Innovation in services and the attendant old and new myths

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INNOVATION IN SERVICES AND THE ATTENDANT OLD AND NEW MYTHS[i]

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Abstract:

Although service activities now account for the greater share of wealth and employment in developed economies, they are still perceived negatively. Once described as residual activities characterised by low productivity, low capital intensity and low skill levels, they are now regarded as lacking in innovative capacity. This article examines these myths and their origins. Innovation in services exists, although it has to be accepted that it may possibly take different forms and be organised differently. Nevertheless, against a background of convergence between a manufacturing sector that is becoming increasingly service-oriented and a service sector that is gradually becoming industrialised, it would be wrong to conclude that there is an irreconcilable opposition between goods and services when it comes to innovation; rather, there are opportunities for mutual enrichment.

INTRODUCTION

In many ways, thinking on services resembles the strivings of the sultan of the fable, who persisted in looking for the keys to his palace under a lantern and not where he had lost them.

It is economic theory that takes the place of the lantern here. This lantern, which for a long time shed light (and a good deal of illumination as well) on our economies, with their roots in agriculture and manufacturing, leaves the service sector in darkness. Thus services constitute the dark side of the economy and of economic theory. Like the medieval forest, it is a dangerous place to venture into. It is the troubling world of myths and legends: a residual world, a "third world", that of the intangible and inexpressible. Its inhabitants are unproductive and estranged (Smith, 1960 ; Marx, 1974): it is the world of priests and "servants" , an unchanging universe, resistant to innovation.

Services now account for more than seventy percent of employment and GDP in most developed countries. As a result, the lantern of economic theory now casts its beam

on only 30% of economic activity, thereby condemning the essential source of jobs and wealth in all developed countries to languish in darkness. Furthermore, the edge of the forest is no longer clearly defined. The world of manufacturing is increasingly inhabited by creatures of darkness and that of services by tangible entities.

The purpose of this article is to investigate some of the myths about services and innovation in services[ii]. The second group are derived to a large extent from the first. What is clear even before we begin is that any researcher as any sultan wishing "to find the key" has no choice but to move his lantern in order to cast his light on the object of his research.

1. SERVICES: THE DARK SIDE OF THE ECONOMY?

According to this first generic myth, which has its roots among the founders of political economy, the service sector is the dark side of the economy, the one that is of little if any interest and that the lantern of economic theory can do little to illuminate. It is said to be a world inhabited by shadows, by incorporeal entities ("intangible products"), by frequently servile individuals who evade the traditional economic tools (productivity) or, more precisely, perform miserably when measured by them or do not even deserve to be taken into consideration by them. It is the world of those who are said to produce nothing (useful): in former times, that of priests and of servants, today that of pizza delivery services and "hot-air salesmen": consultants … and professors. This world of night, of darkness and shadows, is said to constitute a permanent danger for the world of day, which it seeks or helps to smother. This danger has a name: deindustrialisation.

1.1 The myth of the residual sector

In this respect, economists have adopted the same attitude as the primitive peoples described by anthropologists. For an economic theory that had its roots in agriculture and manufacturing, services could only be defined as "that which is neither agriculture nor manufacturing" (Fisher, 1935, Clark, 1940). Thus the world of those who produce (men or free men) was opposed to the "rest": that of those "who produce nothing" (the non-humans).

Thus everything located beyond the light shed by the lantern was termed residual. Other descriptions were used to supplement this one: services were said to be "peripheral", while goods were the "driving forces" in the economy (Cohen and Zysman, 1987). They were described as pathological, as malign cells that tended to proliferate and smother a hypertrophied metabolism (Attali, 1981). They were accused of being responsible for the economic crisis since the seventies (Aglietta and Brender, 1984 ; Lorenzi, Pastré, Toledano, 1980). Bacon and Eltis' diagnosis (1978) is that there are « Too few producers »

As is so often the case, it then became necessary to construct, a posteriori, an argument to justify this condemnation. As with many of the great conquests in human history, it was necessary to legitimate the bad treatment meted out to the "vanquished" (i.e. services), by using criteria derived from (frequently) provisional findings to erect a theory, which was subsequently elevated to the status of a natural law. These

justifications were essentially observations that threw a negative light on services (compared with manufacturing). Thus services were characterised as the world of "that which is not …" (productive, capital-intensive, innovative …). Like all myths, the ones thus forged have proved durable, even if they are refuted by the facts.

