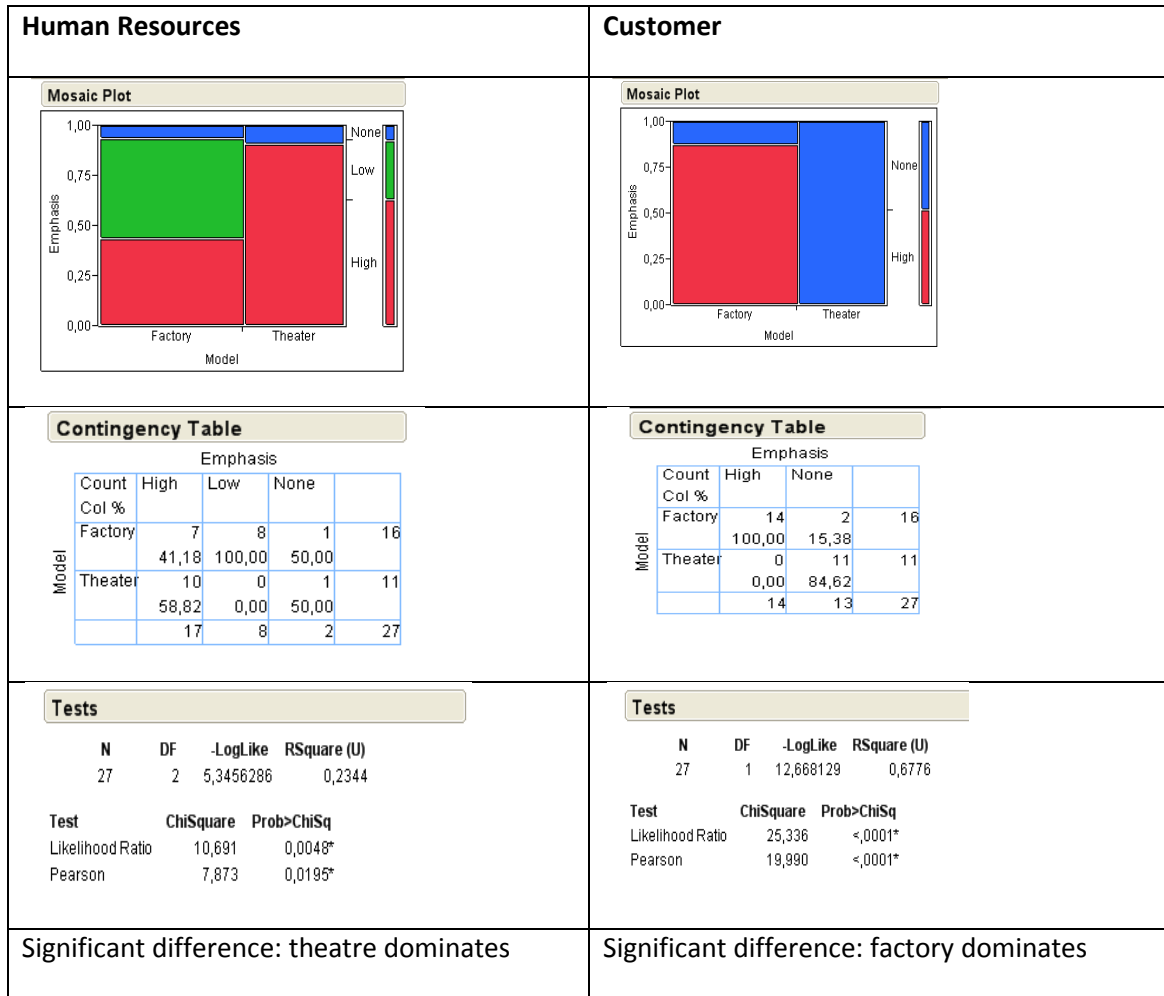
However, it is emblematic how in some contexts this *customer industrialization* is rather appreciated by the customers themselves. It paradoxically allows the softening of the cold and hostile perception that is usually associated with the service factory. Unexpectedly, those companies able to find the right "dose" of customers' involvement, and combining it with the appropriate communication on the customers' crucial contribution to the quality of the service, can make the customers feeling the experience and run their factory as a service theatre!

In this connection analysis, a statistically significant difference in the relationships between the archetypes and the category of design characteristics demonstrates a sharp divergence between operational models. When differences are not statistically significant, it can be inferred that factory and theatre are at least converging in terms of the priority assigned to a specific design characteristics.

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Table 4.3 summarizes the main findings.

Table 4.3. Differences and similarities in designing the archetypes

	Input				Process		
	Customer	**Intangible components**	**Tangible components**	**Human Resources**	**Fixed process**	**Modular process**	**Contingent process**
Factory	Significant difference, factory is dominant	No significant difference	Significant difference, factory is dominant	Significant difference, theatre is dominant	Significant difference, factory is dominant	No significant difference	No significant difference
Theatre							

A clear picture arises. According to these cases, among the categories of input, the customer and the tangible components are the dominant design characteristics for the service factories. The emphasis on the human resources clearly distinguishes the service theatres.

These evidences once again confirm our first findings: service factories look for efficiency and leverage on the customer involvement into their operations, "industrializing" them and shifting stages of production towards them. This emphasis can be marketed as a better customer experience and higher customers' control of the performance of the production process.

Service theatres do not yet emphasize the role of customers within their operations, even if they aim at building a stronger relationship with their audience. Four Seasons Hotels, once again, take care of their customers in a marketing perspective, but never ask to them to self-check in or out! To get this goal, service theatres strongly emphasize the role of their personnel. Considering how I defined the theatre, this makes sense as well. Human resources, particularly at the front side, can guess the customers' needs and improvise if their competences and skills are at the top range of quality.

More counterintuitive is the crucial role that the tangible components play for the service factory. It makes sense if you consider that through an appropriate design of the layout, efficient facilities, advanced hard technologies, factories may on one hand standardize the "experience" and on the other hand, increase their efficiency.

As far as the characteristics of the process are concerned, an interesting evidence emerges. Service factories are still focused on a fixed process design, as a consequence of their search

for efficiency and standardization. Unexpectedly, they share the same emphasis on modular and partially contingent process design with theatres. In relative terms, the modular design of the production process is the main adopted configuration at both the service factories and the theatres. It is interesting to consider the relevant move we observed in any investigated case towards the modularity in process.

In short I can say that factories and theatres look to converge as far as the process design is concerned, whereas a different balance takes place in the combinations of the inputs.

The health care industry, and hospitals in particulars, can help in understanding this dynamics in our sample. Both factories and theatres are converging towards a more modular process and, with respect to the factories, the degree of contingency is increasing. This is because the search for pure efficiency in such a context contrasts with the goal of this service (to contribute to the health of people, even if it is not cost-effective) and with the ethics of this business (they have to preserve a high level of flexibility in producing and delivering their service, as any patient is different from the others and any disease may require different treatments in different context).

A common trend is in place and it moves towards a more massive industrialization of the service theatres. Some crucial observations arise. In terms of sectors, banking focuses on the intangible input, information and on the human resource capabilities. Moreover, processes are becoming more modular. Healthcare, a professional service, is increasingly employing modular processes and standardizing patients around them. Hotels service industrialization strategies are more diverse, suggesting to us that a relationship exists between market positioning and industrialization strategies. For high-end market segments, the emphasis on the role of information technologies and on process standardization is lower. Human resource capabilities are the great challenge. The leverage on the "content" seems to be key. High availability of tangible inputs, data and information, both in the back and in the front side of the service operations, are the key for the industrialization of companies with high-end market positioning. Unexpectedly, their processes are moving from a purely contingent approach towards an increasingly modular system, particularly at the front end of their operations. For the low-end market segments, the role of the customer is becoming more important, coupled with an increasing emphasis on automation and process reengineering.

In general I can sustain the main emphasis is currently placed on enriching the mix of inputs of the service production process, that we could summarize as a "quantitative" practice, i.e. to

provide a higher number of inputs to improve the perceived quality of the service offering. For example, online banks increase the range of financial products they have historically offered, combining banking services with insurance services they buy from partners and resell to customers (more intangible input), and integrate their virtual service with physical branches, as ING is currently doing in Europe (more tangible input - the facilities and more human resources - the contact people). Moreover, great attention is paid to increase the quality of the resources (selection of organic produce in the top luxury hotels and hiring of truly international personnel). In one word, we may say that industrialization strategies are related to the "variety" of the mix of the input. Considering the evidences I discussed above in this perspective, service factories are currently leveraging on input variety more than service theatres, these last ones adopting a more focused approach.

Production process is affected by service industrialization strategies by definition, again with some relevant commonalities between the two observed models and some strong differences as well.

The design of a more modular process is the intersection between service factories' and service theatres' model, and this is the main commonality. The difference consists of the stage where factories and theatres modularize their processes. Factories are tending to adopt a combination of a fixed process in their back office and a modular design in their front office. Theatres are reengineering their process to get a higher level of modularization in both back and front office or, more extremely, to combine a modular back office with a contingent front office.

Finally, even if increasing the variety of the input seems to be the key determinant of the industrialized production process, we have to underline that this variety is predominantly based on the emphasis on the quantity and quality of the customers involvement for the service factories' operations, while the quality and quantity of the human resources drive the service theatres' operations.

More generally, it is evident that a relationship between operational strategy and positioning on our map does exist. "Factories" and "theatres" focus on different tasks, efficiency for factories and experience for theatres. Yet it is surprising to find out that while factories are increasing the variety of their process focusing on the modular design of their front office and involving customers in their operations (to pursue simultaneously a higher efficiency and a

more emotional interaction for their customers), theatres are progressing in the opposite direction, actually converging towards a more service factory-like model.

Figure 4.4. summarizes this reflection and provides a generalization of the phenomenon. The dotted lines represent the most diffused approach for each of the two models, while the larger areas describe the trend we have discussed. Even if our research cannot provide a normative indication so far, we would argue that the future of service operations seems to converge towards a higher modularity of the production process and an increasing variety of the inputs, with different categories of inputs that contribute to this growing variety.

Figure 4.4. The framework applied
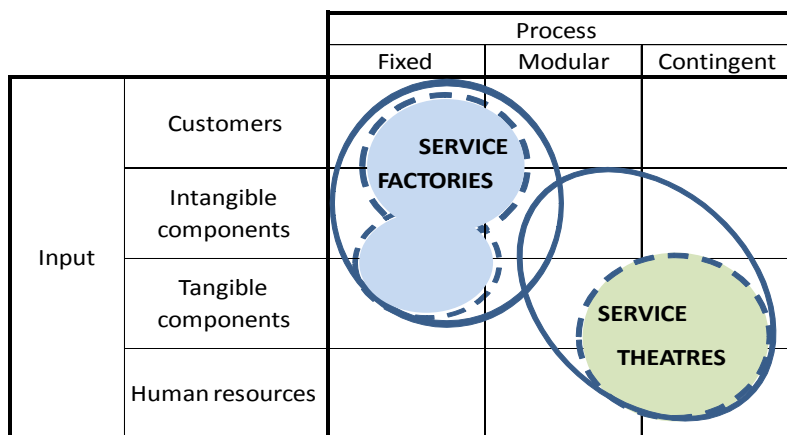
Consequently, I can argue that industrialization strategies are strongly influenced by the operational model adopted, either "factories" or "theatres". Interestingly, the results are not as straightforward as expected, as portrayed in Figure 9 and discussed below.

In their search for higher efficiency and cost reduction, "factories" typically redesign processes in both the back-office and the front-office, creating process modules that can be recombined easily and quickly (Reengineering). Service tasks are often shifted to machines (automation) and to the customers, either by letting them participate more in the process (self-service), or by educating and standardizing them beforehand (customer tuning). These practices reduce the relative importance of human resources and generate cost savings.

The second pattern is that followed by "theatres". It should be noted that these firms are able to standardize their back-office operations as efficiency-driven companies, and they often do

so, as the customer is not present. What distinguishes them from the other group is the set of industrialization strategies they adopt in their front-office processes.

This group of firms also typically redesigns processes, creating re-combinable modules (Reengineering), for both the back and the front office. However, service variety and offering customization are achieved through a greater emphasis on technologies, increasing human resource capabilities, rather than substituting them (informatization). This factor, combined with a high level of process variety, enhances the service customization they can provide. In addition, "theatres" often decide to focus their business on their core competencies, relocating the provision of ancillary services (outsourcing and off-shoring).

Interestingly, a common converging trend across sectors and segments appears. Companies are reengineering their processes towards increasing modularity. This tendency is common to both the companies that have traditionally standardized their operations and, on the opposite side, those that have in the past emphasized the high variability of their processes. A common approach today appears to be to identify sub-processes that can be operated as self-consistent and standard modules, easy to combine and re-combine according to the requirements of the demand, and hence able to deliver a high perception of customization with very cost-effective operations.

A final note is needed on the increasing importance of the role of customers in joint production and joint delivery. The shifting of operations, competencies and information towards customers, emphasizing their contribution to service production is a relevant trend in the "factory" cluster, driven by the search for efficiency and cost reduction. "Theatres", instead, focus on empowering human resources as a way of providing unique experiences to the final client, driven by the desire to increase customers' involvement in and emotional attachment to the service provided. This phenomenon, though, may depend on the characteristics of the service industries in our set. We might not expect a similar emphasis on customer inputs in business-to-business services, such as for example, logistics.

5. Design and Engineering: from Product-Service to Experience

The two archetypes and the Input-Process Matrix are basic frameworks for the design of the service operational model. My perspective is that the most proper operational model can be designed only if a clear understanding of the experience to deliver to customers. In a few words, I'm stating that before designing the service (or, better, the product-service combination) we should design the customer experience. After that, we can engineer the sequencing of the whole stages of the process (Karmarkar and Karmarkar, 2014), and the components of each single stage in order to balance between the demand for experience and the need for efficiency, i.e. industrializing the service.

Many scholars have focused their research on conceptual ideas and descriptive guidelines to design and deliver better customer experience, but very few works have focused on the quality of the experience and the rational ways to design and deliver a consistent product-service experience (Csikszentmihalyi & LeFevre, 1989; Moneta & Csikszentmihalyi, 1996; Wong & Csikszentmihalyi, 1991). More recently, Chang and Horng suggested a way to conceptualize the experience quality (Chang, Horng 2010) and Klaus and Edvardsson introduced a more structural approach to define and measure customer experience (Klauss and Edvardsson, 2014). The goal of my research is to contribute fill the gap in the academic research terms of understanding of the main determinants of the customer experience. The purpose of the following sections is to identify which main variables can describe the customer experience, in order to design and engineer a superior product-service experience.

5.1. Matching the Input-Process framework with the customer experience

Critically reviewing the whole literature and the different perspectives adopted by scholars of the various discipline, one can summarize that the customer experience is the output of a complex and still unclear combination of five dimensions:

- the service production and delivery **process** as it appears when the customer and the provider get in touch. In short, we can say that the encounters matter, because at each main stage (when the customer engages with the provider, before the service provision; during the service provision; after the service provision, when the customer keeps on engaging with the provider) the co-creation of the service influences the experience the customer perceives;

- the service providers, particularly the contact **personnel**, who are in charge of building, preserving and reinforcing the relationship with the customers;

- the **customers** themselves, who interact with the providers and each other, and the quality of their contribution;

- the physical surroundings or simpler the *servicescape,* and all the other physical components of the service, i.e., in restaurant, the location is crucial, but the food is not marginal!!! In short, we can define this dimension the "**tangible components**" of the service. This dimension is central in the perspective adopted by this work, which would like to contribute to the building of a new product-service perspective of the design and engineering;

- the emotional and affective elements which emerge along with the interaction among the providers and the customers, as a consequence of the exchange of knowledge, information, fantasies, feelings and fun. Such a dimension, which is one of the most relevant in the customers' perspective, can be summarized as the "**intangible components**" of the service, as primarily summarized by Baglieri et al. (2011).

Once again, the Input-Process Matrix, with some marginal changes. Furthermore, moving from the original perspective (service to be industrialized) to this wider one (service to be designed to deliver customer experience), it is more relevant the sequencing of the processes than their degree of flexibility. Thus, while in the initial representation of the Input-Process Matrix I presented the variable "process" in a three-degree scale of flexibility (fixed, modular, contingent), in this second version I adopt a three-stage scale: processes taking place **before** the delivery, which represent the way companies engage customers; processes taking place **during** the delivery; processes taking place **after** the delivery, which represent the way companies maintain the relationships with their customers and prepare them to a following cycle of experience.

