



# THE DELIVERY MODE: THE EFFECT OF DIFFERENTIATION IN NEEDS AND STRENGTH OF COUPLING

*To what extent do differentiation in needs of support activities and strength of coupling of support activities affect the relationship between the delivery mode, shared or non-shared, and the perceived value of support activities by the business units?*

MSc in Business Administration,  
Innovation and Entrepreneurship

First Supervisor: Dr. J.G. Meijerink  
Second Supervisor: Dr.Ir. E. Hofman

Randy Rosink  
26 November 2014

## Acknowledgements

During my last period at the University of Twente this thesis is performed for completing the master Business Administration, track Innovation and Entrepreneurship. The assignment is conducted for a shared service center, performing the administrative activities of a laboring company in the Netherlands. Next to my study I have been working for this organization for several years. This has made the study even more interesting, while the interface of theoretical courses and practical experiences increased the awareness of theory and how this is related to practice.

This thesis has been written between January and October 2014. I like to appoint my gratitude to several people. First of all I would like to thank all of my colleagues for their support (participating and pretesting the survey, participation in interviews and all the other ways of support) in accomplishing the graduation assignment. Among others I would like to make a special thanks to my company supervisor for helping me with finding important stakeholders and the translation from theory to practice.

I would like to thank my first supervisor Jeroen Meijerink for the support and feedback to improve the thesis and for keeping me on track during several meetings. Furthermore I would like to thank Erwin Hofman for the feedback.

In finishing my study several difficult moments have occurred. For this reason I would like to thank my girlfriend and my family for their confidence, positive support and dragging me through difficult moments.

Kind regards,

A handwritten signature in black ink, appearing to be 'Randy Rosink', with a stylized, somewhat abstract shape.

Randy Rosink

26 November 2014

## Abstract

Since the nineties the number of Shared Service Centers (SSC) have risen in the Netherlands, echoing the United States. The main goal of the SSC is reducing redundancies by combining the benefits of centralized and decentralized organizational designs, combining the best of both worlds (Janssen and Joha, 2006). However poor designs of the SSC can cause costs to increase and the quality to decrease.

In this study design rules used for designing product platforms and managing product families are tested in a service delivery setting. According to Martin and Ishii (2002) two important design rules in platform design are the GVI (General Variety Index) and the CI (Coupling Index). Hofman and Meijerink (in press) already tested the moderating effect of the GVI, conceptualized as differentiation in needs of HR activities, on the relationship between the delivery mode (sharing or not sharing) and the perceived value of HR activities. In this study the research of Hofman and Meijerink (in press) is repeated for support activities, however we also tested the CI conceptualized as the strength of coupling. According to the theory used in our theoretical framework we assume a moderating affect of differentiation in needs and strength of coupling on the relationship between the delivery mode and the perceived value of support activities. Support activities with a high differentiation in needs and/or a high strength of coupling should be performed in a non-shared delivery mode (embedded in the business units) to create the highest perceived value. While support activities with a low differentiation in needs and/or strength of coupling are assumed to create the highest service value if these support activities are performed in a shared delivery mode (inter- or intra-organizational).

The research did not find empirical evidence that the relationship between the delivery mode and the perceived value of support activities is contingent on the differentiation in needs and strength of coupling of support activities. To go short no clear and grounded advice for reaching the highest perceived value can be given to the decision makers of the case company on sharing or not sharing specific support activities with a differentiation in needs and a strength of coupling. We did find empirical evidence that the strength of coupling is negatively correlated to the perceived value of support activities.

## Table of Contents

Acknowledgements.....	1
Abstract .....	2
Table of Contents.....	3
1. Introduction.....	5
2. Theoretical Background.....	7
2.1 The delivery mode and perceived value .....	7
2.1.1 The delivery mode .....	7
2.1.2 Benchmarking the delivery mode .....	8
2.1.3 The conceptualization of the performance indicator .....	9
2.1.4 Service design for increasing service value .....	10
2.2 Design rules .....	12
2.2.1 Platform thinking in service design .....	12
2.2.2 Conditions in successful product platforms.....	14
2.2.3 Differentiation in needs and strength of coupling.....	15
2.3 Hypothesis.....	20
3. Methodology .....	21
3.1 Contextual background .....	21
3.2 Unit of analysis and sampling.....	21
3.3 Data collection procedures.....	22
3.3.1 The survey research .....	23
3.3.2 The Design Structure Matrix (DSM) .....	24
3.4 Operationalization of the variables .....	24
3.4.1 The delivery mode .....	25
3.4.2 Differentiation in needs.....	25
3.4.3 Strength of coupling.....	25
3.4.4 Perceived value by the business units.....	26
3.4.5 Control variable: Job tenure.....	26
3.4.6 Control variable: Career.....	27

3.5 Pretesting the survey .....	27
4. Research results and analysis .....	28
4.1 Descriptive statistics and correlations .....	28
4.2 Regression and hypothesis testing .....	29
4.2.1 Regression analysis .....	29
4.2.2 Model 1: The control variables .....	30
4.2.3 Model 2: Hypothesis 2 .....	30
4.2.4 Model 3: Hypothesis 1 .....	31
4.2.5 Model 4: Hypothesis 3 .....	31
5. Discussion and conclusion .....	32
5.1 Theoretical contributions and implications .....	32
5.2 Practical contributions and implications .....	35
5.3 Limitations and future research .....	36
5.4 Conclusion .....	38
References .....	39
Appendix .....	43
Appendix 1: Sampled support activities .....	43
Appendix 2: Regression analysis .....	44
Appendix 3: The structure of the surveys .....	45

## 1. Introduction

Since the nineties the number of Shared Service Centers (SSC) have risen in the Netherlands, echoing the United states (Strikwerda, 2010). Before an organization can establish an SSC, choices need to be made about the delivery mode of the activities that need to be executed. The delivery mode is conceptualized as a shared delivery mode (activities shared across business units) and a non-shared delivery mode (activities not shared across business units). Choosing the delivery mode is important for reaching the highest quality for the lowest costs of the activities.

Within literature various benefits of setting up an SSC are mentioned (Bergeron, 2003; Janssen and Joha, 2004; Janssen and Joha, 2006; Schulman, Dunleavy, Harmer, and Lusk, 1999; Schulz, Uebernickel, Hochstein, and Brenner, 2009; Strikwerda, 2010). ‘An SSC consolidates processes within a concern in order to reduce redundancies; it delivers support processes; it is a separate organizational unit within the holding; it is aligned with external customers; cost-cutting is a major driver for implementation; it is focused on internal customers; and it is operated like a business’ (Schulz et al., 2009, p. 9). Within the SSC the benefits of centralized and decentralized organizational designs are combined within an SSC, trying to take the best of both worlds (Janssen and Joha, 2006). According to Janssen and Joha (2006) the basic premise of an SSC seems to be that services provided by one local department can be provided to others with relatively few effort. The know-how that can be developed within an SSC can improve service levels over the different business units, applying best practices for all comparable practices (Meijerink and Boundarouk, 2013). Furthermore central experts within the SSC can provide technological support, project management expertise and can make use of knowledge from past projects. Local experts provide business knowledge and user requirements (Janssen and Joha, 2004). Bundling the development, maintenance and use of services within an SSC means that these costs can be shared across business units. The innovations that were out of reach in the past might become feasible and the money freed can be used to improve service levels without giving up autonomy (Jansen and Joha, 2006). Analyzing scientific literature in depth makes clear that a lot is written about the possible benefits of an SSC and the motives for setting up one. Economies of scale and scope, standardization, a flexible and effective alignment of IT, synergy, mutual learning and a clear management focus are premises of the SSC (Janssen and Joha, 2006). Bergeron (2003) claims that shared services is a collaborative strategy that can be concentrated in a new, semi-autonomous business unit that has a management structure designed to promote efficiency, value generation, cost savings, and improved service for the internal customers of the parent corporation (Bergeron, 2003). Chandler (1977) imposes that sharing can increase productivity and decrease unit costs, often identified as economies of scale. Furthermore Pooled experience, enhance career progression, independent of business, synergies, lean and flat organization, recognition of group functions and dissemination of best practice are important motivations (Schulman et al., 1999).

As one can see, the perceived value for the internal customers of the parent corporation (the business units) is the most important reason for the existence of an SSC. Before statements about value can be made, the perceived value concept needs to be determined. Zeithaml (1988) describes perceived value as the consumer’s overall assessment of the utility of a product based on perceptions of what is received and what is given. The costs, prices paid and time/effort invested, and perceived quality are related to the perceived value (Zeithaml, 1988). Within this

research the ratio of costs and quality is used to interpret the perceived value. However, nearly a third of the respondents within the research of Rona (2008) feel that the promised business benefits of the SSC have not been delivered. Next to this, Janssen and Joha (2006) have studied the accomplishment of motives. The outcomes show that about 38% of the motives were not achieved, however many of the interviewees did not feel that the SSC failed since other accomplished motives seem to compensate the not accomplished motives (Janssen and Joha, 2006). On the question why these objectives are not met, and thereby the perceived value for the internal customers of the parent company, no clear answer can be given.

Accomplishing objectives is influenced by many important aspects, Janssen and Joha (2006) mentions that the design of the SSC is of paramount importance. The design needs to be carefully chosen and balanced in such a way that the different motives are achieved (Janssen and Joha, 2006). A poor design of the SSC may result in low quality and high costs and a decrease of the perceived value by the business units (Hofman and Meijerink (in press)). An SSC can be run in a lot of ways and no clear best practice can be appointed. The variables influencing the design are very complex, and one can most of the times say 'it depends'. Within the field of design rules, a focus is made on platform thinking; 'the collection of assets that are shared by a set of products (Robertson, 1998: 1)'. In the past it was thought to be useful only for organizations that produce physical products. However, within literature the leap to the intangible arena of services is made (Hofman and Meijerink, in press; Lin and Daim, 2009; Meyer and DeTore, 2001; Pekkarinen and Ulkumiemi, 2008). Trying to explain a part of the 'failure' of the SSC, Hofman and Meijerink (in press) have connected the delivery mode, sharing or non-sharing, with the platform thinking theory.

Within the field of platform thinking various authors explored issues dealing with the strategic benefits of developing product platforms and managing product families (Galsworth, 1994; Martin and Ishii, 2002; Pine, 1993; Robertson and Ulrich, 1998; Sanderson, 1991). Martin (2002) stresses a measurement for the GVI (generation variety index) and the CI (Coupling Index), furthermore a relationship can be detected between the two (Martin and Ishii, 2002). Elaborating on this article, Hofman & Meijerink (in press) found a significant relationship between the delivery mode of HR services, shared or non-shared, and the service value perceived by the business units. It was found that this relationship was influenced by the confounding variable: 'differentiation in needs'. However it appears that only a small part of the influence on the relationship between the delivery mode and perceived value of the business units is explained with this confounding variable (Hofman & Meijerink, in press). The findings of Hofman & Meijerink (in press) elaborate on the differentiation in needs (GVI) ignoring the strength of coupling (CI). According to K. Ulrich (1993) two components are considered coupled if a change made to one of the components can require the other component to change. This gap in literature will be researched in this paper, trying to explain to what extent differentiation in needs and strength of coupling influence the relationship between the delivery mode and the perceived service value. The main question of this research is formulated as:

*To what extent do differentiation in needs of support activities and strength of coupling of support activities affect the relationship between the delivery mode, shared or non-shared, and the perceived value of support activities by the business units?*

## 2. Theoretical Background

Within this chapter relevant literature is analyzed thoroughly. Relevant literature from the past is analyzed. Furthermore important subjects are pinpointed and hypotheses formulated.

### 2.1 The delivery mode and perceived value

#### 2.1.1 The delivery mode

In the nineties the number of SSC's has emerged (Strikwerda, 2010). This rising number was a response to the saturation of markets causing a decline in profitability, forcing organizations to cut costs. According to Janssen et al. (2006, p. 104) the popularity of the SSC originates from: 'a combination of advantages, including efficiency gains and an increase in service levels without giving up the control of organizational and technical arrangements and expertise'. The SSC is a separate organization within the holding and is focused on the internal customers of the parent company, the business units (Schulz et al., 2009). The SSC is a semi-autonomous business unit, where activities are bundled (D. Ulrich, 1995). Schulz et al. (2009, p. 9) defined a standardized definition of SSC's; 'An SSC consolidates processes within a concern in order to reduce redundancies; it delivers support processes; it is a separate organizational unit within the holding; it is aligned with external customers; cost-cutting is a major driver for implementation; it is focused on internal customers; and it is operated like a business'. Activities of the business units are delegated and executed in an SSC, the so called support activities. Although the definition of an SSC is clear and looks straightforward, there are several organizational designs that have a common denominator 'the delivery mode of support activities'. These organizational designs are: 1] Joint ventures: the pooling of a portion of activities of two or more firms in a legal organization (Kogut, 1988) 2] Outsourcing: delegating activities to an external organization like vendors, consultants or other third parties (D. Ulrich, 1995). 3] Buyer-supplier arrangements: the transferring of activities from one partner to another, hereby coordination is ensured by an appropriate fit between contact points (Dekker, 2004). 4] Corporate departments: embedding of business unit activities, like for example HR or communication, in a corporate department of the holding (Ulrich, Younger and Brockbank, 2008). 5] Centers of excellence: the distribution and combination of talent throughout the organization (D. Ulrich, 1995). 6] Business partners: generalists that work directly with line managers and leaders of business units, aligning practices with business objectives (Ulrich et al., 1995; 2008). 7] Embedded: organizational designs where the activities are embedded in the business units itself (Ulrich et al., 2008). The delivery mode of activities is the overarching level grasping all of these organizational designs in one conceptualization. In table 2.1 the organizational designs are categorized in a shared intra-organizational delivery mode (within the holding), a shared inter-organizational (between different organizations) delivery mode and a non-shared (embedded in the business unit) delivery mode.