1.2 The myths of low productivity and low capital intensity

These two myths are closely linked. Services have long been thought to be characterised by low capital intensity, in that they do not require the construction of factories and large-scale production lines. They are also said to be characterised by low productivity (Clark, 1940, Fourastié, 1949), a low productivity that may lead to a « cost-disease » (Baumol et al., 1989). The (increasing) introduction of technical systems into service activities has done little to change this perception. Indeed, services are allegedly suffering from a new syndrome, namely Solow's paradox, in which an increase in technical change is said to be accompanied by a simultaneous stagnation of productivity.

Studies by Kutscher and Mark (1983) and then Roach (1988) in the United States helped to refute this myth of the low capital intensity of services. Some of these service activities have for a long time been closely linked to heavy technologies (transport of fluids and commodities: energy provision, air, rail and road transport services), while others are now acknowledged as the main users of information and telecommunications technologies (codified data processing services: banking, insurance, etc.). As far as low productivity and Solow's paradox are concerned, it may very well be that it is our instruments of measurement that are at fault. Our definitions of productivity were developed in and for the world of manufacturing (Gadrey 1994, 1996a ; Gadrey, Noyelle and Stanback, 1992). They are unable to take account of those incorporeal creatures that inhabit the "services forest", beyond the pale of the light cast by conventional economic theory.

Paradoxically, some studies acknowledge the role of technologies in services only to sound the death knell of the "service society" and replace it with a "self-service" society, in which consumers reject market services in favour of domestic production based on a technological system. For Gershuny (1978) and Gershuny and Miles (1983), technology and material artefacts (cars, washing machines, televisions etc., currently already, but to an even greater extent, in the future, computer-assisted teaching and medical diagnosis) make it possible to rescue some activities (public transport, laundries, cinemas, educational and medical services…) from obscurity and subject them to scrutiny under the lantern of economic theory. This use of technological systems in the domestic sphere is, paradoxically, christened "social innovation".

1.3 A society of servants or a society of engineers?

This is the myth that service activities do indeed create jobs but that those jobs are deskilled. At best, workers in such activities are the "servants" of machines (standardised recording tasks), at worst they are the "servants" of other people, as intolerably servile as villeins under the feudal system. Thus from this point of view, the service society is « a hamburger society », a « bad jobs society » or a "society of

servants" (Bluestone and Harrison, 1986 ; Cohen and Zysman, 1987 ; Gorz, 1988 ; Thurow, 1989), in which the new aristocracy armed with service cheques subjugate their fellow creatures by offering them low-grade domestic jobs. Again, this is a myth that has its idyllic counterpart, namely the myth of the "post-industrial society" (Bell, 1973). In accordance with Engel's law, post-industrial society allegedly constitutes a new stage in human progress, based on the production and consumption of services and the pre-eminence of a higher, white-collar tertiary sector. In reality, while it is true that the service society creates low-skill jobs, it is equally true that it is now the principal employer of managers, engineers and other professionals (who form the bulk of recruits in "high-level" services). Severall studies clearly display that from now onwards jobs are on average more qualified in service industries than in manufacturing (Noyelle, 1986; Gadrey, 1996a).

2. THE MYTH OF THE SPECIFICITY OF SERVICES?

The "general" or "macroeconomic" myths outlined above are nourished by the idea that services are intrinsically "different" (from manufacturing). This is to some extent true. In reality, however, the situation is much less clear-cut. Let us examine briefly what it is that constitutes the (relative) specificity of services.