The Figure 5.1. below summarizes the integration of the original framework for service design in an experience-driven perspective.

Figure 5.1. Towards an experience driven framework

		Processes								
		Before (engagement)			During (delivery)			After (maintenance)		
		Fixed	Modular	Contingent	Fixed	Modular	Contingent	Fixed	Modular	Contingent
Inputs	Customers									
	Intangible components									
	Tangible components									
	Human resources									

With this scheme in mind, let's move to the description of the context I selected to test my hypothesis and to the discussion of the evidences of this second stage of my research work.

5.2. Education, industrialization and experience

The focus of my research is based on the impact of the service industrialization on higher education and on the understanding of the dynamics of experience in such a context. The ultimate goal is to identify which design characteristics are more crucial to deliver an outstanding customer experience while industrializing the overall service model.

Education is a crucial part of anyone's life and affects the growth and wealth of the economy of nations. Higher education is fundamental for its contribution to the development of skill and competences that impact on the overall performance of economic systems, contributes directly to the competitiveness of nations, to the quality of life of populations, to the democracy and balance of society in general.

Education still represents one of the most promising growth service sectors for the future, as illustrated in the USA, according to the statistics of the Labor Statistics Department of the US Government (2013).

Nonetheless, education, and higher education above all, is still struggling between the need for quality and the search for efficiency. Many authors from different perspectives still underline the complexity of delivering both a top quality education to a larger part of the population, facilitating accessibility, and preserving the selectivity of an education system that, while offering equal opportunities to anyone, should continue to reward the most performing and

brilliant ones. Most of all, top quality education can be very expensive, because it requires top quality inputs (tangible, intangible and human resources). If we consider the students as a main input of this service operations, top quality education should require a great level of selection at the "intake" level, equivalent to the inbound flow of raw materials and components of a manufacturing company. The consequence is that national education systems are very different, according to the "ideological" perspective adopted in their overall design.

In the USA, the best offering in terms of higher education is mainly represented by the private sector. Selection of the students is a severe combination of merit and financial resources the students (and their family) can commit to education. The main exception is California, with a significant impact of the cost of higher education on the budget of the State. In Europe, there are many different approaches, but in general the public system is very good, at least ensuring an easier accessibility to top schools without selection necessarily based on ability to pay tuition fees. A long debate still persists in countries like Italy on the long-term sustainability of such a model and its real benefits to the growth of the nation.

The revolution in higher education started with the launch of the online learning programs and culminated with the so-called MOOCs, or Massive Online Open Courses.

5.2.1. Traditional on campus higher education

Traditional "on campus" courses are based on a continuous attendance, a strong intimacy among the students and the faculty during classes, a severe and selective grading process, and finally a certification of the level of knowledge acquired. Colleges and universities charge students before they get the degree and provide to them a lot of additional services that, even if complementary to the core service (for example dorms and catering), are important to their economic performance.

Facilities are crucial to attract the students and to offer a high service quality. They largely affect the economics of these institutions. Tuition fees, even if very high in the case of the top ranked schools, cannot ensure the financial sustainability of the traditional model. Public subsidies and fund raising are necessary to complement their revenues.

The core element of traditional higher education is the face-to-face class (F2F). Professors transfer their knowledge to students, who are engaged in the class through the instructors' teaching abilities - a combination of verbal and mimic skills, learning tools, exercises, simulations, cases and so forth. Students are usually stimulated to interact, and the flow of this interaction is both from the professors to students, and vice versa. Instructors usually prevent

students from interacting with their peers during their lectures. Most of all, interaction among students during an exam is prohibited and classified as "cheating", always severely penalized. If team working is part of the learning process, specific sections of the class may be dedicated to collaboration through provision of specific places and rooms designed to support this activity. It is quite unusual for team collaboration to take place in the lecture room, the preference being by the professors to evangelize to their attendants. The length of the single class may vary, but in general it takes 50-90 minutes. The longer the class, the higher the instructor's effort (even physical) to make students paying a high level of attention to his/her work.

5.2.2. Online courses and the MOOCs

Online courses replicate the approach of the "on campus" education. They charge tuition, carry credit and limit enrollment to a few dozen to ensure interaction with instructors. After some attempts to fully substitute "on campus" with "online" courses, the majority of the colleges and universities in the world, and particularly the b-schools, made the choice of blending their teaching approaches into a 'hybrid' format. They sometimes mix online and on campus classes in the same program; in other cases, online courses are adopted for basic, introductory level (pre-courses, for example); they are sometimes used as "complementary" or optional contents, connected to a main stream of topics in a longer sequence of classes.

Teaching material, rules and even the length of the class are in many cases equivalent to the on-campus course.

Tuition is lower than "on campus", but in the majority of cases is still not trivial, because the provider would like to underline that, even if the process of delivery is different, the quality of the knowledge transferred is not. Exams are usually "on campus" and based on the same methodologies and approaches adopted for the on campus classes.

The online courses can be very frustrating for the students. Their chances for feeling part of the class and generating the same "emotional temperature" of the face-to-face class are often lower, but they are handled and evaluated like on campus students, and expected to perform to precisely the same standards. On the one hand, this focus on quality consistency should preserve the caliber of online courses and appeal to those students who, for specific reasons, cannot attend. Originally, colleges and universities expected to enlarge their market through online offerings without cannibalizing their current offerings. On the other hand, these students are evaluated with the same rigor and approaches of the on-campus ones, but

without benefitting from the whole learning experience generated by both the real interaction with the professors and their classmates. At the end of the day, they may pay less but they get less, and may not, in fact, be able to perform at the same level. The result of this has been for large and branded institutions to reconsider their strategy for online courses. At the same time, We have seen a new market segment emerge, from providers who deliver a degree formally comparable with the traditional institutions, but largely based on the online courses and assessment. Their value proposition is based on providing an education at a very affordable tuition fee. Particularly in the USA, this is the origin of phenomenon like the University of Phoenix.

Nonetheless, since 2002, UNESCO has been sustaining online educational projects to facilitate the sharing of top quality education. Dave Cormier, professor at the University of Prince Edward Island used first time Massive Open Online Course to define his class on "Connectivism and Connective Knowledge" in 2008, with around 2200 online students.

Top ranked schools started understanding the power of MOOCs and investing in their own experimental approaches only after 2010, but their entry radically changed the landscape. For example, "Circuits and Electronics" (6.002x), March 2012, was the first MOOC developed by edX, the consortium led by MIT and Harvard. Over 155,000 students initially registered for 6.002x, which was composed of video lectures, interactive problems, online laboratories, and a discussion forum. The course ended in June 2012 and inspired the majority of the top ranked universities in the world to develop similar projects. Most of all, researchers began to analyze the rich sources of data it generated.

A MOOC is usually free, credit-less, and massive. Large platforms, as Cooursera, only recently are asking for a subscription fee, but it is still marginal, if compared with the huge investments required to the whole system to produce and deliver the contents. The concept of a MOOC is 100% consistent with the design of products and services based on the digital technologies and the so called "sharing economy". The audience is potentially as large as possible: anyone with an Internet connection can enroll. Most of all, anyone with a Facebook or Linkedin account can enroll, through a worldwide platform.

There is no selection process, so neither merit nor fees play a role in selection. The real price the applicants pay is not monetary, but is rather their provision of data and personal information for their access.

MOOCs attract a very large volume of students, often numbered in tens of thousands, far beyond that of any class in a single classroom. Faculty cannot possibly respond to students individually, nor can they customize contents and comments to any specific students' question and curiosity except through the use of technology-based solutions (such as decision tree driven course options).

How course material is presented, and how the interactivity is handled, therefore counts for a lot in terms of student learning outcomes. The instructor-to-student interaction is not central, while student-to-student interaction is crucial, emphasized and stimulated. Classmates may lean on one another in study groups organized in their towns, in online forums or even, a contentious issue, for grading work.

The evolving form of MOOCs knits together education, entertainment, gaming ('gamification') and social networking. Unlike its antecedent, the MOOC is a full course designed keeping the "customer" at the very center of the all process.

The medium is still the lecture, but 8 to 12 minutes is the typical length of the single section. Videos may pause, twice or more per clip, for a quiz to make sure students understand the material or, in computer programming, to let them write code.

Feedback is electronic and frequently automatic. Teaching assistants may monitor discussion boards, moderate them and address next subjects to argue. There may be homework and a final exam.

The MOOC certainly presents challenges, particularly if we adopt a traditional perspective. For example, cheating is a reality, and it cannot be prevented. Yet, why should people cheat if there is neither credit, nor final exam nor degree at the end? They attend the course because they want to, not because it is a fixed portion of a longer and complex curriculum whose final outcome is the graduation. So, if they "interact", it's for two main reasons, not necessarily conflicting:

1. they can benefit from the co-working with their classmates, and because the accumulated knowledge they acquire from this collaborative approach is higher than the sum of the single classmates' knowledge.
2. they socialize!

The expectation is that such free courses can bring the best education in the world at the same time as helping people in their careers, through expanded intellectual and personal networks.

A relevant contribution to the design of the learning process is played by the platforms hosting and delivering the MOOCs. A global audience typically does not get directly in touch with a single University. Even if they hold the knowledge to transfer, the teaching skills and facilities, and the labor-force (the faculty), their role in the customer experience chain is traditionally to provide the content, because their access to potential market is historically spatially constrained. Therefore, they need a "channel" to be visible to this mass market. The most well-known platform is Coursera, casting itself as a "hub" for learning and networking. The learning comes gratis from an impressive roster of elite faculty offering a wide range of courses, from computer science to philosophy to medicine. Coursera make suggestions, but ultimately all pedagogical decisions are made by the universities.

The vibe is decidedly Facebook (or any other social network): build a profile, upload your photo, and employ tools for students to plan "meet-ups" with Courserians in about 1,400 cities worldwide. These gatherings may be study groups or social sessions, but undoubtedly no university in the world can usually offer such a feature today.

One of the most troubling aspects of MOOCs to date is their low completion rate, which averages no more than 10% (Breslow et al., 2013). An interesting evidence emerging from online students' comments is that the courses organizing study groups are those with lower dropout rate. For example, Udacity, a MOOCs developer for large corporations like Microsoft and Google, designed a course on building a search engine, organizing Thursday evening discussions of the week's material followed by a social hour at a nearby pub. The group meeting each week at the Ansir Innovation Center, a community space with big tables and comfortable chairs, in the Kearny Mesa neighborhood of San Diego, completed the course with a share higher than the rest of individual students (L. Pappano, The year of MOOC, NYT, 11.02.2012). Platforms may also play a critical role in the way the faculty is selected. Students want to learn from the best teacher, not the dominant academic researcher, as universities currently typically organize faculty selection. In the near future MOOCs will polarize a large part of higher education, particularly in terms of how faculty are attracted, trained and paid, a disruption that may likely be based on the most popular faculty on the platform being compensated more like a TV actor or a movie actor, in essence as a function of the audience they can attract!

Finally, the platforms work on continuous innovation in terms of the tool sets they hold. For example, students can now control how fast they watch lectures: some like to go at nearly

double the speed; others want to slow down and replay. A technology that platforms are testing is based on automatic correction: if the student gets a wrong answer, the software figures out where he/she went wrong, offers a correction and suggests an additional content.

For those activities that cannot be automated, for example the grading of written assignments, MOOC providers are pushed to innovate. Coursera uses peer grading: submit an assignment and five people grade it; in turn, you grade five assignments! Coursera is developing software that will flag those who assign very inaccurate grades and give their assessment less weight!

In short, it can be a revolution, but three components still matter most in online learning: quality of material covered, engagement of the teacher and interaction among students.

The first is not an issue at all for MOOCs: most professors come from elite campuses, and most MOOCs are in technical subjects like computer science and math, with straightforward content.

Providing instructor connection and feedback, including student interactions, is trickier, because of the massive nature of the delivery process. Interaction is stimulated, and it emerges spontaneously, because of the model the MOOCs reproduce, which is the usually called "social networking".

5.2.3. Higher education and the framework

In the following section we map the evidences presented above, comparing the three current models of higher education. The mapping of the service forms will be based on two different steps: first the positioning of the three models on the input-process matrix, in order to identify the most critical determinants of their operational models (Baglieri et. al. 2011); second, the comparison of the three models adopting the 5 steps suggested by Karmarkar and Karmarkar (2014) to properly drive the design of service processes to deliver high level of experience.

The three models adopt different distinctive factors within their operational models.

The traditional on-campus higher education underlines the role of human factors, the quality of faculty first, supported by the service staff and other personnel may deliver. The experience it provides is a combination of different processes, many of them highly routinized and standardized, some of them accepting some degree of flexibility, and finally a contingent set of activities, giving the instructors the freedom to design their programs according to their own abilities and attitudes. The role of the human resources here is crucial, and it affects the effectiveness of such a model, particularly when a mismatch takes place between the

students' expectations for outstanding class performance of the faculty and the hiring process of the professors, which is often based more on their skills as researchers and their track records in terms of productivity of research. In essence, the students, particularly in the most exclusive universities, pay their tuition fees to get the best knowledge, but this system ensures the quality of the knowledge faculty produce, but not necessarily on the quality they can deliver! Finally, on-campus education leverages the "campus" itself: facilities and infrastructure are central to deliver a high level of experience in such a model. It is, therefore, a service theatre that host its patrons in the best premises but cannot always keep the promise that the best actors will always appear on stage, even if the top screen-players were hired!

Figure 5.2. Higher education operational models: plotted on the revised input-process matrix
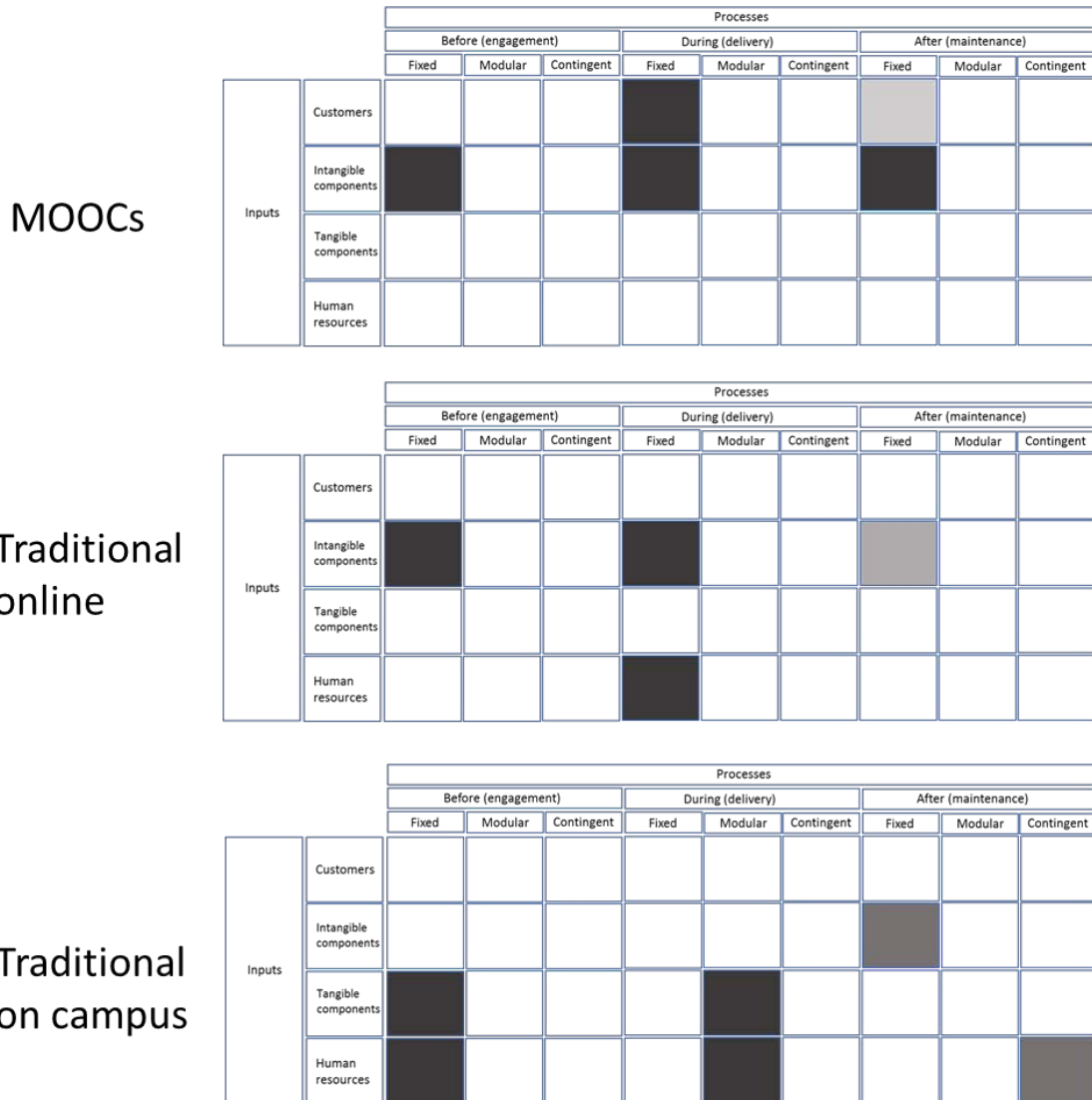
The (traditional) online education looks stuck in the middle. It stresses the quality of the faculty, but it is the same as the on-campus education, with similar strengths and weaknesses. Unfortunately, the online students do not always have the chance to share their real life experience with their instructors, who, even if bad performers in a face-to-face class, when dealing with students in a laboratory or a workshop can sometimes demonstrate the quality of the knowledge they possess. Facilities are not visible to the students, even if in the majority of the cases the production and the delivery of this service take place in the same sites were the on campus students attend their classes. Processes are a combination of rigid procedures and attempts to customize the classes to the audience. In short, neither a traditional online courses are neither service factory nor a service theatre. This unclear positioning can contribute to explain the low success of this model.

