

Luis Miguel Araujo, português, engenheiro e professor do Departamento de Marketing da Lancaster University, tem sido um estimado colaborador desta revista, desde o seu início (ver artigos dele nos números 2, 6, 8, 15 e 18). Neste artigo ele conta com a parceria do Professor Martin Spring, da mesma universidade inglesa. Estamos inaugurando nesta edição, como experiência, a ideia de entregar aos nossos leitores a Integra de um artigo em língua estrangeira, versando sobre um tema relevante para o marketing industrial.

resenha executiva

Services, Products, and the Institutional Structure of Production¹

This paper revisits the product-service distinction from an institutional perspective. Much of the literature in marketing and management has focused on the intrinsic characteristics of services with a view to derive implications for the management of service-based firms. Our key argument is that the quest for foundational differences between products and services is misguided. What counts as a product or a service is dependent on the nature of producer user interactions and the institutional structure of production rather than on any essentialist attribute of products or services. Furthermore, we argue that services play an increasingly important role in manufacturing firms and we explore the reasons that underpin this trend.

Keywords: product-service definitions; institutional structures of production

Previous versions of this paper were presented at a seminar at the Department of Management Science (LUMS) in November 2004, at a colloquium organised by Dr. Damien MacLoughlin (University College Dublin) in April 2005, at the EUROMA conference (Budapest) in June 2005 and the 21st IMP Conference (Rotterdam) in September 2005. Comments and suggestions by participants at these events and by Dr. Keith Blois (Templeton College, Oxford) are gratefully acknowledged.

¹ Reprinted from *Industrial Marketing Management*, Vol 35 n°7, Luis Araujo and Martin Spring, Services, Products and the Institutional Structure of Production, Pages 797-805, Copyright (2006) with permission from Elsevier

INTRODUCTION

This paper revisits the long-standing duality between products and services that have long since dominated the marketing literature. Traditionally, the literature has focused on establishing clear differences between products and services before proceeding to derive implications for the management of service as opposed to product-based firms.

In this paper, we argue that the quest for foundational differences between products and services is misguided and that given that many firms in industrial markets are product and service-based, we need a better framework for understanding how products and services interact within firms and supply networks. A product such as laptop computer, for example, inserts itself into a network comprising manufacturers, retailers, software firms, users with a set skills and expectations, Internet service providers, certified repairers and so on. In this network, there are a variety of service providers and different types of service interactions that accompany the life of the product from the moment it rolls out of an assembly line to its final disposal. These services are highly heterogeneous ranging from tightly scripted and requiring minimal interaction between producer and user (e.g. connection to the Internet) whilst others are more customised, open-ended and interactive (e.g. detection and repair of faults).

Our second main argument is that what counts as a product or a service is determined by what Goase (1992) loosely called the institutional structure of production, namely the different modes of economic coordination in a particular industrial system. The distinction between products and services relies more on these structures rather than any technical criteria involved in their production or use.

The paper is organised as follows: in the first section we review the literature on service-product distinction focusing mainly on marketing contributions. In the second section, we look at a much-neglected contribution from economists

who, in the course of examining the emergence of the service-based economy, have provided valuable insights on the nature of services. In the third section, we examine the impact of institutional structures of production on what counts as a product or service. In the fourth section, we look at recent calls for manufacturers to expand into services and argue that an expansion in service provision is the inevitable by-product of an increasing division of labour and the disaggregation of corporate hierarchies. The paper concludes with an argument for focusing on how product-service combinations are managed within and across firm boundaries rather than persist with the product vs. service-based firm duality.

THE SERVICE-PRODUCT DISTINCTION

The distinction between products and services has a long history in marketing and other disciplines, namely operations management (see e.g. Johnston, 1999) and general management (see e.g. Bowen and Ford, 2002). In marketing the focus was firmly on products and services were often regarded as little more than a peripheral activity that added value to a product. Kotler (1980, p. 374), for example, noted cryptically "...a service is not a physical thing but rather an energy expenditure". In industrial marketing, calls for looking at services as part of companies' marketing strategies can be located as far back as the late 1970s (Gummesson, 1978; Gronroos, 1979). The focus of the service literature was often on the classification of services and the marketing implications stemming from their idiosyncratic qualities (Lovell, 1983) or the development of service packages according to market segments (Boyt and Harvey, 1997).

Fisk et al (1993, p. 68), for example, remarked that the "...four features — intangibility, inseparability, heterogeneity and perishability - provided the underpinning for the case that services marketing is different from goods marketing." To this day, textbooks (e.g.

