Modularity in Creating Value for Diversified Customer Needs in Business Services Markets

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Abstract

This study deals with modularity in developing business services for heterogeneous customer needs. The aim is to discover how to use modular design of services, processes and organizational forms in service production. The research design follows an abductive logic beginning with the construction of a theoretical pre-understanding and elaborating upon it empirically. Two streams of literature are applied: services marketing and the knowledge of modularity of manufactured products. In the empirical part of our study, we elaborate on this through a qualitative single case study. The results show that the value creation through modularity in business services includes service, process and organizational dimensions. Thorough knowledge of customer markets is required for successful modular platform planning in service development and production. Service and production technology, personnel, equipment, and information technology also have to be designed to support modularity. Organizational arrangements increasing overall strategic flexibility within the organization is also needed.

***Keywords**:* Logistics services, mass-customization, flexibility, service platform, co-operation

Introduction

The importance of business services in almost every branch of industry has been increasing due to outsourcing and companies' concentration on core businesses. Therefore, service providers need to constantly develop new ways to create customer value. Customized products and services using flexible product processes in a standardised or modular production system have been seen as good ways to increase the efficiency of developing products for heterogeneous demand. In service production literature on the other hand, research about benefiting from modularity can hardly be found (see, however, e.g. Harvey, Lefebvre and Lefebvre 1997; Homann, Rill and Wimmer 2004). Hence, the way service production can be developed through modularity certainly deserves research attention.

Quite a lot of research on modularity already exists in relation to manufacturing physical products. Although there are arguments against applying manufacturing logic to services as Bowen and Youngdahl (1998) point out, several lessons can be learned. Modularity creates greater flexibility in a system by enabling parts of it to be recombined to serve different customer needs (Schilling 2000). Platform thinking can be used to identify and utilise the shared, i.e. modular, structure and logic of activities and customer offerings in service production. Unlike product platforms that have become standard tools in operations management, service platforms have received limited attention in practical business management and academic service research. (see, e.g., Sawhney 1998; Meyer and De Tore 1999.)

The purpose of this research is to find out how we can apply modularity in developing business services for heterogeneous customer needs. More specifically, we will explore the ways of using modular service processes and organisational forms in service production to create customer value. On the basis of our study, we will also present managerial implications for modular business service development. For the empirical context, we will concentrate on logistic services. Logistics service providers act as the link between the manufacturer and its customers and suppliers. This role creates many challenges for logistics firms and they should be capable of understanding, designing and managing new customer oriented services and logistics solutions for the total supply chain of the manufactured product. Thus the logistics service providers and industry provide a fruitful context in which to study modular service development and production.

The research design of this study follows an abductive logic including the construction of theoretical pre-understanding and elaborating on it empirically. We will construct our model on the basis of existing literature. Mainly two streams of literature are applied. Firstly, services marketing literature is used to find the specific features of business services and their development. Secondly, we will employ the knowledge of modularity generated in contexts of physical products in product development and management research. On the basis of these, we will compose a pre-understanding of modular service development. In the empirical part of our study, we will elaborate on this through qualitative research. We will use a case study strategy concentrating on a logistics service provider firm. We present an empirically grounded model for understanding the benefits of modular service development in logistic services.

Characteristics of Business Services

Services marketing literature has for a long time included studies on consumer services and recently the business-to-business side has also received attention. A special field of interest within business services has been the professional services, which have been studied especially from relationship (Halinen 1997) and value creation perspectives (Lapierre 1997; Hirvonen and Helander 2001). Generally, services differ from physical products in terms of e.g. their intangible nature, parallel production and consumption and co-production of the service provider and customer (Normann 1992). Services literature currently maintains a view of services as not only a category of market offerings in addition to physical products, but as a perspective of value creation (Edvardsson, Gustafsson and Roos 2005). More specifically, studies have emphasised the customer's perspective of value and understanding that services are about co-creating value with the customer and their interactive, processual, experimental, and relational nature form the basis for characterizing services. Business services should then be seen as objects of exchange, where value is created for the customer through a relationship between the service provider and the customer involving interactive, processual and experimental aspects.