The MOOCs are the real disruptive innovation, because they completely change the perspective. Forget the tangible components of the service! Who cares where the "factory" is: it is more relevant to create chances for additional and complementary learning activities, wherever the customers may be. At the end of the day, the provider of the MOOCs is a virtual aggregator, nobody knows where the platform is physically located, and it is consequently everywhere. MOOCs preserve the role of the faculty, but, as said, they must excel as distributors of contents, no matter if they package contents generated by others. Most of all, MOOCs use information. Students' information, most of all: their location, to suggest groups and activities; their performance, to correct them and address towards extra-works; their interests and availability, to involve them in the peer-grading and to suggest next courses to complement their profile. Finally, MOOCs are totally customer-centered and the customer are totally immersed in their own personalized learning experience; in fact this is almost a self-service approach! They grade each other; they virtually interact, more than they can physically interact in a face-to-face class, and this way they learn collaboratively; they meet up, comment, discuss and definitely, once again, lean each other. In a few words, they co-create the course and their co-creation, with the variety each one bring into the operations widely compensate the rigidity of the process, which is highly standardized and automated.

One can say that MOOCs are service factories, but this does not necessarily imply that the customer experience is poor.

The Table 5.1. summarizes how the three models of higher education differ in terms of attention paid to the five steps suggested by Karmarkar and Karmarkar (2014) to generate a memorable experience to the customers.

Table 5.1. Service design and the three operational models

Rules designing the customer experience (Karmarkar and Karmarkar, 2014)	Traditional higher education	Online learning	MOOCs
1. Identify encounters	Maximum attention paid to the selection of students and then to the delivery of the class. After the end of the course, no specific activity is usually foreseen.	Maximum attention paid to the selection of students and then to the delivery of the contents	No selection, the initial encounter takes place on the social networks. The delivery is central, but it is strictly connected to next activities. Platforms and social networks manages the activities after the delivery, the experience can take place after the end of the course.
2. Focus on stages and links	Links are crucial among sections of the class. Stages are long.	Links are crucial among sections of the class. Stages are long. Design of the class (to make it fruitful and appealing) is more important than delivery.	Stages are very short, a lot of links, really embedded into the learning experience
3. Sequencing	Each good instructor places the most "sexy" contents at the very beginning, to engage, and uses the last sessions for company visits and gaming, to leave a great memory of the course.	Same approaches of the traditional education, but with the constraints of being "virtual", which reduces the chances for interaction among instructors and students	Same approaches of the traditional education, but with the constraints of being "virtual", which reduces the chances for interaction among instructors and students
4. Setting the standard	The quality of the syllabus is crucial, contents are connected to the instructor's reputation. Instructor's reputation raises expectations and can motivate to interact with	The quality of the syllabus is crucial, the instructor's reputation raises expectations, interaction is weaker than the real time class	The ranking of the school increases the perceived value, the quality of the syllabus is still crucial, the instructor's reputation can raise expectations, interaction is weaker than the real time class
5. Customers' involvement	Assignments and group-works, pitches and case discussion are frequently used, but typically located as a portion of the service, whose "core" is the class, with an instructor interacting with the audience (one to many) and back (many to one). The interaction among students during the traditional class is discouraged (no many to many when professor is in)	Assignments are usually individual, group-works are not frequent, pitches and case discussion are complex to get. The "core" is the online class, with an instructor presenting and sometimes interacting with the audience (one to many) and back (many to one) through the "chat-room" (synchronous) and the "discussion boards/forums" (asynchronous). The interaction among students during the online class is feasible, not particularly stimulated.	Assignments and group-works, meeting-ups and class discussion are stimulated. The co-working is part of the "core" of the class. The instructor does not interact during videos with the audience, it may happens after class/between sections (one to many and many to one, asynchronous). The interaction among students during the class is encouraged (many to many, even when professor is "on air"). Students share more knowledge and personal background. They grade each other.

It is clear that the two opposites, traditional class and MOOC, leverage on totally different design characteristics. The traditional higher education underlines the quality of the class as a combination of contents "on the edge" and on the instructor's abilities to perform. The most relevant encounters are before and during class, as after class is not usually a central stage. The design of the syllabus usually tries to benefit the "primacy effect" and places "unpleasant" portions of the contents at central stages, symmetrically far from the two main "pleasant" portions, the start and the end of the class. Co-creation is welcome, but always rigidly planned and handled by the instructors. The professor is the "star" of the play, students must interact with him/her, but he/she discourages students from chatting (and cheating), if not allowed. The instructor is both the actor and the director of the show!

Online learning is an intermediate model, it could benefit from many design characteristics that technology process innovation can drive. Yet it is still a limited perspective into what service industrialization may be: it is a way to reduce some costs (maybe), but it still touches a small portion of the "market", because fees and selection reduce the size of the class. It moves the emphasis from delivery to design, but uses the same "labor factor", the professors, who may love to satisfy their narcissism in a face-to-face lecture than to dedicate a long time to prepare and record a virtual class. There is usually little attention to what happens after class, and even if the class is not typically a great and memorable experience, because the technology adopted is very basic (recording a class plus some charts and videos), it constrains the instructor's performance and does not provide the same chances for interaction and students' involvement as in a face to face class.

The MOOCs' process design is once again disrupting. There is very little selection at all, although if any, it is because applicants are self-selecting their desired course. There is typically no focus on a single topic, the range of the offering is so wide that anybody can find the content meeting his/her own need. There is no exclusivity in terms of elite brands, any brand is in. The "word of mouse" counts more than the alumni associations, and the students' feedback on social networks will generate the ranking of the top schools, rather than their history or the Financial Times. Professors are important because they perform and act, not because they research and publish. The design of the course is very rigid, the delivery process is highly standardized, but technology is used and pursued to make each single student live his/her own experience. The students' role is crucial, they co-create the class because they co-create the contents and share their knowledge. Virtually, no limitations persist in terms of age, sex, background, nationalities, education. The more places the students come from the more

chances to practice a unique learning experience. Furthermore, if you travel during the MOOC, you can meet classmates everywhere, and every time. Students co-create the course because they even co-grade! They do the oddest side of any professors' job, and yet they enjoy it. This is a memorable experience, isn't it?

Summarizing, we can argue that:

1. There is an evident weakness in the online learning model, which is the strategic inconsistency: is it a low cost education for a new market or a way to attract the same market segment competing on price? The operational model is consequently an unbalanced mix of technology and people designed having in mind the traditional course as the main product to deliver at a more affordable and convenient way;

2. On campus learning and MOOCs are two completely different services, with totally different strategies and properly differentiated design characteristics. On campus learning can be considered as a very theatre-driven service operations model. The MOOCs are typically factory-driven service operations model;

3. It is hard to say whether on campus learning is more theatrical than MOOC. The latter leverages on the students co-creation of the service and thus can leverage on massive inputs, as many students enroll to the class (usually thousands)! Yet, in a few words, it is clear that even such a service factory as a MOOC is can play (and be perceived) as a theatre, and eventually deliver a very memorable experience.

As discussed by Karmarkar and Karmarkar (2014), customer experience is strongly influenced by many factors, and among them, the impact of digitalization is controversial. In this context, digitalization can increase the active role of the customer in the co-creation of the service. Thus, even if employed with the goal of generating a more factory-driven operational model, it can contribute to increase the perception of a positive experience. This phenomenon can paradoxically transform an online learning experience in a more experiential stage than a face-to-face class. Furthermore, the experience increases as more the number of "co-creators" involved increases, a typical effect of positive externality enabled by digital technologies, while in a traditional learning experience, the theatricality of the class is strictly related to a reduced number of participants and to the instructors' ability to interact with them.

In the next section, I am going to compare these two operational approaches in terms of the degree of experience they can deliver. The goal is to show some quantitative evidence that the more the "theatre" moves towards the "factory" - adopting digitalization as the key strategy

for industrialization of the service production and delivery process - the better it can be in terms of customers' experience. The second version of the Input-Process Matrix is going to be adopted.

5.3. Engineering the educational experience

The all above contributions do not define what experience is in a univocal way. We can first summarize that, according to the literature review, many factors contribute to generate customer experience, but it is still unclear what experience is. With an attempt to identify the construct of experience, I have referred to Carù and Cova (2014), who focused on the change of the customers' skill and their memory of the event. Their argument is consistent with the above discussed literature. In short, according to their approach, experience is the outcome of a transformational process, where different dimensions combine together to modify the skills, attitude and knowledge of the customer. Moreover, as previously discussed, the persistency over time of the memory of the event can be considered a relevant measure of the impact of the product-service experience on the emotional and psychological customer perception of the quality of the event itself. This emphasis does not mean that customer experience only concerns the emotions, but emphasizing the emotional nature of experience can reveal more of the characteristics of experience that underlie the current practices in the design and engineering of the new product-service combinations. The most specific characteristics belonging to experience are regarded as those that provide more intrinsic or personal benefit for customers. In addition, Holbrook and Hirschman (1982) recognized that consumption experience is viewed as a phenomenon directed towards pursuing fantasies, feelings, and fun. I consequently consider that customers tend to subjectively and emotionally evaluate their experience, mixing together both rational and relational factors.

5.4. The data set

In Section 3. I have already briefly presented the methodology adopted at this intermediate stage of my work. The data set was the merge of two independent databases, kindly provided by the same university where the first qualitative research took place in 2015. The final data set consists of:

- database of grades, academic year 2015-2016, in a single class of a specific discipline;
- database of the results of the satisfaction questionnaire of the same pool of students, which can be split in two sub-groups: F2F dataset includes the evaluations of 120

students, who attended in the fall-winter semester a class on Technology Management with a traditional, face-to-face, teaching methodology; HYB dataset includes the evaluations of 141 students, who attended in the same fall-winter semester a class on Technology Management with a hybrid design of the course, 30% face-to-face, traditional, and 70% online, MOOC style, teaching methodology.

A ten-point scale, ranging from "strongly agree (10)" to "strongly disagree (1)" accompanies each statement. The whole questionnaire is currently submitted in Italian and English.

The questionnaire includes a specific question, whose goal is to measure the students' satisfaction through their motivation to suggest other students to attend the same class in the future. This item is very effective for my research, because it may grab the dynamic perspective of experience. Given the scale adopted in this University and the wording of the question ("Would you suggest next year another student to attend this class?", I transformed the data to compute the "Net Promoter Score" of the course (Reicheld, 2003).

The final database contains 27 sample items. I referred to Parasuraman et al. (1988), who suggest to purify the instruments. The iterative sequence of computing alpha-values and item-to-item correlations was repeated several times. It resulted in a set of 17 items, with alpha values ranging from 0.774 to 0.884 across three dimensions, which mainly explain the Service Process and the main encounters (before, during and after the delivery of the service):

- *design*;
- *delivery;*
- *evaluation.*

Table 5.2. Reliability statistics of dimension "Design Process"

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0,791	0,758	6

Item Statistics

	Mean	Std. Deviation	N
FIT	6,84	2,455	261
NSS	8,54	1,278	261

	Mean	Std. Deviation	N
TLEND	7,65	2,052	261
COS	8,54	0,982	261
STSD	6,52	2,963	261
STSA	6,92	2,639	261

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
FIT	38,18	53,279	0,683	0,507	0,721
NSS	36,48	76,473	0,253	0,161	0,810
TLEND	37,37	62,372	0,530	0,323	0,762
COS	36,48	79,420	0,194	0,116	0,815
STSD	38,49	43,789	0,796	0,724	0,685
STSA	38,10	48,339	0,776	0,726	0,691

Table 5.3. Reliability statistics of dimension "Delivery Process"

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0,774	0,782	7

Item Statistics

	Mean	Std. Deviation	N
SEQD	8,57	1,004	261
OHS	8,44	0,878	261
STPD	8,31	1,549	261
PTSD	7,97	1,543	261
ITA	8,71	0,822	261
QUAL	8,66	0,865	261
QUAN	8,20	1,315	261

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
SEQD	50,29	23,952	0,400	0,267	0,764
OHS	50,41	24,297	0,441	0,290	0,758
STPD	50,54	17,126	0,730	0,559	0,688
PTSD	50,89	19,422	0,521	0,407	0,747
ITA	50,15	24,402	0,469	0,329	0,756

QUAL	50,20	24,212	0,461	0,308	0,756
QUAN	50,66	20,734	0,536	0,408	0,738

Table 5.4. Reliability statistics of dimension "Evaluation Process"

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0,884	0,885	2

Item Statistics

	Mean	Std. Deviation	N
FRPE	8,17	1,521	261
CEX	8,03	1,613	261

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
FRPE	8,03	2,603	0,794	0,630	
CEX	8,17	2,312	0,794	0,630	

Exploratory Factor Analysis (EFA) was then used for the analysis of the overall set of items; IBM SPSS Statistics 24 program (the Varimax rotation method) was then used. I followed Hair, Black et al (2006) to derive factors, assess overall fit, and interpret the factors. to measure the dimensions of the student experience. These items and data are extracted from the official database of the students' questionnaire of assessment of the courses. Three factors, as expected, can explain the 92,01% of the whole data set. Two items are individually left out of

this factor analysis. Anyway, as they represent the only two item in my data set which can partially explain two additional dimensions of the customer experience, I preserved them.

The items and the related dimensions are described in Table 5.5.

Table 5.5. Investigated dimensions of the experience

Process DESIGN	FIT: the calendar of the class enables the learning experience NSS: the number of sessions are appropriate to the goal of the class TLEND: the time length of the sessions are appropriate STSD: the course enables students interaction during class STSA: the course enables students interaction after class COS: the information and syllabus provided before the class were appropriate and clear
Process DELIVERY	PTSD: the professor interacted with students during class in an effective way STPD: the students interacted with the professor during class in an effective way QUAN: the quantity of the teaching material and textbooks is appropriate QUAN: the quality of the teaching material and textbooks is appropriate SEQD: the sequence of the contents is consistent with the goal of the class ITA: the instructor's teaching abilities are adequate OHS: the instructor was available for office hours and other extra-class activities
Process EVALUATION	CEX: the methodology adopted for the final evaluation is consistent with the design of the class FRPE: the evaluation method properly assessed the fruitful participation to class and activities
CUSTOMERS	NST: number of students per session

TANGIBLE COMPONENTS	FA: the facility and the classroom are adequate to the effectiveness of the learning process

As said, per the literature review, the experience is the combination between the impact of any event on our skills and knowledge and the memory of this event. In short, we can say that the Grade may (partially) represent an indicator of effectiveness of the learning experience. Thus, we should expect that *the better the learning experience, the better the grade.* Furthermore, the NPS can represent an indicator of the emotional impact of the experience and the memory of the event. Therefore, we should expect that *the better the learning experience, the higher the NPS.*

The final measurement model is represented in Figure 5.3 and Figure 5.4.

