

## The 2009 Naples Forum on Service: Service-Dominant Logic, Service Science, and Network Theory

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### Service Dominant Logic and Service Science: a contribute deriving from network theories

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***ABSTRACT***

**Purpose** – Scope of the paper is to highlight Service Science, Management and Engineering (SSME) and Service Dominant (S-D) logic peculiarities and proposals with reference to network theories such as the Many to Many approach proposed by Gummesson and the Viable System Approach (vSA), an approach proposed and highly diffused in Italy in last decade.

**Methodology/approach** – Conceptual analysis based on new developments in SSME and SD Logic with a thesis that really these scientific proposals are coherent one with the other and may benefit inferences deriving from the mentioned network theories.

**Findings** – We found many-to-many marketing particularly supportive for both SSME and S-D logic for it being a theory grounded on networks, on value co-creation and systems, therefore based upon several of the two theories pillars. On the other hand we have noted that also the vSA, an interdisciplinary approach grounded in system thinking, resource based theory with strong inferences deriving from biology, sociology and mechanics, for its ample perspective represents an interpretation key of complex phenomena, thus it seems suitable for analyzing service systems for its capacity to look to the whole while not avoiding to respect the single characteristics of every observed reality. SSME and SD Logic are two emerging theories who are focused to the comprehension of Services in general, which can be represented by complex systems in which value is exchanged in terms of service among multiple actors. The vSA, asserts that every systems in order to be viable needs to develop among over-systems in an harmonic behavior capable of satisfying critical resources' owners, may contribute to these two discipline development.

**Research implications** – SSME and SD Logic are gradually being integrating one with each other. The research implies that the network theories, and specifically the vSA, could support even more this integration contributing with its own scientific proposals. Briefly we believe that the vSA's view on business finalities, value creation, organizations' relations management are strongly coherent with the one proposed or tacitly implied by SSME and SD Logic.

**Practical implications** – For researchers to critically analyze network theories, and in particular the vSA proposal and theories, in order to verify if and to which extent they may contribute to scientific advancements in Service Science and SD Logic.

**Originality/value** – Although many contributes have focused upon SSME and SD Logic together, highlighting the strong integration between the two scientific proposals, until now there aren't many contributes that adopt network theories and vSA looking for inferences upon the two theories.

**Key words** – Service Science, Management and Engineering; service-dominant logic; service science; Many to Many, Viable System Approach.

**Paper type** - Research paper/conceptual paper.

## **Service Dominant Logic and Service Science: a contribute deriving from network theories**

**SERGIO BARILE – FRANCESCO POLESE**

### **Abstract**

This paper highlights the contribute deriving from network theories, and specifically from Many-to-Many logic and from Viable System Approach to the emerging theories on service.

Network Theories indeed are themselves interdisciplinary theories, and have been approached in many disciplines such as social sciences, biology, computer sciences, management (about Innovation, Organization, Strategies), mathematics, cognitive science, and so on. Within these Many-to-Many in a logic that deduces from Network theories interesting inferences upon Marketing discipline. The Viable System Approach (VSA), on the other hand, is a systemic theory grounded on interdisciplinary basis attempting to address management theories and business administration. Both of these can effectively contribute to the growing debate about service theories development, and in particular about S-D logic and SSME.

### **1. Premise**

Nowadays we can easily assert that businesses are “organizers of value creating systems” (Normann, 1997) and the classical dichotomous between goods and services tends to gradually lose meaning (Kotler, 1977; Normann, 1991; Rispoli and Tamma, 1992; Cercola, 1996) rendering a mainframe in which there is not a distinction, but rather they converge in the same concept (Rullani, 1997) in fact “in the neo-industrial era, *services* is a framework for thinking about value creation, rather than a support activity” (Normann, 1997)<sup>1</sup>. New logic is considered dominant and bases its roots in various strands "historic" and that is the result of a long interpretative trail, the Service Dominant Logic (S-D Logic) (Vargo and Lusch, 2004, 2006), in which all common aspects of old theories can be integrate with a new dominant logic, that can represent the convergence of contemporary marketing thought. By 2004, indeed, IBM has developed a concept of the SSME that, with S-D logic, contribute to a significant change of perspective compared to traditional paradigms that can reverse the relationship between goods and services, even if it is considered as a “frontier research”.

### **2. Emerging theories on Service**

The traditional approach in marketing management (transaction marketing), developed by the second mid of last century, is aimed to “attract” customer and make profits. In this approach, marketing mix or the 4Ps plays a central role, instead the relationships and networks have a subordinate role.

Over the last thirty years, the changes in competitive environment and in society, have caused a paradigm shift in marketing. Relationship Marketing (RM – Grönroos, 1994; Payne, Christopher, Clark and Peck, 1995), opposite of transaction marketing, is focused on long term collaboration with customers and on co-creation of value. The most used term, Customer Relationship Management (CRM – Newell, 2000; Girishankar, 2000; Rigby, Frederick, Reichheld and Scheffer, 2002) is defined as “the values and strategies of RM – with special emphasis on the relationship between a customer and a supplier – turned into practical application and dependent on both human action and information technology”. The philosophy of RM/CRM can made tangible through thirty relationships, the 30Rs, that are an alternative to the 4Ps of traditional marketing management. Relationship Marketing, considered as an interaction in networks of relationships, became “total”

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<sup>1</sup> Service traditionally have been seen as something separate and different from good production (and from related value creation); considering this separation today is a blind alley (Normann, 1997, p.4).

(Gummesson, 2008), by the considerations above, and provides a new systemic view of the meaning of marketing management.