Kotler, 2003) and academic papers (e.g. Bowen and Ford, 2002) rely on these dimensions to convey the notion that services deserve a special treatment.

The implication that can be extracted from these statements is that services are what products are not, and that product-based marketing needs to be adapted for service environments. As Gronroos (1998, p. 235) memorably put it: "The most important change from the product marketing situation is that the product is missing" [emphasis added]. Only occasionally have service marketing authors acknowledged that "... important differences exist between service firms, not just between service firms and goods firms" (Zeithaml et al 1985, p. 43).

In addition, the literature has often stressed the outcome versus process duality to define services. Whereas products appear as pre-produced at the consumption junction, the production of services is performed in a process in which customers interact with the production resources of the service firm (Gronroos, 1998). Service consumption is thus process consumption whereas products are fixed packages of features that do not change during the consumption process.

The notion that service firms have processes rather than pre-produced products as solutions to customer problems raises a few important questions. First, it is not unusual in business markets for users to either request customised products or to actively negotiate with suppliers the specifications they require (Araujo et al, 1999; Spring and Dalrymple, 2000). In short, firms don't always buy pre-produced products and interaction between the resource structures of producers and users is not confined to services. Secondly, it is common for services firms, namely professional services such as law or advertising, to produce customised solutions based on repeatable packages either through straightforward repetition of tried and tested processes or recombination of pre-produced modules (Sundbo, 1994; Grabher, 2004). Finally, there are many service examples when the customer's

interaction with the resource structure of the producer can be fairly minimal or inconsequential as when a utilities customer switches on the lights at night or connects a computer through a modem to an Internet service provider.

In summary, the process versus outcome distinction may well work in situations where customers are insulated from interactions with producers' resource structures. However, the fact that the process of service provision is in many cases short-lived and doesn't provide a window on the supplier's resource structure is another argument that highlights the fragility of this distinction.

More recently, service marketing writers have begun to attack the foundational differences that have helped services marketing develop as a separate field. Vargo and Lusch (2004b) and Lovelock and Gummesson (2004) attempt to debunk the myths underpinning the four foundational attributes of services. When examined more closely the four characteristics of services are found wanting and numerous exceptions can be invoked to counter the supposedly watertight distinction between products and services. For example, tangible goods are often heterogeneous and many services can be mass produced without difficulty, as Levitt (1972) noted long ago. The variability of services can be controlled through strict quality procedures, standardisation of service modules, and automation of service functions (Lovelock and Gummesson, 2004). In an argument reminiscent of Levitt's (1972) aphorism that "everybody is in services", Vargo and Lusch (2004b) propose that services are more universal than goods. In their words, services are the "... application of specialised competences (skills and knowledge) through deeds, processes and performances for the benefit of another entity or the entity itself (self-service)" (ibid, p. 326). The corollaries of the argument that "everything is a service", is that manufacturing and exchange should be seen as services and products as vehicles for service delivery. Furthermore, Vargo and Lusch (2004a) contend that marketing

inherited from economics the notion that value is embedded in products and usage is directly related to product features. Instead, they propose that through product usage, customers are co-opted in the value creation and delivery process. Exactly how value through product usage is created, we are not told.

Levitt (1981) pinpointed the limits of the traditional distinction between products and services and focused instead on the marketing of tangibles and intangibles. At the hub of Levitt's argument is the distinction between products and services whose qualities can be experienced and tested in advance and those that cannot. If it is true that intangibles cannot be assessed and tested in advance, it is equally true that for many complex products the process of installation and appropriation into the user's value system involves a lot more than the product itself. As Levitt (1981, p. 97) puts it: "...you won't know how it performs until it's put to work". The conclusion that Levitt extracts is that whereas tangible products must be "intangibilised" to stress benefits in use, intangible products must be "tangibilised— or to create metaphors or surrogates for tangibility" (ibid, p. 100). Relationships with customers in the case of intangibles need to be managed more carefully and continuously than in the case of tangibles although Levitt stresses that this is a vital for products too, notably in the case of new and complex products.

The trick of turning the tables by affirming that "everything is a service" elides the issue of the role of products in service provision. Put differently, why are so many services delivered through products rather than through other means? Surely, there must be some advantage in embedding service provision in products if we are to accept the truism that "it is all about service provision".

