Service Dominant Logic in the co-creation of value in environmental hygiene services

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Purpose
To introduce S-D Logic and networks and their business implications with value co-creation processes.

Methodology
The paper begins with a deepening of S-D Logic, recent network theories and value co-creation optics, then tries to verify the validity of its findings with an empirical application to the environmental hygiene services.

Findings
In order to strengthen business ability to build and keep relationship with other systems and resources owners', S-D Logic and networking culture may show competitive strategies for effective value co-creation.

Research implications
For researchers to see how S-D Logic has not only marketing implications but managerial and strategical inferences as well.
For practitioners to couple S-D Logic and network theories in order to identify performing competitive strategies.

Originality/Value of the paper
The paper introduced and focuses on S-D Logic and network strategies from a managerial point of view.

Keywords: Service Dominant Logic, Service Networks, Value Co-creation, environmental hygiene services.

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Abstract

The need to guide the action of environmental hygiene companies towards the objectives of a new normative and legislative constraints is one of the main points on which the huge transformation process in relations traditionally held with internal and external individuals is based.

This requires the re-design, for the next few years, of the management system of environmental hygiene services from prevention right through to the entire life cycle of the resource of materials, its extraction, from the finished product right through to waste and the RI products considering best possible solutions.

The trend lies in favouring the instrument of assessment of the life cycle of processes and products, developing eco design and industrial ecology solutions, to the advantage of a production of eco-compatible goods, increasing the instruments of approval of this system through systematic environmental control, risk analysis, LCA-LCI, the development of environmental and product certifications.

The hypothesis subject to control in this contribution is that transposition of the S-D-logic paradigm for environmental hygiene services is capable of achieving the objectives in question.

In particular, this seems possible due to the concepts of co-creation of value, relational approach and reticular structures as vital elements for the competitive advantage in this area of business.

[1] Although the contribution as a whole was a joint effort, paragraphs 1 and 4 were by Raffaele Trequattrini and paragraphs 2 and 3 by Giuseppe Russo.

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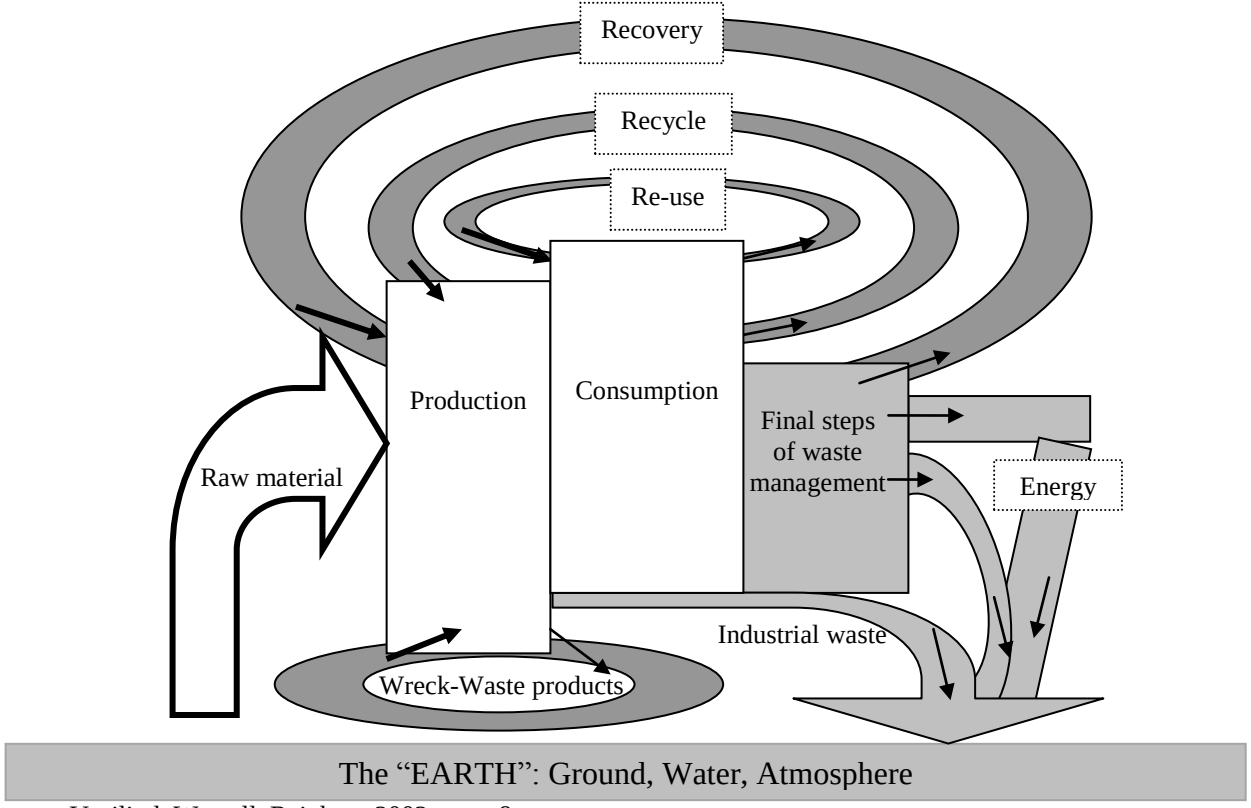
1. Environmental hygiene services and sustainable development