### *2.1 SD Logic*

Service Dominant Logic (S-D Logic, Vargo and Lusch, 2004; 2006; 2008) is a theoretical proposal of marketing discipline that highlights a paradigm shift from goods dominant logic to service dominant logic; following foundations of networked relationships, new value co-creation processes, business interactions, resources integration, the authors attempt a new interpretation in market discipline introducing the dominance of service over products and goods, thus trying to follow an approach considered more faithful and adherent to nowadays competitive context (Rust, 2004) of our Service Economy (Levitt, 1981; Normann, 1997).

In S-D Logic Approach and its ten foundational premises – FP), service must be understood as an application of skills through activities, processes and performances designed to produce a benefit for themselves and for third entity, directly or indirectly related (Vargo and Lusch, 2004). According to this view “the goods are no longer the only transaction objects, but they appear as an appliance for services provision. Service are seen as the real protagonists of interactions and transactions”; Service no longer represents a part of an asset or the intangible side of an output product. It “is the service to be really exchanged” (Vargo and Lusch, 2006).

### *2.2 Service Science*

Service Science, Management and Engineering (in short Service Science) is an IBM initiative that has involved hundreds of researchers worldwide in the attempt of promoting a new discipline capable of satisfying an emerging research issue: the study of Service Systems. It is indeed a multidisciplinary “open source” project, based upon pillars represented by computer science, human behavior, organizational theory, industrial engineering, business strategy, management sciences, social and cognitive sciences, legal sciences. In terms of Science it investigates what service systems are and how they evolve, and about roles of people, knowledge, shared information and technology, as well as the relevance of customers (as demand) inside production processes (as supply); in terms of Management it investigates how improve efficiency evaluation, relations sustainability and systems relations; in terms of engineering it develops new technologies, adequate approaches to promote information check, measurement and diffusion.

Service Science is emerging as a unique field, aimed to discover the complex service systems underlying logic, to establish a common language and a unique system thinking, to nourish productivity, quality, performance, compliance, to improve relationship and innovation rates across the service sector, to develop the skills required in a services-led economy, the knowledge (as intelligence accompanied to and through experience for competitive advantages), and the processes (as key element in organizational skills development).

## **3. *Emerging network theories***

Today, in literature there are many perspectives chosen in several disciplines that have through networks interpreted everyday life or business realities, just as well as biology, natural sciences, computer sciences and so on. Still, no matter how deep you can get in network theories, every attempt in categorizing and generalizing their issues and their investigations dumps into hard difficulties. In a way networks are an intriguing issue, an umbrella concept.

Networking relationships were first emphasised in the 1970s, when studies noted an increase in connections among firms characterised by exchange of information, continuity in relations, and increased commitment, trust, and collaboration (Richardson, 1972; Hakansson and Ostberg, 1975). Various terms have been used to describe these voluntary ties among firms and other economic actors, including “heterarchy” (Hedlund, 1986) and “polycentric structure” (Forsgren, Holm and Johanson, 1991); however, the term “network” has now become generally accepted to describe this emerging economic entities (Bartlett and Ghoshal, 1990).

Studies of network genesis have identified two basic mechanisms in network development: (i) several enterprises that are inherently involved in a common production process deciding to combine their resources and competencies; and/or (ii) a leader enterprise attracting other businesses to join in its activities<sup>2</sup>. In this regard, several authors have taken a particular interest in the so-called “strategic network approach”, primarily interested in the creation and management of intentionally-formed network organizations featuring a specific set of actors (Normann and Ramirez, 1994; Parolini 1999).

Different approaches have deepened the structure and function of networks. Some have analysed networks in terms of organisational forms - including nodes, connections, and aggregating forces as well as net organizational forms (Richardson, 1972; Burt, 1992; Hedlund, 1986; Bartlet and Goshal, 1990). Others have focused on the governance of networks – deepening issues related to autonomous nodes, central control, the notion of dynamic equilibrium, and the phenomenon of structural variability management<sup>3</sup>. Others have examined network strategies, such as resources sharing and common goal achievement<sup>4</sup> (Jarrillo, 1988; Jones, Hesterly, and Borgatti, 1997) in the attempt to valorise networking and social relationships for competitiveness reinforcement (Polese, 2009).

As above mentioned, thus, there are many theories and approaches dealing with networks. We chose, among them, two proposals that are particularly suitable for our investigation purposes, and specifically many-to-many marketing and the Viable System Approach. Both of these, indeed, contribute to the magnification of S-D Logic and SSME theories, enabling a different interpretation perspective of the theories, that may well be supportive to traditional approaches to S-D logic and SSME.

### *3.1 Many-to-Many Marketing*

Last decades have proved that Customer Relationship Management and one-to-one marketing has not succeeded in business practices due to the narrow focus based on the dyadic relationship between a single supplier and a single customer, hence proposing marketing strategies based upon the acknowledgment that businesses interact one with the other within many-to-many networks (Gummesson, 2004), see fig.1.

Basically the intriguing suggestion is that no-one can be considered really isolated, starting from individuals (Donne, 1624) and arriving to businesses (Hakansson and Snehota, 1995); in such an interconnected world (Castells, 1996) how could marketers and enterprises elude their network connections attempting strategies unable to capture the power and usefulness of these relationships (Capra, 1997; 2002). Therefore the three key variables of marketing seem to be relationships, networks and interaction according to a Relationship Marketing, which is “interaction in networks of relationships” (Gummesson, 2004).

