ICT Enabled Distribution of Services: Service Positioning Strategies, Front Office Information and Multi-channeling

de Vries, E.J.

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Chapter Four
Research Design: A Model for the Information Requirements of the Front Office

In chapter two I presented three generic service positioning strategies: the mass, scope and partnership oriented strategies. In chapter three I argued that we lack theories about the information requirements for the specification of services in the front office; I discussed the front and back office dichotomy in service delivery design; I defined the front office; I showed the importance of service specification in service delivery system design; I showed that the degree of customization is a determinant in organizational design; I proposed that we need insight into the information requirements of the front office to enable customization and empowerment and I discussed the general insights on information requirements of the front office that could be extracted from the literature.

In this chapter, I present the research design for the case studies that will be presented in the chapters five to eight. Conform Verschuren & Doorewaard (1999), the research design is divided into a conceptual design, a technical design and an evaluation of the research design.

The conceptual research design is subdivided into sections on the research objectives and questions, the three propositions of the study and an elaboration on proposition one: the model on the information requirements of the front office.

The technical research design is started with the argumentation of the chosen research method (case research) based on the characteristics of the research theme. Then I address the function of the study in the knowledge accrual process, its units of analysis, the site selection criteria, the data collection and data analysis techniques and the structure of research protocol and case study database.

The evaluation of the research design is based on three theoretical instruments.

Conceptual Research Design: Objectives, Questions and Propositions

The objective of this research is twofold. The research contributes to the knowledge regarding the dynamic and complex relationship between organizational design and the application of ICT, through contribution to our knowledge on the relationship between service strategy and service delivery system design. Regarding service strategy, the emphasis will be on the three generic service strategies presented in chapter two. Regarding service delivery system design, the emphasis will be on information required for service specification in the front office.
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The second objective is to derive a reference model that supports ICT application in the front office and that supports distribution strategy formulation in the service industry. The model proposed in proposition one serves as such a reference work and will be discussed in the next section.

The study focuses on the following research questions.

1. How is the degree of customization of services, that needs to be specified in the front office, related to the information requirements in the specification process and can front offices be classified based on this relation?
2. How is the effectiveness of the front office influenced if the required information for the specification of a certain degree of customization is not available?
3. How are the types of front offices related to the business unit’s service positioning strategy?

The first research question follows from the front and back office dichotomy in service delivery design, the importance of service specification in service delivery system design and the idea that the degree of customization is a determinant in organizational design in general and service specification in the front office in particular. To achieve reliability in services, promises about subsequent phases of the complete service process need to be made during service specification. Therefore information in the front office needs to reflect the subsequent phases of the delivery process and its customization options. The search for a classification scheme is motivated by our current limited knowledge on the information requirements of the front office, asking for explorative and descriptive research. Knowledge accrual often starts with description and classification.

The second question is motivated by the simple fact that if there are requirements, there must be consequences as well if requirements are not met. Some of these consequences could be drawn from the literature study presented in chapter two and three and are presented in proposition two.

The third question arises because in question one a relation is proposed between the degree of customization and the information requirements for service specification and in chapter two three process based service strategies were distinguished based on the degree of customization. The front office (and it’s information requirements) is a specific part of the complete service delivery process. Thus, if the process based service strategy is determined by the degree of customization and the information requirements of the front office as well, there must be a relation between the service strategy and the type of front office. Answering this question might lead to the eight characteristic of the three generic service strategies, which characterizes the information needs of the front office: the front office type. Given the fact that the other characteristics say something about the aspects process / service type, customer-supplier interaction, value adding focus, management, marketing and economies; adding an informational aspect contributes to our understanding on service strategies.

To answer the research questions, I will confront three propositions with the practice of eight front offices in four business units of Dutch service providers.
Proposition One: Model of the Information Requirements of the Front Office

I propose, that the degree of information which is required in the front office to specify the service, increases in accordance with the degree of customization. This is congruent with the idea that the degree of customization is a determinant for organizational design and thus for the design of the information aspect of front offices as well.

I categorize the information into information regarding the relation with the customer (relation information), information regarding the ‘product’ (product information) and information regarding the service process (process information). Although ‘the product is missing’ (Grönroos, 1998) in services, using the term ‘product’ has become widespread in the service industry (Shaw, 1990). In this proposition, the term product refers to the structure of the service (activities) to be delivered. The term process refers to the process by which service activities are linked. Process information provides ‘logistical’ knowledge to the front office, like delivery time norms or capacity availability.

Five degrees of customization are distinguished with matching degrees of information. The five resulting combinations of a degree of customization related to relation, product and process information to specify that degree of information are the types of front offices. The five types are labeled as ‘counter’, ‘one-stop-shop’, ‘field and inside service’, ‘control room’ and ‘symbiosis’.

This leads to a model for the information requirements of the front office. The model is shown in figure 4.1 and elaborated on in the next section.