Business services are a group of very diverse objects of exchange (Axelsson and Wynstra 2002). Firstly, the relative levels of pure service content and the physical elements of the exchange can vary a lot. Any service offering exchanged in the business market is often more or less a combination of both physical and abstract elements. Furthermore, the knowledge intensiveness of the services may vary from complex management consulting services to facility services such as cleaning or catering. The level of standardization (see, e.g., Lampel and Mintzberg 1996) also may vary according to service provider's strategies. Certain services need to be highly customized for the specific needs of the customer whereas other services can be offered as standard.

The business-to-business context brings forth specific features. Purchase decision making is often considered a complex process involving a group effort. The idea of an informal buying center including various individuals within the buying organization possessing different roles in the decision making was presented in the seventies by industrial marketing researchers (Webster and Wind 1972). Furthermore, the notion of derived demand has been emphasized as an essential characteristic of the business-to-business market setting (Hutt and Speh 1994). Thus, the demand generated by business customers can not be understood unless the demand facing the business customer is not acknowledged. Finally, a distinguishing feature of the business setting is the complexity of exchange mechanisms (Dwyer and Tanner 1999). In business market settings, inter-organizational exchanges can take place in highly competitive market settings or in a close and long-term co-operative partnership between the seller and the buyer including any players in between (Webster 1992). In a

business services context, the nature of the exchange mechanism between actors is closely related to the degree of standardization in the service offering.

Business services thus represent an important yet multifaceted phenomenon from the service provider's perspective. However, with rising expectations and highly specified needs of customers, the providers of business services no doubt face problems in their service development. Cost efficiency is essential in service production and cost savings can be expected if the service production can be standardized. Modularity can be seen as a tool for standardizing the service production for achieving better customer value as well as better profitability.

Modular product platform

Modularity of Products, Processes and Organizations

In operation management literature modularity means that parts or components of a product are sub-divisible into modules. Modules which are easily interchanged and replaced produce flexibility in production that makes changes in product development and production easier (see, e.g., Heizer and Render 2004). A general theory of modularity, developed by Schilling (2000) defines it as the degree to which the components of the system, i.e. the elements of a product, processes of a production system or parts of an organization, can be separated and recombined to create customer oriented products without losing or with only little loss of functionality.

For modular products the relationships between components should be defined by the standardized component interfaces. This means that the elements of a product have to be unchanged to allow the processes to become loosely decoupled with low coordination need between processes and hence allowing easy re-coupling of the elements. Designing a new product only requires that all the components developed fulfill the standardized component interface specifications. It means that a firm must have good knowledge of the relevant components and their interactions. An example of the modular architecture with standardized interfaces is the system of Electronic Data Interchange (EDI) in logistics. (Sanchez and Mahoney 1996.) The appropriateness and degree of product modularity has been analyzed based on Schilling's (2000) testable propositions of inter-firm product modularity by Asan, Polat and Serdar (2004).

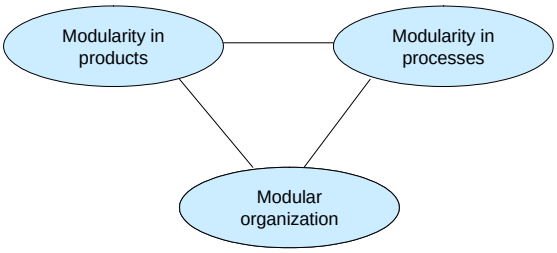
Modular processes (Hoogeweegen, Teunissen, Vervest and Wagenaar 1999) are built from one or several production elements, e.g. in ordering, the sending and receiving of orders (by phone, fax, EDI); for documentation, the creation and printing, the electronic sending and receiving of documents; and for delivery consisting of pick ups from a consignor to a forwarder, transfers to a carrier, transportation to the destination, deliveries to a consignee. Modular organization is based on the need for a flexible learning organization that can solve problems through interconnected coordinated self-organizing processes (Daft and Levin 1993 in Sanchez and Mahoney 1996). Contract manufacturing, alternative work arrangements and the formation of alliances are presented by Schilling and Steensma (2001) as three ways of creating modularity in an organization. Prerequisite factors in the use of these organizational forms are availability of standards, technological change as drivers and a competitive industry environment that is heterogeneous in input and demand.

In a decomposition system (Sanchez and Mahoney 1996) the interactions between subsystems are weak and the tasks within a multidivisional firm, e.g. an international logistics service operator, have low coordination. This means that the modular organization functions as a group of weakly connected subsystems. This independence of modules brings forth the need to coordinate different modular functions efficiently.