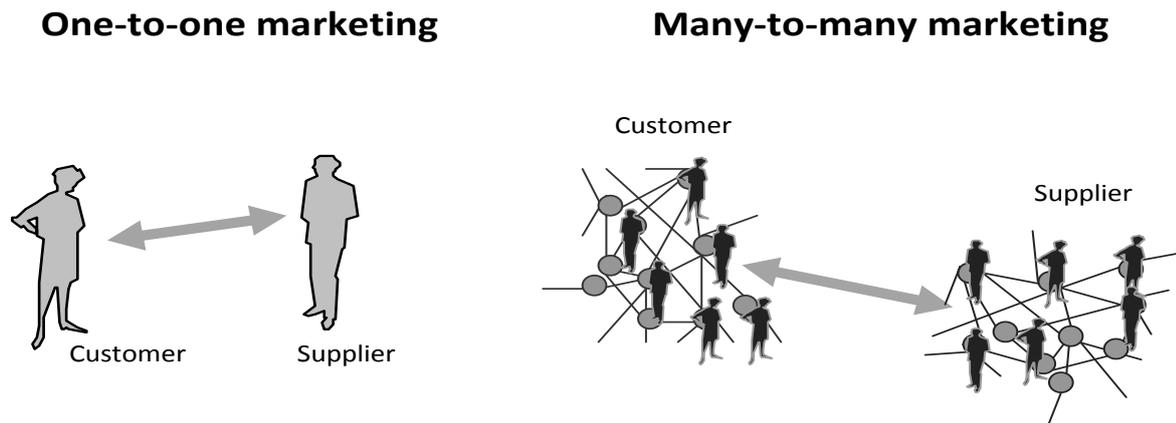
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<sup>2</sup> See Thompson, 1967.

<sup>3</sup> See Hakansson, 1987; Burt, 1992; Jones, Hesterly and Borgatti, 1997.

<sup>4</sup> See Jarrillo, 1988; Jones, Hesterly and Borgatti, 1997.

fig.1



*Source: Gummesson, 2004*

### 3.2 The Viable System Approach

The vSA is a theory linked with network analysis and based on general system theories, or rather on social analysis interpreting business behavior within a dense pattern of interactions in which the firm, being a viable system itself, immersed in a context, is in contact with viable systems and single components<sup>5</sup>. It is, hence, a systemic theory, a methodological approach not only capable of interpreting and directing nowadays business arena, as well as everyday life and decision making processes of organizations, groups and communities, individuals. Indeed, it proposes a new representation of the behavioral approach to business and relative interactions with its context (the theory), and suggests a new interpretation of consolidated and strategic organizational, and managerial models (the practice).

The concept of the firm as a system is not new to the subject of economics. The origins of system theory go back to the 1950s when a group of scholars from various scientific and social fields (von Bertalanffy in 1956, and others) developed an interdisciplinary theory based on the concept of systems. Their systems viewpoint rejected the idea that certain phenomenon could be fully understood exclusively through an analytical approach (reductionism), especially when the investigated subject consisted of complex emerging phenomenon characterized by difficulties of understanding external influences just analyzing significant interaction among components, as with the firm (holism). However, a possible understanding can be achieved through the acquisition of new interpretative schemes capable of organizing the phenomenon complexity (see fig. 2 for the development that allows information flows rising knowledge from chaos to certainty).

More specifically, a relational approach for the firm's government and management, has been reconsidered by the vSA (Golinelli, 2000, 2005, 2009; Barile, 2006, 2008a, 2009), which has gathered several multidisciplinary contributions, configuring the enterprise as an open<sup>6</sup> system<sup>7</sup>, finalized<sup>8</sup>, organic<sup>9</sup>, autopoietic<sup>10</sup>, cognitive<sup>11</sup> and cybernetic<sup>12</sup>.

<sup>5</sup> The comprehension of systemic organizations, and of the relevance of their social and business relationships in local contexts, in fact, effects business behavior, every systems survival capacity as well as the overall evolution (Barile, 2008a).

<sup>6</sup> von Bertalanffy (1956): Enterprise as a opened system, immerse in environment with which interacts, exchanging information, material and energy.

<sup>7</sup> von Bertalanffy (1968): System as a "complex of interacting elements"; Parsons (1965): Systems' Hierarchy Principle; Luhmann (1990): "System elements are rationally connected".

<sup>8</sup> Beer (1975): Enterprise as a system with own finalities and committed to survivor.

<sup>9</sup> Hannan and Freeman (1977): Enterprise as an organic system, with a life cycle alike living organism, pursuing its survivor in a selective environment, refer also to Darwin evolutionism).

The *vSA* considers the firm as a viable system; viable, in this sense, is used to refer to the firm's need to constantly increase its survival capacity through time, representing the finality of the firm as a system. On the other hand, the accomplishment of a viable behavior depends on the characteristics of the interaction between the components<sup>13</sup>. Thus, if an usual conceptualization of the firm is a combination of interacting parts, organized according to the goal to be reached, the relationships and interaction existing in every business arena and emphasized by *vSA* seem to take on a key role.

The firm as a viable system interacting with other systems gives rise to a unique system. Thus, homogenous groups of stakeholders with whom the firm as a viable system has relations that can be identified as over-systems and subsystems with which the enterprise interacts.

The governance of the viable firm has to address and direct the system towards a final goal by transforming static structural relationships into dynamic interactions with other viable systems. It can also be said that the ability to organize relationships delineates the efficiency of government action, which is a main characteristic of viable systems (Barile, 2008a).

Top government action consists hence in the transformation of survival impulse in choices and decision making contributing to the equilibrium of the system (internal viewpoint), from one side, and to the satisfaction of over-systems, from the other (external viewpoint).

The role of these relationships is twofold in that they can either represent interests (threats/risks) and/or increase resources (opportunities/profit), which the firm, acting as a system, needs in order to guarantee its strength over time. Resources, in this perspective, lose the property characteristic, since it is more important the availability of the resource, that may be guaranteed by a satisfactory relationship between the viable firm and its over-system.