Once it is manufactured, a good usually acquires an autonomous physical existence. It enjoys a high level of exteriority vis-à-vis the person who made it and the person who is going to consume it.[iii] Services are, in general, intangible (Smith, 1952; Marshall, 1960) and do not possess that quality of exteriority. They are consubstantial with those producing them and with those consuming them: they cannot be held in stock (Stanback, 1979). They seldom exist outside of these individuals. They are not a given outcome, but rather an act or a process. By developing the metaphor of the "service triangle", Gadrey (1996b) following Hill (1977) has helped to bring into widespread use the definition of a service as a set of processing operations carried out by a provider (B) on behalf of a client (A) in a medium (C) held by A and intended to bring about a change in the medium C.

Most of the difficulties outlined below are linked. Nevertheless, they are presented separately in order to facilitate analysis and to allow slight differences to be taken into account.

2.1 The problems of product standardisation

In service activities, the "product" is not always completely "formatted" or codified, i.e. precisely defined in advance of being delivered. However, this is also true in a way of some custom-made material goods: spectacles, for example, are usually made to a set of highly personal specifications.

Each service transaction is in a way unique since it is produced *interactively* with clients, in response to particular (non-standardisable) problems they have and in an environment that is always different. Of course, this infinite diversity of possible forms taken by the "product" in response to the wide variety of customer needs should not be confused with the particular variation known as innovation. The first is

random, ephemeral and unintentional, while the second is generally intentional. It lies above the threshold of visibility and can be isolated. In sum, it adds to system variety.

2.2 A product that manifests itself through its effects over time

The "product" supplied by a service provider may manifest itself through the effects it produces over a longer or shorter period of time (although this is also true, to a certain extent, of spectacles, which help to maintain or even improve visual acuity). In order to take account of this characteristic, Gadrey (1991) proposes that a distinction should be made between:
- the direct or immediate "product" (the actual delivery of the service) : e.g. a consultation with a doctor or lawyer, a visit to a garage, etc.
- and the indirect or mediate "product" (the subsequent results, whether expected or not) : change in the state of health, legal situation, working order of vehicle, etc.

2.3 The question of the service relationship

One of the fundamental characteristics of service activities, particularly "knowledge-intensive" ones, is client participation (in various forms) in the production of the service (Fuchs, 1968). Various concepts have been developed in order to take account of this client involvement. They are sometimes used synonymously. In reality, they denote different aspects of the same phenomenon, and can be differentiated from each other by their theoretical substance.

Thus the term **interface** denotes the meeting or contact point between customer and service provider. It frequently refers to a physical place: a window in a ticket office, a restaurant or an office. However, the contact can equally well take place on the telephone. In general, the term denotes contact between individuals or groups of individuals. However, it may also denote contact between the customer and the technologies used by the service provider (e.g. a bank cash dispenser or a ticket or stamp machine).

It is at this interface that the **interactions** between customer and service provider take place, i.e. that various elements are exchanged. These exchanges may involve information or knowledge, emotions, verbal or gestural civilities or the performance of repair or rectification tasks. This interaction which relates to various elements may vary in intensity. It also reflects the balance of power between and the influence exerted on each other by client and service provider. The term **co-production** generally denotes situations in which the (essentially operational) interaction is intensive and balanced.

The three other terms ("servuction", socially regulated service relationship and service relationship) have acquired the status of theoretical concepts. In management sciences, the neologism **"servuction"** denotes the process whereby a service is produced (Eiglier, Langeard, 1987). The "servuction" system takes account of the relations between the following elements: the client, the physical medium, the contact personnel, the service, the system of internal organisation and other clients. The notion of **socially regulated service relationship** (Gadrey, 1991) considers services

from the point of view of the social rules that control the relations between agents involved in service situations. The term **service relationship** (de Bandt, Gadrey (eds.), 1994) is defined as a "mode of coordinating the actors on the supply and demand sides", whether for services or for goods. This service relationship comprises, on the one hand, operational relations or interactions (co-production) and, on the other, the social relations that control and regulate (by contract or convention) the action in question.