Flexibility in the service organization (supply chain network) helps to change production volumes and service mixes quickly. The use of platform planning with modularity for value creation requires a definition of service requirements in a close relationship with customers and the identification of production elements with suppliers (sub-contractors, alliance members). The use of technology for information sharing, data transfer, customer relationship management and planning and scheduling is necessary to manage modular platform planning (Hoogeweegen et al. 1999; Lohse, Ratchev and Valtchanov 2004). For example, Koudal and Coleman (2005) indicate that flexibility in product design

and platforms makes it possible to modify service offerings quickly in order to meet customer and market demands. (Figure 1.)

Figure 1 Modularity in products, processes and organizational form



Benefits of Modularity in Service Development

In service operations management, flexibility and modularity are not as well-known concepts as in product modularity research. For instance, Fitzsimmons and Fitzsimmons (2004) state that flexibility is only related to location choices and to the ability to adapt to future changes in customer demand. Applications of modular production in manufacturing are driven by lower logistics costs but also by shorter lead times and customization. Applying van Hoek's and Weken's (1998) ideas to logistics service providers, modularity means the integration of various activities (functions) within a company and development input to design services producing both efficiency but also responsiveness to market demands for service variety and customization. (see also Bowen and Youngdahl 1998).

Based on just-in-time or computer-integrated manufacturing strategies, Harvey et al. (1997) study the role of information technology in the banking industry, attempting to find sources of flexibility in service delivery processes. They define flexibility as the ability to manage with the remaining variability from external sources, i.e. after managing internal variability related to product and process design, management and organizational factors. A flexible service company can manage variability coming from changes in services, volume of demand, or in service delivery processes (time and place) with minimum cost.

Hence, modularity can be seen as a measure for managing heterogeneity (variability) in demand for logistics services. Schilling (2000) suggests that in the case of heterogeneous inputs and demand, the modular system is superior, while in the case of heterogeneous input but homogenous demand, the non-modular system is more cost efficient. In the third case, if there is variety in the needs of customers, but input is homogenous, modularity can produce scale flexibility but may not increase the scope of possible service configurations.

The most important element in a modular organization is its strategic flexibility in reacting to an ever-changing business environment which can be found within "virtual organizations" (see Mowshowitz 1997 in Hoogeweegen et al. 1999). Successful use of modularity in service production therefore also requires some modularity in the organization design, enabling the utilization of core capabilities in problem solving. Forces driving the development of modular organizational forms are heterogeneity in input and demand for products while prerequisite factors are the availability of standards, technological development, and intensive competition (Schilling and Steensma 2001).

By using sub-contracting as an organizational module, the firm can scale its production according to external variability related to current demand without increasing its own labor input or capital investment. Hence, sub-contracting forms a source of scope flexibility for a firm. It can specialize in core processes creating high customer value while sub-contractors provide other resources (standard processes). Upton (1994 in Harvey et al. 1997) suggests that flexibility is "the ability to change and react with few penalties in time, effort, cost or performance and the use of modularity for products, processes, and organizational forms can offer a tool to handle these pressures better.

Modular Service Platform

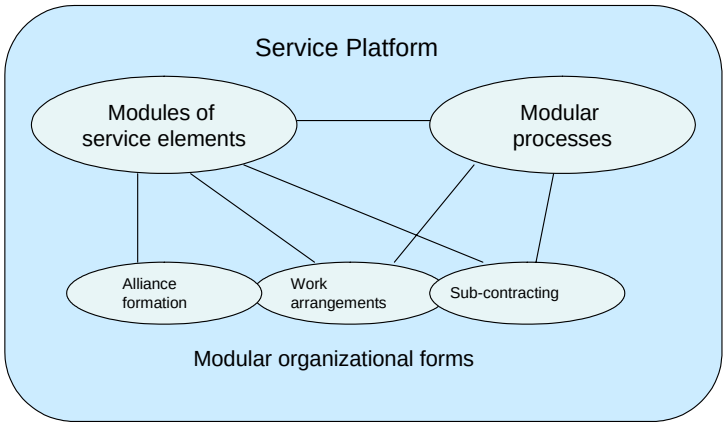
Modular service production relies on segmented customization, customizing only the downstream areas of the supply chain, and a customer relationship; but the production processes must provide a

compatible basis for the standard service components, and sub-processes (see different production strategies in, e.g., Lampel and Mintzberg 1996). Platform thinking is a key that can help manage highly diversified customer needs where commonalities among a company's service offerings, target markets, and processes for leveraging offerings are identified and analyzed (Sawhney 1998). A platform consists of independent sub-systems (sub-processes) and the interfaces between them. These sub-systems and interfaces can be innovations or specific assets oriented and based on capabilities and technologies within a firm, and also external to the firm, e.g. sub-contracting or contract manufacturing. For customers, platforms with several sub-systems need to be seamless, producing a flow of services for the different needs of customers with competitive prices. (Meyer and De Tore 1999.)