To summarize, it can be said that government has to reinforce the coordination and harmonization of the relationships created with relevant over-systems<sup>14</sup> (business owners, the financial system, workforce, clients, etc.), to better manage the acquisition of resources. Moreover, the government must be able to direct a wise management of structurally embedded resources in order to reinforce the processing of resources structurally incorporated in the firm, which give rise to specific skills that enable the firm to create value for the relevant over-systems. As a matter of fact, these intricate relationships created by government vanish every firm's boundaries in that government must pursue actions which do not only influence "internal" components, in search of consonance and resonance with other systems and enabling harmonic and sustainable (viable) behavior.

Interpreting the deep meaning of *vSA* through the concept of consonance and resonance we can infer interesting contributions to the above mentioned theories, as well as the structure-system dichotomy. As far as this last is concerned we can observe that the *vSA* in the attempt of sublimizing both an holistic approach capable of overviewing the whole, and a reductionistic approach capable of focusing on characteristics, parts and single components of every system introduces the two concept of structure and system. Structure refers to the static moment, thus characterizing a reductionistic view of the observed reality focusing on its components and relations: it focuses on the how the observed phenomena is constituted. System refers to the dynamic in evolution, in an holistic view of the observed reality, in this way enabling the interpretation of interactions: it focuses on the behavior of the observed phenomena.

As far as consonance and resonance are concerned, we can observe that:

- Consonance is the compatibility between systemic actors, it refers to a static vision, and represent the potential harmonic relation.

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<sup>10</sup> Maturana and Varela (1975): From biology autopoiesis phenomenon; Luhmann (1990), on social autopoiesis: environment is complex, hence enterprise is stimulated to selective mechanism to align its complexity with the external one.

<sup>11</sup> Clark (1993): Cognitive approach suggests that in knowledge is the principal value creation asset.

<sup>12</sup> Beer (1975): From cybernetics the enterprise as a system capable of homeostatic self-regulation.

<sup>13</sup> See below for a deepening of consonance and resonance concept.

<sup>14</sup> The relationships created should influence behaviour in such a way as to maximize all contributions made on behalf of both the firm's and the stakeholders' interest (Bartlett and Ghoshal, 1990).

- Resonance is the effective harmonic interaction, thus referring to the dynamic vision.

These conceptual categories are both connected to the structure/system dichotomy.

Consonance is “structural” and is linked to *relations* concept. Resonance is instead related to the system, concretizing the compatibility between *interacting* entities (Golinelli, 2009).

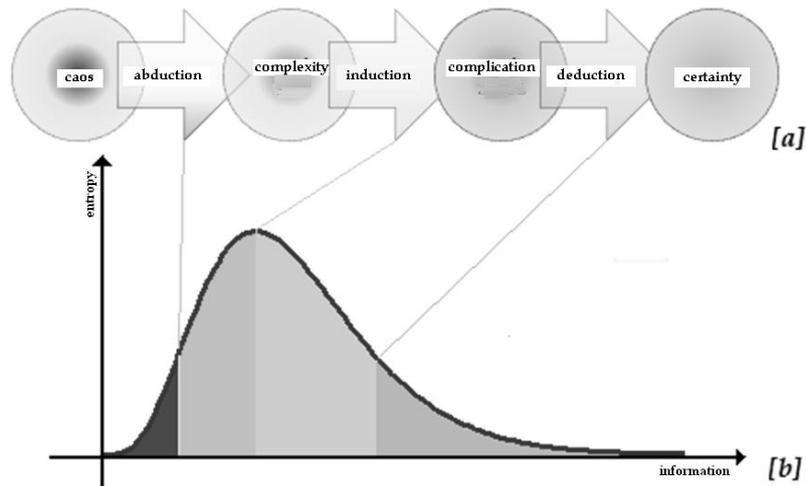
An useful metaphor for this concept is represented by a symphony orchestra, where the presence of several instruments working together and a common purpose are a necessary but not sufficient condition for correct musical performances. Instruments interactions for melody creation depends on their consonance (e.g. the sound vibration they produce has to be compatible with the final purpose) but, to attain effective compatibility, each instrument has to sacrifice a part of its own sound potential in order to achieve a shared and satisfactory outcome.

In other words consonance may be referred as the correct design of a business process in relation with its distribution partners, whereas resonance may be referred to the contractual agreement between the same business and its distribution partners effectively realizing the win–win interaction positively pursuing both parts competitiveness and success. Again, it is like an efficient e-marketplace platform build by a retailer. The marketplace represents a consonance trait, but only when clients, customers and partners effectively adopt the ICT tool resonance takes place for everyone’s benefit. For instance think about the latest model of Personal Digital Assistant (PDA), and how an old business man can approach its use. The attitude is distant, skeptic, and probably the man is not going to use it and valorize its functions. Think about the same ICT tool learning process performed by a charming young woman, skilled and polite, whose role is to explain every PDA function and let the old business man speed up his control over the object. It is very probable that the man is going to get a resonant interaction with the PDA quickly, and this is not at all related to the technical specifics of the tool, but basically to the way effectively the interaction take place. Hence *vSA* postulates decision making coherently with a progressive process of knowledge and informative alignment, in which starting from a distant position of two actors compatibility and informative variety, these get close one to the other in a gradual process of consonance and resonance due to the cognitive harmonization.

Knowledge development processes, in other words, may be initially represented by abductive inferences, later verifiable inductively (see fig. 2). This process may be graphically represented by a curve (the equation is  $y = \delta e^{-\beta x} x^\alpha$ ) in which the possible alternatives of a learning process, hence of a decision making process, are declined for a viable system. On the ordinates entropy is represented, whereas horizontally information flow is shown.