2.4 The difficulty of distinguishing between product and process in services

In the case of goods, the distinction between product and process, which is a useful analytical tool, though sometimes difficult to use, is widely accepted. The same is certainly not true of services. Here, the term "product" frequently denotes a process: a service package, a set of procedures and protocols, an "act". In reality, this use of the term depends on the concept of product tacitly accepted by the protagonists in question. If they understand the product to be analogous with the immediate act of providing a service, then it is more or less synonymous with it.

2.5 The importance of informational asymmetries

In the case of services, and particularly those in which the intangible and relational aspects are important, the correspondences between the competences brought to bear by the service provider and the "product" are generally much hazier and more difficult to codify: they are to a large extent tacit and subject to problems of informational asymmetry (Holmstrom, 1985). For these reasons (and others), it is not always possible to restore a service to its proper or former state once it has been provided.

3. INNOVATION IN SERVICES: THE MYTHS

The generic myth here is that of the inability of services to produce innovation. Just as they are considered to be unproductive and of low capital intensity, so services are said to be incapable of innovating or to confine themselves to adopting technological innovations originating in manufacturing industry. Nothing could be further from the truth. A myth of this kind can cause serious difficulties in an economy dominated by services, since it precludes serious thought (particularly on the part of the public authorities) about ways of energising an area of activity of great importance for the future of firms, industries and nations.[iv]

3.1 Innovation does not exist: the origins of a myth

In reality, this generic myth can take a number of different forms, according to which:

- innovation in services simply does not exist;
- innovation in services is strictly technological and adopted;
- innovation in services is incremental and insignificant.

The explanations for this refusal to acknowledge the existence of innovation are to be found in the myths outlined above (in which services are perceived to be the "dark side" of the economy). In fact, if it is accepted that innovation has a positive connotation and if, as economists claim, it is the engine of growth, it would be paradoxical for a residual, peripheral sector that was not a driving force in the economy to be capable of it. Furthermore, if what is being sought in the world of intangible products are innovations in the sense of physical goods, then it is highly likely that the quest will be in vain.

In other words, these myths have their origins in the manufacturing and technological bias of our analytical apparatus. In neo-classical economics, the question of innovation is perceived through the concept of the production function and is limited to process innovation (as incorporated into technical equipment). From this perspective, it is but a short step to reduce innovation in services to the mere adoption of technical equipment produced by the only driving force capable of innovation in the economy, i.e. manufacturing industry. The main body of literature implicitly or explicitly related to innovation in services focuses on the following generic theme: the impact of the new (informational) paradigm on services (for a survey of that literature cf. Gallouj, 1997).

More modern economic analyses (based on evolutionary and neo-Schumpeterian approaches), which are more sensitive to the characteristics of the "black box" of the firm, i.e. to learning phenomena and the mediums through which they are enacted (routines) and to the tacit and idiosyncratic aspects of technologies, and more inclined to accept a broader definition of innovation, have not succeeded in ridding themselves of this technological bias. In such analyses, services are dominated by the suppliers of their technical equipment (Pavitt, 1984; Gallouj, 1997).

It is of course possible to find circumstances that attentuate the second myth, that "innovation in services is strictly technological and adopted". In the past few years, services have indeed become the main users of information technologies, which of course modifies the "services landscape" and raises extremely important theoretical and empirical questions (concerning in particular the consequences of the introduction of these technologies for employment, productivity, trade, work organisation, skill requirements, etc.). The fact that this phenomenon is important both in itself and in terms of its consequences should not blind us to other manifestations of innovation in service activities.