In summary, the product-service distinction founded on the four idiosyncratic features of services as well as the process versus outcome consumption doesn't bear much scrutiny. If anything, recent contributions that have suggested the balance should be swung towards

services, have shied away from a more balanced approach concerning why, how and when particular product-service combinations should be deployed to address particular types of demand. In the next section we look at approaches to the definitions of services that have been used by economists addressing the service-based economy from an institutional and national accounts perspective.

AN INSTITUTIONAL PERSPECTIVE ON SERVICE DEFINITION

In the economics literature, the contributions of Hill (1977, 1999) and Gadrey (2000) deserve a special mention. Hill (1977) argues that a necessary condition for some item to be a good or a service is that it must be capable of being the subject of a transaction between two or more different economic units. To identify the characteristics of goods or services, the focus should be on the interaction between producers and users.

For Hill (1977, p. 318) a service "...may be defined as a change in the condition of a unit or a person, or of a good belonging to some economic unit, which is brought about as a result of the activity of some other economic unit, with the prior agreement of the former person or economic unit". The focus on producer-user interfaces leads Hill (1977, p. 320) to reflect on how the institutional structure of production is critical for the definition of services: "...one and the same activity such as painting may be classified as a good or a service depending purely on the organisation of the overall process of production amongst the different economic units. [...] some changes in the share of service industries in total output or employment may be determined purely by changes in which production is distributed amongst different producers and may have no influence whatsoever on the share of services in the final expenditure."

Hill (1977) insistence that services cannot be exchanged between two economic units since no property rights can be attached to services, raises the question of how

are services made tradeable. A typical definition of market exchange matches the exchange of property rights to the physical transfer of products in exchange for money (Hodgson, 1988). Hill's (1977, p. 336) claims is that a "... service is produced by one economic unit for another, but it is not exchanged between them"

Hill (1999) follows up this trail and provides further clarification on the distinction between products and services. Products are regarded as entities whose existence is independent of their qualities or the relationships that brought them into being. Ownership *is* the right, conferred by law, custom or tradition to use or dispose of whatever is owned and to prevent others from doing so, if desired. The ability of products to be disentangled from relationships and capable of independent circulation makes them the ideal case for market exchange. By contrast, the outputs of services are not separate entities that exist independently of the relationship between producers and users.

Hill (1999) refines the institutional definition of services and uses the comparison of a subcontractor and an independent producer who makes components for sale. The component producer owns his output prior to selling it, can build up stocks of components and control the flow of his own output. The producer has to bear the capital cost of holding any inventories and run the risk of having unsold inventories, a situation which is impossible for a subcontractor or indeed service producers in general. The difference between purchasing a product through the component producer or a service through the subcontractor boils down to who controls the timing and location of production, who bears the capital costs and who assume the risks in this transaction. In summary, the distinction between products and services often depends more on economic factors that determine boundaries and areas of responsibility in a producer-user interaction than on technical factors concerning the production process.

In Hill's schema, products are not just eminently tradeable but their independence

from producer-user interactions allows a clear physical separation between production and exchange activities. As Demsetz (1993) remarked, products can be seen as embodying specialised knowledge in a way that is highly advantageous for promoting the division of labour. Products allow knowledge to be packaged in a way that makes knowledge transfer between firms inexpensive and practical since the instructions needed to use products do not require in-depth knowledge about how they are produced. Products thus act as a means of separating production from exchange and delimiting user-producer interaction - users only have to be "instrumentally knowledgeable whilst substantively ignorant" about the products they purchase, to use Loasby's (1998, p. 169) felicitous expression.

Delaunay and Gadrey (1987) and Gadrey (2000) develop Hill's definition by positing that a service activity is an operation intended to bring about a change in the status in a reality C that is owned by consumer B effected by service provider A at the request of B and in many cases in collaboration with B, without leading to the production of a entity that can circulate independently of medium C — circulation understood here as the transfer of property rights rather than circulation in space. Gadrey et al (1995) define the production of a service to organise a solution for a problem that does not principally involve supplying a good. The most interesting aspect of this definition is that products are seen as the limiting case of services — when no independent output to which property rights can be attached independent of the relationship between A and B.