Figure 5.3. Measurement model of assessing the validity of GRADE
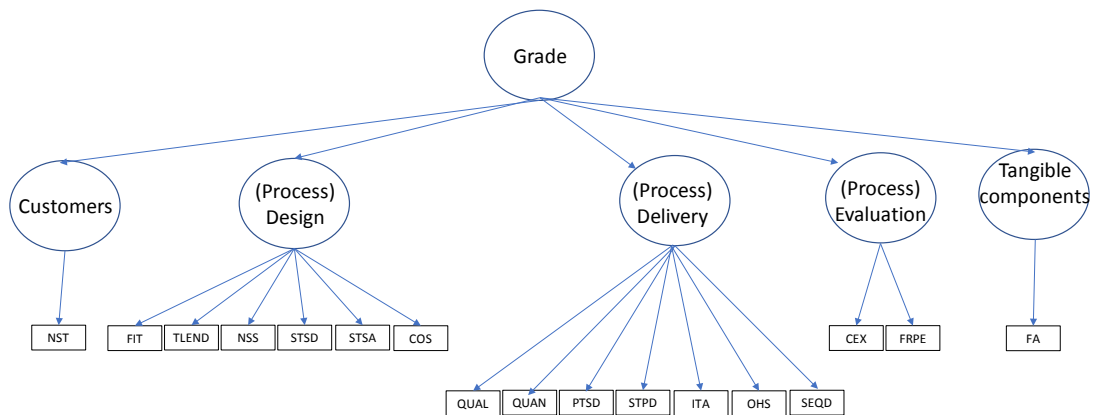
Figure 5.4. Measurement model of assessing the validity of NPS
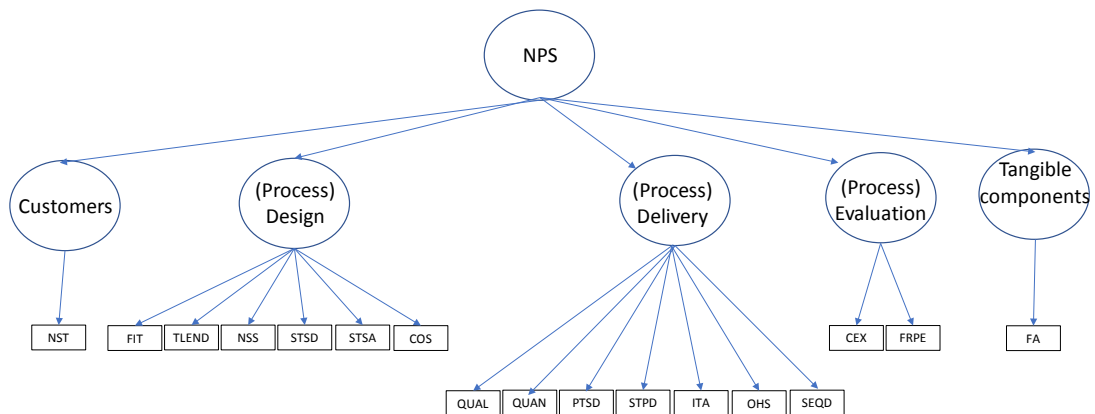
5.3.1. Data analysis

Data from the two sample sets (Face-to-Face, Hybrid) were analyzed, first jointly and then separately.

As shown in Figure 1 and 2, Grade and NPS are two second-order factors. Customers, Design, Delivery, Evaluation and Tangible are first-order factors. As far as Design, Delivery and Evaluation, because of their lower-order factors, I calculated the mean values of indicators, which are associated with each lower order factors.

The result of assessing the convergent validity is shown in Table 5.6 And Table 5.7, respectively for Grade and NPS.

Table 5.6. Results of assessing the convergent validity: GRADE

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	.748[a]	0,560	0,551	1,8077	0,560	64,853	5	255	0,000

a. Predictors: (Constant), EVALUATION, DESIGN, DELIVERY, NST, FA

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1059,596	5	211,919	64,853	.000[b]
	Residual	833,257	255	3,268		
	Total	1892,852	260			

a. Dependent Variable: GRADE
b. Predictors: (Constant), EVALUATION, DESIGN, DELIVERY, NST, FA

Coefficients[a]

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.	95,0% Confidence Interval for B Lower Bound	Upper Bound	Correlations Zero-order	Partial	Part	Collinearity Statistics Tolerance	VIF
1	(Constant)	16,264	1,624		10,017	0,000	13,066	19,461					
	NST	-0,713	0,066	-0,523	-10,774	0,000	-0,843	-0,583	-0,270	-0,559	-0,448	0,733	1,364
	FA	-0,232	0,059	-0,193	-3,919	0,000	-0,348	-0,115	-0,374	-0,238	-0,163	0,709	1,410
	DESIGN	0,635	0,096	0,359	6,651	0,000	0,447	0,823	0,342	0,384	0,276	0,592	1,689
	DELIVERY	1,457	0,158	0,415	9,218	0,000	1,146	1,768	0,537	0,500	0,383	0,853	1,172
	EVALUATION	0,034	0,081	0,019	0,414	0,680	-0,127	0,194	0,068	0,026	0,017	0,862	1,160

a. Dependent Variable: GRADE

Table 5.7 Results of assessing the convergent validity: NPS

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	.628[a]	0,394	0,382	1,044	0,394	33,194	5	255	0,000

a. Predictors: (Constant), EVALUATION, DESIGN, DELIVERY, NST, FA

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	180,977	5	36,195	33,194	.000[b]
	Residual	278,057	255	1,090		
	Total	459,034	260			

a. Dependent Variable: NPS
b. Predictors: (Constant), EVALUATION, DESIGN, DELIVERY, NST, FA

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.	95,0% Confidence Interval for B Lower Bound	95,0% Confidence Interval for B Upper Bound	Correlations Zero-order	Correlations Partial	Correlations Part	Collinearity Statistics Tolerance	Collinearity Statistics VIF
1	(Constant)	5,925	0,938		6,317	0,000	4,078	7,772					
	NST	-0,302	0,038	-0,450	-7,903	0,000	-0,377	-0,227	-0,230	-0,444	-0,385	0,733	1,364
	FA	-0,167	0,034	-0,283	-4,884	0,000	-0,234	-0,100	-0,391	-0,292	-0,238	0,709	1,410
	DESIGN	0,208	0,055	0,239	3,772	0,000	0,099	0,317	0,266	0,230	0,184	0,592	1,689
	DELIVERY	0,473	0,091	0,273	5,179	0,000	0,293	0,653	0,402	0,308	0,252	0,853	1,172
	EVALUATION	0,060	0,047	0,067	1,272	0,205	-0,033	0,152	0,107	0,079	0,062	0,862	1,160

a. Dependent Variable: NPS

Overall, the result demonstrated convergent validity. It is interesting to notice that all the dimensions are highly statistically significant, except for Process Evaluation, that is likely the most arguable one, because of the worded statement of measurement and the timing of their assessment: the students assess the consistency of the exam and the impact of extra-class activities on the base of the statements in the syllabus and before "experiencing" the exam and getting the grade. Thus, their interpretations and feelings are highly divergent.

It is relevant to observe the negative directions of the dimensions "Customers". Unfortunately, the instrument is likely to possess a low explanatory ability. Anyway, it looks like a large number of students do not positively contribute to generate a favorable learning experience.

One could argue that the negative directions of the Facility is unexpected and counterintuitive. Once again, I must underline this item has a very marginal impact on the whole experience, according to the previous data analysis. Yet, it is relevant to observe that the tangible components of the service in general, and specifically in higher education, are commonly considered crucial for the perceived quality of the students' experience.

This finding can depend on the differences in the service provision of the two sub-groups. Consequently, I separated the two subgroups.

The results of the assessment of the convergent validity per subgroups are shown in Table 5.8. and Table 5.9.

Table 5.8. Results of assessing the convergent validity by subgroups: GRADE

Model Summary[b]

TYPE		R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
F2F	1	.797[a]	0,636	0,620	1,7991	0,636	39,763	5	114	0,000
HYB	1	.878[c]	0,770	0,762	1,2214	0,770	90,454	5	135	0,000

a. Predictors: (Constant), EVALUATION, FA, DELIVERY, NST, DESIGN
b. Dependent Variable: GRADE
c. Predictors: (Constant), EVALUATION, NST, FA, DESIGN, DELIVERY

ANOVA[a]

TYPE			Sum of Squares	df	Mean Square	F	Sig.
F2F	1	Regression	643,532	5	128,706	39,763	.000[b]
		Residual	368,999	114	3,237		
		Total	1012,531	119			
HYB	1	Regression	674,713	5	134,943	90,454	.000[c]
		Residual	201,397	135	1,492		
		Total	876,110	140			

a. Dependent Variable: GRADE
b. Predictors: (Constant), EVALUATION, FA, DELIVERY, NST, DESIGN
c. Predictors: (Constant), EVALUATION, NST, FA, DESIGN, DELIVERY

Coefficients[a]

TYPE			Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.	95,0% Confidence Interval for B Lower Bound	Upper Bound	Correlations Zero-order	Partial	Part	Collinearity Statistics Tolerance	VIF
F2F	1	(Constant)	17,480	2,262		7,728	0,000	12,999	21,961					
		NST	-0,729	0,074	-0,569	-9,853	0,000	-0,876	-0,583	-0,636	-0,678	-0,557	0,959	1,043
		FA	-0,081	0,106	-0,044	-0,758	0,450	-0,291	0,130	-0,191	-0,071	-0,043	0,964	1,037
		DESIGN	0,786	0,170	0,291	4,635	0,000	0,450	1,122	0,352	0,398	0,262	0,811	1,233
		DELIVERY	1,125	0,178	0,365	6,318	0,000	0,772	1,478	0,451	0,509	0,357	0,960	1,042
		EVALUATION	0,017	0,099	0,011	0,171	0,864	-0,180	0,214	-0,131	0,016	0,010	0,805	1,242
HYB	1	(Constant)	-2,882	2,183		-1,320	0,189	-7,200	1,435					
		NST	0,255	0,153	0,074	1,669	0,097	-0,047	0,557	0,360	0,142	0,069	0,875	1,143
		FA	-0,230	0,051	-0,210	-4,490	0,000	-0,331	-0,129	-0,562	-0,360	-0,185	0,777	1,286
		DESIGN	1,692	0,205	0,468	8,237	0,000	1,286	2,098	0,796	0,578	0,340	0,527	1,897
		DELIVERY	1,212	0,265	0,261	4,574	0,000	0,688	1,736	0,722	0,366	0,189	0,524	1,907
		EVALUATION	0,414	0,142	0,135	2,918	0,004	0,133	0,694	0,479	0,244	0,120	0,794	1,260

a. Dependent Variable: GRADE

Table 5.9. Results of assessing the convergent validity by subgroups: NPS

Model Summary[b]

TYPE		R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
									Change Statistics	
F2F	1	.632[a]	0,400	0,373	1,075	0,400	15,185	5	114	0,000
HYB	1	.799[c]	0,638	0,625	0,801	0,638	47,649	5	135	0,000

a. Predictors: (Constant), EVALUATION, FA, DELIVERY, NST, DESIGN
b. Dependent Variable: NPS
c. Predictors: (Constant), EVALUATION, NST, FA, DESIGN, DELIVERY

ANOVA[a]

TYPE			Sum of Squares	df	Mean Square	F	Sig.
F2F	1	Regression	87,679	5	17,536	15,185	.000[b]
		Residual	131,646	114	1,155		
		Total	219,325	119			
HYB	1	Regression	152,704	5	30,541	47,649	.000[c]
		Residual	86,530	135	0,641		
		Total	239,234	140			

a. Dependent Variable: NPS
b. Predictors: (Constant), EVALUATION, FA, DELIVERY, NST, DESIGN
c. Predictors: (Constant), EVALUATION, NST, FA, DESIGN, DELIVERY

Coefficients[a]

TYPE			B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Zero-order	Partial	Part	Tolerance	VIF
			Unstandardized Coefficients		**Standardized Coefficients**			**95,0% Confidence Interval for B**		**Correlations**			**Collinearity Statistics**	
F2F	1	(Constant)	6,898	1,351		5,106	0,000	4,222	9,575					
		NST	-0,313	0,044	-0,524	-7,070	0,000	-0,400	-0,225	-0,565	-0,552	-0,513	0,959	1,043
		FA	-0,061	0,063	-0,071	-0,956	0,341	-0,186	0,065	-0,183	-0,089	-0,069	0,964	1,037
		DESIGN	0,236	0,101	0,188	2,333	0,021	0,036	0,437	0,218	0,214	0,169	0,811	1,233
		DELIVERY	0,277	0,106	0,193	2,602	0,010	0,066	0,488	0,275	0,237	0,189	0,960	1,042
		EVALUATION	0,042	0,059	0,057	0,705	0,482	-0,076	0,159	-0,053	0,066	0,051	0,805	1,242
HYB	1	(Constant)	-3,373	1,431		-2,357	0,020	-6,203	-0,543					
		NST	0,060	0,100	0,033	0,604	0,547	-0,138	0,259	0,286	0,052	0,031	0,875	1,143
		FA	-0,172	0,034	-0,300	-5,111	0,000	-0,238	-0,105	-0,586	-0,403	-0,265	0,777	1,286
		DESIGN	0,701	0,135	0,371	5,210	0,000	0,435	0,968	0,696	0,409	0,270	0,527	1,897
		DELIVERY	0,544	0,174	0,224	3,133	0,002	0,201	0,888	0,639	0,260	0,162	0,524	1,907
		EVALUATION	0,190	0,093	0,119	2,044	0,043	0,006	0,374	0,434	0,173	0,106	0,794	1,260

a. Dependent Variable: NPS

Splitting the analysis in two subgroups changes marginally the scenario.

As far as Grade is concerned, the significance of the dimension "Tangible" (measured by the item Facility) is no longer relevant for the students who attended the 100% face-to-face class. Interesting to notice that for the students who attended the hybrid class, the dimension "Customer" (measured by the instrument Number of Students per Session) changes its direction, even if not statistically significant. Finally, the Evaluation improves its significance for the hybrid subgroup, apparently because the different delivery process influences their perception of the consistency of the evaluation process.

In the analysis of the validity of the measurement for the NPS, the split of the two subgroups has got an impact on the significance of betas for the Face-to-Face subgroup and partially for the hybrid one.

Shortly one can argue that the different (learning) experience would require different instruments to grab the most relevant dimensions of the "digital" experience.

5.4. Discussion

This study performed a rudimental procedure to develop an instrument of experience and assessed its basic properties. I first clarified this construct by reviewing the literature and conducting a qualitative study. Experience is conceptualized as the combination of the change of skills and attitude of the customers and the memory they preserve of the event. Factors, according to literature, include the customers themselves, the tangible components of the service, the intangible and emotional components, the role of the personnel, and finally the characteristics of the service production and delivery process. Next I analyzed the data of an existing dataset in a very specific service context, that is higher education. I conducted a study to validate the items and purify the measurement. The items I extracted from the dataset did not allow me to assess all the dimensions I have identified from the literature review. Nonetheless, the results of developing and assessing the instruments revealed the validity of the constructs and the convergent validity of the measurement.

The study confirmed that some differences emerge when measuring and assessing the experience in a more "digital" context. In short, we can argue that directions of the dimensions may change and that the determinants of experience change. Consequently, ad hoc, different instruments and assessment must be elaborated.

For academic research, this study clarifies, even if only partially because of the inadequacy of the dataset and the related items, the conceptualization of experience and shows a basic approach to develop and test an instrument to assess an predict the impact of the most relevant dimensions of the customer experience.

For practitioners, this model suggests the critical elements for the design and the engineering of the customer experience. As we have seen, for example, the third encounter, after the pure delivery of the service, is as crucial as the "design" and the "delivery" themselves. Nonetheless, in our context its impact in undervalued.

Furthermore, while it is clear that the customers themselves and the tangible components play a crucial role for the perception of the experience, few attention is paid to these two elements and to the way to measure and predict their impact.