For a new platform strategy a firm should decide which kind of customer needs, markets and customer segments offer the most promising growth opportunities by analyzing markets and competitors. This is done by determining the core building blocks with which it is possible to produce and deliver the desired new services. Four categories of core competencies are needed: customer knowledge, service technologies, process technologies, and organizational capabilities. (Meyer and Lehnerd 1997; Sawhney 1998; Meyer and De Tore 1999.) The platform planning means that the product architecture for developing new services is modular. The platform planning can be function-based, i.e. based on the ability to be separated from and recombined with service functions and how these are distributed (see service technology as core competence in Meyer's and De Tore's (2001) platform). Another type of modular platform is manufacturing-based where modularity relies more on the production technology and 'assembly' operations of service production (see, e.g., Asan et al. 2004).

The platform approach can offer a mean to create customer value by sharing service elements and production sub-processes across platforms of services; logistics service companies can design diversified services efficiently, increasing flexibility and responsiveness and take market share from competitors who do not utilize platform planning in service development and production. Robertson and Ulrich (1998) see a greater ability to customize products to different market segments and customers with less cost as benefits of platform planning. The cost and time of service development can also be lower because some or all elements of a new service already exist and have been tested. The production and delivery of services via a platform may cost less due to the higher volume of parts used in several services, e.g. the modular unit loads or vehicles suitable for several type of goods. Asset-specific investments are also lower for modular than dedicated equipment and facilities designed to meet one customer's needs. Platform planning may decrease the complexity of production system and a lower number of parts and processes can decrease costs in operation management, service delivery and sales. Platform planning allows companies to improve service quality because it is easier to improve and monitor fewer service elements and processes for better services. A modular service platform consists of individual sub-systems or modules of service and production elements and organizational structure (Figure 2).

Figure 2 A modular service platform



The interfaces of those sub-systems are based on specific capabilities and process technologies. By renewing platforms systematically, a firm can produce new services to meet different market or

customer segments needs. Platform planning is not always successful; the main problem is the organizational force as a barrier to finding the balance between commonality and distinctiveness of modules. Functional organization, i.e. separate production and marketing functions (management) can be a reason for failure and hence the use of modular platform planning in service design also requires organizational structures to be adapted. (Robertson and Ulrich 1998.)

In the modular production model used in the empirical study, the most important blocks were service sub-systems which consisted of the elements of each service and production (activities, tasks) and organizational capabilities and forms (Schilling and Steensma 2001). To leverage its competencies the service company should concentrate its service development on growing markets, and develop robust but flexible service platforms serving the fast and cost-efficient design of new services (Meyer and De Tore 1999).

Empirical Study of Modular Service Production

Research Strategy

Next we will elaborate on our conceptual model through an empirical qualitative case study. The purpose of our study is to find out how we can apply modularity when creating new business services, particularly logistics services for heterogeneous customer needs. The object of the study, modularity in creating business services, thus represents a complex phenomenon which can not easily be separated from its context. More specifically, we have set out to explore the benefits of using modular service processes and organizational forms in service production. We have adopted the case study strategy in order to be able to carefully examine modularity in business services using multiple levels of analysis. By looking at modularity both at the level of service processes and organizational issues, we are able to take the various aspects of the complex research phenomenon into account. On the basis of these, we argue that the single case study strategy represents an applicable research strategy for the purposes of our study.

The selection of the case is crucial, especially with a single case strategy. In order to find a suitable case, we first identified a field of the service industry that would provide a context for the modular service development. An interesting industry, where modular service development represents a current challenge is the logistics services industry. Alternative services industries might include e.g. facilities management services or some types of professional services such as management consulting or marketing services. However, the logistics services industry can be seen as a good choice for a context in which to study modular service development as it includes both physical and service goods in central roles. Although freight transport services consist of the physical movement of goods, according to Harvey et al. (1997, 30), they involve the following features of services: they always involve at least one customer contact, and there is increasing demand to have them bundled and delivered at the right time, and at the right place in the customer's supply chain. Furthermore, services are produced as they are demanded, and they involve less physical aspects and delivery than manufactured goods. The existence of both physical and service elements can make the service processes more visible than for example in professional services.