<table>
<thead>
<tr>
<th>Front office type</th>
<th>Degree of customization</th>
<th>Relation information</th>
<th>Product information</th>
<th>Process information</th>
</tr>
</thead>
<tbody>
<tr>
<td>‘Counter’</td>
<td>Pure standardization</td>
<td>Anonymous transactions</td>
<td>End products</td>
<td>Norms for delivery time of end products</td>
</tr>
<tr>
<td>‘One-stop-shop’</td>
<td>Segmented standardization</td>
<td>Characteristics of market</td>
<td>Assortment</td>
<td>Norms for delivery time of assortments</td>
</tr>
<tr>
<td>‘Field and inside service’</td>
<td>Customized standardization</td>
<td>Customer profiles</td>
<td>Standard components</td>
<td>Capacity availability</td>
</tr>
<tr>
<td>‘Control room’</td>
<td>Tailored customization</td>
<td>Development of the relationship</td>
<td>Smallest replicable units</td>
<td>Capacity assignment</td>
</tr>
<tr>
<td>‘Symbiosis’</td>
<td>Pure customization</td>
<td>Opportunities for partnership</td>
<td>Design knowledge</td>
<td>Implementation and sourcing potentials</td>
</tr>
</tbody>
</table>

Figure 4.1: Model of the information requirements of the front office
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The model encompasses three important elements of services: the degree of relationship marketing, the nature of the service process expressed in the degree of customization and process control / capacity management. The model can be used to determine the right level of control over commercial processes (building relationships and specifying services according to customization options) and over operational processes (by having process information available in the front office). This way the model supports the basic function of service providers: matching customer needs with services and the delivery of these services through reliable processes.

Proposition Two: Effectiveness of the Front Office

The second proposition states that the effectiveness of the front office decreases when the information requirements for the specification of the corresponding category of customization are not met. Table 4.1 shows the relation between insufficient information and the ineffectiveness of the front office. Ineffectiveness is supposed to manifest itself as follows.

1. **Limited proactivity.** Berry and Parasuraman (1991) see a proactive approach of the customer as a requisite for relationship building. Customers want their relationships to be managed actively (Stone and Woodcock, 1995). Proactivity could be seen as ‘knowing whom to go to and knowing with which commercial message’. If we look at proactivity this way, proactivity is limited when assurance about knowledge on the customer or the product is limited. Proactivity stems from insufficient relation information or product information. Assurance is seen as one of the five service quality dimensions (Berry and Parasuraman, 1991).

2. **Specification quality problems.** According to Berkley and Gupta (1995) complete service specification before service fulfilment commences, decreases customer fear and thereby improves perceived quality and complete service specifications initiate fulfilment and decreases the likelihood of errors in fulfilment. Reliability is seen as the number one dimension of service quality (Parasuraman et al., 1991). Reliability is about promising the right things and keeping promises. Without information on subsequent phases in the service delivery process (product and process information) it becomes hard to provide realistic promises to customers. Without high quality specifications (resulting from sufficient product and process information) it will be hard to keep promises during fulfilment.

3. **Longer specification lead-time.** Besides providing customers with a complete set of specifications, the front office needs to be responsive as well (Parasuraman et al., 1991). Responsiveness is seen as one of the five service quality dimensions (Berry and Parasuraman, 1991). Longer specification lead-times stem from insufficient product or process information because the front office is supposed to consult the back office to get this information.
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<table>
<thead>
<tr>
<th>Ineffectiveness:</th>
<th>Limited proactivity</th>
<th>Specification quality problems</th>
<th>Longer specification lead-time</th>
<th>Limited protection of the back office</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insufficient relation information</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Insufficient product information</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Insufficient process information</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

Table 4.1: The relation between insufficient information and ineffectiveness

4. Limited protection of the back office. Protecting the back office operating core from external disturbances (Chase and Tansik, 1983) and specialization into customer contact (Fitzsimmons and Fitzsimmons, 1997) were the main reasons to separate front office from back office. If back office processes need to be disturbed for service specification activities, question could be asked on the specialization degree of the front office and on the efficiency of the back office. Information handling between front and back office will be on product or process information (in case that this information is insufficiently available in the front office).

Proposition two implicates a shortfall in three dimensions of service quality. Reliability will decrease if the right promises can’t be made in the front office or if the back office isn’t able to meet up to made promises. This will manifest itself as specification quality problems. Assurance problems (limited knowledge on customers or products) will manifest itself as limited proactivity. Low responsiveness (in the sense of providing the service as promptly as possible) will manifest itself in longer specification lead-time than necessary or desirable. Reliability, assurance and responsiveness are defined in table 3.3 in chapter three.

Proposition Three: Generic Strategies and Front Office Type

The third proposition deals with the relationship between the service positioning strategy and the types of front offices categorized in the model of proposition one. Three generic service positioning strategies are distinguished: mass orientation, scope orientation and partnership orientation. These three strategies were derived from the literature and described in detail in chapter two and are summarized in table 4.2.

I propose that service providers with a mass orientation rely on the front office types 'counter' and 'one-stop-shop'. Service companies with a scope orientation rely on the types, 'field and inside service' and 'control room'. Service providers with a partnership orientation rely on the types 'control room' and 'symbiosis'.
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<table>
<thead>
<tr>
<th>Service positioning strategy ➔</th>
<th>Mass orientation</th>
<th>Scope orientation</th>
<th>Partnership orientation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organizational design characteristics:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nature of the service process</td>
<td>Standardized / Infrastructural</td>
<td>Modular / component based</td>
<td>Ad hoc structured and interconnected with customer processes</td>
</tr>
<tr>
<td>Service type</td>
<td>Product (standardized)</td>
<td>Service/product (mass customized)</td>
<td>Pure service (customized)</td>
</tr>
<tr>
<td>Value adding focus</td>
<td>Process and source</td>
<td>Process, interactive and client</td>
<td>Client and interactive</td>
</tr>
<tr>
<td>Interaction governance</td>
<td>Selling</td>
<td>Sparring</td>
<td>Jobbing</td>
</tr>
<tr>
<td>Management approach</td>
<td>Production-line perspective</td>
<td>Empowerment perspective</td>
<td>Empowerment perspective</td>
</tr>
<tr>
<td>Marketing approach</td>
<td>Transaction marketing</td>
<td>Relationship marketing</td>
<td>Relationship marketing</td>
</tr>
<tr>
<td>Economies</td>
<td>Economies of scale</td>
<td>Economies of scope</td>
<td>Economies of relationships</td>
</tr>
</tbody>
</table>

Table 4.2: Characteristics of three generic service strategies

The customization degrees ‘standardization’ and ‘segmented standardization’ are both seen as being standard services and ‘tailored standardization’ is seen as an advanced opportunity for service providers. ‘Tailored standardization’ and the ‘control room’ are seen as a to be explored area between mass customization and pure customization, making this type of front office suitable for both scope and partnership oriented strategies. This subject is further elaborated on in the next section on the model.