There are far too many studies by economists, sociologists and management specialists that claim to tackle the question of innovation in services by reducing it to the impacts of adopted technologies for there to be any possibility of examining them all here (For a survey, cf. Gallouj, 1997). We will confine ourselves to mentioning the most successful of these attempts, namely Barras' reverse cycle model (Barras, 1986, 1990). According to this model, the dynamic of innovation in services follows a life cycle (the reverse of the traditional industrial cycle) in which the introduction of technical systems is followed by sequential phases of incremental process innovations, radial process innovations and "product" innovations.[v] In the case of banking, for example, the life cycle would begin with the computerisation of back-office tasks,

continue with the introduction of automatic cash dispensers and lead ultimately to home banking.

This generic myth of the non-existence of innovation has certain corollaries that it is important to emphasise. Services are, allegedly, as unacquainted with R&D as they are with innovation, despite the large number of engineers and managers now employed in service industries. And the proof is that national and international indicators of R&D and innovation (the Frascati and Oslo manuals, for example) almost completely ignore services.[vi] (Gadrey et al., 1993, 1995).

3.2 Innovation in services does exist: we've all experienced it

Innovation in services does exist. Each one of us has already experienced it, when travelling by plane, eating in a McDonalds or a restaurant operated by the Sodexho group, spending a night in a Travelodge hotel, ordering a pizza from a home delivery service, taking a Club Med holiday or waiting for the bus under a J.-C. Decaux bus shelter. However, it can take different forms and be organised differently. Moreover, some services (notably the most knowledge-intensive ones), not content with being innovative themselves, have exacted the ultimate retribution on behalf of the "world of night" by playing an important role in their clients' innovation processes (particularly those in manufacturing industry).

Thus the trend towards deindustrialisation can be considered in a less negative light. If services are expanding, it is perhaps also because they are (more) innovative and because, in accordance with the Schumpterian notion of waves of creative destruction, relatively non-innovative structures are giving way to more innovative structures.

3.2.1. It can take different forms

Drawing once again on the wisdom of fables, economic theory might be said to resemble the blind shepherd whose only memory is that of a sheep and who reduces every discussion to the following question: does it look like a sheep?

It is no more possible to reduce the various forms of innovation to technological innovation than it is to apprehend the world in all its diversity using just a sheep as a yardstick. Just like manufacturing industry, the service sector is a locus for product, process, organisational and market innovations. Even so, it still has to be accepted that the semantic content of each of these types of innovation should not be unduly inflexible (C. and F. Gallouj, 1996, Gallouj and Weinstein, 1997, Djellal and Gallouj, 1998; Sundbo, 1998).

Although it is playing an increasingly important role in services, (material) technology is not an inevitable component of innovation. Innovation can and frequently does take place without the use of technology (a new form of insurance policy, new financial instruments, a new area of legal expertise, a new restaurant format,etc.) This does not mean that these innovations are not or cannot be based on a material technology (computer or telecommunications systems, for example) but that they may in certain cases dispense with them. Not to accept this is seriously to underestimate the innovative capacity of service activities. The silence of national and international

indicators of R&D and innovation can be explained by this mistake. It is not that service activities are incapable of R&D and innovation but rather that these highly "technologist" indicators are unable to capture what actually happens in service industries (the inevitable, and by now very familiar lantern…). Under these circumstances, it is hardly surprising if it is really only innovation in IT services that is properly reflected in these indicators.

Like product innovation, process innovation can be intangible. It can consist of methods, that is it can be like the text of a play or the screenplay for a film that defines the words, action and movements of each individual involved (consultants' procedures, or the methods employed in catering). Some of these methods might be based on technical systems (computerisation of recruitment methods), while others might be embodied in tools (legal expert systems), but this is not a necessary condition for innovation. In other words, it would be wrong to take the view that innovation takes place only when it is embodied in a technical system.