<b>Shared delivery mode (inter-organizational)</b>	<b>Shared delivery mode (intra-organizational)</b>	<b>Non-shared delivery mode (embedded)</b>
Joint ventures	Shared service center	Embedded in the business unit
Outsourcing to an external organization	Corporate departments	
Integrative buyer-supplier arrangements	Center of expertise	
	Business Partners	

**Table 2.1: The organizational designs and the delivery modes**

This conceptualization is two-sided; the shared delivery mode (inter- and intra-organizational) and the non-shared delivery mode (embedded). Hofman and Meijerink (in press) conceptualize the delivery mode as follows; (1) a shared delivery mode reflects the execution of common HR activities by delivery channels that are shared across business units and (2) the non-shared delivery mode refers to the execution of HR activities using delivery channels that operate for a single business unit. The conceptualization of Hofman and Meijerink (in press) focuses on the delivery mode of HR activities. Within this research a focus is made on the delivery mode of administrative support activities, later mentioned as support activities. Besides this difference the conceptualization of Hofman and Meijerink (in press) is used for this research.

### **2.1.2 Benchmarking the delivery mode**

An important issue in organizational design is making a choice between the shared or non-shared delivery mode. This is why a benchmark needs to be determined, the so called performance indicator. The performance indicator, a set of values used to measure against make it possible to choose the most suitable delivery mode. In finding this set of values literature mentions a lot of advantages of the shared delivery mode (Quinn, Cooke, and Kris, 1977; Janssen and Joha, 2006; Schulman et al., 1999; Schulz et al., 2009). A shared delivery mode can increase productivity and decrease unit costs, often identified as economies of scale (Chandler, 1977). Furthermore pooled experience, enhanced career progression, independence of business, synergies, lean and flat organization, recognition of group functions and dissemination of best practices are important motivations (Schulman, 1999). Next to this necessity is helping the business units to focus on their core business and several products and synthesis are achieved within an SSC (Janssen, 2004). The risks of developing new systems and services can be reduced by concentrating innovations and by learning from experiences, the weaknesses of resources can be overcome and strengths can be exploited by centralization within the SSC (Janssen, 2004). This is an important risk reduction technique. The governmental case Janssen (2004) studied, concluded with advantages like: ‘the achievement of higher-than-average performances, the safeguarding of key process confidentiality, a better control over their realization and the minimization of the risks of developing dependencies towards an external supplier’ (Janssen, 2004, p. 220). The developed know-how can improve service over the different business units, applying best practices for all common activities. Furthermore central experts can provide technological support, project management expertise and can make use of knowledge from past projects. Local experts provide business knowledge and user requirements (Janssen, 2004). This is called mutual learning (March, 1991) or cross-group learning (Reilly, 2000).

These advantages facilitate a categorization, covering all the benefits. These categories are the service costs (what is given) and service quality (what is received), categorized in table 2.2. Within this research the performance indicator of the delivery mode is the ratio between service cost and service quality (Cronin, Brady, and Hult, Athanassopoulos, 2000; 2000; Hallowell, 1996). In the next paragraph a detailed conceptualization of the performance indicator is given.

Service costs	Service quality
Reduce redundancies (Schulz et al., 2009)	Delivering support processes (Schulz et al., 2009)
Cost cutting (Schulz et al., 2009)	Increasing service levels (Janssen and Joha, 2006; Quinn et al., 2000; Schulman et al., 1999)
Efficiency gains (Janssen and Joha, 2006)	Flexibility (Quinn et al., 2000)
Lack of resources can be prevented (Janssen and Joha, 2006)	High control (Quinn et al., 2000)
Economies of scale (Chandler, 1977)	Expertise, mutual learning (Janssen and Joha, 2006; March, 1991)
Synergies (Schulman et al., 1999)	(Schulz et al., 2009)
	Necessity, focus on core business (Janssen and Joha, 2006)
	Services tailored to customers (Quinn et al., 2000)
	Focus on continuous improvement (Schulman, 1999)

**Table 2.2: The advantages of the shared delivery mode categorized in service costs and service quality**

### 2.1.3 The conceptualization of the performance indicator

The performance indicator is the ratio between the service costs and service quality. Among others the conceptualization of the overarching performance indicator of the delivery mode is the perceived service value by the business units (Hofman and Meijerink, in press; Maatman, Bondarouk and Looise, 2010; Meijerink et al., 2011). In this paragraph a thorough conceptualization of the performance indicator for the delivery mode is given.

First of all Zeithaml (1988, p. 14) conceptualizes perceived value as: ‘the consumer’s overall assessment of the utility of a product based on perceptions of what is received and what is given’. The ‘what is given’ focuses on the costs of the service and the ‘what is received’ reflects the quality of the service in this research. Numerous studies have endeavored to model the interrelationships between quality, value and satisfaction (Cronin et al., 2000). Hallowell (1996) mentions that value equals perceived service quality relative to the price the consumer pays. Furthermore Athanassopoulos (2000) describes value as the amalgamation of service quality and price attributes. Cronin et al. (2000, p. 211) concluded with: ‘the influence of perceptions of service quality and value on behavioral intentions is considerably more integrated than is reported in literature’. Cronin et al. (2000) conceptualize perceived value as the ratio between the quality of the service and the costs of the service. To go short perceived service value of support activities is conceptualized as the ratio between the costs of the service and the quality of the service. These constructs of perceived service value are now elaborated.

Service quality is hard to evaluate because intangible services have other cues than tangible products and cannot be judged by style, hardness, color etcetera (Parasuraman, Zeithaml and Berry, 1985). Maatman et al. (2010) define the quality of services as the perceived value of the business units in relation to their needs. Parasuraman et al. (1985) labeled ten service quality determinants. In the next phase of their research an overlap of the determinants has been found, leading to five determinants ordered by importance (Berry, Zeithaml and Parasuraman, 1985; Parasuraman, Zeithaml, and Berry, 1988). 1] Reliability: the consistency of performance and dependability, this exists of performing services properly at the first time, honoring promises, accuracy, keeping correct records and performing the service at the designated time (Parasuraman et al., 1985). 2] Responsiveness: the willingness or readiness of employees to provide service activities in terms of prompt service (Parasuraman et al., 1985). 3] Assurance: the possession of required knowledge and skills like; politeness, respect, consideration, believability, honesty and freedom of danger/risk/doubt (Johnston, 1995; Parasuraman et al., 1985). 4] Empathy: making the effort to understand the customer needs and the approachability of the employees (Johnston, 1995; Parasuraman et al., 1985). 5] Tangibles: the physical evidence of the service like; appearance of personnel, tools/equipment used and physical representations (Parasuraman et al., 1985). These five determinants measure the quality of support activities in the perception of business units. As mentioned these are ordered by importance in the eyes of the customers (the business units).

The costs construct of the perceived service value by the business units is two-dimensional; monetary and non-monetary. The monetary side is impressed in prices paid by business units (for performing the support activities) for the shared delivery mode in comparison to prices paid in a non-shared delivery mode. The non-monetary side is the time and effort business units need to invest for receiving the support activities in a shared delivery mode, thus also in the non-shared delivery mode (Meijerink, Hofman and Hemels, 2011). If the monetary costs of sharing a support activity are lower than not sharing a support activity, sharing positively influences the perceived value by the business in this case. Furthermore if the time and effort invested in a shared delivery mode is lower than it is in a non-shared delivery mode, sharing the activity has a positive effect on the perceived value of the business units. This construct is used for comparing the costs of shared and non-shared delivery mode. In this research the construct service costs is defined as prices paid, and time and effort invested by the business units.

The perceived value increases if the service quality of support activities improves and/or the costs drop. This conceptualization is used as the performance indicator for comparing the shared and the non-shared delivery mode and can support decision makers in choosing the most suitable delivery mode.

#### **2.1.4 Service design for increasing service value**

According to Maatman et al. (2010) service quality is related to the needs (benefits) of business units. Business units anticipate on reaching these needs by sharing support activities. It appears that the anticipated needs are not always satisfied (Janssen and Joha, 2006; Rona, 2008). The needs, in the case Janssen and Joha (2006) studied, are not satisfied and this has influenced the by the business units perceived value. In the case studied by Janssen and Joha (2006) cost are related to needs like; increased productivity, synergies and lower maintenance costs. However

these needs are not accomplished and are influencing the costs of the service. On the other hand service quality related needs like; mutual learning, higher service levels and lower control are not satisfied and cause the service quality to decrease for the shared delivery mode. Surprisingly this did not mean that the shared delivery mode was a failure in the eyes of the business units, a lower perceived value by the business units compared to the non-shared delivery mode. Due to the not anticipated benefits like; better cost predictability, better information security/authorization and imposing successful practices the business units did not conclude that the shared delivery mode failed. Not fulfilling the predicted benefits can be caused by various reasons. Janssen and Joha (2006) argue that the design of the shared service is of paramount importance for reaching the benefits. The design of the shared delivery mode results in the allocation of support activities and for allocating support activities; the scope needs to be strictly demarcated, accountability needs to be delegated and authority needs to be assigned (Fawaz, Daheb, Audouin, Du-Pond, and Pujolle, 2004; Hofman and Meijerink, in press). This means that designed processes from the past need to be evaluated and adjusted to the semi-autonomous business unit. The redesign of these processes needs to be done accurately. An inaccurate redesign can decrease the perceived service value by the business units, increasing costs and decreasing quality. Costs may rise because continuous negotiations need to take place to keep the process run smoothly (Rindfleisch, 1997). Next to this quality can drop because service activities are not performed in a way business units want. This is why service design is important in reaching the benefits of the shared delivery mode.

Discovering design rules of the delivery mode and increasing the perceived value in terms of higher quality and lower costs are leading to the platform design theory: ‘the collection of assets that are shared by a set of products (Robertson and Ulrich, 1998, p. 1)’. Designing a platform is the process of identifying commonalities in the offerings of the organization. First of all product families can be identified as the collection of products that share the same components of a product (Halman, Hofer and van Vuuren, 2003). The key of platform thinking is the sharing of these components across a family of products. The standardized components, used in every product of the product family can be integrated in the product platform. The differentiation in the products of the product family is created by the additional components that are added to the product platform, creating an individual product. Using a product platform is more efficient and economies of scale can be reached (Robertson and Ulrich, 1998). Economies of scale lower the costs per product. Furthermore the goal of platform design is reaching benefits like synergy, lower risk and improved service (Robertson and Ulrich, 1998). A clear comparison between the benefits of sharing support activities across a set of services in the service environment and the sharing of assets across a set of products in a product environment can be made. The shared delivery mode of support activities in service environments is the product platform in product environments. Furthermore platform design and the shared delivery mode have the common goal of increasing the perceived value (decreasing costs and increasing quality). For this reason platform thinking is used to explain the relationship between the delivery mode and the service value of support activities perceived by the business units.

Within the tangible arena of product environments lots of research is done on platform design and the way it can increase the quality and lower the costs of the product. Within service environments this phenomenon is studied to a smaller extent. This gap in literature can be explained because the assumption existed that platform design was only suitable in product

environments. This assumption has changed over the past years and among others, the leap between service design and platform design is set (Hofman and Meijerink, in press; Lin and Daim, 2009; Meyer and DeToreb, 2001; Pekkarinen and Ulkuniemi, 2008). The literature about product platforms is used to see if product design rules are useful in service design. Focusing on design rules elaborated in product platform design, thus not in service design. These design rules are used to explain the effect of the shared delivery mode on the perceived service value of support activities, trying to find a benchmark of what delivery mode to choose for a specific support activity.

## 2.2 Design rules

### 2.2.1 Platform thinking in service design

The platform design originates from production environments. Halman et al. (2003, p. 150) conceptualize platform design as: ‘the process of identifying and exploiting commonalities among a firm’s offerings, target markets, and the processes for creating and delivering offerings, appears to be a successful strategy to create variety with an efficient use of resources (e.g., cost or time)’. Meyer and Lehnerd (1997, p. 7) define the product platform as: ‘a set of common components, modules, or parts from which a stream of derivative products can be efficiently developed and launched’. The key of the platform approach is sharing modules and other assets across a family of products (Halman et al., 2003). Within platform design the product family, components and the platform are important concepts. These concepts are elucidated here, and the link with service design is made. The concepts are clarified using a simplified example of an organization in the laboring market in the Netherlands existing of two business units with different target markets (figure 2.1).