Finally, while customer experience strongly depends on emotions and engagements, instruments to design and validate their relevance are still missing.

5.4.1. Limitations

This study represents the first attempt to operationalize a conceptual model elaborated in the past three years, anyway it has some limitations.

First, it is based on a context where the users of the service are not properly "customers". Undergrad students, actually, do not pay for the single class, and to be honest in the majority of the case their tuition fees are paid by their parents. Consequently, they neither feel nor play as pure "customers". On the one hand, this peculiarity can reduce the potential conflict between provider and customer when the latter perceives an imbalance between the paid price and the provided value.

Second, the dataset I adopted appeared unable to take a complete picture of the dimensions I would like to describe. Therefore, the study is still partial and soon a more comprehensive data collection (in a different context) is needed.

Third, this study is run in a context where customers (students) may interact each other. This is the most relevant difference between the face-to-face traditional teaching process and the new, industrialized and digitalized, learning approach. In a MOOC, for example, students may interact each other without affecting the quality of the teaching, and probably learning in a more productive way, thanks to this fruitful socialization. In my current study this dynamic is not completely described, once again because of the inadequacy of the current questionnaire adopted to collect data.

6. The engineering of the experience: the new framework

6.1. An experience-based framework

In the previous sections, I have presented different aspects of the same issue, i.e. how the shift from a product-service centered approach towards an experience centered perspective may affect both our economy and more specifically the Technology, Innovation and Operations Management methodologies and practices.

The focus of my study is the need to bridge the service industrialization, driven by the pervasive diffusion and adoption of the information technologies, and the customer experience. The starting point of my discussion has been the unbalance between these two elements. Service industrialization is taking place underneath the surface of what generically is called digital transformation and it is usually undervalued. Scholars are engaged with the change in the business models and the redesigning of large corporations, but its impact is stronger, and even social and cultural. Most of all, service industrialization is often confused with service standardization, while the power of the new technology is exactly its ability to increase efficiency while providing a powerful set of options to deal with variability and deliver flexibility. On the opposite, customer experience is any businessman's and marketing scholars' *mantra*. Experience is the keyword for the rethinking of many corporate strategy, and basically it is still unknown what it means from an operational point of view.

I have underlined that experience can be defined as a change in one's competences and skills *timed* the memory of this change. *Intensity* of the experience depends on how deeply the competences and skills have been changed and how long the memory of the transformational event persists. Furthermore, we have seen that the demand for experience may vary because of both the context, the background and the *willing to risk*. In a theme park, the expected *quantity* of experience is basically the replication of the sensations and emotions of the last visit, with a marginal demand for newness. If the context is disorienting the customer (for example while travelling abroad), newness can sound unpleasant, and the *dependability* of a service factory can comfort more than any other unexpected solution. If the demand is for the unexpected and the willing to risk very high (think about any fan of horror movies), the increase in the peak of the experience must be highly perceivable and the *wow* is what customers ask for.

Moreover, the longer the positive memory of the event, the higher the assessment of the experience. Memory, as said, depends on both the intensity of the change of skills and

competences and the sequencing of the events. If the food was stunning, the check was reasonable, but your car was destroyed at the valet parking, you cannot preserve a great memory of the dinner at that three-Michelin-stars restaurant. And you'll neither go back nor suggest anyone to go nor write a positive comment on Tripadvisor!

On the opposite, any gambler knows he/she is going to lose money at the casino, but they must get back once again, with the secret hope of winning and the explicit awareness that the real bet is how long their budget for the night can last! If, at the end of the night, they can enjoy a glass of champagne, unexpectedly offered by the management, whatever the performance of the visit, they will preserve a positive memory of that night, and they come back sooner!

We usually focus on the delivery of the core service. Yet, as the example of the car accident at the valet parking has introduced, experience is a comprehensive performance of a longitudinal sequence of events, which starts before the delivery and ends up time after. Consequently, we can generate the positive memory during the delivery, and we can preserve this memory managing the relationship with the customers long after the provision of the service.

In short, I am suggesting that design and engineering of the experience consists of taking care of the all relationship with customers, not simply focusing on the core event.

Through the experiment with undergrad students I presented in the previous section, I demonstrate that both the predecessors and the successors of the core event are more crucial than usually expected, and influencing both the performance (the change in competence and skill) and the memory in a significant and often undervalued level.

Furthermore, both the performance and the memory of the experience are emphasized if the transformational event takes place in a social context, as showed by my experiment on the educational experience. It means we must care about both the relationship between the service provider and the customer, and among customers as well. Designing processes which can facilitate the socialization of the experience contributes to increase the experience as a whole, statically and dynamically. The former, because of the beneficial impact of involving any single customer into the transformational process, and thus leveraging on the "punctual" co-creation. The latter because any single customer's memory of the experience contributes to feed the collective memory of the experience, thanks to the exchange of knowledge and emotions along time through both the *traditional* and *digital* networking.

According to what I presented in the previous section, to engineer the experience is similar to deliver a good food. It is a matter of:

- goals: must this food feed mass of people or delight a few guests?
- ingredients: which are the components we can mix together? What about their quantity and quality?
- transformational processes: how can we prepare, cook, and serve this food? Can we adopt different technologies? If yes, do they affect the outcome, in quantity and quality?
- rules of the game: what are the proper sequences to follow during the preparation, the cooking and the serving of this food?

Engineering of the experience semantically means to industrialize processes and components constituting the product-service combination, in order to ensure the conformance of outcome to an expected and previously designed level of experience. As with a good food, we should consider since the very beginning:

- the goal: strategically position our product-service combination between the two opposites of the factory-theatre dichotomy. This is crucial, because, as seen before, there are some relationships among the strategic positioning of the operational model and the characteristics of both the processes and the inputs;
- the ingredients: identify the inputs we should consequently mix along the processes. As any great chef, we must consider any deviances among the ideal best ingredients and the available items. Given the expected level of performance to deliver, then we may either need to redesign portions of our processes or to pre-process our ingredients. This is what, in the service design, I called as strategies for industrialization: outsourcing and offshoring, reengineering, informatization, automation, self-service and customer tuning are all practices whose goal is to redesign both the processes and the input in order to deliver the expected performance in a more efficient way;
- transformational processes: configure the characteristics, in terms of technology, capacity and flexibility, of each process. Even if we can theoretically say that from the technological point of view the characteristics of the processes are independent from the inputs, in practice the quantity and quality of the ingredients may require some specific configurations and technological settings to make. This means that the design

and the engineering of the experience is not a pure linear process. There must be a continuous iteration between the decision making on both the inputs and the processes, which increases the complexity of the all design activity, because of the body of competences we must match together. Furthermore, this implies that the design of the product-service combination in the perspective of the customer experience must fulfill a "concurrent engineering" approach, as already consolidated in the product design and development so far;

- *rules of the game*: these have been already cited in Section 2, and refer to the five steps suggested by Karmarkar and Karmarkar (2014) to design a memorable customer experience. In short: to identify the encounters; to focus on both stages and links; to properly sequence the up and down of the emotions; to clearly set the standard; to involve customers. To them, I can add evidences of my current research, which can be summarized as follows: the *design* and the *maintenance* of the experience are as critical as the delivery; customers are *transformed* by both the service provider and the other customers, *socialization* is part of the experience. Finally, a fast recovery system in case of service failure must be designed as well, because the shorter the time to recover any drop of the experience and higher the peak of the next positive event, the shorter the memory of the failure.

With this statements in mind, now I present and discuss the first implementation, still ongoing, of my approach to the design and engineering of the experience. It is a very special case history, which I started observing in 2012 and is now producing the first outcomes of the project.

6.2. The Milano Ristorazione case: *dreaming of happy children*[7]

Milano Ristorazione is an articulated example of the demanding attempt to combine factory and theatre. The company delivers mass catering service, mainly to schools, on behalf of the Municipality of Milan. Over time, it decided to adopt the typical operational configuration of large scale production firms, thus centralizing the meal preparation phase in a small number of cooking centers with high production capacity. However, this choice caused several frictions with a portion of children's parents, who constitute Catering Commissions as well as a proper

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Citizens' Representative. Although these stakeholders cannot formally represent the whole population of parents of the 80,000 children served daily, they are nonetheless the most aware representative, and thus they determine a strong opinion movement. The latter had not always been in harmony with Milano Ristorazione in the past. In particular, some service industrialization choices were perceived as the company's progressive and intentional departure from the pursuit of a high quality for both the final product and the production process. Moreover, these choices were interpreted as giving up the provision, not only through the end product, but also through the service dimension, of a better experience in a very important moment, that is the consumption of food in schools.

More recently, due to some changes at the management level and the introduction of professionally experienced executives, the company began to pursue a different strategy regarding both the industrial aspects and the relationship with the different levels of customers (i.e. the "client", which is the Municipality of Milan, the final customer, the children and the *influencers*, children's parents). However, company's operational freedom is limited by several constraints. On one hand, guaranteeing the mass production of tens of thousands of meals per day undoubtedly requires a *factory-driven* approach. On the other hand, the sense of responsibility that Milano Ristorazione must preserve when dealing with the nutrition of its young customers, forces the company to take into consideration three main dimensions: the quality of the service offered; the education of pupils and the transmission of the right values in the development of their relationship with food; and the social and psychological side of sharing a meal in a community.

The following pages describe the recently undertaken attempt to find a fair balance and to create of a service *factory* that could increasingly resemble a service *theatre.* Most of all, this is the story of how this company is looking for transforming a routinary event in the daily life of thousands of young kids into a more experiential and transformational event!

6.2.1. 82.000 meals per day: can they even be good?

Milano Ristorazione was founded in July 2000, following a resolution of Milano's Municipal Council, with the specific mission of providing a quality catering service to schools, retirement homes and local reception centers. Since January of the following year Milano Ristorazione has been appointed for the management of the whole school catering service. The Municipality of Milan directly owns 99% of the company's shares, and also the remaining 1% through SOGEMI SpA, a company participated and controlled by the Municipality itself. Lombardy's regional

capital boldly undertook a path in opposition to the majority of Italian cities, which, in those years, were mainly externalizing non-core services. Differently, Milan decided to invest in the in-sourcing of a competence considered as pivotal for improving citizens' welfare.

During the first ten years the company had, initially, a long period of management and strategic stability. As the 10th anniversary approached, different and frequent changes at the management level occurred. As a result, the company was obliged to work on a short term planning horizon, within a context where corporate development strategies had to be pursued taking into consideration the set of general, and at times uncertain, political directions. In spite of the conditions determined by the context, the company took the decision of centralizing cooking centers, which are the kitchens actually responsible for school catering in the city. The underlying industrial plan had the ambitious objective of reducing the original number of 43 cooking centers to 4 main central facilities, against the 25 of the time, and to dedicate peripheral kitchens to the preparation of "made to order" meals[8].

The first and controversial step of this production strategy was the investment for the creation of the Sammartini cooking center, an innovative settlement with a futuristic look, erected on a reclaimed land and eventually converted to industrial area in via Sammartini, in Milan.

Milano Ristorazione's whole productive and logistic system is characterized by the high volumes managed on a daily basis: 82,000 prepared, distributed and served meals each day; more than 900 employees; a fleet of more than 130 vehicles; with an annual average revenue of 83 million euro. The numbers above are, clearly, typical of a *factory* and of an environment aiming at increasing system's efficiency and productivity. These aspects are particularly relevant when considering the price restrictions Milano Ristorazione has to comply to. Indeed, each meal is paid 4.23 euro by the Municipality. A cost that is only partially covered by the annual fee paid by parents, which, by the way, is also one of the highest in Italy. Hence, while operating with such a revenue per unit, the company has to meet some binding requirements on the quality of both production processes and transportation and should also show strict rigor in the selection of raw materials. On the other hand, it is hard to expect that Milano Ristorazione could also buy finer supplies, from organic and short supply chain productions

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[8] These would be those dishes that for the peculiarity of the recipe or for the limitations of the current technologies cannot be prepared with much advance from the consumption moment. For a better understanding, see the section dedicated to the productive processes.

and show an attitude of greater creativity and imagination for the lunch breaks in the over 400 school canteens under its responsibility!

However, management complexity and efficiency constraints are not sufficient to justify a give up on striving towards the *theatre* and technical-industrial approaches less oriented to volumes and production scale. The reason for this is also related to the stakeholders Milano Ristorazione has to delight, not necessarily for contractual reasons, but both for a sense of social responsibility and for the *in-house* nature of the company within the Municipality of Milan.

This last element also implies a contribution of the company to the delicate and continuous search for political consensus. Indeed, the Municipality of Milan is the only formal customer of Milano Ristorazione. The relationship between the Municipality and the company is regulated by a Service Agreement specifying the technical, hygienic and qualitative requirements of the service and also providing guidelines for the purchase of products and services from third parties. Within the structure of the Municipality of Milan, there is a branch dedicated to the management of the relations with Milano Ristorazione. This body also runs checks and inspections in cooking centers as well as at the very moment of meal provision in the canteens.

Yet, the real consumers of the service are children, the elderly in council rest homes and people in reception centers. However, these consumers do not really have a "voice": due to the overall size of the audience, service satisfaction is verified on samples. Yet, their disapproval can be daily revealed by the "refusal" the food, which is certainly an important indicator for Milano Ristorazione as well as a source of inefficiency and waste, which however is always *ex-post.*

The parents are the third category of stakeholders. Considering the number of meals served, they are the largest majority and counts for about the 10% of the Milan population and the 20% of the voters. Parents' contribution arises from Catering Commissions, which are bodies constituted by a representative of parents on a voluntary basis, who verify the actual quality of the service and facilitate the exchange of information between the customers, the company and the Municipality itself. As previously stated, these Commissions play an essential and complex role, which benefits both the Municipality and the company. On one hand, they allow the Municipality to monitor whether the company abides by the rules stated in the Service Agreement. On the other hand, they provide Milano Ristorazione with a thorough control

system on canteens and on service provision phases, supporting the work of company's inspectors who also operate daily sample checks.

Catering Commissions, from an impulse of the most motivated and emotionally involved parents, later gave origin to an actual Citizen Representative body, with the aim of dialoguing with the Municipality and with Milano Ristorazione to foster a significant improvement of the service, and specially to make sure that the Service Agreement is respected in all its parts. The Agreement is indeed the object of a legal dispute against the company, which in the past was accused to have partially disregarded the document. The Citizen Representative is the evolution of an original self-determined committee, which today, for initiative of the parents themselves, is selected through an election and it is formally recognized by both the Municipality and Milano Ristorazione.

The conflict between the Citizen Representative and Milano Ristorazione was exacerbated by the company's previous management, with great damage for the company itself, which instead would have gained much more benefits from a more collaborative relationship with parents and from a more appropriate and clear communication towards them. The result was an attitude of mistrust and prejudice of the parents towards Milano Ristorazione, which only recently, thanks to the new management, is trying to make up for the situation. In particular, in 2012 Milano Ristorazione redefined its company mission by stating the ambition of "significantly influencing the emotional and cultural development of future society". This twist translates in set of operational implications and planning objectives:

- *redefinition of company's identity,* and in particular a greater reciprocity and continuity in the dialogue with citizenry and with Catering Commissions, to overcome the long-standing conflict between the two social parts in order to revive cohesion among stakeholders;

- *emphasis on transparency*, through a higher accessibility and fruition of key information for consumers, particularly relying on online communication channels;

- *continuous improvement of the quality of the service*, with a number of actions to improve menus, a greater attention for fresh organic products from short distribution chains and from local producers, so to give the possibility to learn and appreciate the richness of the Italian and local gastronomic tradition;

- *reducing waste*, not only paying attention to environmental sustainability, but also, and especially, to social sustainability. Hence, by reviewing portions and with a more

precise and efficient meals production system, to deal with large quantities as well as with last minute variations;

- *taste and health education*, which implies the alignment of the service provided to the expectations of the customers, by making children and families more aware of the importance of food variety and of the social value of meals.