After selecting the industry for the context of the case, we moved on to choose the actual case for our study. The most important criterion for the case selection was that the case company should have at least some level of modularity in its service production. The case selection was based on a previous study related to the roles of logistics companies in networks (Pekkarinen, Väyrynen, Juga and Kilpala 2004). The empirical data included in-depth interviews of 18 logistics service providers and an initial analysis of this data resulted in the identification of one service provider applying some degree of modularity to its service production planning. Another main criterion for the selection was the existence of clearly varying customer needs. The identified service provider's customer base included a variety of different types of customer organizations with varying needs. Consequently, this firm was chosen as the case for this study.

The data collected from the case company included an in-depth interview with the managing director; the interview was tape recorded and transcribed. In addition to this, the service offerings of the company were thoroughly studied through various documents including service descriptions and

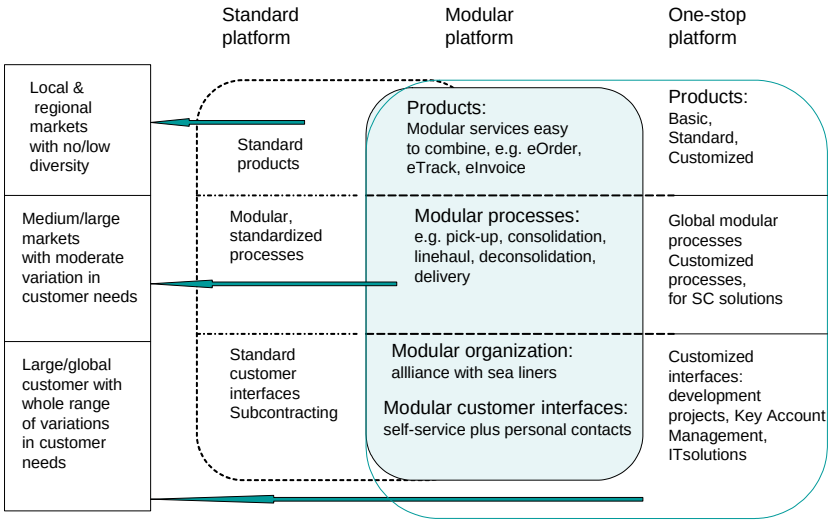
brochures. The empirical data was analyzed by categorizing it on the basis of the theoretical pre-understanding. In the following, we will first introduce the case company and its service offerings and then analyze the modularity in its service production.

Modular Service Production in the Case Company

The case company is a global logistics service provider. Its services are standard service products with a wide range of value added services customized by industries, e.g. insurance, pick and pack, labeling and finance. Customer values are speed, reliability, flexibility and a customer orientation is used for analyzing necessary service elements. Standard services are, for instance, road and rail freight transport for less than full loads and full load shipments as well as air freight, express, parcel and break bulk services. Logistics solutions are customized for each customer where process modularity enables the building of cost efficient customized solutions utilizing similarities in customer needs. Modularity in service production has especially been utilized for air freight and express services.

The case company keeps global companies as ideal customer segments where manufacturing and retail as well as banking, insurance and other finances are present. However, it has found only a few true global partnerships; most of its relationships are contract-based. Its role in each client's supply chain depends on the nature of the relationship but the case company is the leading logistics provider for its global customers. In future, the company would like to become a one-window supplier providing supply chain management solutions. IT is an important tool for developing customer relationships and customers' SCM; it is also used for training global customers and implementing services. In Figure 3, three different platform for the case company are presented.

Figure 3 The modular logistics service platform model for the case company



Three main common sub-systems of processes were found; electronic information, physical movement of goods; and management. Each of the sub-systems can be divided to several sub-processes. For instance, the electronic services offered can include ordering, booking, and tracking processes. Documentation and billing, e.g. customs clearance, billing charges and duties can be produced more traditionally (road and rail) or totally electronically (air, express). Transport services consist of the core physical service processes of the movement and handling of transported goods, e.g. pick-up, consolidation, line haul transport by air carriers, cross-docking and delivery. The management sub-systems, e.g. operation management or customer relationship management consist of different standardized management processes to plan, control, and develop the design, production, and delivery for customer segments or individual customers. In managing the customer relationship different interfaces and processes are used, e.g. help-desk and on-line service helper options, or customized IT systems for global customers. In Table 1 the main findings are shown for modularity in case company related to the modular platform framework presented in Figure 3.