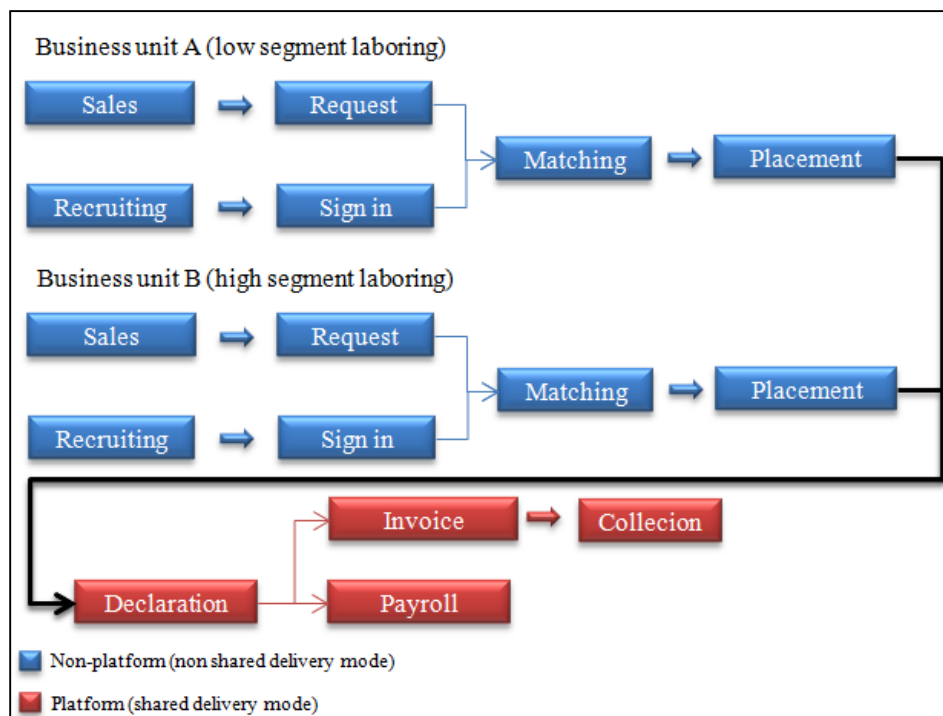


Figure 2.1: a simplified overview of the product families in a service environment

The product family is a collection of products that share the same assets (Meyer and Utterback, 1993; Sawhney, 1998). These assets may include components, knowledge, and production processes (Halman et al., 2003; Robertson and Ulrich, 1998). Within a service environment the product family is the collection of processes that share the same support activities. Within the example the service family can be identified as low and high segment laboring. The processes of both services share the same activities. The main activities of business unit A and B are more or less the same, thus there is a variation in for example the sales and recruiting activities that are performed. This leads to the component construct. A component is a part of the bigger total. The component needs to be recognizable in the individual product/service and needs to possess a substantial amount of functionality compared to the individual product/service it is part of (Miller and Elgard, 1998). To go short a component in service environments is a recognizable part of a service and can exist of several components, although its functionality needs to be substantial. Within the given example the activities are mentioned (i.e. collection, recruitment etc.), these activities exist of one or more components. Components of the activity 'collection' could be for example the regular collection, legal collection and reporting to the business units.

The product platform is the most important concept in platform design. This is not an individual product nor a product family, thus the common basis of the individual products within the product family (Halman et al., 2003). The task of differentiating a product for a specific customers needs to be postponed until the latest point in the supply network (Feitzinger and Lee, 1997). First of all a platform in service environments needs to be conceptualized. A service is the sequence of activities, also called the process, performed to eventually deliver an individual service to a client. The individual delivered service can be seen as the non-material equivalent of an individual delivered end-product. The platform in a service process are the activities that can be standardized across business units. These specific activities can potentially be performed in a shared delivery mode, the service platform. At the moment the service platform in figure 1 is; declaration, invoice, payroll and collection. The other activities have common components over the product family, however there is a variety in some of the components within these activities. This means that these activities are hard to standardize, that is why these are not integrated in the product platform 'yet'. The activity of sales for the low segment and for the high segment has grounding differences and this is the core business of the business units. This is due to the fact that there are two business units targeting specific markets (Simpson, 2003). These specific markets are approached and influenced on a different manner. This differentiation in components of the activities is why these are not in the service platform. The service platform; declaration, invoice, payroll and collection is the common basis of activities performed in a shared delivery mode for the business units. It is important that the process steps earlier in the process are fulfilled and agreed by all the parties, the employee, the employer and the business unit. Exceptional clients with modified special treatments are not taken into account in this example. The activities that can be shared in the service platform are delegated to the shared service center. The other activities are not shared and embedded in the business units. It can be concluded that the shared delivery mode is the product platform in service design. Within this research the service platform is conceptualized as the common basis of all support activities that can be performed in a shared delivery mode, from which a stream of derivate services can be efficiently developed and launched.



### 2.2.2 Conditions in successful product platforms

In platform design several authors explored issues dealing with strategic benefits of developing product platforms, managing product families and conditions of the platform design (Galsworth, 1994; Martin and Ishii, 2002; Pine, 1993; Robertson and Ulrich, 1998; Sanderson, 1991). There is a possibility that these conditions can be translated to service design, fixed on the conditions that are needed for choosing a delivery mode. This choice needs to fulfill the anticipated benefits and increase the perceived value of the business units.

Robertson and Ulrich (1998) observed two common dysfunctions in attempting to create product platforms. 1] A balance between the commonality and the distinctiveness needs to be present. A fact is though that this balance is frequently hindered by organizational forces. These forces can exist between different departments of the organization, thus also between different activities. For example the pressure between sales (selling as much as possible) and engineering (producing as cheap as possible) can lead to a trade-off. During the design of a product platform a trade-off needs to be made between the commonality and the differentiation of the products in the product family (Simpson, 2003). According to Siddique, Rosen and Wang (1998) two separate indices for commonality exist, the component - and the connection commonality. This can be compared with the findings of Marten and Ishii (2002) introducing the GVI (general variety index). This index helps identifying components that are likely to change over time. Furthermore Marten and Ishii (2002) introduce the CI (coupling index) for measuring the coupling between the components. The findings need to reduce the life cycle costs of a product by reducing the impact of variety. Analyzing GVI and CI can give an organization handholds in choosing the delivery mode. The perceived service value of sharing support activities can be influenced by these constructs, and can help in making a rational decision for sharing or not sharing support activities. Within platform design these constructs influence the choice for putting an activity in the product platform or not, which influences the perceived value. 2] Even when platform planning with a committed team is started it can cause problems. The committed teams need to create rational control over a product platform and take away resistance. Organizations have a history of embedding product development in business units and resistance against change can exist (Meyer and DeTore, 2001). Thus also with a committed team the platform planning can be bogged down in details. This can result in giving up the platform.

Connecting these conditions of the product platform with the service platform makes clear that differentiation and commonality is a trade-off that needs to be made. Furthermore a trade-off exists in the choice of sharing or not sharing certain activities in the service platform. Both the trade-offs are probably effecting the perceived value by the business units. Concluding Marten and Ishii (2002) introduced the design rules of GVI and the CI in product platforms. These design rules of the product platform are used as design rules of a service platform, and in this research for explaining the effect of these design rules on the relationship between the delivery mode and the perceived service value by the business units.

### 2.2.3 Differentiation in needs and strength of coupling

The GVI, introduced by Marten and Ishii (2002, p. 1), is: ‘a measure for the amount of redesign effort required for future designs of the product’. A derivative of this conceptualization of the GVI is ‘differentiation in needs’. This also reflects the variety in support activities that the business units need and the heterogeneity of support activities performed for the business units (Halman et al., 2003; Martin and Ishii, 2002). In service platforms it is important to know what effort is required for future designs of the service. Meijerink et al. (2011) found that differentiation in needs is a significant moderator of the relationship between HR service value and the delivery mode. Differentiation in needs is a design rule that gives insight in the redesign effort of activities to keep up with future needs. Considering and reconsidering the design of activities can be seen as conflict, because parties concerned with the redesign are negotiating about how the design of the activity should be. Conflict for non-shared activities that change regularly is time and resource consuming, although in a shared delivery mode this conflict is even more time and resource consuming because more parties are concerned with the changes. This slows down the flexibility of the business units, a change in activities needs to be agreed by several parties in the product family. Adjusting support activities in the shared delivery mode means that all the business units need to adapt the redesigned service platform, influencing the perceived service value by means of quality and costs. Meijerink et al. (2011) concluded that a shared delivery mode increases the service value positively when the differentiation in needs is low and negative when differentiation in needs is high. To go short choosing a shared delivery mode for a support activity that has a high differentiation in needs can cause a decrease of the perceived service value because more time and resources need to be invested to keep up with future needs. Within this research this moderating effect is tested in another setting, leading to the following hypothesis:

*Hypothesis 1a: The perceived value of support activities with low differentiation in needs is higher when delivered through a shared delivery mode compared to a non-shared delivery mode*

*Hypothesis 1b: The perceived value of support activities with high differentiation in needs is higher when delivered through a non-shared delivery mode compared to a shared delivery mode*

Next to differentiation in needs the coupling index is an important construct in product platform design. The CI measures: ‘the coupling among the product components (Martin and Ishii, 2002, p. 1)’. According to Ulrich (1993, p. 423): ‘two components are considered coupled if a change made to one of the components, the more likely a change in one will require a change in the other’. Next to this the coupling between components, in our research support activities, can be two sided; information supplying activities and information requiring support activities (Martin and Ishii, 2002). Coupling of activities can be seen as the interaction, by means of information, between activities. Furthermore the interdependence is the extent to which activities depend on each other for accomplishing their tasks (Daft, 2007). Daft (2007) describes three interdependencies; pooled (activity A and B do not interact with one another), sequential (activities A becomes input for activity B) and reciprocal (activity A is input for B and B on its turn is input for A). Within service environments this in- and output is seen as a flow of information, a support activity can interact with another activity by supplying and/or requiring information. In literature a model is designed to map these interdependencies by means of the



Design Structure Matrix (DSM) (Carracascosa, Eppinger and Whitney, 1998; Yassine, 2004). Although the constructs in this matrix are named differently, the meaning is the same (figure 2.2). The pooled, sequential and reciprocal interdependencies are in the DSM matrix respectively the parallel, sequential and coupled configurations of the interactions between activities (Yassine, 2004). This are the three basic building blocks for describing the relationship between system elements (Yassine, 2004).

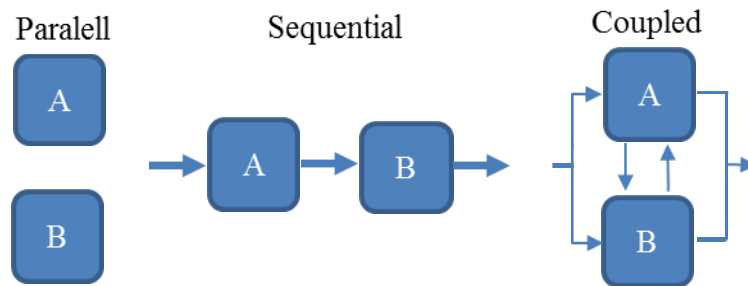


Figure 2.2: Parallel, sequential and coupled activities

According to Vanderfeesten, Reijers and van der Aalst (2008) coupling is measured by the number of interconnections among, in our case, support activities. The interconnection is the up- and/or downstream flow of information, the interaction between support activities. To go short the coupling is conceptualized as; the number of support activities a support activity requires information from and/or supplies information to. Clarifying this for the interdependencies means that: ‘parallel’ activities have no coupling, ‘sequential’ activities are coupled requiring information for performing downstream activities and the most complex configuration ‘coupling’ are coupled, down- and upstream information flows are existing. The higher the numbers of interdependencies between support activities the more stakeholders are involved in the potential redesign of a support activity. These interdependencies of support activities can result in complicated interactions between both people and tasks (Yassine, 2004), the process of considering and reconsidering the support activities. Eventually the complicated interactions should lead to a consensus that is presumed to be the best for the stakeholders, these complicated interactions are conceptualized as conflict. In organizations diverse forms of conflict between people and tasks exist. According to Cosier and Rose (1977) two common forms are goal conflict and cognitive conflict. These forms of conflict are conceptualized as respectively: ‘an interpersonal relationship involving divergent preferences regarding at least one of the decision outcomes and the awareness of inconsistent inferences drawn from identical information’ (Rose, 1977, pp. 378-379). According to De Dreu and Weingart (2003) conflict can be defined as the process resulting from the tensions between members of a team of real or perceived differences. This conflict is concerned with relational (i.e. personal taste, political preferences and interpersonal style) and task issues (i.e. distribution of resources and judgment and interpretation of facts) (De Dreu and Weingart, 2003).

Both coupling and conflict are conceptualized; 1] coupling is about the number of support activities a support activity requires information from and/or supplies information to and 2] conflict is the process resulting from the tension between support activities with different preferences of the stakeholders; a person, group or organization that has preferences for performing a support activity. Conflict can occur in the process of taking away the tensions between stakeholders, the more parties with different preferences involved the higher the

potential of conflict. To go short the higher the number of support activities a support activity is coupled to, the more stakeholders are involved in the process of solving the conflict, the harder it is to reach a consensus for solving the conflict. On the other hand not coupled support activities have a lower potential of conflict, since less stakeholders are involved. Coupling is assumed to be 'positively' related to conflict.

During the process of conflict reaching a consensus is the main goal, taking away the tensions between the stakeholders. While the process of solving the conflict takes place, the support activities are considered and reconsidered until a consensus between the stakeholders is reached. According to De Drue and Weingart (2003) conflict interferes with performance and has a negative influence on the productivity of teams, since time needs to be invested in negotiating the preferences. Next to this costs may rise because of the time and resources that are invested to make the considering and reconsidering of support activities possible and keep the process to run as smoothly as possible (Rindfleisch, 1997). The flexibility will be lower, because adjustments can only be made by negotiating with other stakeholders (Quinn et al., 2000). Since perceived value is conceptualized as the ratio between service costs and service quality a link between conflict and perceived value can be appointed. An increase of conflict causes the productivity and flexibility to decline and the costs to rise. Therefore a negative relation between the conflict and perceived value is expected, a rise of conflict causes a decline of the perceived value for support activities.

The causal relation between coupling and conflict and on its turn between conflict and the perceived value of support activities is explained in the following examples.

**Example 1 (support activities, no coupling):** Activity A does not interact with activity B, this means that activity B will not change if activity A is reconsidered and the other way around. The activities are not coupled and thereby the potential of conflict is low. In this case the perceived value of activity A and B are not influenced by coupling.

**Example 2 (support activities, sequentially coupled):** Activity A interacts with activity B, information from activity A is needed to perform activity B, this means that if activity A changes the more likely activity B changes. The potential of conflict is high. In this case the perceived value of activity B can be influenced by coupling.