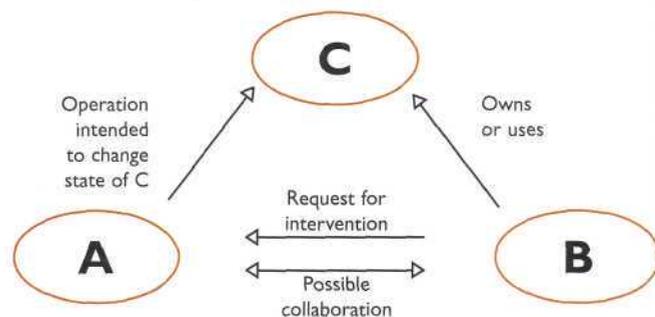


Figure (after Delaunay and Gadrey, 1987)

Gadrey (2000) seizes upon Hill's two demand rationales for services, "assistance or intervention" and "the provision of maintained technical capacities that customers can avail themselves of in exchange for payment" to add a third rationale, "live performance". These different rationales have direct implications for the types of customer-supplier interaction required and the relational as well as spatial proximity of these interactions. In the first and latter cases, relational as well as spatial proximity is required whereas the second case does not imply relational or spatial proximity. For example, customers can avail themselves of a technical capacity through technologically mediated interactions at a distance (e.g. telephone lines, websites) and without relational proximity.

Gadrey's three service logics evoke access to a socio-technical capacity embodied in specialised human competencies and technical apparatus. In the case of "request for assistance or intervention", this socio-technical capacity consists of means for the performing diagnostics, maintenance or repair to produce the desired effects on an object owned by the purchaser of the service. In the "access to maintained technical capacities" logic, this capacity may often be invisible to the user and may involve a complex logic of supply and access (e.g. Internet banking service provision). Under the "live performance" logic, this capacity is embodied in a complex set of scripts involving both human performances and material arrangements (e.g. the stage and seating in a theatre).

Hill and Gadrey's contributions clarify the nature of services and places producer-user interaction at the centre of attempts to distinguish products and services. However, the notion that services cannot circulate as independent entities in a property rights space begs the question of what makes services tradeable at all. In addition, the product-service distinction relies too much on a clear-cut separation, institutional as well spatial, between production and exchange. For many products, as we highlighted earlier, there is a more intricate relationship

between production and exchange and closer spatial as well as relational proximity between producers and users.

THETRADEABILITY OF SERVICES TRANSFERS AND TRANSACTIONS

The issue of tradeability is often conflated with the transfer of property rights and tangibility. Tangible goods to which properties can be unequivocally attached provide the classical definition of market exchange (Hodgson, 1988). Production and exchange can be neatly separated in the case of tangible goods but this is not the case in services since it is not possible to transfer ownership of a service from one economic unit to another.

Baldwin and Clark (2003) adopt an engineering systems approach to defining where transactions should be located in a complex production system. The driver for defining transaction *loci* is the notion of mundane transaction costs, or the costs of defining what is to be transferred, counting, valuing and paying for the transfers. At some points in the system, transfers are simple, and therefore easy to standardise, easy to count and easy to value. At other places, transfers are complex and in some cases impossible to standardise, impossible to count, and impossible to value.

At first sight, only products seem to be tradeable according to Baldwin and Clarke's definition of transactions. In their analysis of a more complex transaction between two enterprises, where specifications could not easily be translated into product characteristics, Baldwin and Clarke (2003) contend that the two parties had to become locally and temporally de-encapsulated with respect to the specification issue. In their terms, buyer and supplier had to allow a whole set of material, energy and information transfer to occur across their boundaries, which were uncounted, unstandardised and uncompensated. The implication drawn from this example is that product-based transactions involve a whole series of service-based exchanges that resemble intra-firm transfers.

Penrose (1959) seminal distinction between resources and the productive services they render provides a good platform for the following discussion. As Penrose (1959, p. 25) reminds us:

"The important distinction between resources and services is not their relative durability: rather it lies in the fact that resources consist of a bundle of potential services and can, for the most part, be defined independently of their use, while services cannot be so defined, the very word 'service' implying a function, an activity".

As Penrose (1959, pp. 74-75) remarks, it is the heterogeneity rather than the homogeneity of human and material productive services that makes firms unique: "Productive services are not 'man-hours', or 'machine-hours' or 'bales of cotton' or 'tons of coal', but the actual services rendered by the men, machines, cotton or coal in the productive process. Although it is manifestly services that in this sense that are the actual (physical) 'inputs' in production, a less specific or more indirect definition is usually required when services must be expressed as measurable homogeneous quantities, for example, if it desired to measure the cost of certain productive services or to construct technological production functions for certain outputs'."