For its coordinated customer interfaces, the case company uses development meetings and Key Account Management for big customers, normal sales visits, and daily operative communication. The physical resources are mainly owned but a subsidiary's road fleet is used in domestic haul transport. The case company has its own IT systems and it also has is own or long-term rental terminals and warehouses. IT has an extensive role in customer service, but it is also a critical tool for service and process implementations. The extensive delivery network, automatic distribution centers, efficient transport fleet and modern information system (IT) are seen as competencies that help deliver on promises made to customers with particular speed. Core competencies for the case company are the ability to develop services (Hertz and Alfredsson 2003), fast responsiveness to changes, its modular service production system, flexibility in customer interface, generic human skills, and the fact that it is partially highly specialized.

Table 1 Empirical findings for modularity in the case company

Dimensions of modularity	Case company
Services	*Standard services* e.g. road, rail freight services, express.
	Modular services are combined from standard and value-added services, e.g. air and express services, fulfilling customers' needs.
	*Customized logistics solution*s from standard, modular and special value-added services.
Processes	
Information	Intensive use of IT in service production and delivery.
	Standard IT-processes available to all customers with self-service via internet, interactive options also available.
	For customized solutions the modules of eServices are used for cost efficiency in production and management.
Physical movements of goods	Road line haul transport is outsourced.
	Other processes related to physical handling of goods are partitioned to separate processes for delivering services as standard, modular or integrated to client's processes.
Management	Operation management system is extensively IT-based.
	Customer relationship management is segmented by customer markets.
	Customized relationship interfaces for big and global customers, e.g. development meetings, specialization of staff, key account management.
Organisation	
Strategic target of modularity:	Case Company can offer their services cost efficiently, the role in each client's supply chain depends on the customer relationship differences by platform:.
	Platform1: Standard service supplier to small customers
	Platform 2: Contract supplier offering modular services to large volume customers. considering the benefits of modularity in service production
	Platform 3: One-stop supplier with a range of variation in service offerings to meet customer's needs on the basis of partnership
Subcontracting	Road transport is sub-contracted to a subsidiary owned together with another big domestic actor for flexibility and cost efficiency.
Work arrangements	Case Company alters scale and scope of own staff more than using leased staff; personnel seen as a strategic capability.
	Expertise within organization is guaranteed by training and development projects and meetings.
Alliance/partnership formation	Case Company forms partnerships with sea liners for global sea freight services

Conclusions

The case analysis shows that the global logistics service provider, by choosing a modular production strategy for cost efficiency and flexibility, can offer logistics services in very different markets without losing its competitiveness or functionality. The modular, common processes are used to produce so called basic service components from which customer oriented service packages and solutions are easier to design and deliver. The case company uses differentiation (industry and relationship segmentation) in service design and delivery but tries to utilize modular processes worldwide across all customer segments. By differentiating e.g. IT services by the type of customer needs, three different platforms can be defined.

The case company offers on its standard platform a catalogue of standard air freight and express services from which a customer can choose the best service for her needs; customized services are produced by a modular standardized process with its own fleet and minor subcontracting with no personalized customer service. The modular platform planning is used for larger contractual customers whose needs are mostly standard and easy to produce by self-service delivery. However, some personalized customer service forms are used electronically, on-line and through contact with sales personnel. The third platform, one-stop shopping, is offered to global customers with a high variety of logistics needs and large volume. The customer gets all the services it needs from the case company, which is using modular processes but customized service delivery and customer relationship management. For instance, the case company developed the unique service configuration “Scandinavian distribution” for a global customer.

Based on the case study, we can say that deep industry-oriented skills, modular processes for standard service components and customer-oriented service delivery with the strategic use of IT for managing customer segmentation are essential competencies for logistics service providers. Modular organizational forms such as sub-contracting, different work arrangements and partnerships within the supply network are applied by the case company to ensure higher flexibility and cost efficiency in service production.