**Example 3 (support activities, reciprocally coupled):** Activity A interacts with activity B, information from activity A is needed to perform activity B and information from activity B is needed to perform activity A, this means that if activity A changes the more likely activity B changes and on its turn the more likely activity A changes again. The potential of conflict between stakeholders is high. In this case the perceived value of activity A and B can be influenced by coupling.

Since coupling is expected to affect conflict and conflict to affect the perceived value of support activities, a direct negative relation between the coupling and the perceived value of support activities is assumed. The higher the number of support activities that are coupled to a support activity (the number of support activities, the support activity requires information from and/or supplies information to) the lower the perceived value of the specific support activity that is

coupled in terms of lower quality and higher costs. However being interconnected to other support activities is not enough to cause conflict, which is why the relation is elaborated in depth. Every support activity can be classified as: not coupled support activity, information requiring support activity (IRSA) and/or information supplying support activity (ISSA). According to Ullrich (1993), in our case the support activities, are coupled if a change made to a support activity, the more likely another support activity requires a change. The assumed change rates of support activities are already conceptualized and elaborated as the differentiation in needs. In this research the differentiation in needs of the information requiring support activities are abbreviated as  $IRSA_{diff}$  and the differentiation in needs of the information receiving support activities is abbreviated as the  $ISSA_{diff}$ . Every support activity has a degree of differentiation in needs, preferences in a specific moment in time thus also over time (Hofman and Meijerink, in press; Martin and Ishii, 2002). Coupling only measures the number of support activities it requires information from and/or supplies information to, leaving the change rates (differentiation in needs) of these support activities out of scope. The interactions between activities are occurring more frequent if the  $ISSA_{diff}$  and the  $IRSA_{diff}$  is high. The change rates are higher and conflict occurs more often, this is why the variable strength of coupling is introduced.

An analysis of all the interactions between support activities result in a complicated web of interactions, a web of down- and upstream interactions between two or more support activities. The interactions are elaborated in more depth for giving a conceptualization of the strength of coupling, where the  $ISSA_{diff}$  and the  $IRSA_{diff}$  is taken into account to measure the strength of coupling of the IRSA. The conceptualization makes clear how coupling and differentiation in needs are combined into the variable strength of coupling. There is a one-way downstream interaction of information between the support activities, sequential. If the  $ISSA_{diff}$  is high and the IRSA is sequentially coupled to the ISSA than the likelihood for the IRSA to change through interactions of information is higher. However an upstream interaction of information between support activities can also be present, reciprocal. In this case the IRSA becomes an ISSA and the ISSA becomes an IRSA, where the same relation counts. A high  $ISSA_{diff}$  increases the potential of conflict of the IRSA. In this research it is assumed that the IRSA is more likely to change if it is dependent of changes in ISSA's with a high differentiation in needs. On its turn this potentially causes more conflict, decreasing the service quality and raising service costs of the IRSA. The last option is that there is no interconnection between the support activities. The conflict and thereby the perceived value of the activities with no interconnection is not influenced by the differentiation in needs of other activities, thus only by the differentiation in needs of the activity itself.

Activity A	Interaction	Activity B
$ISSA_{diff}$ low	—————→	IRSA has a low likelihood of conflict
$ISSA_{diff}$ high	—————→	IRSA has a high likelihood of conflict
IRSA has a low likelihood of conflict	←————	$ISSA_{diff}$ low
IRSA has a high likelihood of conflict	←————	$ISSA_{diff}$ high

Figure 2.3: Interactions

The research focuses on the effect of the ISSA's with a differentiation in needs that on first hand supplies information to the IRSA. The conflict and thereby the perceived value of the IRSA is assumed to be affected by the differentiation in needs of one or more ISSA's, although also by the differentiation in needs of the IRSA itself. This total is conceptualized as the strength of coupling; the total differentiation in needs of the ISSA's added with the differentiation in needs of the IRSA;  $\text{Strength of coupling} = (\text{ISSA}_{\text{diff}} + \text{ISSA}_{\text{diff}} + \dots + \text{ISSA}_{\text{diff}}) + \text{IRSA}_{\text{diff}}$ .

The assumed effects of the strength of coupling on the conflict and thereby on the perceived value of the IRSA can be illustrated as follows.

		Conflict	
		High	Low
Strength of coupling	High		
	Low		

		Perceived value	
		High	Low
Conflict	High		
	Low		

Figure 2.4: the assumed effect of strength of coupling on perceived value

The white fields in the illustration clarify the expected relations in figure 2.4. First of all the strength of coupling of the IRSA is assumed to have a 'positive' correlation with conflict, the higher the strength of coupling the higher the conflict and the lower the strength of coupling the lower the conflict. On its turn an increase of conflict for the IRSA is negatively related to the perceived value and the other way around. To go short a high strength of coupling of the IRSA is assumed to have a lower perceived value compared to an IRSA with a low strength of coupling. The following hypothesis is tested to see if this theory can be confirmed or rejected.

*Hypothesis 2: The perceived value of support activities with a high strength of coupling is significantly lower than it is for activities with a low strength of coupling*

The external driver of change (differentiation in needs) and the internal driver of change (strength of coupling) are already elaborated (Martin and Ishii, 2002). Both of these drivers are concerned with change rates and the number of stakeholders that are involved in solving a conflict leading to an in- or decrease of the perceived value of support activities. For differentiation in needs the number of stakeholders rise in a shared delivery mode compared to the non-shared delivery mode. Since more groups have preferences in a shared delivery mode the likelihood of conflict increases if an activity needs to be redesigned. Next to this the strength of coupling is also about a rise in the number of stakeholders, the more ISSA's an IRSA needs information from the more stakeholders have preferences. In case an IRSA is delivered in a shared delivery mode this increases the number of stakeholders even more, more business units have preferences. The number of stakeholders that have preferences in a shared delivery mode is higher than in a non-shared delivery mode. Conflict for non-shared IRSA's with a high strength of coupling is time and resource consuming, although in a shared delivery mode this conflict is

assumed to be even more time and resource consuming since even more stakeholders are involved in the considering and reconsidering of the IRSA. The strength of coupling of the IRSA is expected to moderate the relationship between the delivery mode and the perceived value of the business units. An IRSA can also be an ISSA for other support activities, this is why the information requiring and information supplying support activities are distinguished and conclusions are drawn on the strength of coupling of every IRSA. To go short an IRSA with a high strength of coupling in a shared delivery mode is assumed to have more conflict, since more stakeholders are involved compared to a non-shared delivery mode, leading to a decrease of the perceived value. On the other hand an IRSA with a low strength of coupling in a non-shared delivery mode is assumed to have less conflict, since fewer stakeholders are involved in solving the conflict. This is hypothesized as follows.

- Hypothesis 3a: The perceived value of support activities with a high strength of coupling is higher when delivered through a non-shared delivery mode compared to a shared delivery mode*
- Hypothesis 3b: The perceived value of support activities with a low strength of coupling is higher when delivered through a shared delivery mode compared to a non-shared delivery mode*

## 2.3 Hypothesis

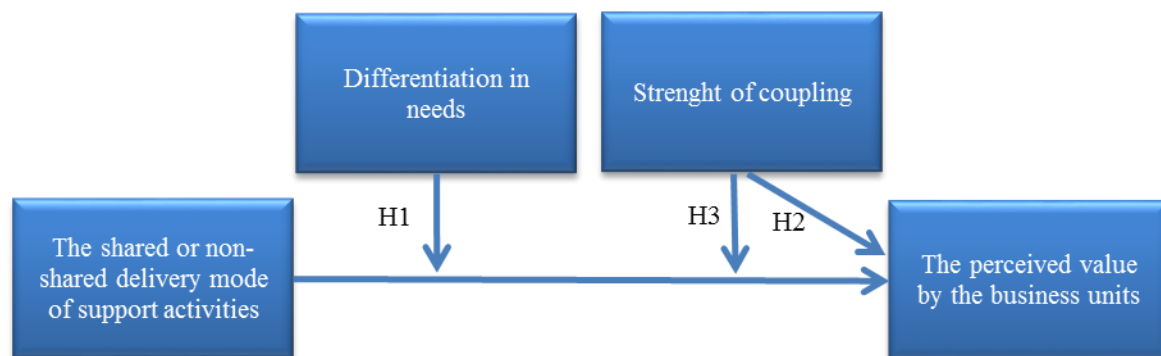


Figure 2.5: the hypothesis

### 3. Methodology

In the chapters before, the hypothesis have been formulated. This chapter describes the research methods used for testing the hypothesis. First of all the contextual background, the sampling and the procedures are elaborated. Next to this an operationalization of the variables is given.

#### 3.1 Contextual background

About ten years ago the laboring company in question (later mentioned LabCom) started a shared service center. Due to anonymity reasons this SSC is called ShareCom. They provide and are responsible for the administration and cash flow of LabCom. ShareCom is an internal joint venture of the business units within in the LabCom, existing of the several. ShareCom supports all of these labels. This research focuses on some of the business units of LabCom; Professionals, Techniek, Bouw, Transport and Uitzenden. According to the annual report 2001, the main driver of setting up ShareCom was to raise the competitiveness and increase the profits of the business units. Furthermore focus on core competences of the business units, a culture aimed at good results and service value, efficient use of IT, reaching economies of scale, creating a flexible organization, fast integration of new developed/acquired business, an efficient management of international customers and suppliers were reasons for setting up ShareCom. Since the establishment the service portfolio has been constantly changing, more activities are shared and others are delegated back to the business units. This way cost cuttings for the internal clients (the business units) are reached, service quality rose and some processes have been automated.

At the time of the research January 2014 till September 2014 ShareCom was constantly trying to unburden the business units by taking over more support activities (administrative activities). In doing this it appeared that in some cases support activities are shared across business units thus not for all business units 'yet'. To go short there is a variety in the delivery mode of support activities; some are performed in a shared delivery mode and some in a non-shared delivery mode. That is why this case is a useful research setting for testing the hypothesis.

#### 3.2 Unit of analysis and sampling

The unit of analysis in this research is the support activity that is performed through a shared or a non-shared delivery mode. First of all insight is needed in the support activities that are performed, the sample. In figure 1 a simplified overview of the service was already given.

Before a clear and sufficient sampling frame can be generated some activities are ruled out for diverse reasons. 1] A variance in the delivery mode is important for testing the hypotheses, making it possible to make a comparison between the shared and non-shared delivery mode. Furthermore a spread of shared and non-shared support activities over business units needs to be present. 2] The sample is limited in size by focusing on specific processes that are performed by every business unit. 3] Manually performed support activities from the past have been fully automated for all the business units, like declaration, payroll and invoicing. LabCom has penetrated ICT innovations into the whole organization to automate processes, these are ruled out from the sample. 4] The borders between the processes and activities need to be clear for enabling a measure for the strength of coupling that is reliable, because both the information supplying and information requiring activities need to be the sample.



For these reasons the purposive (judgmental) sampling method is used, ‘select a sample on the basis of knowledge of a population, its elements and the purpose of the study’ (Babbie, 2010, p. 193). Knowledge of the various processes is gained through a detailed document analysis, the study of recorded human communications such as websites, working processes and systems (Babbie, 2010). Completing the list of support activities is done by reviewing the list with three knowledge carriers. 1] A consultant of LabCom; knowing the processes and how to perform the activities involved. 2] A rayon manager of LabCom; having an overview of the laboring processes and activities involved in commercialization of the total service package LabCom delivers. 3] A team leader of ShareCom; this team performs shared support activities for a business unit of LabCom, having insight in the cooperation between ShareCom and LabCom. Furthermore the team leader has a detailed overview of the process. In these reviews additional questions can be asked and more detailed information can be gathered. In the pretest of the questionnaires the activities are discussed again, explained later on.

In the research the demands of the sample and knowledge gathered have led to the selection of two complete process steps that are performed by/for the earlier selected business units; ‘sign in’ and ‘placement’ (figure 2.1). Both of these process steps are to a large extent the same for the business units. The list of activities is generalized in such a way that every activity is performed in/for all the business units that are in the research. In the scheme underneath the spread of shared and non-shared activities is given. At the end this is leading to a sample of 52 activities that are researched for testing the hypothesis (appendix 1; the samples activities). Due to the fact that complete process steps and all of its activities need to be in the sample, it is impossible to spread the number of shared and non-shared activities equally. Covering both process steps completely leads to a sampling framework and sample that are the same.

<b>Sample</b>			
<i>Business unit</i>	<i>Number of support activities</i>	<i>Shared delivery mode</i>	<i>Non-shared delivery mode</i>
Professionals	52	32	20
Techniek	52	16	32
Bouw	52	16	32
Transport	52	16	32
Uitzenden	52	16	32

**Table 3.1: The Sample**

### **3.3 Data collection procedures**

In this chapter the data collection methods and procedures are elaborated. This research conducts two ways of data collection. First of all a survey is conducted for collecting information on the variables differentiation in needs and the perceived value of the business units. The strength of coupling is partially measured by filling in the Design Structure Matrix using interviews. The exact measures of the variables are elaborated later on.

### 3.3.1 The survey research

Data on the differentiation in needs and the perceived value by the business units is collected through a survey research, this quantitative methodology is used because of the size of the sample, 52 support activities. The advantages of survey research are; feasibility within a short period of time and the flexibility in the amount of questions. Weaknesses of survey research can be; questions need to be at least appropriate to all respondents, inflexible in changing the initial survey throughout the study and artificiality (Babbie, 2010). Taking the weaknesses into account the survey research is the most appropriate method because of the repeating aspect of the standard questions that are asked. Next to this the purpose of the research is not to reach a high generalizability to other populations and external validity may be low. The survey is divided in two questionnaires; the first questionnaire collects data on the variable differentiation in needs and the second on the perceived value of the business units. The survey is split up to prevent respondents to see a covariance between the variables (Podsakoff, Mackenzie and Lee, 2003), this prevents a common method bias.