Decision making is affected by information. At early stage of the dialogue, or of the learning process, information is not ordered, is chaotic, is probably insufficient to enable a fully comprehension of the problem (the curve is hence steep, and goes vertically upwards showing an increase of entropy. As information flows, and the learning process effectively takes place, this entropy gradually goes down to lower levels. This is the gradual process that starts from chaos, via abduction passes through complexity and via induction fosters complication, and finally throughout deduction arrives to awareness.

Fig. 2



Source: Barile, 2009

One of the most interesting inferences of this proposal is the rationalization, and consequent management of the decision making process in order to design and look for cognitive alignment. If satisfactory decision making is due to knowledge and informative resonance (Barile, 2008b) between the involved decision makers, hence a deeper look at their value systems, interests and rooted cultural traits has to be attempted. This is true for marketers addressing business communication plans, for business when defining service experiences, for customers' communities when dealing with a firm's proposal, and so on.

#### 4. Contributes to service theories deriving from net theories

As above mentioned network theories are rooted in many disciplines, and being a complexity theory it is based upon many theories in modern natural sciences including chaos theory, autopoiesis (self-organizing systems) and fractal geometry among others. We believe that network theories may enable a better and wider comprehension of service theories, characterizing Many-to-Many and vSA approach and integrating reticular, relational and systemic perspectives within nowadays new service frameworks of S-D logic and SSME.

##### 4.1 Many-to-many, S-D logic and SSME

At an early stage of S-D logic development the role and contribute to SD Logic deriving from networking theories is controversial, as Vargo and Lusch themselves have pointed out. Despite the sure strong connection, in fact, in their first S-D logic proposition they did not state explicit references to networks and relations (Achrol and Kotler, 2006; Gronroos, 2006; Gummesson, 2006). However, as the authors have lately pointed out, "it is not so much that S-D ignores interaction and networks as it deals with them somewhat implicitly" (Vargo and Lusch 2006, p. 285). Furthermore these authors in the new formulation of FP9, which initially stated how "Organizations exist to integrate and transform micro-specialized competences into complex services that are demanded in the marketplace" increase the networking inferences on value creation according to the proposed logic. New FP9, in fact, states that "all social and economic actors are resource integrators" (Vargo and Lusch, 2008), thus implying that the context of value creation is networks of networks (Payne, Storbacka and Frow, 2008; Michel, Stephen and Gallen, 2008).

In order to explain some interesting suggestions deriving from Many to Many to service theories we can now decline several key dimension in each of these, analyzing the concept of resources, relationships and value creation.

As far as Many to Many is concerned, crucial *resources* are represented by information (production and diffusion), knowledge, competencies (Gummesson, 2004), each of them considered

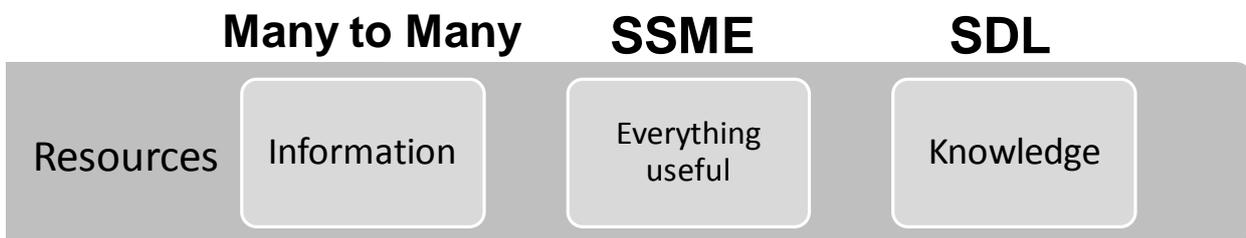
as foundational elements for markets, useful for business strategies and management, as well as for networked system coordination.

For SSME, systems are considered as dynamic configuration of resources (people, technology, organizations and shared information) that create and deliver value between the provider and the customer through service (Spohrer, Maglio, Bailey and Gruhl, 2007). Then in Service Science all actors are considered as a resource, all service tools are considered *useful* instruments for business activities (Polese and Mele, 2009).

In SDL, resources are specialized competences, customers needs, considered all active and operant for *knowledge* improvement and then for business processes (Vargo and Lusch, 2004).

The Many-to-Many contribute to service theories, hence, derives basically from its general consideration about dynamic configurations needed for businesses and for competitive advantage achievement, in line with recent service theories proposals, just like the interpretation as key success factor linked to general *information*, like knowledge, service tools or technology (see fig.3).

Fig. 3



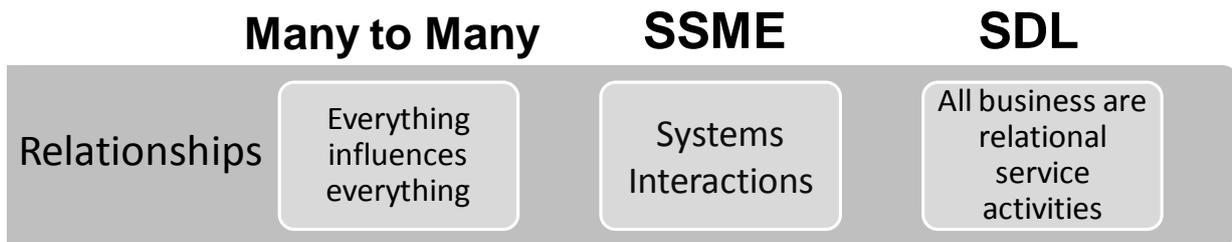
*Source: Our elaboration*

In terms of *relationships*, we observe how networks take precedence over single nodes, since they cannot be reduced to the sum of individual nodes, links and interaction. Networks show that everything is linked with everything and that everything influences everything, offering opportunities but also constraints on individual members and their interactions; networks give rights but also demand obligations. Networks are complex systems in which *everything influences everything* (Gummesson, 2008), identifying many to many relations and what happens between the parties in the relationships is called interaction. These interactions, indeed, take place among businesses as well as customers and they may be activated by both of these independently (Gummesson and Polese, 2009).