6.2.2. The operational model

Serving food to a child, in school, implies much more than simply physically and technically putting some food on a plate. We all know how important and at times delicate, is the relationship of children with food, and everyone has at least once had the experience of having to convince a child that a certain dish deserved being eaten or at least tasted. In some cases, the matter can be complicated due to the specific needs of a child, who may need a "medical" diet (for example due to allergies or intolerances) or an "ethical-religious" one (which is becoming a frequent case, with children from different ethnicities and religions with food related implications). Imagine to cope with this duties by contract, with all the time limitations determined by the short duration of the lunch break, in a community, in an infrastructure which is not always ideal and with a limited number of staff available. Add to this that children, in turn, have their personal food experience and culture deriving from their family habits, which implies that the most appropriate dishes are not always the most appreciated ones. Considering that service provision takes places in a rather chaotic context such as that of the canteen where hundreds of children quickly have their lunch all together, we should not underestimate the significant role of teachers and educators who share the meal with children. Indeed, teachers and educators may, even indirectly, influence the young consumers, with their own personal food culture and tastes.

Moreover, it should be noticed that the food delivered was prepared in the morning in one of the 25 cooking centers, and underwent an urban logistic process, to allow the distribution to the various destinations. As a result, actual food provision phases cannot be carried out with much improvisation or creativity, as there are strict procedures that have to be respected.

6.2.3. Main processes

We shall concentrate on four essential moments:

- procurement and inbound logistics;
- production;
- outbound logistics and distribution;

- administration and reorganization.

Considering the volume of products made annually, the size of raw material supplies is rather impressive, for a total of more than 9,500 tons of foodstuffs processed every year (the equivalent of a 7 Km queue of filled up lorries). This stage is strictly regulated by the specifications indicated in the Service Agreement, which define the requirements for the different categories of products, like fresh vegetables, meat, starchy food and semi-processed products. These specifications bind the company and the producers to observe qualitative, hygienic and quantitative standards, which are extremely strict and imply a rigorous attention to the intrinsic quality of the product.

The supply of foodstuff occurs within the regulations dictated by the Service Agreement. The latter not only indicates the financial constraints (at the moment, price has a major weight, roughly 60% of the vendor rating), but also the qualitative requirements (counting for the remaining 40%). Currently, the aim of Milano Ristorazione is to invert the proportion of incidence of price and quality requirements, but clearly this would further limit the achievement of a cost-effective management model in the company. However, stakeholders and in particular parents, represented by Canteen Commissions, reasonably make pressure to undertake this route. In response to that, Milano Ristorazione recently modified its behavior towards these interest holders, by committing to a number of initiatives. For instance, one of the innovations introduced in the Request for Quotation is to reward supply chain traceability, zero-mile supply chains, and environmental policies tracked by suppliers. Given the relevance of this type of inputs on the final product, the innovation strategies pursued by the company aim at introducing a greater quantity of whole meals and organic products. Furthermore, the company seeks collaboration with organizations promoting business ethics and corporate social responsibility. To give an idea of such activities it is possible to mention the event that took place on the 23rd of May 2012, when the association Libera Terra Mediterraneo offered an organic meal to commemorate the Capaci Massacre.

Raw materials reach its destination every day in the kitchens of one of the 25 cooking centers and in the 76 nursery schools equipped with kitchens, through an intermediate storage stop in the logistics platform of Buccinasco, and formerly in that of Linate, in the Milan area. The logistics platform has become necessary because the quest for efficiency requires centralized and bulk purchases, which, in turn, need to reach large storage warehouses. Moreover,

logistics centralization guarantees a greater homogeneity and safety for the strict medical-hygienic tests the company has to carry out.

However, the delivery to the logistics platform requires a further redistribution. The production unification strategy in a few cooking centers[9] aimed also at eliminating this intermediate step.

The actual *production* of the meal of the day takes place in the cooking center, on the basis of the menu designed by the company's food technologies and nutrition experts, supported by external dieticians and advisors. Furthermore, the menu is increasingly becoming the result of a shared discussion with the Parents Representatives.

The menu seeks two precise goals: being catchy as well as having a good nutritional balance. In addition to the main menu, there is the preparation of special menus for children with medical diets (3.200 per day) or ethical-religious diets (5.579 daily menus).

The menu represents the basis for the production planning of the cooking centers, and thus it guides the sequence of activities that begin every day approximately at 6 a.m. As regards the implemented production technologies, meals are prepared on a daily basis, with the exception of some attempts which, as we will see later, concern the Sammartini cooking center and the peculiar operations the structure is able to bring about.

Dishes are then hermetically sealed in a primary packaging, a plastic or steel[10] pot, and then placed in a second packaging, an isothermal polyurethane tray, that allows the transportation while maintaining the temperature of the finished product for a longer period of time.

The packaging stage is rather critical, as cooking centers serve a great number of canteens and also have to guarantee special menus delivery for each school. As far as special diets are concerned, this identification process takes up dedicated resources and it is carried out in separate areas, treated with particular care from the hygienic point of view, to avoid any risks

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[9] The project did not concern nursery schools, that are incompatible with a centralized production policy given the extreme personalization of the service coming from the almost daily progresses children make in the first stages of their nutritional development. For the same reason, later on, we will disregard this specific context of activity of the company.

[10] The latter ones, generally called "gastronorm", will be soon the only used typology, as a consequence of the high pressure exercised by parents.

of contaminations of ingredients that may be dangerous for the special customers. Special diets are labelled singularly on each single-serving tray for the specific user.

The last relevant stage of the service production process is the *distribution logistics.* Within few tens of minutes, meals are indeed packaged and taken to school canteens and to rest houses for elderly people. The fleet of 114 vans - provided in outsourcing by four different operators - deals with the timely distribution of the isothermal packages to the distinct locations where meals are finally served.

The administration of the meal is carried out by canteen staff, usually belonging to external cooperatives to which Milano Ristorazione assigned the duty of serving the food. The serving cycle starts around 10.30-11.00 a.m, with the delivery of bread and fruit to the canteens. Around 12.00 a.m. the staff prepares the tables and then, just before the beginning of the lunch break, they receive the menu of the day. Dishes are then laid on thermal trays to preserve the required temperature. When children arrive, the staff put the food on the plates. Children spend around 30 minutes to have their lunch. Depending on the size of the school and the production capacity of the canteen, there can be even two shifts for each lunch break. At the end of the whole break, the staff cleans and arranges up, which includes washing up the tableware for the shift of the next day.

All these activities occur over a total shift of about four hours, which ends with the cleaning of the canteen at around 2.30-3.00 p.m.

6.2.4. The Sammartini cooking center

The center was created following the refurbishment and the reconversion of a building formerly hosting the Milan wholesale fishing market. Externally the center, located in *via Sammartini*, still shows the typical features of the original 1934 building, with the three red towers that make it recognizable and famous in the city of Milan.

From the inside of the center, it is possible to observe a cross section of the technological vanguard of the sector, for the machinery as well as for the layout of halls and for their equipment. The layout was indeed designed to support operations fluidity and thus, to maximize overall efficiency of the process.

All these operations occupy an area of more than 2.800 square meters; the layout is graphically depicted in Figure 1. In addition to this area, there are also a set of storing areas, the thermal station and the power station. The thermal station plays a key role in the

production process, as steaming is the main cooking method used in the center. As a matter of fact, this method is the best one to preserve the organoleptic properties of raw materials.

In Sammartini, as well as in the rest of cooking centers, operations begin with *freight delivery* from direct suppliers and from the logistics platform, for the preparation of the menus of the following days. Sammartini weekly receives about 500 liters of extra-virgin olive oil, 700 Kg of pasta and more than a ton of fresh vegetables.

After the inbound quality control, the inbound quality control staff approves the delivery and transfers raw materials to the *storing* areas: the basement floor, for goods received on a weekly basis, and the ground floor, for fresh products delivered on a daily basis.

Figure 6.1. Layout of the Sammartini cooking centre.
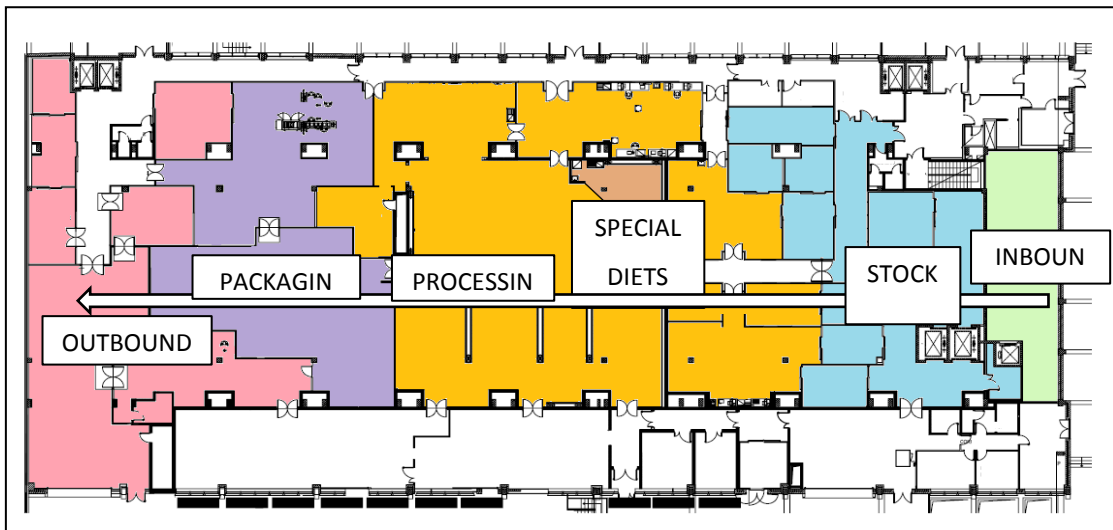
Source: kindly provided by Milano Ristorazione

Once raw materials are ready for the use, they enter the actual *work* cycle. Depending on the recipes, ingredients are washed and cut up into parts, as needed. After that, they reach the different cooking areas according to the specific cooking method used for each single food. Each preparation is carried out with semi-automatic equipment, working on standard cycles set up by the manufacturing company, with the intervention of chefs when needed, for example to modify cooking time or temperatures. Due to the peculiarity of the service provided, which implies a distance in time and in space between preparation and consumption, for some dishes, chefs had to develop a specific expertise: they learned how

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take into consideration the natural progress of the cooking process while the product is in the tray and in the isothermal packaging.

The processing ends with the *packaging* of meals, for both hot and cold dishes, in single or multi portion sealed trays. An automatic scale verifies the actual weight of the tray before the sealing. Trays are thus packaged and kept in refrigerating cells for cold dishes and in warm closets for hot ones, to maintain the correct temperature.

While the main production process takes place, the other *diets* are also prepared: medical ones (about 400 per day), ethical-religious ones (about 600 per day) and lastly white diets, booked everyday according to the needs of each canteen.

The final stage of the production cycle in the Sammartini cooking center regards the preparation of the isothermal containers, equipped with refrigerating plates for most temperature-sensitive food, such as fruit or ice-creams. After a double check on the preparations of containers, divided for each destination school, 21 vans, those assigned to the Sammartini center, begin their planned route of 93 deliveries (meals, bread, and fruit) for lunch breaks in a total of 74 canteens.

Although being a jewel of food technology, the Sammartini cooking center is also a thorn in Milano Ristorazione's side, and it is one of the reasons of the past misunderstandings with parents'.

The Sammartini cooking center required a total investment of 21.7 million euro, which exceeded the initial budget of about 50%. The center indeed, represents a relevant fixed asset absorbing a big share of company's operating margin, due to the remarkable amortization costs arising. From a strictly industrial standpoint, the management goal is to maximize the utilization of the production capacity of this center, which was estimated at about 30,000 meals per day for the *cold chain* and 20,000 meals per day for the *warm chain.*

Unfortunately, the Sammartini center is not running in the most proper way from both the technological and operational standpoints. As previously said, in the original project, the center represented the first of a few large cooking centers, which should have introduced a particular approach in dealing with the operations, which can resemble to the Assemble To Order.

Sammartini was actually created with the aim of using the so-called *cold chain.* This preparation method is already widely implemented abroad, especially in the United States and

in Northern Europe. However, this type of production faces a strong resistance from Italian food culture, as the latter is characterized by high expectations on food variety, quality and freshness as well as the valorization of the local gastronomic traditions.

From a technological standpoint, the cold chain production system consists in the preparation of a semi-finished product which is then blast chilled, reaching about +3°C. Such a decrease in the temperature allows a longer storage time, with a shelf life ranging between 3 to 20 days, when the product is packaged in a protected atmosphere and in properly sealed multi-portions containers. The use of this technological cycle would allow the center to work on two shifts, for a total productive capacity of about 30,000 meals per day.

The purpose of the *cold chain* production system would be to prepare in advance and in large quantities those dishes and semi-processed products that are more complex and make the daily preparation cycle inefficient. Indeed menus, although scheduled for a turnover of similar recipes throughout the month, are rotated among the different areas of the city. With this solution, a complex recipe, concerning more than 80,000 customers, could be prepared in a single huge batch, blast chilled, stored and then distributed according to the sub-quantity needed for any sub-area, as scheduled by the daily menu. In theory, while few large cooking centers could focus on more complex productions, with large volumes and low variety per production batch, the remaining local kitchens could act as final service encounters, thus taking care only of the last stages of the production process, according to the production postponement logic (Pagh and Cooper, 1998).

Despite the theoretic managerial and economic advantages, exploiting Sammartini at full stretch is actually much less simple than originally expected. Such decision, although supported by a clear industrial reason, would require the optimization of current recipes as well as the definition of new ones, in order to operate with the cold chain in an effective and efficient way. Moreover, the current demand for variety in menus seems, at least in the short term, a fundamental claim for both the Municipality, as outlined in the Service Agreement, and the parents, not willing to renounce to it. In addition to this, the Sammartini center has been perceived with a negative outlook because of the production model it represents. Indeed, the latter was interpreted as the transformation of Milano Ristorazione in a large "factory" with the load of all the negative values associated to standardization and the related quest for efficiency and productivity.

At present the result is that Sammartini operates only on one shift and with the traditional warm chain procedure, which causes an under-utilization of its production capacity. The cold chain procedure is used, only sporadically, for the preparation of specific food that have already overcome the prejudice of parents committee and the judgment of young customers.

Today Sammartini produces about 12,000 meals per day, and so represents an outstanding underdeveloped opportunity, upon which top management has to undertake a set of immediate and effective actions. In the short term, the first actions carried out to increase the utilization of the installed production capacity have been the in-sourcing of the preparation of fourth range produces (mainly vegetables), and the centralization of sauces preparation with the cold chain logic.

6.2.5. The current experience

The starting point of the challenge Milano Ristorazione is undertaking is its strive to preserve the best efficiency ever without renouncing to deliver a positive food experience every day to thousands of kids. This strategic goal is controversial. For a long time, the target was simpler and technically easier to get: to standardize the all service in a pure *factory* perspective. This more recent change in the strategy forces to reconsider the whole approach adopted so far, which was very rational and operations-driven, without considering the need for the quality of the relationships and the attention to be paid to the emotional side of the product-service combination.

In the next section, I am going to present the suggestions and actions the adoption of the framework above discussed may provide to such a case. Some of these actions have been implemented in the last years, some others are still under evaluation.

6.2.6. The ingredients

The historical strategic perspective adopted by the management of Milano Ristorazione overestimated the attention paid to the tangible components of the whole service provision.

Equipment and technologies of the cooking centers represented the first pivotal set of factors affecting the quality of the finished product-service combination. The Sammartini cooking center was an unprecedented experiment of centralization of the production process and was designed to prove how the most advanced technologies can both guarantee a systematic high quality of the finished product and contribute to improve the productivity of employees, best motivated to work in a comfortable and properly equipped context. Combined with the attention paid to the quality of the raw materials and the refinement of the recipes, designed

together with the top Italian nutritionists, this focus on the "tangible" components was expected to impress the stakeholders, for the capability of making and distributing a very good and safe food meeting the best financial and operational performances.

Yet, this is Milan, Italy! Food is not simply needed to satiate hunger, it is a part of lifestyle. Paradoxically, there are evidences that the food culture is generally poorer than expected, and parents do not always feed their kids with the best balance among fat, proteins, carbs and vitamins. However, when assessing the quality they expect from the school canteen, they require fresh, tasty and healthy food. And food waste is currently at an unexpected level: according to the most recent survey run by UNICOR[11], the consortium representing the six largest service providers in Italy, in 2015 the average waste was 11% for the main courses, 13% for meat and fish, 22% for sides, 9% for desserts, 10% for fruit and 10% for bread. In short, parents ask for more balanced, zero mile and seasonal food, and kids refuse it. As one can simply argue, the issue is not related to the production process, which the kids cannot appreciate at all. Thus, if Milano Ristorazione really delivers every day a very good food, why don't parents and kids perceive this effort?