This is - at least in part - the problem identified by Baldwin and Clark (2003): to make a transfer into a transaction, there is a need to standardise, count, and compensate. It is worth pointing out that these pinch points have no "natural" place in a firm's activity chain any more than inter-organisational ones do. Indeed, deciding where pinch points should be is fundamental to the challenge of process design in operations management, and in the implementation of such organisational innovations as Just-in-Time (JIT) and Business Process Re-engineering (BPR), which have sought to reduce their number.

The above discussion highlights some of the problems associated with understanding what makes products and services tradeable. On one hand, Baldwin and Clark's (2003) distinction between transfers

and transactions is a Coasean story of looking at institutional structures of production through aggregating activities into larger modules through transactional interfaces. When these interfaces can be made to work, markets take over and when they do not, activities are aggregated into non-modular structures such as firms (Langlois, 2002).

In short, tradeability is associated with the ability to define and attach property rights to tangible, material entities at pinch points in production systems where mundane transaction costs are low. But, as Gallon and Muniesa (2005) stress, materiality and tangibility should not be confused. Services can be made tradeable by defining, delimiting and standardising their content - they can be made to have "objectified properties" and thus become fit for the attachment and transfer of property rights. A car rental for example, defines a period of usage of a car according to a well-defined script of rules and conditions. In this sense, a car rental is as tradeable as the car itself. The expansion of trade in services is often the result of defining new conditions of access to socio-technical capacities (e.g. renting admission to a facility, leasing capital equipment). Lovelock and Gummesson (2004) identify forms of non-ownership such as rental, hire and lease as a springboard for understanding the growth in service offerings. The connection between tradeability and tangibility raises broader issues concerning products and services.

Gallon et al (2002) sidestep the distinction between products and services by focusing on the notion of goods. A good implies a stabilisation of characteristics at the moment an entity, product or service, is ready to be traded. A product is an economic good that can be seen from a variety of perspectives: production, circulation and use. Thus a product corresponds to a process, a trajectory in time whereas a good corresponds to a state at a point in time.

Gallon (1991, p. 136) defined products as programmes of action aimed at coordinating a network of distributed roles. The definition of what a product is, implies a definition of the socio-technical context it will inhabit which should include the roles played by other objects (e.g. power supplies) as well

as different types of human actors (e.g. users, after-sales service people). Products can thus be seen as texts embodying specific programmes of action, inserting themselves in particular networks of skills (e.g. what skills do users need to make the product work, what skills do repair people require to diagnose malfunctions). At the same time, products are themselves accompanied by a variety of texts as they move from production, circulation and use (e.g. logbooks, user manuals, warranties). In short, products do not just circulate as independent intermediaries in pre-established networks but define and describe network of actors connected to their design, production and use (Gallon et al, 2002).

A product's biography can only be traced within these networks. A car, for example, moves from the designer's office to the prototype stage and manufacturer test tracks, to production lines, to an item in a manufacturer's brochure, to transport depots and dealership showrooms. Once in the hands of its first registered owner, it follows another trajectory, of clocking miles on roads, of regular service in maintenance workshops, to used car magazines and dealerships and finally, scrap and recycling yards. The same product can thus have a rich and multifaceted biography and constitute a different good at different stages of its life-cycle (e.g. when it is sold new or second-hand).

Service provision as Gadrey (2000) noted, involves the mobilisation and deployment of different forms of socio-technical capacities. Making services tradeable, as Gallon and Muniesa (2005) remark, is a process of defining boundaries around access to maintained socio-technical capacities, of objectifying what is to be exchanged and of elaborating scripts that govern access to socio-technical capacities. Gallon (2002) characterises the standardisation of service provision and service interactions through what he calls "writing devices" - e.g. texts that objectify the elements of service provision through comprehensive descriptions. Using the example of boat trips in the

Seine, Gallon illustrates how in Gadrey's logic of performance situations, the continuous writing and rewriting of scripts define service content. Some of these texts are paradoxically described as "product files", highlighting how the process of objectification of a service in common language imperceptibly slips into a "product-based" discourse.

None of the above arguments invalidates Hill's notion that one cannot attach property rights to services and make them circulate independently of the relationship between provider and user. But it highlights the spurious association between tangibility, property rights and tradeability. As long as services can be bounded, objectified, clearly specified and scripted into socio-technical capacities they can be transacted just as easily as products.