In S-D logic, integrated and relational provision service systems must be reinforced by relationships between providers and customers (which are simply the fundamentals actors with which interact, among many others). All business processes are characterized by dialogues, continue interactions, updating; all business are then considerable as *relational service activities*.

Therefore service systems (also in SSME) can be viewed just as networks, in which relations among active *participants* (Alter, 2008) are fundamental elements for sustainable development. Hence all *interacting systems* must be refer to their own environments to implement service provisions. In this sense contributes from Many to Many are determined by the specific vision of nets, in which visible and non visible interactions, common purposes, resource sharing can reinforce system performance and its development opportunities (see fig.4).

Fig. 4



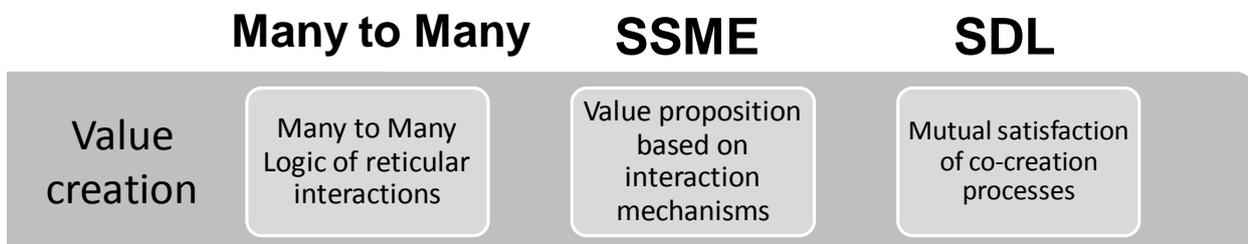
*Source: Our elaboration*

According to network theories, *value* is created in a *many-to-many logic of reticular interactions* strongly affect every activity performed by network's actors, their satisfaction and their competitive behavior.

In Service Science, value creation figures as a *value-proposition-based interaction mechanisms* (Spohrer, Anderson, Pass and Ager, 2008), in which relations between interacting systems, based upon win-win logics, are consciously determined and finalized to a necessary mutual satisfaction (Maglio and Spohrer, 2008a; Spohrer, Vargo, Maglio and Caswell, 2008).

In Service Dominant Logic, historical supply chain was replaced by new *service value networks* (Allee, 2000). Firms have only the opportunity to make their own proposition for market value (value proposition), thus value is not created inside a mere production process reflected in the market sale price (value in exchange), but follows a co-creation process (Vargo and Lusch 2004). Value is then perceived and co-produced by customers, not drawing it directly from the product itself, but by its use, transformation and consumption (value in use) (Vargo and Lusch, 2006), enabling mutual benefits through service (Lusch, Vargo and O'Brien, 2007), allowing then to *mutual satisfaction of co-creation processes* (see fig.5).

Fig. 5



*Source: Our elaboration*

It is hard to find conceptual distinctions, if there are any. The correlations between these theories' interpretation of value concept shows how balanced centrality optic (Gummesson, 2008) nourish win-win logic, collective satisfactions and actors participations, strengthening value co-creation processes effectiveness.

#### 4.2 vSA contributes to S-D Logic and SSME

Main contributes deriving from vSA on emerging service logics can be found in system thinking vision adoptable in all approaches, in terms of value, relationships and systems.

##### 4.2.1 vSA and SSME

As far as SSME is concerned Service involves at least two entities, one applying competence and another integrating the applied competences with other resources and determining benefit (value co-creation), thus defining these interacting entities *service systems*<sup>15</sup>. Moreover, value

<sup>15</sup> See Maglio, Srinivasan, Kreulen and Spohrer, 2006.

depends on the capabilities a system has to survive and accomplish other goals in its environment. Taking advantage of the service another system offers means incorporating improved capabilities. Value can be defined as system improvement in an environment.

Accordingly, the *vSA* as well introduces competitiveness (viability) linking it to the consonant and resonant interactions among systems that share their own resources for the system's benefit in a win-win relationship. Moreover it describes the evolution of the system, hence it can capture the dynamic of its components especially with reference with the variation of consonant and resonant conditions between internal characteristics and external opportunities. Indeed, *vSA* goes beyond that, in the attempt to:

- classify the external over-systems (in order to understand which of them are more critical and influential for business behaviour);
- establish a qualitative method to measure the system capability to satisfactory behaviours (by defining resonance accelerating processes based upon affinity of cultural, knowledge, value and other dimensions).

Also about the agreement between service provider and service client, and more in general about information there are strong contact point between the two scientific proposals.

According to SSME (Maglio and Spohrer, 2008b; Demirkan, Kauffman, Vayghan, Fill, Karagiannis and Maglio, 2008), about agreements we can observe how:

- Negotiation and re-interpretation of information is at the core of meaning-making
- There is not a single window on service delivery performance
- The meaning of information is negotiated in working and organizational relationships
- Negotiating the meaning of IT performance is the ongoing work of client – provider collaboration
- Tools and processes should support the often unacknowledged work of providing “transparent” views – producing good data, deciding what to expose, negotiating meaning (Blomberg, 2008).