This intangibility (and this non-technological dimension), as well as the importance of the service relation, mean that it can be difficult to appropriate and protect innovation in services. In our view, however, they do offer at least one advantage. Since they are to some extent free of material and technical contingencies, services might be said to constitute the last bastion of innovation produced by "romantic improvisation" (a notion that M. Callon (1994) denounces as one of the great myths of technological innovation). The simplest ideas can still lead to the creation of economic empires. There are numerous examples, ranging from pizza delivery services via home help services for the elderly to travel arrangements for tourists.

Product and process innovation are much more difficult to separate from each other in services than in manufacturing. As we have already stressed, a service is not an artefact but a protocol, a formula, a process developing over time and leading to the provision of a "product".

Services have also to be regarded in the wider social context. They are socially embedded (Gadrey, 1994). The notion of "diversity of worlds" developed by advocates of the french "*convention*" approach (Boltanski and Thévenot, 1991)) can perhaps be applied more usefully to services than to any other economic activity in order to explain the multiple forms that innovation can take. More than any other sphere of the economy, the service sector is characterised by a multiplicity of competing and frequently ambiguous "levels of justification" (reference worlds). This tension, which is the source of the wide diversity of explicit and implicit products, can be interpreted in various ways. Firstly, the medium through which many services are enacted is highly specific, involving individuals or groups of individuals whose lives, with their domestic, civic and economic dimensions, are multi-faceted. Secondly, one of the most important elements of the tertiary sector is the large number of activities in which the civic "level of justification" plays, or is supposed to play, a central role, i.e. public and social services.

Thus service activities are the locus for a considerable amount of ad hoc and customised innovation. These types of innovation derive their justification from the domestic and relational world. The resulting innovations are created out of the

interaction between client (user) and provider and do not have the usual relationships to the commercial (or market) world. In particular, they may not be reproducible as such. This characteristic, which is undoubtedly problematic in a strictly market world, creates no problems at all in the domestic world. Thus the introduction of the domestic world allows some of the serious constraints on our theoretical concepts of innovation (the requirement that innovations be reproducible, for example) to be relaxed.

Furthermore, certain innovations, notably but not solely in the public services, have their roots in the social and civic world (e.g. products specific to various physical and social handicaps) and should not be evaluated by reference solely to the market world either. Although such innovations have a cost, they also generate value added which cannot be expressed in terms of volume or value but which might be described as social value added. This type of innovation, like the preceding one, has its roots in a non-market selective environment.

3.2.2. It can be organised differently

Economic theory has long championed a linear concept of innovation, in which the R&D, production and marketing phases succeed each other without interacting. From this point of view, researchers, producers and sales staff are specialists belonging to separate, hermetic universes.

Such a theoretical concept is far removed from the reality of manufacturing companies. It is fundamentally incompatible with the real nature of service activities. Services are, by definition, interactive, and innovation here tends to be organised in a quasi-natural way in accordance with an interactive model (Kline and Rosenberg, 1986), i.e. a model in which actors from various departments interact. This seems to be the rule even in heavily bureaucratic organisations such as insurance companies (Gadrey et al., 1993; Gadrey and Gallouj, 1994). The development of a new, mass-market insurance policy, for example, requires the participation of lawyers, actuaries, IT specialists, loss adjusters, sales staff and customers. And in the case of consultancy services, it is clear that those who produce innovations are the very same people who sell the services (i.e. those in direct contact with clients). It can hardly be any different in activities in which a part of the innovation is produced at the interface between provider and client.

This (quasi-natural) interactivity does not, of course, preclude the existence in certain cases of specialist innovation departments, particularly in very large companies. However, such departments, when they exist, are seldom the only actor in the innovation process. They are almost always complemented by (and in competition with) formalised but non-permanent innovation structures (project groups made up of individuals from various departments) and by a high degree of informal individual activity, particularly in knowledge-intensive activities.