The surveys are both conducted among the rayon managers (=RM) of the business units, instead of the large amount of consultants. In contrast to the consultants the RM is chosen because of their:

- insight in the current demands of sampled activities
- broad overview of expected changes and future expectations of the sampled activities
- ability to appreciate the quality and costs of the sampled activities
- control over the consultants that in some cases perform the activities

In total a number of 37 questionnaires for the first survey are send to personal mail addresses of the RM, the second survey is dependent on the response of the first survey. The list of mail addresses is collected using the on intranet available telephone guide. This guide is checked and tracked on a regular basis and up-to-date. The second survey is only send to the respondents on the first survey because both the questionnaires need to be coupled for analysis. A digital questionnaire<sup>1</sup> is send by personal mail, using a personal link so that the participation is restricted and both questionnaires can be coupled. The answers collected from the respondents are kept anonymous and personal data is deleted as soon as both questionnaires are coupled, to guarantee anonymity of the answers given. This is done so that the response bias is minimized, preventing distorted data due to motivated responses to create a favorable impression of reality (Fuller, 1974).

Within the first five working days 8 (22%) surveys returned. The RM, from whom no survey returned after the initial invitation, is mailed with a reminder after 7 days. After the reminder the response rate was 30%. Finally, 13 days after the initial questionnaire was send, the respondents that did not fill in the survey are called as a reminder for filling in the survey. The total response rate of the first survey is 43%, a total of 16 respondents who filled in the whole first survey. Nine days after the final call for the first survey the second survey was send to the respondents of the first survey. The response rate was 22% (8) and after reminding the total response rate was 24.3% (9 respondents). This response is enough for research because of the spread of the

---

<sup>1</sup> URL: [www.enquetesmaken.com](http://www.enquetesmaken.com)



respondents (every business unit at least 1) and the large sample size resulted in 468 support activities.

### **3.3.2 The Design Structure Matrix (DSM)**

The coupling is measured by using the Design Structure Matrix. In this matrix all the support activities are placed down the side as row headings and across the top as column headings (Yassine, 2004). The interactions, information requiring and information supplying, between activities are mapped in this matrix. In this research two separate matrixes are filled, this is done to keep the borders between the process steps 'Sign in' and 'Placement' clear.

The activities used for the survey research are also used in this matrix. For filling in these matrixes qualitative interviews are conducted with one RM of every business unit, five interviews in total. This method is used because giving clear and complete information to the participant is important for filling in the matrix in a proper manner. These interviews are conducted with one rayon manager of every business unit. The RM has insight in the sampled activities and the interactions between the support activities, have the ability to understand the research topic better and are also selected for filling in the questionnaires. The selection of the RM, located throughout the Netherlands, is done in a systematic manner for keeping the costs of travelling within limits. Next to this the RM that is interviewed is not asked to fill in the survey for preventing a common method bias. How both of datasets, survey and DSM matrix, are combined is explained in the operationalization of the variable strength of coupling. The native language of the respondents, Dutch, is used for enabling them to better express themselves.

The interviews are structured in the following way. 1] First of all a short introduction about the research topic is given, making the interview subject feel ease (Leech, 2002) 2] The sampled activities are ordered in a chronological manner (what activity is performed first), this makes it easier to map the interactions between the activities. The matrix is analyzed and filled in a semi-structured way, walking through the matrix from top to bottom asking the interviewee if the activity requires information from one or more of the other activities. The questions in this interview are standardized to be sure that differences in answers are due to differences of insight of respondents rather than influenced by the questions asked (Gordon, 1975) 3] The filled matrix is then summarized mentioning all the interactions between activity the support activities, so that the respondent can think about the given answers again.

### **3.4 Operationalization of the variables**

Before the data collection can start an operationalization for the variables needs to be made. The goal of this operationalization is to gain data for analysis and interpretation in this paragraph (Babbie, 2010). This study exists of four variables, the delivery mode and differentiation in needs are independent. The strength of coupling is an independent moderating variable on the relationship between the delivery mode and the perceived service value, thus also a hypothesized dependent variable of the differentiation in needs. The perceived value by the business units is the dependent variable. To rule out confounding effects two control variables are included in the research. All of the variables are elaborated hereafter.

### 3.4.1 The delivery mode

As depicted in the theoretical background the delivery mode is a two dimensional variable, the shared - and the non-shared delivery mode. In a shared delivery mode the support activity is performed by ShareCom and in the non-shared delivery mode the business unit performs the activity. Data on the delivery mode of the sampled activities is gathered during the reviews of the list of activities, these knowledge carriers have insight in the activities and who performs it. In this research the shared delivery mode is coded as 1 and the non-shared delivery mode as 0.

### 3.4.2 Differentiation in needs

According to Joshi and Sharma (2004) an explanation for product failure is that products do not reflect customer preferences. In this explanation two reasons are mentioned; customer preferences are not verified enough and preferences have changed over time. The generation variety index is also about the customer knowledge that needs to be known for differentiating preferences in a specific moment in time, thus also over time (Hofman and Meijerink, in press; Martin and Ishii, 2002). The construct of Joshi and Sharma (2004) and Hofman and Meijerink (in press) is used for measuring the differentiation in needs. Like in the research of Hofman and Meijerink (in press), a survey is held and the questions are repeated for every support activity in the sample. The answers are based on a five-point Likert scale (1= 'strongly disagree' to 5 = 'strongly agree'). The bivariate inter-item correlation is 0,640 ( $p < 0.01$ ) with a reliability of 0.781, this is an acceptable level ( $0.8 > \alpha \geq 0.7$ ).

Variable indicators:

- Question 1: The needs of your business unit, with respect to the activities mentioned below, are constantly subject to change (change from time to time)  
*Dutch: Stelling: De eisen van uw label, ten aanzien van de onderstaande activiteiten, zijn voortdurend aan verandering onderhevig (veranderen van tijd tot tijd)*
- Question 2: Your business unit has, with respect to the activities mentioned below, a wide range of (different) needs  
*Dutch: Stelling 2: Uw label heeft, ten aanzien van de onderstaande activiteiten, zeer uiteenlopende (verschillende) eisen*

### 3.4.3 Strength of coupling

According to Vanderfeesten, Reijers and van der Aalst (2008) coupling is measured by the number of interconnections among, in our case, information receiving activities. In this research the Design Structure Matrix is used for measuring the coupling (Carracascosa, Eppinger and Whitney, 1998; Yassine, 2004). In the matrix all the support activities are placed down the side as row headings (information requiring) and across the top as column headings (information supplying) (Yassine, 2004). In figure 3.1 an example of the matrix is given.

No coupling				Sequential				Reciprocal			
Requiring	Supplying			Requiring	Supplying			Requiring	Supplying		
		A	B			A	B			A	B
	A				A				A		
	B				B	1			B	1	

Figure 3.1: The representation of activities in the DSM matrix (Yassine, 2004)

In the matrix the interactions are marked with a 1 and fields that do not indicate interactions are left empty. For example in the sequential strength of coupling activity B (IRSA) requires information from activity A (ISSA) and is marked with a 1. The diagonal fields do not have any interpretation for the activities, these fields are blacked out. The dataset of strength of coupling is gathered in interviews with one rayon manager of every business unit and by surveys conducted with one or more RM of every business unit. The strength of coupling is measured by combining the data from the survey and the DSM matrix. The survey research gives insight in the differentiation in needs and perceived value of every support activity in the research and the coupling gives insight in the interactions with one another of every support activity. Because only one RM of every business unit is interviewed for filling in the DSM matrix, it is necessary to use one DSM matrix for more surveys that returned from a business unit. This enables us to calculate the strength of coupling for the total sample. The differentiation in needs of every activity is added to the column headings, the ISSA's, as a figure. For every activity (row heading) the total differentiation in needs of the ISSA's supplying information to one IRSA is summed up. Furthermore the differentiation in needs of the IRSA itself is added to this, leading to the following calculation:  $\text{Strength of coupling} = (\text{ISSA}_{\text{diff}} + \text{ISSA}_{\text{diff}} + \dots + \text{ISSA}_{\text{diff}}) + \text{IRSA}_{\text{diff}}$ . The strength of coupling of every activity is added to the dataset in SPSS as a variable.

#### 3.4.4 Perceived value by the business units

The perceived value by the business units is conceptualized in terms of service costs and service quality. Perceived value raises when service quality of support activities improves and/or the costs drop. Service quality is the perceived value of the business units in relation to their needs and service costs (Maatman et al., 2010). The service costs are expressed in monetary (the prices paid) and non-monetary (time and effort invested by the business units). The conceptualization is the ratio between what is given (costs) and what is received (quality) (Cronin, 2000; Zeithaml, 1988). Like Hofman and Meijerink (in press) the perceived value is measured by giving a description of the support activity and asking the same questions for all of these activities. The answers are based on a five-point Likert scale (1= 'strongly disagree' to 5 = 'strongly agree'). The bivariate inter-item correlation is 0.335 ( $p < 0.01$ ) with a reliability of 0.502, where  $0.6 > \alpha \geq 0.5$  has a poor is a poor although acceptable reliability.

Variable indicators:

- Question 1: Overall your label appreciates the execution of the following activities as very high  
*Dutch: Stelling: Overall waardeert uw label de uitvoering van de onderstaande activiteiten als zeer hoog*
- Question 2: In relation to the overall costs, time and effort, the execution of this activity satisfies the needs of your label very well  
*Dutch: Stelling: In verhouding tot de kosten, tijd en inspanning voldoet de uitvoering van de onderstaande activiteiten zeer goed aan de verwachtingen van uw label*

#### 3.4.5 Control variable: Job tenure

In existing literature a correlation between experience (job tenure) and openness to change has been researched (Boeker, 1997; Wiersema and Beltel, 1992). The openness to change can affect the variable perceived service value. After all a manager that is working for LabCom for a longer

period can be more conservative. That is why this control variable is added to the survey as an open question.

Control variable indicator

Question: For how many years have you been working for LabCom?

*Dutch: Hoeveel jaar bent u werkzaam voor LabCom?*

### 3.4.6 Control variable: Career

LabCom has acquired several laboring organizations in the past ten years (i.e. \*\*\*\* and \*\*\*\*). The integration of these organizations in LabCom has changed a lot for the employees of the acquired organizations, like processes, colleagues and culture. The reorganization can have grounding effects on the way this group rates the perceived value. The control variable is added in the survey and answers can be given (1 = 'yes' and 2 = 'no')

Control variable indicator

Question: Have you been working for, a later taken over by the LabCom, organization (for example; \*\*\*\*, \*\*\*\*, \*\*\*\* of \*\*\*\* etcetera)?

*Dutch: Bent u werkzaam geweest voor, een later door de LabCom overgenomen, organisatie (bijvoorbeeld; \*\*\*\*, \*\*\*\*, \*\*\*\* of \*\*\*\* etcetera)?*

### 3.5 Pretesting the survey

The surveys are pretested to eliminate the possibility of an error as far as possible (Babbie, 2010). In an interview with three persons; 1] A manager from ShareCom having an overview of the research design and insight in the processes. 2] A rayon manager from LabCom having the ability to closely look at the sampled activities and the questions asked 3] A fellow student has the ability to look at the questions asked with respect to the variables measured and the explanations given, next to this the methodology is analyzed. The pretests are semi-structured and especially focus on the questions asked, making the activity descriptions more clear and complete, sharpening the letters/explanations and criticize the methodology. The feedback is processed and the questionnaires are ready to be send.

An important note, that became clear during the reviews, is that several definitions for a business unit are used all over the organization. The definition of business unit what is used in this research needs to be made clear before the survey starts. The business unit of every respondent is known and it is not a necessary question for analysis. However the question is added to make clear what we mean by business unit, making the participant aware on how to interpret business unit and thereby the statements. For answering the questions one can choose the following answers: 'Bouw', 'Techniek', 'Professionals', 'Transport', 'Uitzendbureau' and 'Otherwise, namely: ...'. While the question is added to explain the definition of business unit, it is also used to indicate the business unit the respondent is working for in the data analysis. It appeared that all the business units the RM is working for is corresponding with the answers given on the question.

Question: What business unit of LabCom are you working for?

*Dutch: Voor welk label van LabCom bent u werkzaam?*

## 4. Research results and analysis

### 4.1 Descriptive statistics and correlations

In table 4.1 the correlations, the means and the standard deviations of the variables differentiation in needs, strength of coupling, delivery mode, perceived value and the control variables job tenure and career are presented.

Variables	Mean	Standard deviation	1	2	3	4	5
1. Perceived value	3.94	0.68					
2. Job tenure	13.78	14.64	0.46*				
3. Career **	1.89	0.32	-0.33	0.19*			
4. Delivery mode***	0.34	0.48	0.06	0.05	0.03		
5. Differentiation in needs	2.68	1.08	0.21*	0.55*	0.64	-0.15*	
6. Strength of coupling	10.32	11.36	-0.05	0.16*	0.01	-0.15*	0.24*

N = 468 support activities

\* =  $p < 0.01$

\*\* 1 'yes', 2 'no'

\*\*\* 0 'non-shared', 1 'shared'

**Table 4.1: Descriptive statistics and correlation**

The descriptive statistics in table 4.1 mention a mean of 3.94 (SD 0.68), 2.68 (SD 1.08) and 10.32 (SD 11.36) for respectively the perceived value, differentiation in needs and the strength of coupling. About 92 percent<sup>2</sup> of the support activities in the sample have a perceived value of more than neutral ( $> 3$ ), while 38 percent<sup>3</sup> of the support activities have a more than neutral ( $> 3$ ) differentiation in needs (1= 'strongly disagree' to 5 = 'strongly agree'). In the dataset the differentiation in needs is high at level 3.76 or more ( $> 1\sigma$ ) and very high at level 4.84 ( $> 2\sigma$ ) or more, the strength of coupling is high with a score of more than 21.68 ( $> 1\sigma$ ) and very high with a score of more than 33.04 ( $> 2\sigma$ ).