Waste disposal and associated environmental hygiene services began to emerge as a problem with the onset of the industrial revolution[4], although the actual nature of the issue changed over time.
In the agricultural world, the word "refuse" (rubbish) was of no significance, as all waste products were re-used in other contexts.[5]. In this context, which can be called an ecological context, nothing is thrown away, or better still, everything is re-used.
Modern industrial production floods the market with products containing chemicals and chemical formulations; when they are disposed of, they can't be re-used as they are, i.e. appropriate recycling processes are required (Figure 1).
In this context, ideological differences of the past must give way to a more pragmatic and constructive debate.

[4] In this regard, see AA. VV., *I rifiuti nel XXI secolo, il caso Italia tra Europa e Mediterraneo,* Edizioni Ambiente, Milano, 1999.

[5] In general, we tend to get rid of things which are of no economic value to us. In fact, products made of precious metals, even though they are not degradable, do not cause pollution as even when they are disposed of, they always have a high enough value not to be dumped in the environment (Ecodeco S.p.A 1993). This means that pollution is nothing other than the dumping in the wrong place of a resource (C. MIO, 2001) perceived to be worthless. As such, the "refuse problem" exists only because no economic value can be attributed. Indeed, whilst raw materials, semi-manufactured goods and finished products are carefully guarded on the basis of their perceived value, waste products are disposed of on account of the potential cost they represent for their owners to have them "handled" correctly. Hence, the challenge facing the 21st century is to attribute a value to refust, just like in agricultural communities, where waste products represent a useable (and used) resource in other processes.

Figure 1: The use and disuse of materials and waste



Source: Vesilind, Worrell, Reinhart, 2002, page 8

The problem of waste and associated management of environmental hygiene requires a huge cultural change, and challenges operators and the population[6] to develop systems which are a radical departure from those of the past.
To address this problem, the best option seems to be, as happens in most European countries, to adhere to the following list of priorities: reduce and limit waste at source, re-use, recycle, energy recovery, send waste to landfill. Ultimately, this means introducing appropriate integrated waste management policies.
Integrated management, social awareness, re-organisation and upgrading of options provided seem to be the way forward in order to tackle the current emergency, although the success of these actions depends on the value created from the aforesaid waste management.
It must also be mentioned that this value depends on a number of moral considerations.[7]. If the generation of wealth does in fact mean the generation of wellbeing as well, managing environmental hygiene services without due consideration to the adverse effect its ineffectiveness can have on people (e.g. destroying natural resources, pollution, etc.) means that it will not in fact generate wealth[8]. In other

[6] Opposition posed by the population seems to be unrelated to the type of treatment plant considered, and to the theoretical suitability of the area (for example, the absorbency of the land does not influence opposition to landfill sites). Opposition in Italy appears to be linked primarily to distrust of institutions in charge of monitoring installations perceived to be potentially dangerous, in the same way as occurred for power plants. The opposition of local communities tends to be focused where there is a perceived imbalance between costs and the risk to the local community, and the benefits to a much wider population. (ASCARI, S., 1992).