In other words we are suggesting that the relation between service provider and service client introduced within service science may be integrated by a methodology that contributes to the qualification of these relations both from a design point of view (designing service systems requires the preventive qualification of relationships among public and private bodies, organizations, individuals) and from a government and management point of view (in order to reach a diffuse satisfactory behaviour capable of promoting value network co-creation. In the interpretation of *vSA* contribute to SSME we can easily note how decision making processes above shown in fig. 2 are perfectly coherent with this service systems' design, in which processes are becoming increasingly more technologically complex and information architectures and infrastructures have attempted to strengthen enterprise computing and system performance (Demirkan and Gaul, 2006), enabling business virtualization and complexity management. Indeed, the informative variety alignment that promotes service systems ability to satisfy co-operant actors, indeed, may be interpreted as the consonant, and after resonant, interaction between two actors that gradually get into harmonic interactions while their knowledge and informative heritage get closer one to the other. The agreements seems to be reached if and only if the actors are capable of cognitive alignment, otherwise they are not going to share a value experience capable of enabling service systems' performances.

Moreover, both SSME and *vSA* deepen the analysis of complexity, recently identifiable as a core topic to discuss about in scientific and epistemological debate today, pervading all disciplines for its cross-cutting content. Complexity reflects, on the one hand, the attention that researchers of different disciplines give to this issue and, on the other, it underlies the contradictions and incongruities related to methodological approaches and studies of disciplines. Thus the complexity concept definition, identifying the variables in its description and the techniques and tools by which it can be investigated, assumes different connotations according to different observed contexts, in

order to decline complexity implications for firm's government in conditions of uncertainty, and the basic formulations of risk assessment and management (Barile, 2009; Golinelli, 2009).

At the same time, according to system thinking and service logics, SSME explores how service value is created in a network context and how the structure and dynamics of the value network as well as customer expectations, influence services ecosystem's complexity (Basole and Rouse, 2008). Service value networks' complexity not only depends on the number of actors but also on the conditional probabilities that these actors are involved in delivering service to the consumer.

In SSME, service systems' typical characterizations and metrics are represented by resilience, speed, and efficiency for *processes* and by complexity, variety, rhythm, and degree in activities for *structures*, both used to describe any work system (Alter, 2008).

Firms must reduce system's complexity to improve their possibilities of success, trying to measure it on the base of the networked system characteristics of a representation, as follows (Basole and Rouse, 2008):

$$C = \sum_{i=1}^T p_{t_i} \sum_{j=1}^N -(p_{n_j|p_{t_i}}) \log(p_{n_j|p_{t_i}}), \quad (1)$$

where T is the number of types of transactions in the network, N is the number of nodes in the network,  $p_{t_i}$  is the probability of a type i transaction,  $p_{n_j|p_{t_i}}$  is the conditional probability that the jth node is involved given the transaction is type i, and the logarithm is to the base 2.

In sum, complexity is a relative concept, never declinable in an absolute sense but only in terms of specific contexts of reference. It refers to the qualitative traits of the observed phenomenon correlating a combination of multiplicities and autonomies with the impossibility of any explanation. Considering perspectives and characteristics of the observer compared, connecting and interactive relationships between events, perceived phenomenon as a single unit interpreted from a holistic point of view, it could be simplified describing networked systems on three parameters: variety (possible variants which a phenomenon may present to the observer), variability (a further variety, which can be observed with the passing of time and which is to be added to the existing one) and indeterminacy (linked to the ability to fully understand a phenomenon) (Barile 2008a; Golinelli, 2009).

#### 4.2.2 vSA and S-D logic

About the role of customer, S-D logic proposes that the customer is a co-producer of service. Marketing is a process of doing things in interaction with the customer. The customer is primarily an operant resource, only functioning occasionally as an operand resource (Vargo and Lusch, 2004). Moreover, the authors continue about the firm-customer interaction, highlighting how the customer is primarily an operant resource, customers being active participants in relational exchanges and co-production (FP6: The Customer is Always a Co-producer).

In this co-creation interaction vSA could support S-D logic for its proposal about consonance and resonance interactions among actors, strengthening value co-creation processes and experiences. Moreover about Vargo & Lusch's Fundamental Premise n.8 (FP8) "A Service-Centered View Is Customer Oriented and Relational Interactivity, integration, customization, and co-production are the hallmarks of a service-centered view and its inherent focus on the customer and the relationship".

How could we ever miss, from the vSA point of view, that this relation is just a part of the dense patterns of a system that relate its behaviour and success possibilities to many other systems with which the system interacts, looking for viable behaviour through consonant and resonant interactions (in the attempt of increasing internal capacities through external resources).

But with the parallel we can go even further. The S-D logic paradigm shift, indeed, proposes

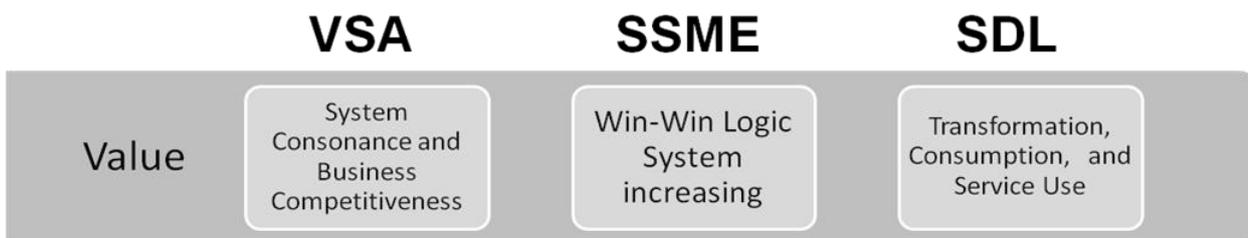
If we look at goods from a manufacturer perspective, in fact, we can identify tangibility, the separation of production and consumption, standardization, and non-perishability as normative qualities (Parasuraman, Zeithaml and Berry, 1985). But these qualities loose significance in the proposed change of perspective, since "standardized goods, produced without consumer

involvement and requiring physical distribution and inventory, not only add to marketing costs but also are often extremely perishable and non responsive to changing consumer needs” (Vargo and Lusch, 2004).