The frequent absence of R&D departments makes it difficult to identify autonomous R&D activity. Nevertheless, it most certainly exists. Obviously it is to be found in R&D departments when they exist. However, it can also be found in the activities of less permanent structures (e.g. project groups). It is usually one of the facets of

innovation projects that may comprise analytical and conceptual activity, sometimes accompanied by tests. It can also take forms that are not captured in national and international R&D indicators, namely those of the human and social sciences. The following can be cited by way of examples: psychology put to use in recruitment consultancy, human resource management; and in the field of insurance: anthropology, sociology, economics and management, law and political science, danger science, etc.

3.2.3 The revenge of the "world of night": services in support of innovation in manufacturing

Many service activities have now reversed their subordinate relationship with manufacturing industry in matters of technological innovation. In other words, they produce their own technical systems, either by themselves or within a power relationship favourable to them. This is the case, for example, with automatic cash dispensers, cleaning robots and cooking and refrigeration equipment for fast-food restaurants. It also applies to certain large distribution chains that exert pressure on their suppliers and impose specifications so precise that it indeed becomes possible to speak of suppliers of technology dominated by service users.

However, another phenomenon is even more clearly indicative of the revenge of the "sector of darkness". This is the active role played by the so-called "knowledge-intensive services" in their clients' innovation processes (particularly those in manufacturing industry). Whether the innovations relate to organisation, strategy, products etc., these service providers assist their clients in a variety of ways, to differing degrees and at different stages in the innovation process. It is no exaggeration, therefore, to speak of "consultant-assisted" model of innovation (Gallouj, 1994 ; Bessant and Rush, 1995 ; Antonelli, 1996).

Conclusion: convergence between goods and services in respect of innovation

Like many great peoples who have been defeated on the field of battle but who succeed ultimately in imposing their culture on their conquerors, services can be said to have taken their revenge on manufacturing industry. Indeed manufacturing industry is also increasingly inhabited by incorporeal entities and is gradually coming to resemble the tertiary sector. There are numerous indications of this convergence between manufacturing and services. The institutional boundaries between some service companies and certain manufacturing firms are no longer very clearly defined. Various forms of service now constitute the main component of many industrial goods. And as we have seen, some services are called on to tend ailing manufacturing industries.

At the same time, however, there are some indications of a reverse trend towards the industrialisation of certain services. There is, therefore, some degree of convergence between goods and services. The most important theoretical instrument in this convergence is undoubtedly the notion of service relationship, understood as a mode of coordination between economic agents in both services and manufacturing (de Bandt et Gadrey, 1994). This convergence means that, beyond the myths we have examined, there are opportunities in the economics of innovation for mutual enrichment between goods and services. This means, for example, that manufacturing activities can draw inspiration from service firms in the development of interactive

models of innovation and that the different forms of innovation outlined above can be applied equally to manufacturing activities. In other words, if we underestimate innovation in services, we are also underestimating innovation in manufacturing industry.

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NOTES

[i] We take our inspiration here from the title of an article published by Michel Callon (1994), from which we also borrow the following definition: "Myth: simplified, frequently illusory image that groups of human beings develop or accept in respect of an individual or phenomenon and that plays a decisive role in determining their behaviour or judgement".

[ii] Our goal in this paper is not to attempt and document the extent to which these myths are held. Instead, our purpose is to identify the specific myths and point out why they turn out to be no more than myths. This essay was written as part of a European Union financed project (DG XII, TSER program) called SI4S (Services in Innovation and Innovation in Services) and envolving nine european teams from Denmark, France, Germany, Greece, Italy, Norway, Sweeden, United Kingdom.

[iii] unless it is a custom-made product that cannot be easily transferred to another user (spectacles, machine tools, customised software etc.).

[iv] For a more comprehensive analysis of these various myths and of the studies of innovation in services cf. F. Gallouj (1994) and C. Gallouj and F. Gallouj (1996).

[v] For a critical analysis of this model see F. Gallouj (1997 and 1998).

[vi] It is by no means unusual for economic theory to consider that that which it is unable to measure does not exist.