**Proposition One: The Model of the Information Requirements of the Front Office**

In this section I will further elaborate on the model presented in proposition one. In proposition one, five degrees of customization are distinguished with related degrees of information. The relation between the degrees of customization and the information requirements of the front office is outlined in the model in Figure 4.1. In the model five types of front offices are distinguished. These are labeled as ‘counter’, ‘one-stop-shop’, ‘field and inside service’, ‘control room’ and ‘symbiosis’. The information that is required to specify higher degrees of customization is also sufficient to specify lower degrees. Thus, the information from the 'field and inside service' front office type is sufficient to specify the degree of specification, which belongs to the 'counter' and 'one-stop-shop' front office type. It is obvious that a standard service can be composed out of standard modules, for instance.

At first I describe the degrees of customization. Then I discuss the relation, product and process information (the columns of the model) and I will relate this
information to the literature study in chapter two and three. Then I will elaborate on
the front office types (the rows of the model). I will end this section with some
general remarks on the model.

**Degrees of Customization**

Following Lampel & Mintzberg (1996), I distinguish five degrees of customization
ranging from pure standardization to pure customization. In *pure standardization*,
the same service is delivered to each customer without any customization.
*Segmented standardization* offers a different standard service for different market
segments. The service itself remains standard but the offering is focused on a certain
segment. *Customized standardization* offers the possibility of assembling a
customized service out of standard components. This resembles mass customization.
*In tailored customization*, a service model is adapted to a customer's wishes, the
intervention depth of customer wishes enters the production process but this
customization does not enter the design process. Customization is not a question of
assembling standard components but enters the production process in which smaller
units than standard components are combined to form a customized service. In *pure
customization*, customization stretches as far as the design of the service, by
allowing to specify new service concepts and elements. I follow Lampel and
Mintzberg in differentiating between five degrees of customization because their
categorization is the most comprehensive one and very much resembles the well
known concept of the Customer Order Decoupling Point (CODP), thus the idea that
the intervention depth of customer wishes determines the type of service, as
concluded in chapter three. It should be noted that because services are unstockable
the CODP should be seen from an informational perspective, as was suggested in
chapter three.

Differentiating between five instead of three degrees of customization doesn't
seem to be congruent with the literature review in chapter two on the nature of the
service process. One should see ‘standardization’ and ‘segmented standardization’
as being standard services. Segmented services are standard services targeted to a
specific market segment and having the opportunity to be bundled with other
standard services into service packages. It is for this reason that I found it attractive
to take the category of ‘segmented standardization’ into account.

‘Tailored standardization’ is taken into account in the model for other reasons.
ICT is providing us with the opportunity to combine on the lowest thinkable level of
smallest replicable units (Quinn & Pacquette, 1990), to price discriminate on the
lowest level (Shapiro & Varian, 1999), to analyze information on customer
relationships on a longitudinal basis to follow the development of the relation and to
provide us with a detailed status on the assignment of capacity on customer orders
(for example by using workflow management technology). For these reasons it is
conceptually attractive to distinguish an ‘advanced level’ in between mass
customization and pure customization to investigate whether this level makes
empirically sense. The ICT opportunities just mentioned inspired me to relate the
relation, product and process information on the ‘control room’ row to ‘tailored
customization’. Furthermore, I had some experience with composing services out of
smallest replicable units before the start of this study (De Haas et al., 1994).
When the service provider offers higher degrees of customization, the complexity of the specification process increases. This growing complexity can be kept in check by the ready availability of relation, product and process information.

**Relation Information**

Relation information on the mass customization level in the model is needed to recognize customers, their needs, preferences and transaction profile and to differentiate between customers. This relation information is taken together in a customer profile. Recognizing customers is seen as a requisite for relationship marketing as was concluded from the literature study in chapter three. I suppose this information to be sufficient to support financial and social bonding, which was related to a medium degree of customization in chapter two (Berry & Parasuraman, 1991). Lower levels of relation information are information on characteristics of market segments, like socio demographic information, to target standard services to certain market segments (segmented standardization) or just information on the transaction (leaving no possibilities to target or customize). Both kinds of information are enough to achieve financial bonding. Higher levels of relation information are on the longitudinal development of the relation on the ‘advanced’ level of the ‘control room’ or on the opportunities for partnership. This last level indicates structural linkages between the service provider and customer on decision-making, strategic, organizational, commercial or technical processes and supports structural bonding. This highest level of relation information is congruent with the idea that in partnership oriented strategies the nature of the service process is interconnected with customer processes.