The answers are very simple. First one: there are both no emotion and no management of the relationship with customers.

If we recall the golden rules of the design of experience, first we should identify the encounters. For parents, the first encounter is when they get aware of the menu of the week for their kids. The acquisition of this information is not friendly. Parents should visit the Milano Ristorazione website and download a pdf document, which depicts the whole season menu, per week. One must first of all know which is the current week (because of the rotation, the menu is the same for the whole city, but in the same week the four menus are delivered simultaneously by large group of districts). Then, day after day, one should remember. And what else? It is a matter of fact that, if kids are aware of what they are going to eat for lunch, their acceptance of the food increases. Yet, parents are not "tuned" to set the standard of the kids' expectations and they are prepared only in that small portion of more active and conscious ones.

Consequently, at this first encounter, the quantity and quality of information provided to families, and either directly or indirectly to kids, would change the current condition. The simplest solution could be the development and distribution of an application which can

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[11] Source: Corriere.it, 2015, March 27th

reduce the cognitive distance between Milano Ristorazione and the thousands of parents. This technological solution is not yet available. Some third parties are already providing the daily update on the menu, but it is a very basic service, and does not contribute to a positive perception of the Milano Ristorazione work.

The second, and apparently most relevant encounter, is the delivery of the food and kids enjoying it in their school canteens.

The canteen itself is frequently the weak point of the whole experience. Lunch at school is a quite recent practice in the primary school in Italy, following a Reform of the Compulsory Education of a few years ago. After this reform, kids were asked to stay longer at school, and the provision of food became functional to the whole educational experience. Yet the large majority of the facilities were neither equipped for locating a proper space to store and prepare the food, nor for placing tables and chairs and even preserve a space for allowing kids to walk through with trays in total safety. Finally, sound is a major issue. Some schools must accommodate almost 400 pupils per shift, which means 400 young people who chat and play (they are 6-10 years old) and simultaneously should taste the food and appreciate its quality. All this must take place in 30 minutes. Honestly, it is a very hard task! Thus, while the priority for investments in the past was on the *back office industrialization*, with emphasis on productivity and cost effectiveness, the current focus must be on the *front office industrialization*, with joint investments to renovate and refurbish those school canteens where the facility is not consistent with the strategic goal of the Company.

At this encounter, human resources, working at the different stages of the process, are the real catalyzing agent of the potential for experience to deliver.

In its operations, Milano Ristorazione employs internal staff, as well as personnel from external cooperatives (for instance in the delivery at the school canteens) and from logistics operators (for transportation and logistics in general). This external staff is expected to participate to training activities, according to the terms of agreement with Milano Ristorazione, in order to engage them into the specificity of the service.

Chefs and kitchen staff play the main role in the production process: thanks to their skills they can become the differentiating factor between a top food and a normal outcome. One of the frequent issues is indeed linked to the variability of the "on the plate" result, depending on the different cooking center of origin, even for an identical recipe prepared with the same ingredients. As a consequence, many training sessions are scheduled to continuously update

chefs on recipes and new technologies, and to align and share their practices. These training sessions also allow the operators to exchange their opinions and experiences, and thus both the Department of Quality and the Department of Operations can standardize behaviors and operational procedures.

If compared with the previous sections, the Milano Ristorazione strategy looks like a factory which would like to play like a theatre, sticking in the middle of its operations strategy. Great emphasis on the tangible side of the business (the food and the manufacturing processes), forgetting this is mainly a service, and relations play the largest role. And so, while investments are dedicated to the production side, the relevance of the two first encounters (*before the delivery* and the *delivery*) is underestimated:

1. as said, no matters the quality of both raw materials and the equipment at the kitchen if at the moment of truth, at the canteen, there aren't physical and technical conditions to appreciate the food in an appropriate atmosphere;

2. exchange of information and relationship management with parents is neglected and limited to the very transactional interaction with the Parents Representatives. Customer involvement, which is crucial in an industrialized *service factory*, is marginally pursued;

3. logistics and delivery are strongly influencing the kids' experience at the canteen, because they represent the front side of the service. At these two stages of the process, Milano Ristorazione adopts external staff. Even if trained and instructed, their engagement in the whole process cannot be expected at the most proper level, simply because the indicators of their performance are not related to the customer experience and to the emotional interaction with kids, but to speed and efficiency.

As far as the role of the **customer,** the multiplicity of players involved present a set of pitfalls as well as many opportunities.

The Municipality of Milan, in the past, adopted a transactional approach, formally checking Milano Ristorazione activities, with the objective of minimizing the impact of school catering service on its budget. This was pursued on one hand by keeping an extremely low price and on the other by trying in the last years to adjust the fee paid by families. Nonetheless, every (real or perceived) inefficiency and every issue raised, even only by the media, concerning Milano Ristorazione ends up affecting the Municipality directly, as the latter, besides being the company's main client, is also its main shareholder. Citizens - who are also voters - reasonably

expect that a municipally owned company would seek to balance budget requirements with the welfare of the community.

Consequently, a reciprocal, more collaborative approach should be pursued. This collaboration would be more beneficial for the both parties if focused on the setting of the customers' expectations, through a clearer definition of the reciprocal roles and the appropriate communication. Most of all, the Municipality of Milan has been very active, in the most recent years, in shortening the distance with the communities of citizens, but this portion of stakeholders has been unexpectedly neglected.

Yet, priority first: the main aim of the company itself should be to please the final customer of the service, who are the children in the schools of Milan. Frankly, this is a complex task, which only partially depends on the transactional side of the consumption of the food. Firstly, the liking of a plate, depends on the child's expectations and on his/her experience within the family. If a child is familiar with eating snacks, white pasta, hamburger and chips on regular basis, he or she will not be easily persuaded to eat fish or legumes. Therefore, to increase the awareness of the importance of a balanced, and varied diet, with fibers, carbohydrates and proteins, Milano Ristorazione undertook a first series of campaigns, mediated by teachers, aimed at making children and families more conscious of the benefits provided by a healthy diet. An experimental reengineering of the process described so far has been recently designed and tested, following the application of my *experience-driven* framework. I will discuss it in the next section.

The last category of "customers" are parents. I already said about the lack of communication towards them, but we cannot forget there is a part of the all parents, the 5,000 members of Catering Commission, which – notwithstanding the Milano Ristorazione reluctance – for free and totally voluntarily co-produce a significant stage of the process. Both the Municipality and Milano Ristorazione sustain do not have financial resources to run a quality control of the delivery stage: therefore, the members of the Catering Commission plan and carry out daily, extensive and random controls during meals administration. As a matter of fact, they play an essential role in Milano Ristorazione service operations. For this reason, the behaviors showed by the Municipality and the company in the past towards these volunteers is rather surprising. The former underrated their importance and the latter showed great annoyance when volunteers pointed out serious non-compliances with the Service Agreement.

In short, parents are not involved in the initial encounter, where it would enable a very effective setting of the expectations of both the parents and the kids; then, they run a portion of the operations for Milano Ristorazione, the last on field quality control, but they cannot expect all to be nutrition or food-technologies experts. Moreover, each one has its personal idea on food education and quality of food and service. Such a variety, driven by the customer involvement, as already stated when talking about the Input-Process Matrix, is not easy to manage for the company if not monitored from the beginning. In the past, the result of the poor attention dedicated to manage the relationship with this peculiar portion of parents and the lack of "education" on the specific topics they deal, basically generated a hostile and conflicting debate, which paradoxically gave origin to the spontaneous setup of a citizenry representative, which sometimes felt as an opponent and not as a potential partner of Milano Ristorazione.

6.2.7. The processes

At Milano Ristorazione, the industrialization of the service process has been mainly focused on the "back office" activities, namely procurement and inbound logistics, operations and outbound logistics. The search for efficiency and productivity addressed the company towards a *factory-driven* operations strategy, which emphasized the rational and *engineering* side of producing and delivering food to thousands of kids every day, and totally forgot the emotional, cultural and social side of enjoying food as a pleasant stage of a stressing study day.

A partial, but not sufficient attention has recently been paid to the "front office" activities, as said before, even if once again the (reasonable) obsession for cost-effectiveness has addressed towards inappropriate solutions. Outsourcing (which is a common and very effective strategy for service industrialization, as said in Section 1., and particularly to enabling the focus of internal resources on the most critical activities for customer experience) has been pursued to reduce labor cost. People, dealing with kids at lunch break and interacting with the teachers and the staff of the schools, are motivated to run quickly and efficiently their operations. Even if trained by Milano Ristorazione to care about the kids and if they may have a personal attitude towards the quality and the importance of their service, they do not feel at all part of the Milano Ristorazione processes and performance.

Yet, most of all, the reengineering of the processes at Milano Ristorazione is "value-driven", and not "experience-driven", as I am suggesting in this work. Namely it means that the focus is on back and front office, and not on the service encounters, which would address attention

towards the three main processes: the design of the service and the setting of the expectations; the delivery at lunch break; the collection of the feedback and the management of the relationship after the delivery.

No need to go in depth in this analysis, as many elements have been already discussed in the previous paragraphs. Just some additional comments.

The first encounter is highly neglected. A marginal customer involvement is required in the design of the characteristics of the menu, both functional and emotional. Once the menu is conceived, there is no chance for the different stake holders, and mainly the parents, to either contribute or provide suggestions. Week after week there is no communication flow between families and Milano Ristorazione. Neither customer's involvement nor the links between the weekly stages of the service are emphasized. Milano Ristorazione is proud of creating the operational conditions to deliver good food at a very low cost with a very high logistics performance, but none is "educated" to understand the complexity of this task. Furthermore, as "good" food may be a relative concept, it is hard to get a general appreciation of the quality of this catering service without the proper cultural preparation on the standard of quality for Milano Ristorazione.

In the second, central and crucial encounter, the delivery at lunch break, there is the most evident discrepancy between the rational approach to the management of service operations and the *experience-driven* service management I am proposing. The processes are well designed and work properly. Yet, kids are unhappy and parents keep on complaining. Milano Ristorazione refuses to run any "customer satisfaction" survey to better understand the reasons behind this diffused dissatisfaction. Thus, the most effective *proxies* are both the rate of food waste (as said, close to 13%-15% of daily quantities) and the rate of "white diet" requests, which not by chance arise to almost 5% of the school population (from the 1% daily average) when some very contradictory meals (lasagna pasta, fish metballs, squid rings, for example) are in the menu of the day. This is the evidence of what I have sustained so far: service is a combination of ingredients, thanks to properly designed processes. Focusing only on the quality of the processes is highly misleading, because of the difference between goods manufacturing and service production. In the former, the customers can appreciate only the output, and even if the quality of the input is not always at the best, it may happen that, thanks to very effective process, the output is perceived as better than anyone can expect. Not

in the latter, where customers are directly involved in the operations and where the intangible components (information and emotions) are very crucial.

Kids are unhappy because nobody cares about their feelings while having food, in many cases at an inappropriate location, unaware of the food they are going to have, in a very short time window. Parents complain because they don't feel part of the process!

The third encounter is totally ignored. The interaction with the Parents' Representative and the Canteen Commissions are highly suffered by Milano Ristorazione, which has never clearly understood the urgent need for a more "circular" approach. Sensing the kids' feedback (directly and through the parents' mediation) and providing a quick response to complaints and requests for improvement concurrently represents the encounter "after" the past delivery stage and the encounter "before" the next one. One could ask why this third stage is so underestimated. The answer is quite easy: for a very long time, Milano Ristorazione considered customers neither the kids nor the parents. They represented a captive market, and did not voluntarily pay the annual fee for service after selecting among many choices, but because the Municipality of Milan appointed it as the single provider of the catering services of city. The context is now changing, yet. First, the recent controversies between parents and Milano Ristorazione have interested the all public opinion, because of both the impact they had on the press and most of all on the social networks. Consequently, they have indirectly affected the assessment of the quality of the administration of the city and may have an effect on the election for the major. Second, in Italy a movement for the free choice at the lunch break is arising. In 2016, actually, the Superior Court of Turin, in Piedmont, declared the right for parents of refusing the service provided by the Municipalities and the freedom to provide autonomous solutions for their kids. The movement of parents which triggered this small revolution is called "the party of the sandwich", because many parents were convinced which a sandwich, made at home with good ingredients, could be better than the food provided by the school canteens. Even if a more recent act, still under discussion at Italian Senate, in July 2017, regulated the obligation for schools to provide food at lunch break and the prohibition of introducing food which is not provided by certified and qualified vendors, properly and publicly appointed, at the school canteens (for health and safety reasons), a debate is progressing and the risk is very high for Milano Ristorazione. As the new guidelines of this new articles of the act under discussion emphasize a lot the educational side of the lunch break for the pupils, a strategy focused only on the rational side of the business can create some

difficulties to Milano Ristorazione when the new bid for the catering service in the City of Milan will be called.

6.3. Implementing the new framework

In order to experiment a more experience-driven approach and to acquire new skills and competences, enabling to face the change in the context I described before, Milano Ristorazione recently implemented some change in a sample of primary schools in the city of Milan, following rigorously the framework and under my supervision.

6.3.1. The first encounter: preparing families and kids to the food experience at school

First of all, parents and teachers of these schools have been involved in the selection of a range of potential meals to be cooked and delivered to their kids per each quarter. Parents, through a simple survey, online and through a questionnaire, could select their choices and suggest changes in ingredients and recipes. Those recipes which did not receive an approval from the majority of the parents were cancelled from the school menu. Those recipes which received minor suggestions and were approved by the majority of parents were changed and included into the rotation of the menus. Those ones which, even if approved, got major requests for changes, were tested and submitted again to the all body of parents, clarifying which changes had been made and which changes, for technological or health and safety reasons, were not carried out. If approved in this second version, the recipe has been included into the menus.

Following this involvement in the design stage, parents and teachers have been invited to visit the Sammartini Cooking Centre and have been directly required to cook those recipes together with the chefs. Once they have tasted the food at the cooking centre and tested the complexity of the preparation, they have been required to taste the food replicating their kids' same conditions of lunch break (the school canteen, 3-4 hours after the food has been cooked, in a crowd of people chatting and moving, in 30 minutes), in order to appreciate the slight difference (if any) of quality generated by the logistics and the relevance of the *servicescape* on the perception of the quality of the food! Finally, week after week, all parents receive a newsletter with the menu of the week, the specificity of each single recipe, the relevant news on the ingredients, the vendor, the territory they come from, the history of the food, and a lot of suggestions for the dinner menu, at home, to be prepared to the kids in order to balance the daily needs for carbs, proteins, sugar and so on.

Teachers, who can play a crucial role in the whole process, because of the influence they have on kids, have been involved in a project to increase their pupils awareness on the social impact of the food waste.

A total of more than 1000 people, counting only parents and teachers, have been involved in this experiment, for a kids population of about 440 pupils of two primary schools (Istituto Comprensivo Morosini-Manara, via Morosini, and Istituto Comprensivo Cavalieri, via Ariberto, in Milan city centre).

6.3.2. The second encounter: delivering food at school

At the second stage, the main focus was on kids. To ensure a link between the first stage and this one, parents have been invited to explain the whole project to the kids. Furthermore, the weekly newsletter included a daily story to introduce to the kids in a funny way the characteristics of the daily menu. Parents were kindly asked to read day after these stories to their children, particularly for the youngest of the first and second class. For the oldest ones, a booklet with the same stories have been handed out each week in each class, to pupils and to teachers.

To increase the kids' involvement in the service operations, Milano Ristorazione introduced a self-service system, which has been gradually adopted according to canteens layout. Unfortunately, there was no chance to refurbish or renovate the two locations, because of budget constraints and the ownership of the maintenance of the school facilities, which is not in charge of the school themselves, but – accordingly to the nature of the schools – of either the Municipality or the Lombardy Region or, finally, the Central public administration.

The self-service differs from the traditional delivery I described in the previous paragraphs because of the layout of the distribution areas and the role of the kids. In the traditional process, food is handed out directly by the staff, which place the trays on the tables before the kids get into the canteen. This is to avoid a flow of kids standing up and sitting down continuously and to reduce the time they wait in a line, given the 30 minutes constraints.