In table 4.1 the correlations between the variables in the research are presented. Some of these correlations are now emphasized in depth to explain the most important correlations resulting from the research. 1] The differentiation in needs and perceived value have a significant positive correlation of 0.21 ( $p < 0.01$ ) with one another, a raise of the differentiation in needs causes a significant increase of the perceived value of the business units. In contrast to Hofman and Meijerink (in press) a positive correlation of differentiation in needs and the perceived value is found. These results are discussed later on. 2] A significant ( $p < 0.01$ ) negative correlation between the delivery mode and differentiation in needs (-0.153) and the strength of coupling (-0.145) exist. Given this, the shared delivery mode has a significantly lower differentiation in needs and strength of coupling than the non-shared delivery mode has. 3] The dataset gives significant ( $p < 0.01$ ) evidence that there is a positive correlation between the differentiation in needs and the strength of coupling. This correlation is caused by the using the differentiation in

<sup>2</sup>  $z = \frac{3-3.94}{0.68} \approx -1.38$ , from z table  $p = z > -1.38 \approx 0.92$

<sup>3</sup>  $z = \frac{3-2.68}{1.08} \approx 0.30$ , from z table  $p = z > 0.30 \approx 0.38$

needs of ISSA's for calculating the strength of coupling of the IRSA. 4] The moderating variables differentiation in needs (0.55) and strength of coupling (0.16) have a significant ( $p < 0.01$ ) positive correlation with the control variable job tenure. The respondents that have a higher job tenure, working longer for the organization, rate differentiation in needs and strength of coupling as significantly higher. 5] There is also a significant ( $p < 0.01$ ) correlation between job tenure and perceived value (0.46), the perceived value of support activities is rated higher if the respondent is working for LabCom for a longer period. The control variable career is only significantly related to job tenure and is not significantly correlating with any of the other variables. All of the other correlations are not significantly ( $p < 0.05$ ) related to each other. For testing the hypothesis a regression analysis is conducted.

## 4.2 Regression and hypothesis testing

### 4.2.1 Regression analysis

The multiple regression analysis is used as a statistical instrument for modeling and analyzing trends among the dependent and one or more independent variable(s). Four models are generated in table 4.2. The data in the regression analysis is not aggregated to business unit level. Because different scales are used to measure the variables, the standardized coefficients of the SPSS output are used. In attachment 2 a regression analysis is added using another measure for the strength of coupling.

Variables	Model 1	Model 2	Model 3	Model 4
Constant (intercept)	4.134*	4.231*	4.186*	4.181*
<i>Control variables</i>				
Job tenure	0.483*	0.525*	0.523*	0.523*
Career	-0.124*	-0.13*	-0.127*	-0.125*
<i>Main variables</i>				
Delivery mode		0.068	0.139	0.131
Differentiation in needs		-0.036	-0.017	-0.016
Strength of coupling		-0.115*	-0.115*	-0.119*
<i>Moderating effect</i>				
Delivery mode X differentiation in needs			-0.076	-0.089
Delivery mode X strength of coupling				0.024
Model F	67.886*	30.522*	25.488*	21.818*
R <sup>2</sup>	0.23	0.25	0.25	0.25
Adjusted R <sup>2</sup>	0.22	0.24	0.24	0.24

N = 468 support activities

\*  $p < 0.01$

**Table 4.2: Regression model for service value**

In the regression analysis the independent variables are tested against the dependent criterion variable perceived value. How does the perceived value change if one of the independent variables is varied, while the other variables are held fixed. In doing this four models are generated. In model 1 the control variables are tested, model 2 tests the second hypothesis, in



model 3 the first hypothesis is tested and model 4 tests hypothesis 3. The results are analyzed hereafter. The results are discussed in the next chapter.

#### 4.2.2 Model 1: The control variables

The contingency of the control variables job tenure and career are tested against the perceived value of the business unit in this model. In fact both the control variables job tenure and career are significantly related to the service value respectively 0.483 and -0.124 ( $p < 0.01$ ). The longer a respondent is working for the organization (job tenure) the higher the perceived value of the support activities. The perceived value of the support activities is related to the control variable career (function has been integrated to the organization), the support activities that are rated by correspondents from whom the function was not integrated to the organization rate the perceived value significantly lower than those from whom the function was integrated. A remark that needs to be made is that only one respondent answered 'yes' on the control variable career, the job of only one of the nine respondents was integrated in LabCom. No comparison between respondents whose functions are integrated to LabCom can be made. The contingency between career and the perceived value of support activities could be caused by a coincidence and is not confirmed by other respondents.

#### 4.2.3 Model 2: Hypothesis 2

The main variables delivery mode, differentiation in needs and strength of coupling are added in this model. The delivery mode 0.068 and the differentiation in needs -0.036 are not significantly ( $p > 0.05$ ) related to the perceived value of the business units.

On the other hand the perceived value of the IRSA's is significantly ( $p < 0.01$ ) affected by the strength of coupling -0.115 of the IRSA. In hypothesis 2 a negative correlation between the strength of coupling and the perceived value of support activities was expected, the higher the strength of coupling the lower the perceived value of the support activities. The collected data provides enough evidence to confirm the hypothesis ( $y = -0.115$ ,  $p < 0.01$ ). Hypothesis 2 is accepted: 'The perceived value of support activities with a high strength of coupling is significantly lower than it is for activities with a low strength of coupling'. The regression line is plotted in figure 4.1, important note is that a strength of coupling has a very low chance of being more than more than 33.04 ( $> 2\sigma$ ).

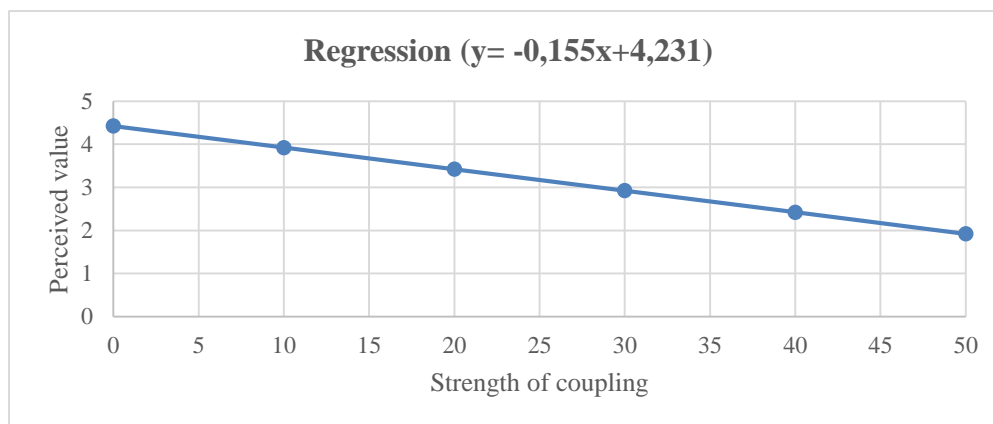


Figure 4.1: Regression

#### **4.2.4 Model 3: Hypothesis 1**

This model tests the moderating effect of the differentiation in needs on the relationship between the delivery mode and the perceived value, this is done for testing hypothesis 1 on the total sample of 468 support activities. The variation of the variables in the research can be accounted for predicting only 23.9%, the adjusted  $R^2$  is used because of the large sample size, of the value for perceived value in the linear regression analysis. In this regression model no significant ( $p < 0.05$ ) moderating effect is present. The test shows a non-significant p-value of 0.475 for the moderating effect of differentiation in needs on the relationship between the delivery mode and the perceived value of support activities. This means that hypothesis 1 ‘The perceived value of support activities with low differentiation in needs is higher when delivered through a shared delivery mode compared to a non-shared delivery mode’ needs to be rejected. In the research the effect of the delivery mode on perceived value is not significantly contingent on differentiation in needs, no significant moderating effect exist.

#### **4.2.5 Model 4: Hypothesis 3**

In this model the moderating effect of the strength of coupling on the relationship between the delivery mode and the perceived value is tested. The regression test presents an insignificant regression of 0.024 ( $p > 0.05$ ). This is why hypothesis 3 is rejected. In our research setting no statistical evidence is found that the relationship between the delivery mode and the perceived value of the business units is contingent on the strength of coupling.



## 5. Discussion and conclusion

In this chapter the findings of this research are critically examined, explaining the theoretical contributions and implications in the first paragraph. Next to this the link between theory and the practice is described. The last section is about the limitations of this research and recommendations are made for future research. Furthermore the most important conclusions are summarized.

### 5.1 Theoretical contributions and implications

The moderating effect of the differentiation in needs and strength of coupling on the relationship between the delivery mode and the perceived value of support activities is tested. Interesting findings like no significant moderating effect of differentiation in needs and strength of coupling and the significant negative effect of the strength of coupling on the perceived value of support activities are found. These and more findings are elaborated hereafter, analyzing the result in depth.

In this study we have empirically tested design rules from platform theories in a service environment. According to Martin and Ishii (2002) the GVI in our research differentiation in needs and the CI in our research the strength of coupling, are important design rules in platform design. Both of these variables are hypothesized as moderating variables on the relationship between the delivery mode and the perceived value of support activities by the business units. Among others the differentiation in needs is tested in a service delivery setting. Hofman and Meijerink (in press) tested the moderating effect of HR activities on the relationship between the HR delivery mode and the perceived value of HR activities. They found that the differentiation in needs is a valid design rule for organizing HR service delivery. In this study the differentiation in needs is tested in a different setting, while it focuses on administrative support activities to deliver the main service of LabCom. We found that the relation between the delivery mode and the perceived value of support activities is not significantly contingent on the differentiation in needs of support activities. This can be explained by the methodological and theoretical differences, the differences are discussed later on. The results in our setting are not significant and do not support decision makers in making a rational choice of sharing or not sharing a specific support activity, for reaching the highest perceived value. However we did find a significant positive correlation (0.21) between the differentiation in needs and the perceived value, while Hofman and Meijerink (in press) have found a negative correlation. These differences in results between the research of Hofman and Meijerink (in press) and the study we conducted could be explained in many ways. One of the most important causes could be the poor bivariate inter-item correlation of the perceived value in our research, meaning that there is a poor consistency between the two items measured to rate the perceived value of support activities. This indicates that the multi-item variable indicators used in the survey are not consistent with one another and the reliability is poor. According to Shrout and Fleiss (1979, p. 427): “unreliable measurements cannot be expected to relate to any other variable, and their use in analyses frequently violates statistical assumptions”. Since the research is testing the moderating affect of the variable differentiation in needs on the relation between the delivery mode and the dependent variable the perceived value, the poor consistency of the dependent variable could have influenced the results. The inter-item correlation in the research of Hofman and Meijerink (in press) was higher.

The insignificant results and the different results between the findings of Hofman and Meijerink can be explained by comparing the research settings and methodologies used, although also by analyzing the theoretical context of both the studies. A comparison between the research settings and methodologies are elaborated first. 1] The unit of analysis differs, while Hofman and Meijerink (in press) have sampled the HR activities and we sampled administrative support activities. An HR activity is not a part of the core product or service an organization is delivering to paying customers, since HR activities are not directly connected to the core service or product of the organization. In our setting a part of the core service is studied using a purposive sampling method while Hofman and Meijerink (in press) sampled almost all of the HR activities. In our setting this was impossible due to several reasons as mentioned in chapter 3.2. The different sampling methods can cause contradicting results, since we purposively sampled specific support activities assuming that a representative sample is drawn from the population of support activities for measuring the variables. It is possible that the sampled support activities, or a part of the sampled support activities, indicate different results for the variables than when all the support activities were sampled. This could have caused a selection bias, where the sample used is not a good reflection of all the support activities. To go short it is possible that the results in our study do not reflect the population of support activities. 2] The layout of the questionnaires in this research differ from the surveys conducted in the research of Hofman and Meijerink (in press). Within this study the variable indicators are mentioned as a statement where the respondent is asked to rate this statement against the sampled support activities, than the next statement is given and all of the support activities are summed up again for the rating. In the study of Hofman and Meijerink (in press) the HR activities are mentioned and the respondent is asked to rate this activity on the two statements right after each other, examples are given in attachment 3. Different layouts of the questionnaires are acknowledged to affect the responses (Jenkins and Dillman, 1997; Sanchez, 1992; Smith, 1995). These different layouts of the questionnaires could have influenced the results on differentiation in needs and the perceived value, thus also the strength of coupling. Since seeing a comparison between the statements is harder in our research, because statements are not repeated and asked for every support activity in one question. Respondents that can read and rate both the statements for every support activity after one another are probably rating the activities more consistent, increasing the inter-item correlation of the variables.

However the different results can also be explained by elaborating theoretical differences in context; the case companies that are tested. Our case company has more than ten years of experience in delivering support activities in a shared delivery mode, while the case company in the research of Hofman and Meijerink (in press) is only sharing HR activities for about three years. This difference can influence the perceived value, since there is more knowhow on what delivery mode causes the highest perceived value of support activities. This difference in context can cause a difference in the variety of support activities, support activities are already shared or non-shared in the best possible way reaching the highest perceived value. In our case company the possibility exists that no 'wrong' allocated support activities exist, to go short support activities with a high differentiation in needs are performed in a non-shared delivery mode and the other way around (blue dots figure 5.1). Since less experience exists in the case company used by Hofman and Meijerink (in press) a higher variety in the delivery modes can exist, where HR activities can also be allocated in a 'wrong manner' (red dots in figure 5.1). The results in this study are probably influenced by the difference in variety of the support activities in both

studies. A lower variety of support activities can cause a lower significance of the results, since the spread of the results is lower. All of these differences could have caused the dissimilarities of the results.