**Product Information**

It is obvious that front office employees need information on the product as well, although as can bee seen in the next chapters about the cases, in practice the product information is not always sufficient. Being able of some degree of customization in service operations doesn’t mean that information on these abilities is available in the front office. Product information brings the product related knowledge (such as service descriptions, prices or combination options) to the front office. Information on the availability of services, its price and customization variables was also mentioned in the literature study in chapter three. The different levels of product information in the model reflect the customization variables stemming from the degree of customization. Product information is needed to make the right promises about subsequent phases in the service delivery process, to inform and advice customers, to come to complete specifications to reduce customer fear, to initiate fulfillment processes and to define the implementation set of the service network (some of the service specification functions presented in chapter three). Through this information the organization is able to make customers aware of the services available and to ensure that the needs of customers can be fulfilled.
Process Information

Process information is about service capacity. It brings 'logistical' knowledge to the front office (such as delivery time norms or the availability of production capacity) and enables the service provider to make reliable predictions regarding delivery. The degrees of process information in the model are congruent with the idea of Chase and Acquilano (1995) that capacity management shifts from static (based on service forecasting) to dynamic (based on customers actual needs) when customization increases, resulting in a shift of information about capacity in the same direction.

For standardized services, service forecasting is possible, the forecast is translated into service delivery capacity and based on this capacity service delivery time norms are used in the back office to manage it and these norms are made available in the front office to make customers reliable promises. This works for individual products and for assortments of standardized products (as long as delivery time norms are aligned within the package). For mass customization this doesn’t work any longer. The assembling of components might lead to a wide range of combinations, so that it becomes impossible to set delivery time norms for all combinations. Furthermore, some components might be needed more than others, meaning that some service activities are needed more than others. Because the market decides which combinations are chosen, forecasting becomes difficult and capacity management becomes more dynamic. The only way to give customers a reliable indication of the service delivery time is to dynamically compute delivery time based on information about capacity availability.

The next level of process information is somewhat more advanced in the sense that not only information on capacity availability is available but also information on which capacity has been allocated for which customer (capacity assignment). This provides the opportunity to reallocate capacity in the case of prioritizing a valuable relation. Whether this is done will be based on relation information (the development of the relation). On the highest level of process information, information is needed about implementation and sourcing potentials because we have to do with the development of new service concepts (customization enters the design process). New service concepts lead to new service activities for which the question during service specification is: can we do it ourselves or are we able to source these activities on the market?

In the next sections I will describe the rows of the model, the front office types.

Counter

The 'counter' is an outlet for one or more services. 'Counters' are structured for optimal efficiency. Therefore, services are standardized and product information is required about predefined end products. The approach of the customer is reactive. Customers are not differentiated. Relation information can thereby remain restricted to the anonymous registration of transactions. Instantaneous delivery occurs or a standard delivery date is supplied which is reflected in the process information. Any kind of customer differentiation or customization is supposed to result in a diminishment of 'counter' efficiency.
One-Stop-Shop

The 'one-stop-shop' is a concept in which the selling and cross selling of standard services or standard service packages are targeted to market segments against the lowest costs ('segmented standardization'). The fact that a certain market is targeted makes cross selling or packaging of related products attractive. Product information is available about end products or assortments of end products (service packages). Relation information is about market segments, like for instance demographic or geographic information. During service specification, one must be able to determine to which segment the customer belongs, in order to focus offering and to cross sell services. A travel agent, for example, offers the senior citizen a Peloponnesus round trip in Greece in the early summer, with air conditioned hotel accommodation, a B-class rental car and cancellation insurance. Another segment, the 'youngsters', will be presented with another service package: 'island hopping'. Process information is comprised of delivery date norms for the whole package to prevent fragmented delivery. No differentiation is made between customers when it comes to delivery.

In the 'one-stop-shop', customization of services would make demands on employee's time and knowledge. This would conflict with bulk (cross) selling against low costs, the primary goal of the 'one-stop-shop'.

Field and Inside Service

In the front office type 'field and inside services', the customer will be given the idea of a relationship by recognizing the customer, some social bonding and by allowing services to be customized. To be able to service a wide range of customers at relatively low costs, the service provider will customize its services out of standard modules. The 'field and inside services' front office type therefore is a mass customization front office type.

The metaphor 'field and inside services' refers to traditional front offices in which salespeople like account managers (the 'field service') are supported in their sales and relationship management activities by an 'inside service' which is focused on administrative and secretarial services. The 'field and inside service' is structured with the objective to build relations with customers by the field service and to do transactions or to provide information as efficiently as possible by the inside service. Nowadays both field and inside services can be automated as well as is often the case in electronic commerce applications.

In this front office type relation information is available in the form of customer profiles. These are used to support a proactive customer approach and to facilitate social bonding. This information has bearing on the status of the relationship (including classifications such as 'suspect', 'prospect', 'lead', 'frequent customer', etc.) and on trial purchases, contact persons, 'decision-making units', contact histories and transaction histories. Product information is required about standard components from which the service is composed. Process information in this front office type, consists of information which bears on the available capacity of the process steps through which standard components are produced and assembled. It is not possible to reliably indicate the date of delivery without this information. For many service
providers, it is simply not possible to determine reliable delivery date norms for all of the possible component combinations.

When higher levels of customization have to be specified within the 'field and inside service' efficiencies associated with mass customization will be lost. The specification and service delivery process will become more complex because the amount of customization possibilities will increase. Such complexity will be hard to implement on a large scale, which is the goal in mass customization.

**Control Room**

The 'control room' aims to build up a structural bond with commercially attractive customers by way of 'tailored customization' delivery. The requirements of the customer are matched with the available capacity of the organization or network of service deliverers in conformation with the importance accorded to the relationship with the customer.