[7] According to modern philosophical debate (H. Jonas, 1990), the moral code must be re-interpreted in light of the radical changes to man's ability to act in the technological age. In practice, the principle of individual responsibility obliges modern generations to limit their demands in order to guarantee a future in which human life is still possible.

8 A well-known doctrine (G. Zanda, 2006) defines as irresponsible any business that "excludes respect for the environment, for the local community, and for the health and needs of its employees, the nation, for its suppliers etc. from its decision-making processes"

words, any increase in business assets that causes a net detriment to collective assets and therefore also lowering the quality of life for people immediately and in the long-term, cannot be considered to any extent a real increase[9].

It follows that the value (wellbeing) is created through the management of environmental hygiene when it becomes as integrated as possible (increase of the degree of refuse recycled); by re-using raw materials and saving energy, this helps to create greater wellbeing compared with disposal in landfill sites or in waste-to-energy plants.

It is evident that economic, social and environmental sustainability are not achievable in absolute terms because goods cannot be produced at zero cost (absolute economic sustainability), i.e. fulfilling the needs and requirements of all stakeholders including manufacturers, customers, the local community, users etc. (absolute social sustainability). In a similar vein, at the current state of technological development, it also seems impossible to prevent any affect on nature (absolute environmental sustainability).

It can be concluded then, that the way to achieve sustainable development is the constant pursuit of continuous improvement in a push to get closer and closer to it.

This said, it is also certain that the effective management of environmental hygiene services requires synergic and far-reaching actions involving and making responsible all individuals and bodies involved in the refuse chain (*network*).

In this context, a relationship marketing approach may be useful (Gummesson, 1993) based on *network-type systems* [10], and identification at the same time of *network* actors and relative processes to create value in the S-D-Logic approach, which considers each participant as a dynamic, operand and operant resources (Vargo, Lusch,

[9] Cf. G. Catturi, 1990

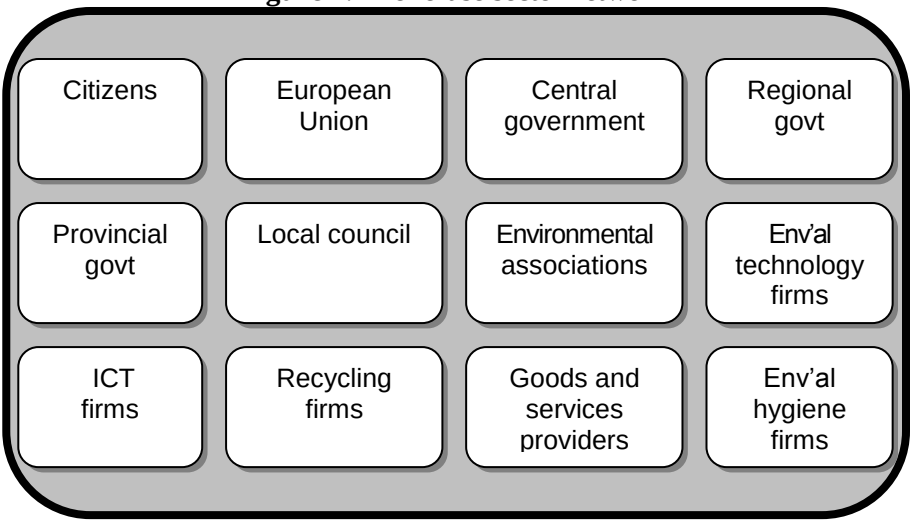
[10] Much has been written on the subject, the most prominent of which are the thoughts of Richardson, 1972; Burt, 1982, Jarrillo, 1988, Hakansson, Snehota, 1995, Rust, 2004; Hakansson, Ostberg, 1975; Samara, Biggiero, 2001; Barbarasi, 2002; Frels, Shervani, Srivastava, 2003; Capra, 2002, Gulati, 1998; Castells 1996.