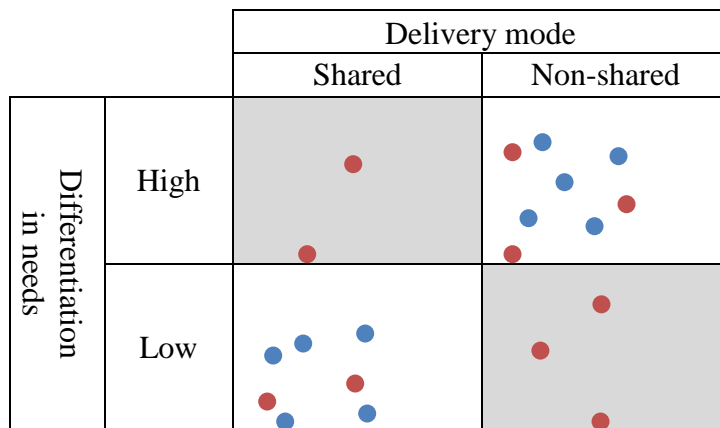


Figure 5.1: a possible variety of activities

In this study a contribution to the research of Hofman and Meijerink (in press) is made by retesting the differentiation in needs in another setting, however another design rule is also studied. The research on the design rule strength of coupling is contributing to existing literature by empirically testing this in a service environment. We found that there is no significant moderating effect of the strength of coupling on the relationship between the delivery mode and the perceived value exists in our setting. The strength of coupling is not a valid design rule for organizing service delivery of support activities. However the external validity is low and a significant effect could be present in other research settings, since the earlier given explanations for the different results on the moderating effect of the differentiation in needs are probably also be present in these results.

Second, in this study the interdependencies of support activities are mapped using the DSM matrix (Carracascosa et al., 1998; Yassine, 2004) and differentiation in needs is collected through a survey. The combination of these datasets in the strength of coupling is a contribution to literature, the total differentiation in needs of the ISSA's and the IRSA. Despite the fact that the measuring instrument of the strength of coupling can cause unexpected differences, as explained in section 5.3, the negative relation that is found between the strength of coupling and the perceived value of support activities by the business units is elaborated in more depth. Support activities with a high strength of coupling increase the likelihood of conflict between the decision makers (rayon management) of the different business units, considering and reconsidering redesigns of the support activities. The higher the number of rayon managers involved in solving the conflict the harder it is to reach a consensus on the design of a support activity. The study supports the findings of De Drue and Weingart (2003), conflict interferes with the performance. This study contributes to this by linking the strength of coupling to perceived value, while research already subscribes the relation between conflict and performance. An empirical test of the relation between the strength of coupling and the performance of support activities, the perceived value, in a service delivery setting is conducted in this study. The finding that the strength of coupling is related to the perceived value of support activities can be caused by conflict and is interesting for future research. In our research the rate

of conflict is not measured and this could be an interesting topic for future research, testing the relation between conflict and the perceived value of support activities. Still an even more interesting topic is to see if the relationship between the delivery mode and the perceived value of support activities is contingent on the rate of conflict.

Furthermore, the performance indicator perceived value is contingent on the control variable job tenure, a significant positive correlation is found. In existing literature the job tenure was expected to be negatively correlated to the perceived value because of the openness to change (Boeker, 1997; Wiersema and Beltel, 1992). Among others we found that job tenure is positively correlated to the perceived value (Hofman and Meijerink, in press; Mckee, Simmers and Licate, 2006), since self-efficacy increases and skills for collaborating are growing for the RM with longer job tenures. The RM with a longer job tenure experience higher service levels of the support activities.

## **5.2 Practical contributions and implications**

The results in this study do not give a grounding advice on sharing or not sharing of support activities if the differentiation in needs or the strength of coupling is high or low. The perceived value of the support activities in a shared or a non-shared delivery mode is not contingent on the differentiation in needs and strength of coupling. Theoretically the perceived value of support activities is the highest when support activities with a high differentiation in needs and/or a high strength of coupling are not shared and the other way around. Based on the data in this research the advice would be that it does not significantly matter what delivery mode is used for support activities with various differentiation in needs and strength of coupling.

However we did find a significant negative correlation between the strength of coupling and the perceived value of support activities. The higher the strength of coupling, the lower the perceived value. For reaching a higher perceived value of support activities it is recommended to lower the strength of coupling. In practice the strength of coupling can be lowered by standardization. Standardization can be seen as managing operating procedures by using fixed interfaces of the interactions between support activities (Hsieh, Chou and Chen, 2002). This managing of processes makes it possible to control information flows between support activities. These standardized interfaces for performing the activities can make information flows more efficient, using for example communication forms and/or scheduled meetings. The complicated interactions between both people and tasks can be simplified in this manner (Yassine, 2004). Organizations can use these standardized interfaces to lower the potential of conflict and increase the perceived value. The affect of strength of coupling on the perceived value of support activities can be decreased by managing the interfaces and prevent/solve the potential conflict in a more efficient way. This decreases the time and resources that need to be invested for solving the conflict enhancing the perceived value by the business units.

### 5.3 Limitations and future research

A limitation in this research could be the self-appraisal bias in the second survey, since the rayon management was asked to judge the perceived value of support activities that are sometimes performed by the consultants in their business unit. This motivational bias can influence the ratings given for the support activities performed by the business units, thus also the support activities in the shared delivery mode. The support activities performed by the business unit could be rated higher for not exposing the managing skills of the rayon manager, since they have control over and need to manage the consultants to reach higher service values. On the other hand negative ratings can be given for support activities performed in a shared delivery mode, since the rayon manager possibly wants the embedded support activities to have better ratings than the shared support activities. However the rayon management is the only possible respondent that has an overview of the quality and costs of the support activities in a shared and non-shared delivery mode. We tried to prevent this bias by asking objective answers, guaranteeing anonymity and explaining that the data is not used for other purposes. However the bias could still exist. This potential bias could be prevented in future research by selecting an organization where respondents exist that are able to rate the perceived value independently.

Another limitation of this study are the interviews conducted with the rayon management, due to time pressure and lack of resources. One rayon manager per business unit was interviewed for filling in the DSM matrix, the rayon manager was chosen systematically. This dataset was used to calculate the strength of coupling for one or more respondents on the survey. Hence, there is a possible selection bias (selecting rayon managers geographically because of a lack of resources) and interviewer bias (influence of interviewer that distorts the response). In future research the selection bias could be prevented by selecting the respondents at random and the interviewer bias can be prevented by hiring an objective interviewer for conducting the interviews. We minimized this interviewer bias by standardizing the interviews. In the interviews a description of the study is given, for preventing motivational answers in the survey, rayon managers that are interviewed where not asked to fill in the survey because of their knowledge of the study and a possible self-appraisal bias.

Furthermore the formula for calculating the strength of coupling is having some important complications. This complication is the fact that the strength of coupling of the IRSA can be the same, while the differentiation in needs of the ISSA's is different. This is illustrated in the following example. The  $IRSA_{diff}$  is 3 for both of the examples. 1] The differentiation in needs of the ISSA's is 1 for activity A, 1 for activity B and 5 for activity C. Using the formula the strength of coupling of the IRSA is 10 ( $1+1+5+3$ ). 2] If the differentiation in needs of the ISSA's is 2 for activity A, 2 for activity B and 3 for activity C the strength of coupling of the IRSA is 10 ( $2+2+3+3$ ) also. In example one ISSA C has a very high differentiation in needs, increasing the potential of conflict. In the second example no support activity has a high differentiation in needs, the potential of conflict is lower compared to example one. However the strength of coupling in both of the examples is the same, indicating that the IRSA in these samples are having the same potential of conflict. The opposite is true because example one has a higher potential of conflict than example two. In example one activity C has a very high differentiation in needs causing more information flows to the IRSA than in example two. This is influencing the perceived value while this was not taken into consideration in the operationalization of the variable strength of coupling. Despite the fact that we found a significant relation between the

strength of coupling and the perceived value of the IRSA, this operationalization could have influenced the results and needs to be considered in future research. For preventing these complications to occur in future research we are suggesting to use another measure. This can also prevent the significant correlation of 0.24 between the differentiation in needs and the strength of coupling. For future research the strength of coupling can be measured by counting the number of information flows a support activity is receiving from other support activities. The total number of support activities the specific support activity requires information from, leaving the differentiation in needs of the information supplying support activities out of scope. Furthermore the allocation of the support activities need to be taken into consideration, performing groups of support activities that are interacting with one another in the same way (shared or non-shared).

The definitions on causality (cause-effect relations) and correlation (two variables that orderly have a coherence) are quite different. Within our research the correlations between the variables are measured. Statements about the causality cannot be made since we did not met the three fundamental conditions for measuring a causal relation; ‘(a) the cause has to proceed the effect, (b) the cause had to be statistically associated with the effect, and (c) there had to be no plausible alternative explanation for the effect other than the cause’ (Rutter, 2007, p. 378). In future research the causal relationship can be studied by measuring the assumed independent variable, than the assumed dependent variable and then the assumed independent variable again. In our study this would mean measuring the variables in the following sequence; differentiation in needs, perceived value and the differentiation in needs again. Furthermore possible confounding variables need to be eliminated and time lags between the moments of measuring need to be increased, since the assumed independent variable needs to have time to cause the assumed effect on the dependent variable and the other way around.

Last but not least, due to time pressure, we were forced to collect the data for this study during the holiday period in the Netherlands. This has influenced the number of respondents in the research. We would recommend to collect data around the holidays in future research.

Some findings in this study are interesting for future research since the contingency of the relationship between the delivery mode and the perceived value of support activities on moderating variables is still not declared. Retesting the moderating variable in yet another setting could give more insight in this topic. An even more interesting study is to see if the relationship between the delivery mode and the perceived value of support activities is contingent on the rate of conflict. Since support activities performed in a shared delivery mode with a high differentiation in needs and/or a high strength of coupling theoretically cause conflict and conflict on its turn causes the perceived value to decrease.



## 5.4 Conclusion

The objective of this study is to explain to what extent the differentiation in needs and the strength of coupling affect the relationship between the delivery mode, shared or non-shared, and the perceived value of support activities by the business units. The results indicate that the relationship between the delivery mode and the perceived value of support activities by the business units is not significantly affected by the differentiation in needs and strength of coupling. To go short, no clear and grounded advice can be given to the decision makers of LabCom on sharing or not sharing a specific support activity with a differentiation in needs and strength of coupling for reaching the highest possible perceived value. In theory our advice would be not to share support activities with a high differentiation in needs and/or a high strength of coupling and to share support activities with a low differentiation in needs and/or a low strength of coupling. However according to our study, reaching the highest perceived value is not contingent on both of these moderating variables, to go short the choice of sharing or not sharing a support activity with a differentiation in needs and strength of coupling is not significantly affecting the perceived value. According to our study, it does not matter what delivery mode is chosen for support activities with a differentiation in needs and strength of coupling, with the objective to reach the highest perceived value.

## References

- Athanassopoulos, A.D. (2000). Customer Satisfaction Cues to Support Market Segmentation and Explain Switching Behavior. *Journal of Business Research*, 47, 191 - 207.
- Babbie, E. (2010). *The Practice of Social Research* (Vol. 12th). California: Belmont.
- Bergeron, B.P. (2003). *Essentials of shared services*. Hoboken: John Wiley & Sons Inc.
- Berry, L.L., Zeithaml, V.A. and Parasuraman. (1985). Quality counts in services, too. *Business horizons*, May- June, 44 - 52.
- Boeker, W. (1997). Strategic change: The influence of managerial characteristics and organizational growth. *The Academy of Management Journal*, 40(1), 152 - 170.
- C.R. Jenkins, and D.A. Dillman. (1997). *Towards a Theory of Self-Administered Questionnaire Design*. New York: Wiley-Interscience.
- Carracascosa, M., Eppinger, S.D., Whitney, D.E. (1998). *Using the design structure matrix to estimate product development time*. Paper presented at the ASME Design Engineering Technical Conferences, Atlanta.
- Chandler, A.D. (1977). *The Visible Hand: The Managerial Revolution in American Business*. United States of America: Belknap Press of Harvard University Press.
- Cronin, J., Brady, M.K., Hult, G.T.M. (2000). Assessing the Effects of Quality, Value, and Customer Satisfaction on Consumer Behavioral Intentions in Service Environments. *Journal of Retailing*, 76(2), 193 - 218.
- Daft, R.L. (2007). *Understanding the Theory and Design of Organizations*. Mason: South-Western Cengage Learning.
- Dekker, H.C. (2004). Control of Inter-Organizational Relationships: Evidence on Appropriation Concerns and Coordination Requirements. *Accounting, Organizations and Society*, 29, 27 - 49.
- Fawaz, W., Daheb, B., Audouin, O., Du-Pond, M., Pujolle, G. (2004). Service level agreement and provisioning in optical networks. *Communications Magazine, IEEE*, 42(1), 36 - 43.
- Feitzinger, E., Lee, H.L. (1997). Mass customization at Hewlett–Packard: The power of postponement. *Harvard Business Review*, 75(1), 116 - 121.
- Fleiss, P.E. Shrout and J.L. (1979). Intraclass Correlations: Uses in Assessing Rater Reliability. *Psychological Bulletin*, 86(2), 420 - 428.
- Fuller, C. (1974). Effect of Anonymity on Rate and Response Bias in a Mail Survey. *Journal of Applied Psychology*, 59(3), 292 - 296.
- Galsworth, G.D. . (1994). *Smart, simple design: using variety effectiveness to reduce total cost and maximize customer selection*. Vermont: Omneo, Essex Junction.
- Gordon, R.L. (1975). *Interviewing: Strategy, Techniques and Tactics*. Illinois: Dorsey Press.
- Hallowell, R. (1996). The relationships of customer satisfaction, customer loyalty, and profitability: an empirical study. *The International Journal of Service Industry Management*, 7(4), 27 - 42.
- Halman, I.M., Hofer A.P., van Vuuren, W. (2003). Platform-Driven Development of Product Families: Linking Theory with Practice. *Journal of Product Innovation Management*, 20(2), 149 - 162.
- Hofman, E., Meijerink, J., Hemels, H. (in press). *To share or not to share: that's the question! When does sharing of HR services maximize perceived HR service value?* International