 Relation information in the 'control room' emphasizes the development of the relation because the service provider only wants to invest in commercially valuable customers by 'tailored customization'. The specification of this degree of customization is often time consuming and expensive because it is based on the smallest replicable units in the production system. The main difference between customer profiles in the 'one-stop-shop' and relation information on the development of the relationship is whether the information indicates rather static (short term) elements of the relation or the information indicates how the relationship dynamically develops over a longer time period (for instance information on the monetary value, potential spend index, the degree of customer acquisition or the position in the relationship life cycle). Product information is available on the level of smallest replicable units from which service delivery can be constructed. For example, in retail, this applies to cubic centimeters of shelf space. In the software industry, this applies to objects or to program routines. In the 'control room', process information regards not only the availability of service capacity but also the allocation of capacity. A combination of this information and relation information can lead to decisions in which commercially valuable customers are given production priority over other customers who already had service capacity been allocated to.

The 'control room' cannot deliver pure customization, the highest level of customization. The specification for the design of new service concepts often requires a project-oriented approach, in which people, information and knowledge differ per project. In the 'control room' the service concept (overall design) within which customization is specified is the basis for task assignments to employees and the resulting information requirements of the front office and doesn't differ per project.

**Symbiosis**

Customer relations can reach an intensity in which both partners wish to co-operate in the design of a new service. This new service can be offered by the service provider to the partner or can be offered to third parties by both partners. The mutual relation has reached the status of 'symbiosis'. The service provider is dependent on
the customer for the recoupment of investments made, while the customer is dependent on the service provider for his unique provision of customized services by which the customer achieves his objectives. Both parties are structural bonded and have invested in assets specific to their co-operation. The design of new services is a unique process that is to be undertaken on a project basis. One can speak of a temporary pool of personnel, knowledge and information from both parties. 'Symbiosis' refers to the most far-reaching level of relationship building, customization and process control.

Relation information will be on the possibilities for co-operation within the relation. Particularly information regarding the importance that the partner places in the mutual relation (like co-operation intention and compatibility) and information regarding the commercial appeal of the partner's relational network. The former gives insight into the customer's willingness for long term bonding. The latter gives insight into the possibilities of mutually profiting from the partner's business. Product information consists of conceptual knowledge regarding the design of service concepts, eventually backed up by elements and experiences from former service designs. Process information regards the options for implementing the new service concept in one's own processes, or of contracting parts of it out to third parties. This information gives insight into the 'time-to-market' of the new service and into the possibilities of implementation.

A higher degree of customization than pure customization is not known, but higher degrees of co-operation are known. It is not unthinkable that partners learn each other very well and get highly structurally bonded after one or more pure customization initiatives that they decide to strategically align or merge.

In the next section I discuss some general remarks on the model.

**General Remarks on the Model**

The model is congruent with the ideas on information requirements in service processes as mentioned in chapter three. Some of these congruencies are already referred to, others are discussed below.

The model is in line with some of the ideas proposed by Chase and Acquilano (1995). It is congruent with a more procedural/script based handling process for standardized services and an approach of empowerment by information and knowledge distribution in (mass) customized services. The model is also in line with the idea that specification of higher levels of customization is related to higher levels of contact, looser specifications, relatively lower production efficiency and better opportunities for additional sales. Furthermore the model is congruent with the idea that low customization and thus tight specifications are related to procedural worker skills, loose specification ('medium' customization) to trade skills and high-level customization to diagnostic skills.

In addition to this, the model is congruent with Surprenant and Solomon's (1987) ideas on interpersonal adaptive behavior and customization (service option adaptation) in the front office. In formal service settings (standardized script bases service settings) little interpersonal adaptive behavior is expected by customers and therefore limited support of relation information is required. With an increase in
customization, customized personalization behavior is expected and therefore higher levels of relation information are needed to support the front office employee. This line of thinking resembles Chase and Acquilano’s ideas in the last paragraph.

In addition to Chase and Tansik (1983), who proposed that low contact workers (back office) deal with customer surrogates packed in information (like orders for instance), I propose, through this model, that high contact workers (front office) deal with production surrogates packed in product and process information. Product information provides information on the structure and sequence of service activities and process information provides information on the capacity to perform these activities. This offers the opportunity to make reliable promises about subsequent phases in the service delivery process during service specification and provides the link between service marketing and service production, which is seen as a strategic activity (Grönroos, 1990; Berry & Parasuraman, 1991; Lovelock and Wright, 1999).

In the model I make an abstraction from the parties who fulfil the service. Whether this is done by a business unit, by a network of business units or a dynamic network organization, like a virtual organization, doesn’t impact on the abstract information requirements of the front office. In all these cases we need to know about the relationship with the customer, the customization options provided in the service and the availability of service capacity to fulfil the service. Vandermerwe (1994) views networks as configurations of service processes. By having information available on service processes, the front office is able to perform like a multifunctional access point in business networks (Vandermerwe, 1994; Mowshowitz, 1997). A medium through which resources can be sourced, mobilized and funneled to serve the customer (Vandermerwe, 1994).

Furthermore, I make an abstraction from ‘implementation issues’. The information could be available through different media, including ICT, paper and people. Nevertheless, the model is composed with having the enabling potentialities of ICT in mind. Information technology provides businesses with new opportunities to increase the availability of information in the front office. Customer requests and services can be matched more quickly and effectively when information systems carry information on customers, products and service capacity (Stone and Woodcock, 1995). Information systems provide the opportunity to improve service consistency by specifying and programming customizing variables in advance (Berkley & Gupta, 1995).

Relation information becomes available through digital customer profiles (Jeffery, 1996). Transactions are registered electronically with the help of point-of-sale technology, electronic order systems or the Internet. Front office employees register customer interactions in customer relationship management systems. Together with data from market research and transaction data, interaction data forms the basis of database marketing. With database marketing purchase and interaction patterns are analyzed to predict cross and deep selling, to target suspects and prospects and to draw up the customer relationship portfolio.