This research will increase knowledge regarding the benefits of modularity by focusing on logistics services. In Table 2 we collect the means of modularity creating value in developing businesses, especially logistics services to varying customer needs. A thorough knowledge of customer markets is required for the successful use of modular platform planning in service development and production. Also service and production technology, personnel, equipment and information technology have to be designed to support modularity. Organizational arrangements which increases overall strategic flexibility within an organization are also needed to meet all of the pressures the business services will face. In many ways, modularity has already become a part of strategic management and operations in the logistics industry. They use leased staff, sub-contracting in production (transport, IT) and alliance or network formation to gain more flexibility to meet the ever-changing needs of today’s customers. The development of services to meet new customer needs or new markets can be faster with lower costs, improving flexibility. However, the manager needs to know which kind of services modular design and production is appropriate for. If it is not possible to share or separate the independent service components of a service without losing some of its functionality, modular services are not the right answer. For example, in the case of full load road transportation from origin A to destination B, it is difficult to see any benefits of the use of modular platform planning. However, for a firm with several service portfolios such as our case company, full load direct shipments are just one standard platform.

Table 2 Value creation through modularity in developing business services to varying customer needs

Dimensions of modularity	Means of customer values
Services	Higher flexibility managing external variability in current demand, changes in volume, time and place.
	Scale economies; increases of production with lower cost and gain markets from competitors.
	Scope economies; higher number of service offerings with lower costs, possibility to offer a larger variety of service with same production system.
	Better responsiveness of new service development, changing service offerings faster.
	One-stop shopping: service provider can offer all services customers demand without losing cost efficiency and flexibility.
Processes	
Information	Information technology has a dominant role in modular processes creating seamless interfaces between processes.
	IT is a necessity to modularity gains in information sharing, transferring, managing customer interfaces and service design and planning.
Physical movement of goods	Higher number of services delivered by the same production system and processes.
Management	Possibility to utilize core competencies to manage modular services and sub-processes for seamless total service to customers.
	Management system consists of service design, production and delivery with differentiated customer interfaces by markets.
Organization	
Strategic target of modularity	A source of strategic flexibility improving ability to manage intensive competition and changes in technology and business environment.
	Superior if inputs of production and demand for services both are heterogeneous.
Subcontracting	Scale economies in production: changes fixed costs to variable costs, high competence with sub-contractors improving service quality and lowering costs.
	Flexibility to adjust to changes and variation in demand increases, e.g. seasonal variation.
	Risk in investments decreases, no investments in fleet
	Sub-contractors offer standard processes, own personnel can specialize to offer higher customer value service.
Work arrangements	Scale economies: higher production without increasing own labour and capital costs.
	More flexible use of production system.
	Better utilization of core competencies e.g. the use of leased staff for flexibility in volume and cost efficiency.
Alliance/partnership formation	Greater scope flexibility improves ability to meet customers' changing needs.
	Sharing venture capital risk offers cost benefits.
	Higher responsiveness to new business opportunities.
	Networking with strategic partners improves competitiveness, e.g. global network of express services.
	Access to critical capabilities lacking in-house.

To conclude, in creating value for diversified customer needs the idea of modularity in service development can be applied, as we have discussed. Although our empirical context represented the logistics services industry, the results from our study can also be applicable to other similar industry contexts as well. The use of modularity in terms of the three dimensions can help service providers to create value for their customers as well as for themselves also in other industries. In addition to the means for creating value discussed earlier, modularity can be seen as one way to make the services more visible. This can help the service providers to communicate the customer value that their services can generate also in the negotiation phase as the customer is trying to evaluate the service provider's value creation abilities. This is especially relevant in the business services context, as the services are typically difficult to demonstrate in advance for the customer.

With respect to future research avenues for modularity in service development, an important area is to focus more on the co-creation aspect (see, e.g., Edvardsson et al. 2005). In modular service offerings, the role of customer may in fact increase in the co-production of the value if certain actions are transferred to the customer, e.g. self-service regarding the information about the offerings. Customer's understanding of the available solutions and one's own needs becomes essential in modular services. However, in case of business services, this may be difficult to the customers (Axelsson and Wynstra 2002). This may be the case also in so called standard service needs because customers may consider their needs as standard, yet value could be increased if more complete tailored solutions would be used. To this, the service provider's expertise may bee needed. Thus, this co-creation of value in light of modular service development certainly needs more research attention.

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