- Conference of the Dutch HRM Network. University of Twente, The Netherlands. Groningen.
- Hsieh, A.T., Chou, C.H., Chen, C.M. (2002). Job standardization and service quality: A closer look at the application of total quality management to the public sector. *Total Quality Management*, 13(7), 899 - 912.
- Janssen, M., Joha, A. (2004). *Issues in relationship management for obtaining the benefits of a shared service center*. Paper presented at the Proceedings of the 6th international conference on Electronic commerce, New York, USA.
- Janssen, M., Joha, A. (2006). Motives for establishing shared service centers in public administrations. *International Journal of Information Management*, 26(2), 102-115.
- Johnston, R. (1995). The determinants of service quality: satisfiers and dissatisfiers. *International Journal of Service Industry Management*, 6(5), 53 - 71.
- Joshi, A.W. and Sharma, S. (2004). Customer knowledge Development: Antecedents and impact on new product performance. *Journal of Marketing*, 68(October), 47 - 59.
- Kogut, B. (1988). Joint Ventures: Theoretical and Emperical Perspectives. *Strategic Management Journal*, 9, 319 - 332.
- Leech, B.L. (2002). Asking questions: techniques for semistructured interviews. *Political Science & Politics*, 35(04), 665 - 668.
- Lin, L., Daim, T.U. (2009). Platform Strategy Framework for Internet-Based Service Development: case of eBay. *International Journal of Services Technology and Management*, 11(4/2009), 334 - 354.
- Maatman, M., Bondarouk, T.V., Looise, J.C. (2010). Conceptualising the Capabilities and Value Creation of HRM Shared Services Models. *Human Resource Management Review*, 20, 327 - 339.
- March, James G. (1991). Exploration and Exploitation in Organizational Learning. *Organization Science*, 2(1), 71-87. doi: doi:10.1287/orsc.2.1.71
- Martin, M.V., Ishii, K. (2002). Design for variety: developing standardized and modularized product platform architectures. *Research in Engineering Design*, 13, 213 - 235.
- Mckee, D., Simmers, C.S. and Licate, J. (2006). Customer Self-Efficacy and Response to Service. *Journal of Service Research*, 8, 207 - 220.
- Meijerink, J., Bondarouk, T. (2013). Exploring the central characteristics of HR shared services: evidence from a critical case study in the Netherlands. *The international Journal of Human Resource Management*, 24(3), 487 - 513.
- Meijerink, J., Hofman, E., Hemels, H. (2011). *Sharing HR activities and its impact on HR service value: the coningent effect of commonality potential*. Paper presented at the Conference of the Ducth HRM Network, Groningen.
- Meyer, M.H., and Utterback, J.M. (1993). The product family and the dynamics of core capability. *Sloan Management Review*, 34(3), 29 - 47.
- Meyer, M.H., DeTore, A. (2001). Perspective: Creating a Platform-Based Approach for Developing new Services. *Journal of Product Innovation Management*, 18(3), 188 - 204.
- Meyer, M.H., Lehnerd, A.P. (1997). *The Power of Product Platforms: Building Value and Cost Leadership*. New York: Free Press.
- Miller, T.D., Elgard, P. (1998). *Defining Modules, Modularity and Modularization*. Paper presented at the OPS Research Seminar, Fuglsoe.
- Parasuraman, A., Zeithaml V.A., and Berry L.L. (1985). A Conceptual Model of Service Quality and Its Implications for Future Research. *Journal of Marketing*, 49(Fall), 41 - 50.

- Parasuraman, A., Zeithaml V.A., and Berry L.L. (1988). SERVQUAL: a multiple-item scale for measuring consumers perceptions of service quality. *Journal of retailing*, Spring, 12 - 40.
- Pekkarinen, S., Ulkuniemi, P. (2008). Modularity in developing business services by platform approach. *The International Journal of Logistics Management*, 19(1), 84 - 103.
- Pine, B.J. (1993). *Mass customization: the new frontier in business competition*. Boston: Harvard Business School Press.
- Podsakoff, P.M., MacKenzie, S.B. and Lee, J.Y. (2003). Common Method Biases in Behavioral Research: A Critical Review of the Literature and Recommended Remedies. *Journal of Applied Psychology*, 88(5), 879 - 903.
- Quinn, B., Cooke, R., Kris, A. (2000). *Shared Services: Mining for Corporate Gold*. Harlow: Pearson Education.
- Reilly, P. (2000). HR Shared Services and the Realignment of HR. *Brighton: Institute for Employment Studies*, 368.
- Rindfleisch, A. Heide, J.B. (1997). Transaction Cost Analysis: Past, Present and Future Applications. *Journal of marketing*, 61(October), 30 - 54.
- Robertson, D., Ulrich, K. (1998). Platform Product Development. (*Unpublished Work*).
- Rona, D. (2008). *Finance shared services – Delivering the promise*.
- Rose, R.A. Cosier and G.L. (1977). Cognitive Conflict and Goal Conflict Effects on Task Performance. *Organizational Behavior and Human Performance*, 19, 378 - 391.
- Rutter, M. (2007). Proceeding From Observed Correlation to Causal Inference; The Use of Natural Experiments. *Perspectives on Psychological Science*, 2(4), 377 - 395.
- Sanchez, M.E. (1992). Effect of Questionnaire Design on the Quality of Survey Data. *Public Opinion Quarterly*, 56(201 - 217).
- Sanderson, S.W. (1991). Cost models for evaluating virtual design strategies in multicycle product families. *J Eng Technol Management*, 8, 339 - 358.
- Sawhney, M.S. (1998). Leveraged high-variety strategies: from portfolio thinking to platform thinking. *Journal of the Academy of Management Science*, 26(1), 54 - 61.
- Schulman, D.S., Dunleavy, J.R., Harmer, M.J., and Lusk, J.S. (1999). *Shared Services: Adding value to the Business Units*. New York: Wiley.
- Schulz, V., Uebernickel, F., Hochstein, A., Brenner, W. (2009). *Definition and Classification of IT Shared Service Center*. Paper presented at the Proceedings of the Fifteenth Americas Conference on Information Systems, California.
- Siddique, Z., Rosen, D.W., Wang N. (1998). *ASME Design Engineering Technical Conferences*. Paper presented at the DETC98, DTM-5661.
- Simpson, T.W. (2003). Product platform design and customization: Status and promise. *Artificial Intelligence for Engineering Design, Analysis and Manufacturing*, 18, 3 - 20.
- Smith, T. W. (1995). Little Things Matter: A Sampler of How Differences in Questionnaire Format Can Affect Survey Responses. *Proceedings of the American Statistical Association, Survey Methods Section*, 1046 - 1051.
- Strikwerda, J. (2010). *Shared Service Centers II: Van kostenbesparing naar waardecreatie*. Den Haag: Van Gorcum.
- Ulrich, D. (1995). Shared Services: From Vogue to Value. *Human Resource Planning*, 18, 12 - 23.
- Ulrich, D., Younger, J., Brockbank, W. (2008). The Twenty-First-Century HR Organization. *Human Resource Management*, 47(4), 829 - 850.

- Ulrich, K. (1993). The role of product architecture in the manufacturing firm. *Research Policy*, 24(1995), 419 - 440.
- Vanderfeesten, I., Reijers, H.A. and van der Aalst, W.M.P. (2008). Evaluating workflow process designs using cohesion and coupling metrics. *Computers in Industry*, 59(2008), 420 - 427.
- Weingart, C.K.W. de Drue and L.R. (2003). Task Versus Relationship Conflict, Team Performance, and Team Member Satisfaction: A Meta-Analysis. *Journal of Applied Psychology*, 88(4), 741 - 749.
- Wiersema, M.F. and Beltel, K.A. (1992). Top management team demography and corporate strategic change. *Academy of Management Journal*, 35(1), 91 - 121.
- Yassine, A.A. (2004). An Introduction to Modeling and Analyzing Complex Product Development Processes Using the Design Structure Matrix (DSM) Method. *Quaderni di Management*, 9.
- Zeithaml, V.A. (1988). Consumer Perceptions of Price, Quality, and Value: A Means-End Model and Synthesis of Evidence. *Journal of Marketing*, 52(3), 2 - 22.

## Appendix

### Appendix 1: Sampled support activities

Placement	Sign in
Checking and replenishing the company file	Ask candidates to register online
Checking and replenishing the employee file	Obtain the name and address of the candidate
Determine the start date of the placement with the customer	Obtain the date of birth of the candidate
Determine the start date of the placement with the employee	Obtain the sex of the candidate
Determine the end date of the placement with the customer	Obtain the telephone number of the candidate
Determine the end date of the placement with the employee	Obtain the e-mail address of the candidate
Identify any billing departments, project billings and invoice references with the customer	Obtain the licenses which the candidate has
Determine the (expected) number of hours with the customer	Obtain the education of the candidate
Determine the (expected) number of hours the employee	Obtain the last education of the candidate
Determine the function name	Obtain the work and think level of the candidate
Establish contact with the company (contact person for the job and approval of hours)	Obtain of the availability of the candidate
Determine the gross hourly rate of the employee with customer and employee	Obtain the number of hours that the candidate can / will work
Determine the corporate rate with the customer (normal hours, hours surcharge etc.)	Obtain the days on which the candidate is available
Determine the type of reward	Obtain the maximum desired travel distance
Determining the reservation set (the number of vacation days, etc.)	Obtain the desired gross salary (per unit) of the candidate
Determine the travel allowance with the customer	Entering the curriculum vitae of the candidate
Determine the travel allowance with the employee	Accepting the terms and conditions
Enter the placement information or send it to ShareCom	Analysing the incoming profiles and take appropriate follow-up steps
Opening a new placement file	
Importing the company data in the placement	
Import the employee data in the placement	
Enter the date of the placement	
Enter the date of the placement	
Entering the established billing departments, projects, and references (optional)	
Enter the (expected) number of hours per week	
Enter the function name	
Enter/monitor the determined contact data	
Enter the gross hourly rate of the employee	
Enter the company rate	
Enter the type of business agreements	
Enter the reservation set (the number of vacation days, etc.)	
Entering the fixed travel allowance	
Confirm the placement and send it to the employee	
Confirm the placement and send it to the customer	

## Appendix 2: Regression analysis

In this regression analysis another measure is used for measuring the strength of coupling. Coupling is measured by counting the number of support activities a support activity requires information from.

Variables	Model 1	Model 2	Model 3	Model 4
Constant (intercept)	4.134*	4.151*	4.172*	4.228*
<i>Control variables</i>				
Job tenure	0.483*	0.518*	0.484*	0.516*
Career	-0.124*	-0.127*	-0.125*	-0.124*
<i>Main variables</i>				
Delivery mode		0.146	0.044	0.096
Differentiation in needs		-0.042		-0.45
Coupling			-0.141*	-0.142*
<i>Moderating effect</i>				
Delivery mode X differentiation in needs		-0.070		-0.066
Delivery mode X coupling			0.034	0.036
Model F	67.886*	28.659*	31.176*	22.544*
R <sup>2</sup>	0.23	0.24	0.25	0.26
Adjusted R <sup>2</sup>	0.22	0.23	0.24	0.24

N = 468 support activities

\* p < 0.01

### Appendix 3: The structure of the surveys

This research, mentioning the statement and ask respondents to rate every support activity.

#### Statement 1

<b>Stelling: De eisen van uw label, ten aanzien van de onderstaande activiteiten, zijn voortdurend aan verandering onderhevig (veranderen van tijd tot tijd) *</b>					
Stelling 1	Volledig mee oneens	Oneens	Neutraal	Eens	Volledig mee eens
Het controleren en aanvullen van het bedrijfsdossier	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Het controleren en aanvullen van het employeeedossier	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

#### Statement 2

<b>Stelling: Uw label heeft, ten aanzien van de onderstaande activiteiten, zeer uiteenlopende (verschillende) eisen *</b>					
Stelling 1	Volledig mee oneens	Oneens	Neutraal	Eens	Volledig mee eens
Het controleren en aanvullen van het bedrijfsdossier	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Het controleren en aanvullen van het employeeedossier	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Hofman and Meijerink (in press), mentioning the HR activity and ask the respondent to rate this HR activity on both of the statements.

Het uitvoeren van een maandelijkse salarisverwerking:	Geheel mee oneens	Oneens	Neutraal	Eens	Helemaal mee eens
De behoeftes van gebruikers, voor deze dienst, zijn voortdurend aan verandering onderhevig.	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	<input type="checkbox"/> <sub>5</sub>
Gebruikers hebben zeer uiteenlopende behoeftes t.a.v. deze dienst.	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	<input type="checkbox"/> <sub>5</sub>