Anyway, the observation of the lunchtime at these canteens demonstrated that kids do not need the whole 30 minutes to eat their food. They spend naturally this time to socialize, but, as said, in many case, this socialization does not contribute to make them appreciate the quality of their meal.

Thus, Milano Ristorazione decided to place the food into "distribution islands", each one for a category of food (pasta, fish/meat, veggies and sides, fruit and water). Kids take their trays and they compose it the way they want. They can start from fruit and end up with pasta or mixing them. Teachers and staff control each pupil visit any single island. The most relevant change is in the need for staff in each canteen per shift. With the traditional approach, given the need to fill in and distribute hundreds of trays in a very short time, at least 5-6 people per shift were required. With this new distribution process, 4 staff people can manage the all break. Most of all, they don't run through the canteen, because the kids carry on the "last mile" of the logistics. And so, they can stand up at each island and can explain to kids what is in the food. If someone is reluctant, they make them tasting it and then they fill their dish. This *storytelling* proved to be very effective, such as the one at home, before the delivery. Kids who remember the content they read (or have been read for them) at home, ask for additional clarifications. The ones who do not remember or simply did not know about the food, ask for the whole piece of information. They spend more time than the past in understanding the food they are going to have and, as expected, the more they appreciate the more they like it!

Children are responsible to place on their trays the different dishes of the menu, and at the end of the meal, they have to tidy up and to take back the tray to the dedicated trolley. The self-service system made the whole administration procedure quicker and more efficient.

The staff selected for this experiment is fully employed at Milano Ristorazione. Many of them have been moved for the cooking centers to the school canteens. This is to leverage on their knowledge on food preparation, recipes, and Milano Ristorazione best practices when *storytelling* to the kids. Their roles have been replaced with external resources, with proper competences, and under the supervision of the chefs of the cooking centres.

6.3.3. The third encounter: sensing and responding after the delivery

An original communication flow has been activated, with kids, with parents and finally with teachers.

Parents and teachers, every week, can provide their feedback through a questionnaire in the final section of the newsletter above discussed. Most of all, a dedicated email account has been activated for urgent communication, if any issue in a menu of the day. People who complain or provide suggestions are aware they will be requested for further clarifications and, if any change approved, they will be involved in the testing of the new recipe.

Children must every day fill in a quick and simply questionnaire on the satisfaction of the menu of the day. With the same "emoticons" system, at the end of the week they are required to grade their satisfaction on the whole menu of the week.

6.3.4. The golden rules in the design and engineering of the experience.

I have already told about the customers' involvement and the activities run to set the standard and manage the whole expectations. Moreover, I have discussed the solution adopted to connect the stages and take care of the links such as the stages.

In order to the sequencing of the substages, Milano Ristorazione made the decision of rethinking the weekly menus taking into accounts the U-shape dynamic of the customer experience. The weekly menu always starts and ends up with a very positive peak; the most "unpleasant" food must be placed very far from the end. In short, menus start on Monday with a pasta (kids love tomato sauce and most of all, "white pasta", a very simple recipe, pasta with butter and parmigiano), and cheese. Fish or legumes are on Tuesday. Wednesday and Thursday include soups and omelettes, Friday is always for the most favorite food, for example pizza. On Friday, season fruit is frequently substituted with ice cream!

6.3.5. Outcomes and lesson learned

From the quantitative point of view, the only data have been available for my study and analysis of this case concern the food waste in the two schools of the experiment and the number of "white diets" required every day.

Both them improved considerably. Food waste decreased by more than 70%, white diets by 45%. The former is an amazing result of this experiment. It confirms the relation between the emotional side of the service and the perceived quality of the provision. Parents, teachers and kids feel engaged since the very beginning into the building up of a pleasant lunch break.

Parents contribute, even if not in such a radical way, to the design of the menu. They are consequently motivated to settle up their kids' expectations. Most of all, they appreciate the complexity of such a service from the operational point of view, and understand the reasons why of each plate and selection. Finally, they are encouraged to provide feedback. They can tell their opinions, knowing they will be taken into consideration.

Teachers are involved into the process, making them feeling the lunch break as an additional and crucial portion of their pupils' learning experience. As parents, they feel the beneficial effects of being engaged and providing feedbacks. Most of all, this unexpected involvement

into a third party's service makes them proud of the relevance of their contribution and of the enrichment of the lunch break of a pedagogical functionality.

Kids have more time to understand the food they are required to eat. Kids enjoy the chance of being free to move from a linear process to a non-linear one, filling their trays the way they want and when they want. Kids appreciate the radical change of the perspective: it's not simply food, it is a central stage of the all learning process, integrated into it, involving their most relevant opinion leaders in the adult world, parents and teachers. The more they understand the food, the more they enjoy it, the less the waste and the "strategical" request, early in the morning, to their parents, for the white diet!

A still persisting weakness of the all experience is the recovery of service failure. No ad hoc process has been conceived and industrialized to react and recover to lack on quality on food delivered, contamination or breaks of the packaging, errors or delays in the delivery and logistics in general, amplification of complaints on the social networks.

7. The final framework: generalization and conclusions

7.1. Contribution to theory

After a long sequence of analysis and investigations, we are close to a final, comprehensive framework, which can unify in a single model the relationships I have found between service industrialization and customer experience, and provide an effective tool to design a product-service combination in an experience-driven perspective.

This framework can be represented in Figure 7.1., which I am now going to comment.

Figure 7.1. The framework of the Design and Engineering of the Experience
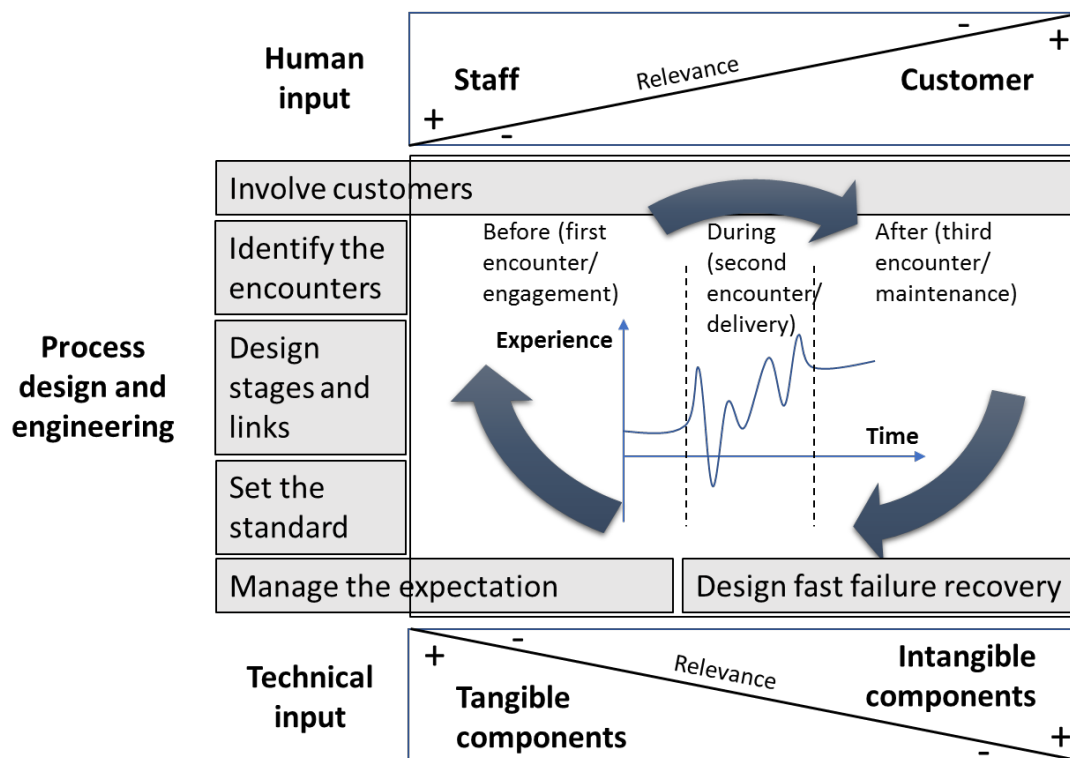
7.1.1. Inputs and trade-offs

The study of the multiple cases and even the in-depth analysis of the single case in Section 6. demonstrate the dynamics of the move from a theatre-driven operational model to a factory-driven one. In a service theatre, the relevant inputs are both the staff and the tangible components (including the "product", the tangible side of any product-service combination). On the opposite pole, both customers and the intangible components (information) are the crucial ingredients of a service factory. As said, according with the overall corporate strategy, each company should define its positioning along this ideal two models. In the reality, as

showed in Section 1., the proper model is a hybrid of the paradigms, and the mix of the ingredients may change considerably. Yet, the evidences of my research clearly demonstrate that the service industrialization does not reduce the "emotional temperature" of an hybrid system, because it moves the focus from the capability of the company (thanks to the competence and skills of its staff and to the flexibility and quality of its hard technologies) of meeting the variety of customers' expectations towards the co-creation of the experience (thanks to the socialization of the customers' skills and competences and the effectiveness of the soft technologies in managing and connecting the flows of information).

The first main outcome of my research is that a clear trade-off does exist between staff and customers, the two human factors on the one hand, and between tangible and intangible components, the two technical factors.

The more the customer involvement, the lower the need for a massive adoption of human resources. It is not simply a matter of "production capacity", as one can argue when implementing a self-service strategy for industrialization. The very relevant benefit is in the consequences of socialization: the more customers interact each other, the more they can improve their experience, because of the sharing of their knowledge and skills. Yet, one can doubt that socialization is necessarily producing a better outcome: the diffusion of fake news on the social network, just to give an example, is the demonstration the problem is most of all to improve and select the quality and trustworthiness of the shared information. Therefore, the more the customer involvement, the higher the relevance of the intangible components, which are, as said information and competences exchanged among the players of the service processes. We can say that not only moving from an experiential service theatre to an experiential service factory the combination customer-information is the most relevant, but the quality itself of the processes combining these two category of inputs makes the real difference. That is the reason of the next step, the *design and engineering of the experience*, which is the design and engineering of the processes producing and delivering the experience.

7.1.2. The very essential of the engineering of the experience

I underline the concept of "engineering the experience", because it is the shift from a product to a service economy which requires for this change in perspective. Experience can no longer be approached as the extemporaneous outcome of an economic transaction, but it must be conceived as the real expected output of any company's operations. Yet, the experience is the output to achieve. We don't sell products and services. We deliver experience! We neither

maintain products nor offer after sale assistance. We care about a relationship and we preserve our trustworthiness!

Yet, we achieve such a goal because we properly balance the mix of both the human and technical factors (see above) and we design and engineer the sequence of stages and links through which they are processed and transformed. Delivery is crucial, but the initial stages make the difference. A fast and effective service failure recovery annihilates the memory of an unpleasant peak of the service, what typically is defined as a "pain point". However, it is the positive memory of the experience which motivates the loyalty towards a provider and it is the need to live again a pleasant time of life which stimulate to replicate the purchase.

The second main conclusion of my work is that, among the three major encounters we can identify in any product-service combination, both the initial one and the final one requires more attention to pay than usually done.

The initial stage is crucial because in this first touch point, we set the standard and start managing the customer's expectations. It is in the first encounter we start interacting with our customers, no matter if physically or virtually. It is at this stage they can start co-creating the experience with us, even socializing each other.

The final stage, the post-delivery encounter, is beneficial for the long-term memory of the transformational event. As said, the experience is a combination of functional and emotional attributes over time. In a learning experience one benefits from both studying new disciplines and sharing a portion of life with other people. The post delivery encounter preserves over time the both items. What do you remember of the last conference you attended? In the medium and long term your memory becomes dim. Therefore, engaging customers after the transaction is a way to create a relationship and motivate them to search for a replication of a very pleasant and memorable experience into a next transaction. Therefore, as represented in the Figure 7.1., the production and delivery of experience is (or should be) a cyclical process. The final encounter of a previous event, if the entire process is properly designed and engineered, flows into the initial encounter of a next event.

7.1.3. Industrialization can deliver experience

Traditionally we have connected industrialization to standardization and standardization to low prices, mass market, large volume, and poor experience. I have first argued that even a service factory can be perceived as an experiential provider of services, most of all because the dependability of service operations contributes to reduce the customers' anxiety and meet

their demand for reducing risks when approaching any experience of consumptions. Second, I have demonstrated that the proper leverage on the customers' involvement contributes to increase the perception of a pleasant experience, for two reasons. First, because the increased capability of dealing with a wide variability of demand of a product-service system emphasizing the customer co-creation; second, because of the sense of belonging and accountability it generates; third because of the beneficial impact of socialization.

The third conclusion of my work is that customer involvement is facilitated by the adoption of the new digital technology, this way enabling both the co-production and the socialization. Combined with a proper design and engineering of the entire process, as in the case in discussed in Section 5., we can dramatically impact on the overall experience, in the short term as well. Engaging customers is not simply asking for their opinion. It means to define at which stage and how deeply they can co-operate with Operations and creating the context to make them feeling the reciprocal benefits of their contribution. In parallel, connecting each stage to the next, defining the sequence of our processes and making those conditions for positioning very positive peaks of functionalities and emotions at both the start and end of the delivery, contribute to provide a positive memory of the transformational event.

Finally, the observation of many different contexts in various sectors (accommodation and hotels, restoration and catering, vending and automatic distribution, retail banking, healthcare, education) confirmed me that experience is not simply a static output, but, because of the process cycle I have described, but a dynamic outcome, which declines over time. The decay of experience is the consequence of both the decline of the effects of the transformational event in terms of skills and competences, and the weakening of the memory of the emotional side of the event.

7.1.4. The dynamic of experience

The implications of what discussed above are twofold.

First, a sinusoidal curve is much more appropriate to describe the cycle of the experience than a U-shaped curve, as suggested by literature. Experience is actually the final outcome of any transformational process which, while taking place - stage after stage - may generate positive and negative peaks of both functionalities and emotions. The outcome is not necessarily additive to the past experience, and if very negative, can be detrimental. The role of the initial encounter should consequently be to assess the customers' background; the role of the final

encounter should be to reduce the risk of decay over time or, if suitable, to control this natural decline, in order then to restart from a pre-defined level.

Second, the relative weight of the functional attributes and the emotional ones is not perfectly balanced and over time the latter contribute to the memory of the event more than the former. You probably do not remember the all disciplines of your undergraduate curriculum, but if the faculty and your classmates left you a pleasant recall, you still preserve a positive memory of those years. The maintenance of the end of the sinusoid at a stable level (or a slight negative slope) can benefit from the emotional side of the socialization we can generate thanks to the digital technology. In short, the more we facilitate the building of communities of customers connecting each other over time, the higher the probability they preserve a positive (or less declining) memory of the relationship with us.

7.2. Limitations and further research

This is not the end. This is the start of very long research activity. Many limitations constrain today the outcome of my research. First, a quantitative and large analysis of data must be carried on the relationship among experience and the three main encounters of any service production and delivery process. Most of all, I must find an appropriate context to measure in a longer run the effects of the proper design and engineering of the experience. The conclusions I have generalized in the previous paragraph are based on the combinations of the evidences of the quantitative research presented in Section 2. and a single case discussion. Even if the data are statistically significant, I have already said about the specificity of the former. As far as the latter, the single case based research is usually suggested in the theory building approach. Yet, to test the hypothesis and to confirm my thesis, a next stage is required.

Finally, the all work is based on the assumption that customers do not simply buy a product, but require a combination of product and service, even in the goods manufacturing industries.

Two questions are still open, anyway.

First: what is experience in the business-to-business context? As discussed in the Section 1., there is some relationship between what we have defined as "experience" and the construct of "risk". Particularly in the B2B context, a positive commercial experience is probably connected with the capability of the provider to deliver a mix of functions and solutions which meet their customers' expectation and mitigate any risk in their business. It is a matter of

trust, dependability and creativity. It is very interesting area to scientifically explore and managerially exploit.

Second: if, as suggested, in any product-service combination we should first design and engineer the experience, how can then we deploy it into design characteristics of the product? It looks like a supremacy of the intangible side of the relation (the service) does exist on the tangible side (the product). Even agreeing on this, and transforming the product design and engineering in an ancillary process of the overall service design and engineering, how can we technically connect these two very different context?

A long way is still in front of scholar and researcher of these topics. Hopefully, my humble contribution will help them in

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