Product information is made available to the front office through product repositories and service selling applications. Information technology provides opportunities to ascribe values to parameters in production systems. But parameterization is often limited to the options that are built into the system.
ICT Enabled Distribution of Services

Pawson, Brvard & Cameron (1995) describe a type of information technology application that goes beyond pre-specified options. At J.P. Morgan, the 'language' with which trade floor employees think and work is modeled and expressed in software. These employees are able to structure financial services using their own 'language'.

Providing process information to the front office requires a high level of process control. Information technology offers far-reaching possibilities in process management and control. Some typical technologies are tracking & tracing, workflow management, groupware and enterprise resource planning. These technologies enable service providers to dynamically link product options to process capacity. In this way service capacity availability can be made visible during specification in the front office.

The model serves as a reference work for the application of ICT in the front office. The first consideration to be made is to determine the highest level of customization to be specified. Software systems, which support this level of specification, can also support the specification of lower levels of customization. Through this procedure, one presides over software, which supports varying front offices and distribution channels.

The model serves as a reference work for service distribution management as well. Software, which supports multiple distribution channels, contributes to easier replication of service processes as much of today's process logic can be programmed and distributed by software. As a result, new distribution channels can be set up relatively quickly making it possible for service providers to increase their flexibility and time to market. The replication of service processes is seen as essential in service distribution (Normann, 1991) and traditionally has been a question of service facility design and personnel training. Nowadays (taking e-commerce and e-business developments into account) replication of services has also become a matter of writing and distributing software that includes large parts of the service process logic.

In the last two sections, I introduced the conceptual research design, focusing on the research questions and propositions. In the next section I discuss the technical research design. In the last section of this chapter I evaluate the research design.

Technical Research Design

In the technical research design, I present the methodological issues of the study. I derived these issues from a comprehensive investigation of 55 case studies in the information systems literature which I enclosed in part two of this thesis and which has been published in de Vries & Roest (1999). The following issues will be presented.

- The epistemological orientation of the study.
- The argumentation of the chosen research strategy based on the research theme.
- The function of the study in the knowledge accrual process (exploration or explanation).
Chapter Four: Research Design

- The amount of cases, the unit of analysis, the site selection criteria and replication logic.
- The data collection approach: the sources of data, triangulation and the establishment of a review process.
- The data analysis techniques.
- The research protocol and case study database.

The order, in which I present the methodological issues, is congruent with the presentation order in de Vries & Roest (1999), enclosed as chapter twelve in part two of this thesis.

Epistemological orientation

The orientation of this study is a positivistic one, which becomes clear from the topics addressed in this technical research design (see de Vries and Roest (1999) in part two of this thesis for topics to be addressed for studies done from an interpretive standpoint). This orientation stems from my educational background in the information systems / information management discipline, in which the positivistic orientation is the traditional one (Orlikowski & Baroudi, 1991). This could be said about business economics and marketing as well (my secondary background). Although I became aware of the limitations of this standpoint during my studies, I decided to finish the studies without reorientation (see chapter 9). The study is not completely hypothetico-deductive in nature because the theory of the study is hold against empirical data and revised if needed in an abductive fashion, i.e. the theory of the study guided data collection and analysis but the method left degrees of freedom to be able to collect and investigate data to adjust or refine the theory (in a more inductive way).

Research Theme and Research Strategy

To confront the propositions with practice, case research is applied. Case studies are most suited to studies which deal with 'how' and 'why' questions (see table 4.3) regarding contemporary events, over which the researcher has little or no control and in which the borders between the phenomenon of interest and its context are not clear (Yin, 1994) or to study phenomena not supported by a strong theoretical base (Benbasat, Goldstein & Mead, 1987).

These criteria apply to this study. The central questions revolve around 'how' issues and the research touches on a contemporary phenomenon on which little theory has been built. The specification of services and the information requirements in service processes are under-researched areas (Berkley and Gupta, 1995). The same accounts for the use of customer databases, product repositories and relationship management systems to support front office processes and the distribution of services. The borders between the front office and its context (the rest of the organization) are not always completely clear.
ICT Enabled Distribution of Services

<table>
<thead>
<tr>
<th>Research strategy</th>
<th>Type of research question</th>
<th>Has the researcher control over the situation?</th>
<th>Focused on contemporary events?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experiment</td>
<td>How, why?</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Interview</td>
<td>Who, what, where, how much, how often?</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Archival analysis</td>
<td>Who, what, where, how much, how often?</td>
<td>No</td>
<td>Yes/No</td>
</tr>
<tr>
<td>Historical analysis</td>
<td>How, why?</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Case-study</td>
<td>How, why?</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Table 4.3: Relation between research strategy and research questions (Yin, 1994)

Function of the Case Study in the Knowledge Accrual Process

This case study can be characterized as exploratory. The case study is an accepted strategy for exploration (Benbasat, Goldstein & Mead, 1987; Lee, 1989; Yin, 1994). The theory of the study will be held against empirical data and revised if needed in an abductive fashion (Gummesson, 1991), i.e. the theory of the study will guide data collection and analysis but the method leaves degrees of freedom to be able to collect and investigate data to adjust or refine the theory or to come to new theoretical understanding in a more inductive way (see figure 4.2).

Unit of Analysis, Site Selection Criteria and Replication Logic.