2004 a-b).

2. Networks and co-creation of value in environmental hygiene services

In recent years, waste management using an integrated system of environmental hygiene services has taken on an increasingly important social and economic role, which has had an enormous effect on businesses. In practice, it is no longer a marginal activity "hidden" from public view, having become over a short period of time, an activity of fundamental importance for the overcoming of environmental, health and social emergencies that have already or will emerge in the future (Marelli A., 2005).
The ecosystem of the aforesaid services involves a number of actors who are influenced by external economic, political and social factors.
In this case in particular, the researcher was faced with a *service system* (Maglio, Spohner, 2008) for which the various components on a global scale making up the *network* need to be defined (Fig. 2).
Within this network, all stakeholders (*customers*, service providers and enablers, etc.) play an active part as dynamic, operand and operant resources in the value creation process (Vargo, Lusch 2004b).
The *network* illustrated in Figure 2 is structured therefore as a system of interdependent functional entities (Golinelli, 2005 and 2008; Barile, 2008), which together help to tackle the environmental complexity with a star-type model capable of finding the value in modernity and the contributions of multiple actors in the value creation process rather than sequential and transactional systems.

Figure 2: The refuse sector network



Local authorities, firms engaged to provided environmental hygiene services and citizens play a fundamental role in this *network.*

In fact, local authorities are given roles, functions, competences and responsibilities by various bodies (European Union, central government, regional and provincial councils) responsible for waste management. Local authorities have a strategic role to play as the regulating body of all parts of the service provision process as well as overseeing it. It represents a preferential institutional body in relationships with environmental hygiene firms engaged to provide the relative services.

Firms working in the environmental services sector are responsible for the operating management of the service, and therefore also for how effective, efficient and cost-effective the services and activities carried out are.

In the "waste economy" citizens have a crucial role as the meeting point of demand and supply: on the one hand they are actors requiring a service, and on the other, they participate in the co-production of the raw material the service is based on. In this role, they affect both the

generation of refuse (determining quantities and types of refuse) and the way environmental hygiene firms deal with it, taking part in the complex *feedback* mechanisms that link local councils, environmental hygiene companies and citizens.

Institutional bodies (EU, central government, regional and provincial councils) have the task of regulating the sector by issuing the required regulations.

In such a complex environment, creating value proves difficult to achieve and to quantify, also because of the many needs of the various *stakeholders* which are often extremely different and very difficult to combine.

Local authorities and, first and foremost, town/city councils, need to ensure waste is collected to keep streets and public spaces clean and free of eyesores, and need to do it as effectively, efficiently, and economically as possible, bearing in mind that local councillors also need to keep TARSU taxes down and not overburden citizens in order to maintain their political reputations. At the same time, they have to make sure these activities are carried out in an economically, environmentally and socially sustainable way, since if this is not the case, they will then find themselves burdened with economic, environmental and social costs which could completely offset any economic value generated in the first stage of the service provision.

Environmental hygiene firms are restricted in what they can do by the constraints imposed by the local authority, they have to tackle practical problems whilst always looking to maximise profit and guarantee the quality *standards* required by the local council at the same time with the resources they have available... This all happens to the detriment of the essential role played by bodies developing technological and operating innovations in an aim to raise the economic, environmental and social service standards, and which could be implemented by investing and working with the various actors in the *network* concerned.

The recycling sector steers the new integrated management system as it

attributes an economic value to the waste products that form the basis of their transformation processes (re-products or secondary raw materials, etc.) Nevertheless, this is not a common role as even though it may promote integrated waste management by giving waste a value, it owes its own existence to the ability of the environmental hygiene services management system to collect and separate waste (resources) in a way that suits recycling requirements.