A number of implications follow from the above discussion. First, the institutional definition of services favoured by Hill poses interesting issues related to how services can be made tradeable. For example, in industrial markets customers can avail themselves of technical capacities before and after product exchanges that may be difficult to disentangle and value independently from product transactions. In other words, we are still in the presence of services but services that have not been disentangled from product transactions and objectified as bounded entities. Conversely, firms may adopt transfer pricing policies (e.g. based on activity based costing) to standardise, count and compensate the provision of services in internal customer-supplier relationships, a favourite theme of total quality management (TQM) and cellular manufacturing. In both cases, we are in the presence of services that are not the subject of market-based transactions even though in the latter case they can be accounted for as intra-firm transactions through transfer pricing mechanisms, for example.

A second issue concerns the difficulty of defining products and services independently from forms of economic coordination in particular producer-user interactions. As Baldwin and Clarke's (2003) imply, market-based transactions

conform neatly to the thinnest of interfaces between buyer and seller. Transfers that score low on standardisation, low on ease of counting and valuing belong to the realm of hierarchies and relational contracting. By implication, services should be seen mainly as transfers and thus fall either within relational contracting or hierarchy. But this is a difficult argument to sustain. Transaction points do not emerge naturally where products cross thin buyer-supplier interfaces. Many transactions are embedded in complex buyer-supplier relationships with multiple product and service exchanges. The task of making services objectified and bounded entities that can be transacted is not necessarily an easy one, but is one that is routinely achieved. Baldwin and Clarke's implicit suggestion that services fall by default into the category of uncounted, unstandardised and uncompensated transfers should be tempered by Gallon et al's (2002) notion that specialised work is required to accomplish transactions in the case of products as well as services. Both cases require the objectification and stabilisation of what it is that is being transacted.

MANUFACTURING MOVES INTO SERVICES

In an early example of studies of services in industrial markets, Cunningham and Roberts (1974) remarked that a service is either central to a transaction or it is supplied in conjunction with a product. When a service is bundled with a product, it is either addressed at reducing the workload of the buyer in making the purchase, to reduce the uncertainty associated with the purchase or to increase the usefulness and availability of the product. Hakansson et al (1976) and Hakansson (1980) characterised buyer-supplier relationships in terms of problem-solving and transfer, to denote the range of services involved in finding a solution to an identified need and to transfer the solution to the customer's setting. The emphasis is on the interaction between two parties that co-participate in the development of

the solution and its transfer. Mattson (1973) and Page and Simplinski (1983) used the term systems selling and marketing to refer to integrated solutions of hardware and software, products and services that can in principle be marketed separately.

The upshot of these early examples is that services are always involved in complex buyer-supplier relationships whether they are accounted for as a separate part of a transaction or they are bundled in with products. More recently, in a number of manufacturing sectors erstwhile manufacturers have been forward integrating into systems assembly and supply and the provision of value-added services. Manufacturing has increasingly been seen as an ever-narrower stage of a value-added chain where most profit opportunities reside upstream and downstream of actual manufacturing or what Pavitt (2003, p. 88) called the "...skilled activities that manufacturing firms undertake except manufacturing itself".

Vandermerwe and Radda (1988) and Chase and Garvin (1989) were amongst the first to extol the virtues of broadening the scope of manufacturing to include activities normally delegated to other functions such as helping customers with making products work on site and maintenance. Wise and Baumgartner (1999) note that the in many industries the installed base of products has been expanding steadily due to the accumulation of past sales as well as longer product life spans. The proportion of new sales versus the installed base has pushed manufacturers downstream away from manufacturing new products and towards services required to operate and maintain the installed base. The strategic implication of this shift is clear: manufacturers that ignore opportunities for forward integration will see their profits erode, as more value flow downstream and away from manufacturing.

Davies (2003) argues that rather than just adding services to existing products, firms are changing their strategies, occupying new positions in value chains and developing systems integration capabilities. The argument is that the trend towards outsourcing and vertical disintegration

has led to the emergence of a new type of specialist firm, the systems integrator. Systems integrators focus on the specialist capabilities required to develop and design complex product architectures as well as the capabilities required to interact with and coordinate a network of external suppliers.

Contrary to Wise and Baumgartner's view that opportunities lie downstream from manufacturing, Davies argues that many services are offered before and during the making of the product. Within these services, Davies (2003, p. 340) includes pre-bid negotiations, the bid to contract phase, and the project implementation phase including the detailed design, integration and testing as well as handover to the customer. In the literature on sustainability, product-service systems are seen as a way to move away from sales of material products to dematerialised service provision often associated with changes in ownership structures - e.g. renting or leasing rather than owning equipment (Roy, 2000; Mont, 2002).