This is a multiple embedded case study (Yin, 1994). I studied 8 front offices within 4 business units of 4 companies. The case study is embedded in that is differentiated between the level of the central unit of analysis (the business units and its front office(s)), its context (the company, its market, relevant legislation and non-front office departments) and its subunits of analysis (employees, managers and systems). On all three levels data has been collected and analyzed.

I used the principle of reasoned sampling for site selection. In reasoned sampling the research objects are chosen for analytical reasons. In reasoned sampling one could choose for extreme or deviant cases, typical cases, minimum or maximum variation in cases or critical cases (Hutjes & van Buuren, 1991). The research sites are selected on the criterion of maximum variation to be able to investigate whether all front office types made sense and to be able to investigate the relationship between the business unit’s service positioning strategy and the information requirements of its front office(s). The choice of four business units made it possible to study all three generic service strategies in practice. The eight front offices offered me the possibility to study the specification of all degrees of customization and its related information requirements. The Interpolis case could be seen as a critical case as well. At the start of the study Interpolis was quite explicit about the duality of its Employment Benefits project. On the one hand they expressed a clear need for packaging and simplifying their employment benefits services. On the other hand Rabo and Interpolis wanted to move from product oriented advise to customer-oriented advice and the EB project was meant to contribute to that movement. I
recognized this duality as a duality between a scale and scope or probably even partnership orientation and decided to confront my theory with this case as a semi-critical one.

In the theory building process, I follow a replication logic, not a sampling logic, in which theoretical replication is pursued (Yin, 1994). The objective is to develop propositions, with reference to a number of cases, rather than to test the theory on representative samples taken at random.

Data Collection

I used multiple data sources for data collection: interviews, documents and artifacts, like information systems (specifics are described in the case studies). The use of these data sources is not too time consuming, allows for triangulation and these sources complement each other in their strengths and weaknesses (see table 4.4). The complementary use of these data sources is quite usual in case research as becomes clear from de Vries and Roest (1999) in part two this thesis. The interviews took approximately one hour, were thematically structured, open-ended, were mostly tape recorded, transcribed and in many cases reviewed by the interviewees. In every case several interviews were conducted. The advantage of applying these qualitative approaches is the flexible and responsive interaction which is possible between interviewer and respondents which allows meanings to be probed, topics to be covered from a variety of angles and questions made clear to respondents (Sykes, 1990).

![Figure 4.2: Research scheme for multiple case studies (Hutjes & van Buuren, 1992)](image-url)
### Data Analysis

For data analysis, I used the technique of *pattern matching* (Yin, 1994). In pattern matching an empirically based pattern is compared with a proposed one. For theory revision, I made use of the technique *explanation building*. Herewith, the explanation is built up through a process of iteration from propositions to empirical data back to propositions (Yin, 1994). Both techniques are applied in the the case studies and the cross case analysis.

For data analysis I used *content analysis*, a specific method of text analysis (Lacity and Janson, 1994) and several *conceptually ordered data displays* (Miles & Huberman, 1994) were used. *Triangulation* is pursued by using multiple data sources (documentation, interviews and information systems) and by having two

<table>
<thead>
<tr>
<th>Data source</th>
<th>Strengths</th>
<th>Weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Documentation</strong></td>
<td>- Stable - can be reviewed repeatedly&lt;br&gt;- Unobtrusive - not created as a result of case study&lt;br&gt;- Exact - contains exact information of event&lt;br&gt;- Broad coverage - long span of time, many events, many settings</td>
<td>- Irretrievability&lt;br&gt;- Biased selectivity - if collection is incomplete&lt;br&gt;- Reporting bias - reflects bias of author&lt;br&gt;- Access - may be deliberately blocked</td>
</tr>
<tr>
<td><strong>Archival Records</strong></td>
<td>- <em>Same as for documentation</em>&lt;br&gt;- Precise and quantitative</td>
<td>- <em>Same as for documentation</em>&lt;br&gt;- Accessibility due to privacy reasons</td>
</tr>
<tr>
<td><strong>Interviews</strong></td>
<td>- Targeted - focuses on study object&lt;br&gt;- Insightful - provides perceived causal inferences</td>
<td>- Bias due to poorly constructed questions&lt;br&gt;- Response bias&lt;br&gt;- Inaccuracies due to poor recall&lt;br&gt;- Reflexivity - interviewee gives what interviewer wants to hear</td>
</tr>
<tr>
<td><strong>Direct observation</strong></td>
<td>- Reality - covers events in real time&lt;br&gt;- Contextual - covers context of event</td>
<td>- Time-consuming&lt;br&gt;- Selectivity - unless broad coverage&lt;br&gt;- Reflexivity - event may proceed differently because it is being observed&lt;br&gt;- Cost - hours needed for observation</td>
</tr>
<tr>
<td><strong>Participant observation</strong></td>
<td>- <em>Same as for direct observation</em>&lt;br&gt;- Insightful into interpersonal behavior</td>
<td>- <em>Same as for direct observation</em>&lt;br&gt;- Bias due to investigator's manipulation of events</td>
</tr>
<tr>
<td><strong>Physical artifacts</strong></td>
<td>- Insightful into cultural features&lt;br&gt;- Insightful into technical operations</td>
<td>- Selectivity&lt;br&gt;- Availability</td>
</tr>
</tbody>
</table>

Table 4.4: Strengths and weaknesses of data sources in case studies (Yin, 1994)
investigators independently coding and analyzing the data, the so-called investigator triangulation (Yin, 1994). In every case several opportunities have been provided to get feedback on the data analysis by interviewees and by management. Triangulation is visible in the chapters on the cases. If the material gave me the opportunity, I mixed quotes from interviews with references to documents or information systems. Several conceptual ordered data displays are presented in the chapters on the cases and the cross case analysis chapter.