Besides, the increase in consumption and expansion of a throw-away culture, which is the main cause of the current waste crisis, makes it equally difficult to reduce waste at source. In attempt to reconcile the needs of manufacturers (increase sales) and consumers (increasingly satisfy needs with increasingly customised products), new tools to improve environmental *performance* and relative sustainability are emerging (e.g. valuation of the life cycle of processes and products, development of *eco-design* solutions, and an industrial economy that encourages the production of ecological goods, integrated systems of environmental monitoring, risk analysis models, LCA/LCI, etc.).

In this context and with regards to environmental hygiene services, citizens exhibit interests and multiple needs that are not always reconcilable; on the one hand, citizens want clean streets and no waste in the town where they live whilst on the other, they want the problem to be resolved with the lowest financial burden to them possible. In short, citizens are increasingly aware of environmental issues, but at the same time, they are less and less willing to play a part in making them better (reducing consumption, using fewer disposable goods, using less polluting goods, etc.).
It has to be pointed out that citizens have a critical role to play even before waste is ever generated, i.e. in prevention, purchasing ecological goods, separating household waste, and making it available on different days and in different ways depending on the needs of the firm in charge of waste collection. By contrary, citizens often do not play enough of a role, especially because some of the aforementioned activities are perceived as tiresome and not sufficiently rewarded or encouraged.
In practice, citizens do not attribute the right value to these activities

(investment or missing costs that society will have to incur at a later date in relation to pollution) in terms of improving the quality of the environment they live in.
It should be underlined that the creation of value in the waste sector is also affected by external factors such as the geomorphologic nature of the land, which often underpin the different *performances* achieved by operators in the field.

The environmental culture of stakeholders in the *network* plays a big part. The absence of an environmental, information and communication *"culture"* as regards waste is a constraint to the implementation of a rational and efficient management of services. Making society aware about the problem of refuse, re-defining the information available using all types of media, would probably help change the "culture" of consumers, and with clear positive repercussions on the co-production of the service.

On this basis, it is clear that the "refuse problem" has to be dealt with in a *service value network context* (Allee, 2000) and with a view to sustainable ecological development. [11].
Value can only be generated by the different actors in the system, working together as a *service system*, and in this particular case, production goes through the following stages:
- the ability to exploit functional interdependences that increase relations between the various actors (Richardson, 1972);
- exploitation of social, political and economic interaction between the various bodies (Samarra, Biggiero, 2001);
- the opportunity to focus on each other's *core competenc*es to fill any knowledge *gaps*;
- the best allocation of resources (Frels, Shervani, Srivastava, 2003);
- the benefit of cooperation (Kanter 1994);

[11] One of the earliest definitions of sustainable development highlighted the need to monitor relations between living conditions for present and future generations. Hence, sustainable development can be defined as: “development which meets the needs of the present, without compromising the ability of future generations to meet their own need” (WCED, 1987).

- mutual alliances and strategies (Capra, 2002; Gulati, 1998; Castells 1996).