The much heralded move of manufacturing into upstream and downstream services may thus have little to do with new activities in value systems. Instead, we should be focusing on three phenomena that may explain this trend. First, the increasing disaggregation of value systems into more complex patterns of relationships amongst specialised producers and service providers brings about a growth in service provision - often shifting internal transfers into transactions in Baldwin and Clark's (2003) language.

Secondly, the task of designing new services in the shape of new forms of access to maintained technical capacities provides firms with opportunities to broaden their offering and increase revenue streams often from the same customer base. For example, water utilities use the technical capacities to maintain and repair their infrastructure to design plumbing insurance services for households. Finally, the stream of product innovations often creates temporary disparities between producer and user capabilities that can be exploited by service providers aiming to bridge that gap.

As far as the first trend is concerned, as Pavitt (2003) reminds us, processes of technological convergence and vertical disintegration have been at work for a while in a number of industries. The end result is not just the disaggregation of value chains but also the emergence of specialised firms providing products and services across a broad range of industries. The drivers for this process must be understood with reference to the division of labour and increasing returns.

A recent example is provided by the growth of contract manufacturing in electronics (Sturgeon, 2002). In this field, pressures of market volatility and increased international competition coupled with growing outsourcing have led to a distinctive model of industrial organisation, Sturgeon (2002, p. 455) calls the modular production network because "... distinct breaks in the value chain tend to form at points where information regarding product specifications can be highly formalised.[...] The locus of these value chain break points appear to be largely determined by technical factors, especially the open and de facto standards that determine the protocol for the hand-off of codified specifications."

For Pavitt (2003) both modularity and advances in information and communication technologies have contributed to the disaggregation of product design and manufacturing in a number of industries even if there are limits to these trends. The end result is the migration of manufacturing to far flung places but the retention of highly skilled services in high wage countries. These services comprise such diverse activities as high tech machines processing information rather than materials, knowledge underlying manufacturing activities, capabilities for designing, integrating and supporting complex physical systems and logistics operations. As Pavitt (2003, p. 88) remarks: "The fact that some of these activities are defined as "services" often confuses rather than clarifies".

The second major trend has to do with the increasing number of firms that are disaggregating and reorganising their structures, multiplying the number of

services they provide through access to new forms of socio-technical capacities (Vandermerwe, 1990). Zenger and Hesterly (1997) provide an argument as to how internal initiatives and innovation in performance measurement enhance a firm's capacity to circumscribe and isolate internal activities. Recent innovations in performance measurement both financial and non-financial such as benchmarking, quality measures, and activity based costing provide firms with more accurate, fine-grained measures of subunit performance. In turn, the increased accuracy of cost measurement at the subunit level, aids the internal disaggregation of firms and the generation of new sources of external services. For example, with accurate cost drivers in place, activity centres can be benchmarked against external suppliers and highly efficient units may be encouraged or required to provide external services. In summary, the disaggregation of large firms and the infusion of market based incentives into hierarchies are improving the ability of firms to isolate specific socio-technical capacities which can be used to provide internal as well as external services.

This example poses a further challenge to the model advanced by Baldwin and Clarke (2003) regarding clear-cut distinctions between transactions and transfers. In effect, the disaggregation of large firms and the injection of market-based incentives into hierarchies blur the distinctions between transactions and transfers — as Zenger and Hesterly (1997, p. 216) note "...for many inter-unit exchanges, the formal legal distinction has become the only difference between market and hierarchical governance".

Finally the proliferation of new products, as Langlois and Cosgel (1999) argue, often provide entrepreneurial, service-based opportunities to provide a bridge between the capabilities of producers and users. Consultants may step in to help users specify and seek solutions to newly-found needs as well as integrate those solutions into their operations. Producers may bundle services with products in situations where the connection of the capabilities

embodied in the product and the context of usage of the product are not immediately apparent to users. In more extreme examples, as von Hippel (2005) illustrates, knowledgeable users may undertake a variety of innovation and production roles.

In summary, the growth in services associated with manufacturing should not be associated just with a simple logic of substitution but also connected to the reorganisation of the institutional structures of production. As we have argued, trends towards the disaggregation of value chains and finer partitioning of activities, the fragmentation of corporate structures and the proliferation of innovations all provide entrepreneurial opportunities for new service provision.