A service-centered view, in recognizing that the consumer is always a co-producer suggests that businesses should try to maximize consumer involvement in the customization to better fit his or her needs. A service-centered perspective points to opportunities for expanding the market by assisting the consumer in the process of specialization and value creation.

In this dynamic interaction the *vSA* contributes to the design and management of positive interactions among actors. What are the key elements of positive interactions between producers (with their offer to the market) and customers (with their needs displayed in their choices)? These elements are not definite, since are characterized by every customer, sometimes can be related to customers’ communities or aggregation, but basically can be changing subjectively shaped; most of all they seem to be strictly personal. How can business perform a competitive offering in such a scenario. They have to look to dynamic models who are based on a multi-criteria decision support systems capable of reaching satisfactory conditions with the involved decision makers, in search of a continuous feedback to production processes in order to align their traits to consumers’ need. This is co-design, co-production, co-creation. This is what *vSA* suggests for introducing business behaviour in search of consonant and resonant interactions among systemic actors.

Fig. 6



*Source: Our elaboration*

But indeed there are even more suggestions for the S-D logic debate deriving from the *vSA*, when this theoretical proposal introduces the concepts of homeostasis<sup>16</sup> and equifinality<sup>17</sup>. The intriguing suggestions, in fact, are connected to the systems ability to look for and foster dynamic satisfactory evolutions absolutely in line with value co-creation processes introduced by S-D logic, that basically refer to a process in which all the actors need to be satisfied in a diffuse win-win interaction. Even about this last concept the *vSA* attempts a contribute since it introduces the concepts of enactment and sensemaking (Weick, 1995) as crucial for the context comprehension and consequent action forwarded to satisfactory processed with stakeholders possessors of critical resources (Barile, 2008a). In a way the *vSA* critical resources owners (represented by critical over-systems) could be well intended as every business potential customer of S-D logic, and though enactment and sensemaking these business could in time learn from customers needs how to fulfil their needs and adopt a more competitive behaviour.

Moreover, the comparison between S-D logic and *vSA* can be deepened referring to the “openness” of investigated systems (*service systems* for S-D logic, *viable systems* for *vSA*), leading to dynamic adaptation on external changes influencing business behaviour.

In *vSA*, system thinking considers a necessary adaptive behaviour for business systems aimed to survival in competitive context; S-D logic as well, starting from equilibrium systems in good dominant, going to dynamic systems in the “transition” logics, defines competitive business as “complex adaptive systems” (Vargo and Lusch, 2008).

<sup>16</sup> The ability of every system to react to external changes and modifications through internal characteristics modification, in order to reach new equilibrated conditions.

<sup>17</sup> The natural tendency of every system to direct itself towards conditions characterized by high levels of satisfaction, independently from initial conditions and the alternative evolutionary paths.

Indeed in *vSA*, looking at the adaptations of firm performances when environmental contingencies occur (Contingency Theory), firms are considered *viable systems* if they are able to survive in a particular context thanks to continual dynamic processes of adaptation through several kind of internal changes (business adaptation, involving relationships and peripheral components of the select structure; business transformation, relating to the organisation design; business restructuring, referring to the organisation plan; business rethinking, concerning the business idea like change of identity) (Golinelli, 2009).

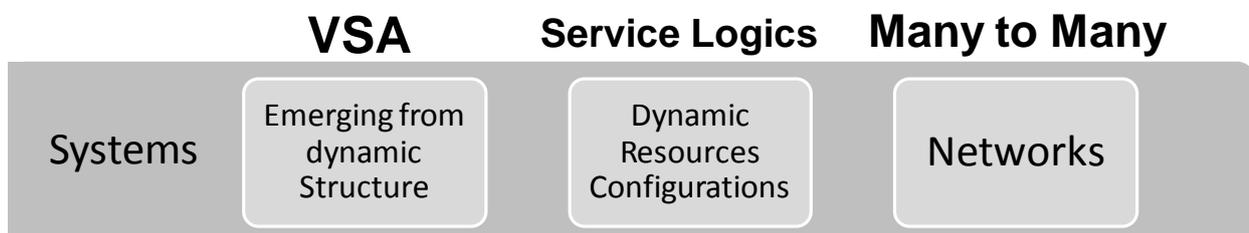
At the same time, in S-D logic, firms performances interpretations lead to dynamic behaviour finalized to gain market share and competitive advantages through necessary adaptations following external changes and stimuli (Vargo and Lusch, 2008). This continuous learning process appears crucial in order to achieve effective positive results: changes should be constantly monitored and evaluated, in order to let cumulative technological knowledge growth happen and produce positive lock in effects. Complex innovation processes need constant priority and attention since in time there is a strong need to re-orient the needs and the tasks/objectives due to both internal emerging constraints and to exogenous opportunities, ideas, innovations. For these reasons service innovation (for both service logics and system thinking) derives from co-operating technological aspects along with social and organizational relations, together with business and market interactions.

### 5. Conclusions

In sum we can observe how strong the connections are between the discussed theories in which many basilar elements are the same, or at least compatible one with the other.

Goods, for instance, may be intended as a structural dimension, related to consonance since it could represent a possible positive interaction between provider and customer. On the other hand service may be intended as a systemic dimension, related to resonance since it represent the effective positive interactions between service provider and customer.

Fig. 7



*Source: Our elaboration*

Many to Many, as well as the Viable System Approach could then be supportive and helpful for the accomplishment of S-D logic and SSME proposals, for them being foundational theories based upon system thinking, value co-creation, networking culture.

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