3. The contribution of S-D-Logic to environmental hygiene services

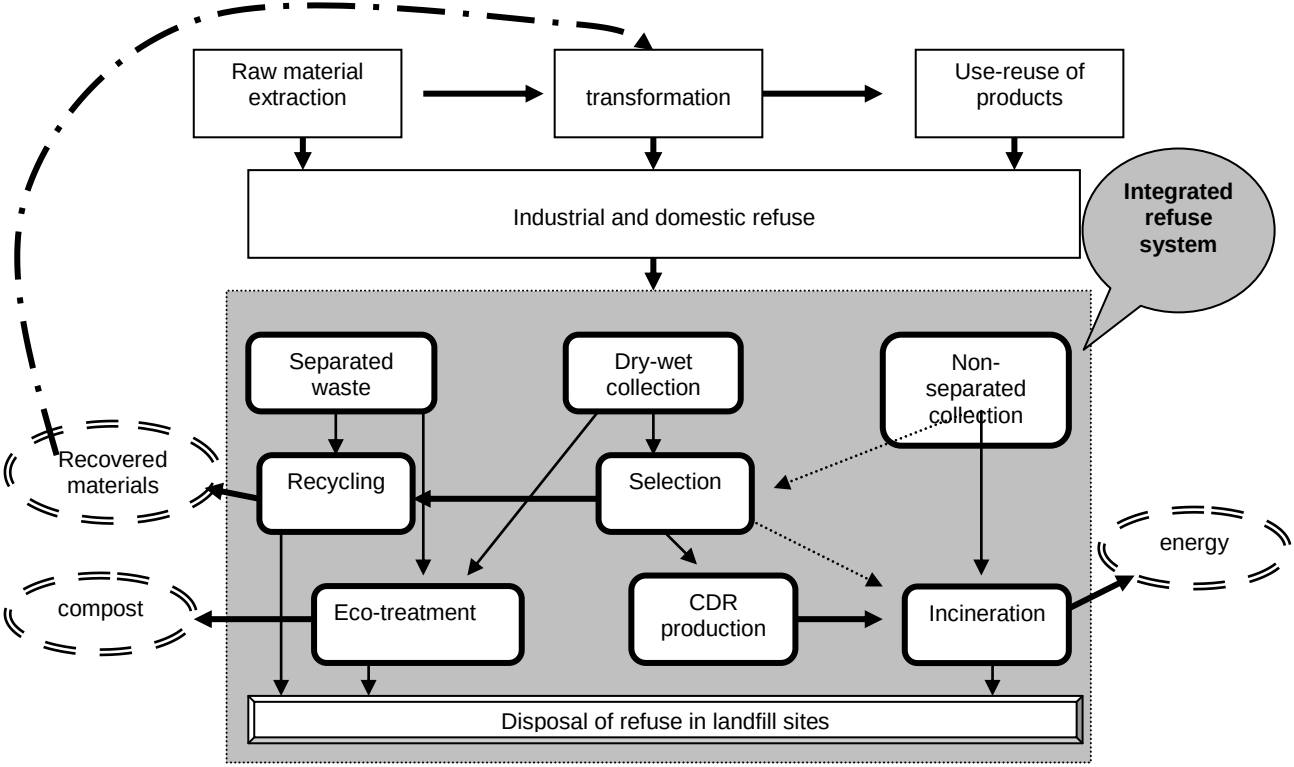
Refuse collection and disposal services are an obligatory public and not individual service and cannot be suspended; they are a public utility that local/central government specifically identifies with associated legislative measures to ensure the provision and control of the service, thereby guaranteeing the needs and requirements of users and supplying a public utility.

Refuse collection and disposal (Figure 3) means a series of services which in turn become public services, i.e. activities in favour of citizens, by way of the social, economic, political and legislative process they go through, in which the particular characteristics and attributes are identified.

In view of the above, it is understandable that services that are part of the "refuse problem" need reviewing from an integrated perspective: one-off solutions, even when successful, do not provide an adequate enough response to the problem.

This is the purpose of Figure 3 which presents the concept of waste not as a last ring in the consumer chain but as a starting point for new manufacturing cycles that exploit internal potential.

Figure 3: Integrated waste system with activities from the manufacturing, consumption, recovery and disposal chain.



Source: Marelli A. 2005

It is clear that in the environmental hygiene services sector there is a strong need for the co-creation of value, for a relationship marketing approach and a network-based structure, to be seen in the same way as other elements which are essential to being competitive.

The value of environmental hygiene services in the waste *network* is jointly created from the cooperation of various stakeholders and *partners*.

Citizens-users participate with a variety of actions in the creation of value. Purchasing habits have an enormous effect on the evolution of the recycling sector and secondary raw materials, given that the use of recycled products or products made from secondary raw materials are a stimulus for the recycling sector and associated integrated management. In waste collection, users are an independent variable for environmental hygiene firms, affecting the quality of service. The *performance* of the type of waste collection method used depends on the correct co-participation of users in the relative service. Separating waste encourages citizens to play an active part and promotes organisational innovation, whilst recycling that takes place after waste has been separate does not require the active participation of citizens and favours innovation in waste treatment plants. There is a definite social value (for society) in increasing the tendency to separate waste, even if it will not be immediately perceptible either directly or indirectly by users, as the benefit of increasing the amount of separated waste lies primarily in the reduction to a bare minimum in the amount of waste that ends up in landfill sites, with obvious advantages in terms of the reduced environmental impact as well. In this context, there are also economic benefits for the environmental hygiene firm when waste is separated, as the cost of collecting waste increases, the cost of disposing of it in landfill sites decreases. Finally, the correct organisation of waste collection underpins the creation and development of socio-economic value, as it makes it possible to:

- Recover raw materials from waste collected (glass, paper, aluminium, batteries, pharmaceuticals, plastic, etc.) with association reduction in the amount of waste to be disposed of.

- Organise the service properly, especially in terms of compliance with quality *standards* enforced by users.
- Increase the earnings of environmental hygiene firms (revenues from the sale of waste collected and lower disposal costs) and the social utility for society in general (less pollution, energy saving, and less wasted resources).
- Not have to extract raw materials. The mining industry is renowned for generating waste, as well as creating other forms of environmental pollution.
- *Improve the economic, environmental and social outcomes* of composting, waste-to-energy and landfill disposal.

In the value creation process, environmental hygiene firms are highly dependent of a multitude of bodies. The role citizens play has already been mentioned, i.e. their co-production potential in the collection of waste, and what an enormous effect it can have on the entire waste processing chain. The way waste is collected, the financial resources available, and the relative technologies to be implemented are determined by the local council, in the same way as central government and European Union directives. The value of separated waste services is influenced by the potential market use of the materials collected (presence of recycling firms). At the same time, the development and survival of firms in the recycling sector depends on the system's ability to collect and separate materials (plastic, glass, paper, toner, aluminium, etc.) that are of an adequate quality for the recycling processes, and sufficient quantity to guarantee the aforementioned firms the required economies of scale. The effectiveness and efficiency of waste collection are also affected by the presence of an integrated waste treatment infrastructure (e.g. recycling and composting, waste-to-energy, landfill sites, etc.). Finally, the value generated by the aforementioned infrastructures is subordinate to the *performance* of the waste collection system in terms of the quantitative results (raw material to be used in manufacturing process) needed to achieve the relative economies of scale, and qualitative results (quality of the raw material fed into the manufacturing process), which are often decisive also for legal

compliance purposes (the incorrect collection, separation or pre-treatment of substances contained in the waste treated make some treatment processes impossible). In this context, the value produced by the environmental hygiene firm itself can be traced to a large extent to its overall organisational skills (technologies, human resources, etc.) and the effectiveness and efficiency of operating activities carried out in supplying the environmental hygiene service.

Firms producing goods and services contribute to the creation of value in the *network* analysed through their ability to:

- Generate secondary raw materials for manufacturing processes. This possibility depends however on the quality of the secondary raw materials generated by recycling firms.
- Introduce product and process innovation to improve relative environmental *performance*.

Based on the above, it can be stated that, in providing environmental hygiene services, the bodies analysed generate a benefit in terms of the S-D-Logic paradigm (Vargo, Lusch, 2004) for themselves and for third parties, either directly or indirectly related.

These principles fully reflect the vision of the service.