CONCLUSIONS

This paper has revisited the nature of product-service distinctions and attempted to shed new light on the growth of services associated with manufacturing. We concur with Gadrey's (2000, p. 386) remark that it is unlikely we will ever arrive at a definitive list of factors distinguishing products from services. Indeed, we go further and suggest that such quest is both unproductive and distracting. Instead, we propose that products and services should be regarded as different types of intermediaries requiring stabilisation and objectification to be transacted as Gallon et al (2002) have argued. The "objectification" of an entity doesn't require that it has to be inscribed into tangible, solid materials even though many services rely on tangible resources as Levitt (1972) pointed out. In summary, making services tradeable requires the regulation of access to maintained socio-technical capacities which may involve a variety of modes of interaction between service providers and users. In some cases, relational and spatial proximity are required whereas in many others access can take place without either.

If it is not straightforward to see how intangible services can be made tradeable, looking at products as anything other than autonomous entities is equally counter-intuitive. Our suggestion, following

Gallon (1991), is that products constitute programmes of action inscribed in physical, tangible materials. But it would be wrong to see products as simple embodiments of knowledge and vehicles for disembedding services from the vagaries of producer-user interactions. The production, circulation and use of products define particular networks and allocate roles to participants in those networks (Gallon et al, 2002). Hill's (1977) suggestion that products should be regarded as entities whose existence is independent of their qualities or the relationships that brought them into being needs amending. The production, circulation and use of products should not be separated from the range of services associated with each of those activities.

The implications of a new perspective on products and services can be seen at three levels. First, rather than attempt to focus on the management of product or service-based firms, we should focus on products and services can be both complements and substitutes for each other. The suggested focus on offerings of product-service combinations employed in Ford et al (2003) is a helpful start to overcome the service-product duality. The challenge for most firms is how to generate a variety of revenue streams from both product and service transactions, as the recent literature on the expanding the role of manufacturing suggests. However, we suggest that moves of manufacturing firms into services often entail significant investments in creating new forms of access to maintained socio-technical capacities and new organisational arrangements to support these services.

Secondly, the relentless focus on the service-product distinction has detracted from a closer examination of the different categories of services and their impact on purchasing, marketing and operations. Although there are recent examples at attempts to categorise services from a business perspective, much work remains to be done here. Gadrey's (2000) three service logics and the work of Axelsson and Wynstra (2002) on categorising business services provide helpful starting points for looking more closely at this issue and extract

managerial implications for organising and managing product-service combinations.

Lastly, an institutional perspective and a better understanding of service-product hybrids provide a rich opportunity to tackle innovation in services and the new focus on manufacturing as providing a service through a product's life cycle. As we have suggested, innovation in services often involves access to new capabilities but also the reorganisation of and the provision of new modes of access existing sets of capabilities. The connection between service provision and institutional structures of production is thus a particularly promising avenue of research. Although there has been some interest in how corporate restructuring provides new opportunities to define, delimit and market new services, there is a dearth of research on the mutual impact of changes in institutional structures of production and the provision of product-service combinations. For example, the quest for replacing the sale of products with new modes of ownership and the provision of services over the life-cycle of a product requires both new capabilities as well as new connections in an institutional structure of production. The challenge is not just to reorganise corporations but also to find new ways to connect new sets of capabilities within and across firm boundaries.

l.araujo@lancaster.ac.uk
m.spring@lancaster.ac.uk

References

- Araujo, L., A. Dubois, and L.-E. Gadde (1999). *Managing interfaces with suppliers.* *Industrial Marketing Management* 28(5): 497-506.
- Axelsson, B. and F. Wynstra (2002). *Buying Business Services.* Chichester, John Wiley.
- Baldwin, C. and K. Clark (2003). *Where do Transactions Come From? A Perspective from Engineering Design, Working Paper No. 03-031, Harvard Business School.*
- Bowen, J. and R. C. Ford (2002). "Managing Service Organizations: Does Having a "Thing" Make a Difference?" *Journal of Management* 28(3): 447.
- Boyt, T. and M. Harvey (1997). "Classification of industrial services: A model with strategic implications." *Industrial Marketing Management* 26(4): 291-300.
- Gallon, M. (1991). *Techno-Economic Networks and herversibility.* In *A Sociology of Monsters: Essays on Power, Technology and Domination*, edited by J. Law. London, Routledge. 38: 132-164.
- Gallon, M. and F. Muniesa (2005). *Peripheral Vision: Economic Markets as Calculative Collective Devices* *Organization Studies* 26(8): 1229-1250.