For data analysis on the front office information model (proposition one), I developed an instrument based on literature analysis, an overview of CRM functionalities and some mini-cases. The instrument is elaborated on and included in Appendix A.

**Research Protocol and Case Study Database**

The case studies are conducted following a protocol containing the following.

- Procedures regarding the training of research team members (doctoral students).
- Introduction material for managers of research sites.
- Procedures to start and finish a case study.
- Procedures for conducting interviews.
- An outline of the case study report and review procedures.
- Procedures for data recording in the case study database.
- Displays and tactics for data analysis.

For every case, a case study database is constructed with the following structure.

- Reasons for selecting the case.
- Introduction letter and research proposal to management.
- Research contract.
- List of interviews and interview designs.
- List of analyzed documents.
- List of analyzed information systems.
- Coding procedures.
- Taped, transcribed and coded interviews.
- All documents and systems documentation.
- Data displays.
- Research notes.
- Case study report.

**Evaluation of the Research Design**

The research design is evaluated with the assistance of three instruments indicated in the literature (Benbasat, Goldstein & Mead, 1987; Lee, 1989; Yin, 1994). Applying
the three instruments to a case study design is informative. It enables us to make comparisons with other case studies and to evaluate whether methodological issues are considered.

Yin (1994) provides four tests, which are common for all social science methods, including case studies. Table 4.5 contains the tests, the tactics to be used and the way these tactics are applied in this study.

Benbasat, Goldstein & Mead (1987) propose the following criteria for evaluating case studies.

- Applicability of the research theme to case research.
- The degree to which the research objective (exploration or explanation) is made explicit
- The unit of analysis, site selection criteria and number of sites.
- The data collection method and its possibilities for triangulation.

Benbasat, et al. (1987) studied several case studies. I repeated their work in de Vries and Roest (1999), which is presented in part two. The case study design presented in this chapter complies with all criteria.

Lee (1989) proposes to evaluate case studies on its analytic rigor based on three degrees of freedom.

- The degrees of freedom in the number of predictions the case study considers. As these degrees increase, the theory’s degrees of falsification, logical consistency and confirmation increase.

<table>
<thead>
<tr>
<th>Tests</th>
<th>Case study tactic</th>
<th>Application of tactic</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Construct validity</strong> (Indicators for used concepts)</td>
<td>• Use multiple sources of evidence</td>
<td>• Interviews, documentation, information systems</td>
</tr>
<tr>
<td></td>
<td>• Establish chain of reasoning</td>
<td>• Made explicit in case study protocol</td>
</tr>
<tr>
<td></td>
<td>• Have key informants review draft case study report</td>
<td>• Part of the case study protocol</td>
</tr>
<tr>
<td><strong>Internal validity</strong> (Causal relations as distinguished from spurious ones)</td>
<td>• Do pattern-matching</td>
<td>• Applied</td>
</tr>
<tr>
<td></td>
<td>• Do explanation-building</td>
<td>• Applied</td>
</tr>
<tr>
<td></td>
<td>• Do time-series analysis</td>
<td>• Not applied ¹)</td>
</tr>
<tr>
<td><strong>External validity</strong> (Generalizability)</td>
<td>• Use replication logic in multiple case studies</td>
<td>• Theoretical replication logic in multiple case study (4 business units; 8 front offices)</td>
</tr>
<tr>
<td><strong>Reliability</strong> (Repeatability of the study)</td>
<td>• Use case study protocol</td>
<td>• Applied</td>
</tr>
<tr>
<td></td>
<td>• Develop case study database</td>
<td>• Applied</td>
</tr>
</tbody>
</table>

¹) The time window of the case studies generally was too short to allow for time series analysis.

Table 4.5: The application of case study tactics for four design tests (Yin, 1994)
Chapter Four: Research Design

- The degrees of freedom in the number of cases in which the theory is tested. The more cases that are investigated, the higher the degree of confirmation.
- The degrees of freedom in the number of rival theories against which the theory is compared. An increase in these degrees increases the theory’s degree of relative predictive power.

Lee compares eight case studies against these degrees of freedom. The number of theory based predictions varied from zero to thirty, where thirty is exceptional. The predictions in four studies have not been made explicit. The number of cases varies from one to four. In the Benbasat, et al. (1987) study, the number of cases varies from one to nine. In de Vries and Roest (1999) this number varies from 1 to 26. In only 5% of all studies more than 10 cases were studied. The number of rival theories varies from zero to three in the Lee (1989) study. This study considers five predictions (see table 4.6).

This study scores quite well on the degrees of freedom in the number of cases with eight front offices being investigated in four business units. It is difficult to make a statement regarding the third degree of freedom as this study examines a topic about which little theory has yet been formulated. Thus, the theory in this study cannot easily be compared with rival ones. The difficulty is that the third degree of freedom regards the degree to which a theory is more informative than rival ones. When a theory cannot be compared with other theories, this does not necessarily mean that this theory is less informative. After all, one theory is more informative than none at all.

<table>
<thead>
<tr>
<th>Propositions (Number of predictions)</th>
<th>Prediction</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1 (3)</td>
<td>The degree of customization predicts the requirements for relation information, product information and process information.</td>
</tr>
<tr>
<td>P2 (1)</td>
<td>Ineffectiveness of the front office is predicted by not meeting the information requirements for the specification of a certain degree of customization.</td>
</tr>
<tr>
<td>P3 (1)</td>
<td>The service strategy of the business unit predicts on which front office types the business unit relies</td>
</tr>
</tbody>
</table>

Table 4.6: Theory based predictions