Table 1: Foundational Premises of S-D Logic

FP	Key elements S-D Logic	Proposed deductions	In environmental hygiene services
FP 1	Service is the fundamental basis of exchange	The application of operant resources (knowledge and skills), "service," as defined in S-D logic, is the basis for all exchange. Service is exchanged for service	Environmental hygiene services are perfectly compatible with this principle in that the collection, recovery or disposal of waste is exchanged for the service to safeguard public health and the natural environment.
FP 2	Indirect exchange masks the fundamental basic of exchange	Because service is provided through complex combinations of goods, money, and institutions, the service basis of exchange is not always apparent	The actual underlying principle of the exchange is inherent in the pursuit of sustainable development and is unrelated to the values assigned to the management of environmental hygiene services.
FP 3	Goods are a distribution mechanism for service provision	Goods (both durable and non-durable) derive their value through use – the service they provide	In a sector in which the asset (waste) rarely has any intrinsic value, the service regulating the mechanism of exchange takes on strategic importance.
FP 4	Operant resources are the fundamental source of competitive advantage	The comparative ability to cause desired change drives competition	Technical know-how and innovation are the basis of each stage of the management of services (e.g. LCA, LCI, eco-design, ecological culture, process and product innovation, new waste collection machinery, new technologies for the recovery and disposal stages, new communication and public awareness techniques, etc.)
FP 5	All economies are service economies	Service (singular) is only now becoming more apparent with increased specialization and outsourcing	Being by nature public services of public utility, a service logic always applies.
FP 6	The customer is always a co-creator of value	Implies value creation is interactional	As regards environmental hygiene services, values can't be assigned to a part of the waste management process until after it has been completed (e.g. the value of waste collection-separation can only be assigned by the subsequent recycling service - the production of secondary raw materials or re-worked products - or by disposal services (incineration, waste-to-energy, landfill sites, etc.).

Continued Table 1

FP	Key elements S-D Logic	Proposed deductions	In environmental hygiene services
FP 7	The enterprise cannot deliver value, but only offer value propositions	Enterprises can offer their applied resources for value creation and collaboratively (interactively) create value following acceptance of value propositions, but can not create and/or deliver value independently	This statement is perfectly suited to the waste sector insomuch as the value is always determined by the end user (e.g. the recycling firm decides the value of separated waste products collected, etc.)
FP 8	A service-centered view is inherently customer oriented and relational	Because service is defined in terms of customer-determined benefit and co-created it is inherently customer oriented and relational	As regards environmental hygiene services, the various customers (citizens, recycling firms, waste treatment plants, etc.) are not consumers or destroyers of value, but active participants in the production process (prosumers).
FP 9	All social and economic actors are resource integrators	Implies the context of value creation is networks of networks (resource integrators)	To create value, all network operators need to integrate the competences and activities of other stakeholders (e.g. the integration between the collection, recovery, production of secondary raw materials, production of re-products, etc. for instance)
FP 10	Value is always uniquely and phenomenologically determined by the beneficiary	Value is idiosyncratic, experiential, contextual, and meaning laden	The value of all activities making up environmental hygiene services is always determined by the end beneficiary (the waste collected in the separated/non-separated waste stage can form the input of various other processes and stages (recovery, recycling, composting, incineration, waste-to-energy, landfill disposal and hence create value at different levels).

Source: adapted from Vargo, Lusch, 2004a; Lusch, Vargo, 2006b.

Dominant Logic (See Table 1) that validates the importance for firms and society in general of the innate sense/need to "do something" for and most importantly with other parties (Polese F., Carrubo L., 2008).

In this specific area of activity, co-participation becomes an essential factor in the creation of value as the inadequate contribution of various actors in the production process restricts the relative potential to create value of individual actors in the *network*.

As proven also by S-D Logic, if actors in the value creation process are not making their essential contribution, it will not only be difficult to determine exactly the value generated by a given offer, but you could also end up creating a "service-product" of no value.

4. Final thoughts and future research

In this article, it has been highlighted how S-D-Logic could be a very effective theoretical approach to analysing the development and competitive upgrading of environmental hygiene services in the refuse sector, insomuch as the foundational premises of this paradigm are to a great extent consistent with the morphological characteristics of the sector concerned.

In any case, these initial considerations are not felt to be conclusive as more detailed study of the link between the foundational premises of the emerging Service Dominant Logic and the interpretation of the potential evolution of environmental hygiene services is required.

In particular, studies looking at quantifying the contribution of each stakeholder in the value creation process may prove useful, and could also encourage the right kind of co-operation-oriented behaviour.

Nevertheless, generally speaking, it seems reasonable to conclude that this theoretical approach correctly interprets the difficult management aspects of the macro-sector concerned which are related, in part, to the nature of the service offered. It appears to be able to accurately illustrate that expectations, quality standards, perceptions, the need to

build relations and the possible strategies of firms can in fact be connected to a service logic with resultant impact on the market structure and innovation in the sector.

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