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Business Architecture: A New Paradigm to Relate eBusiness Strategy to ICT

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Abstract

In this paper we address the concept of business architecture. We explain the concept and, based on a case study, discuss its relevance, operation, relationship with strategy and business models, and value for an organization. Business architectures contribute to clarify the complexity within an organization and form a useful starting point from which to develop functional, information, process and application architectures. In addition, an explicit business architecture helps to structure the responsibilities within an organization, and to shape outsourcing activities, within the primary process as well as with regard to ICT-support. Business architectures contribute to an adequate ICT-governance in order to orchestrate the resources for critical business activities and how to manage the development and support for e-business efficiently.

1   INTRODUCTION

ICT is playing an increasingly important and central role within organizations. Implicitly their dependence on ICT is growing. On the other hand we see that organizations are hampered in their response to changes in the environment due to the existence of organizational stove-pipes and legacy systems. Business strategies that utilize the possibilities offered by ICT to the fullest, are hard to implement. At the other hand, it is often a slow and difficult process to translate adaptations in the strategy to the ICT-domain (Maes, Rijsenbrij, Truijens & Goedvolk, 2000). In recent years there is an increasing interest in business, information and technical architectures, albeit without a common and clear definition of the architecture-concept. Business architecture receives the least attention, which in our view is unjustified, as it can play a significant role in translating the business strategy to the information and ICT-domain as well as to the design of the organization. We often see that when architectures are considered attention is mainly focussed on the information and technical architecture, while hardly any attempt is made to establish a connection between business, information and ICT-architectures. Therefore, the central questions in this paper are: *(1) what is meant by the concept of business architecture, (2) what are the required elements of a business architecture model, (3) what is the practical use of such a model, and (4) how can a model for a business architecture be developed in a concrete case.*

To answer these questions we will start by discussing the concept in more detail, elaborate on insights provided by theory and present our model. We will then analyze the model in a case study, focusing on the usability of the model, and end by reflecting on the case and the proposed model.

There are many reasons why the tendency to think in terms of architectures showed a marked increase in the period when the Internet emerged as a disruptive technology. Although the Internet made a number of new business models possible (Timmers, 1999; Bouwman & Van den Ham, 2003). The limited life span of these models implicate that organization, information and IT have to be flexible in order to respond quickly to changing circumstances and to adapt the business model if necessary. In addition, a critical assessment of the internal processes in many organizations shows a substantial level of redundancy and rigidity. This leads to the redesign of processes (Hammer & Champy, 1993), and the way processes are organized in (often product-oriented) stove-piped (Van Diepen, 2000). Due to this rigid organization, companies are unable to meet customer demands, coordinate processes and offer the painfully needed transparency. As a result, companies find it extremely difficult or impossible to implement Customer Relationship Management (CRM).

In combination with path dependencies current (legacy) information systems often makes it hard to realize changes in the business processes. Companies are limited in their response to changing market circumstances caused by a lack of flexibility and adaptability. Strategic considerations force us to break information systems open and reduce their complexity, using a more modular approach. However, such an approach affects the way these modules (for instance web services) are defined, combined and/or reused, as well as their scalability and the extent to which they can be used in a distributed environment (Turban, McLean & Wetherbe, 2002). Business architectures are an important tool in dealing with the issues described.

2   THE CONCEPT OF BUSINESS ARCHITECTURE

Although the term Business (or Enterprise) Architecture is used a great deal, the concept is not defined unambiguously. The concept is used within modelling approaches (IEEE 1471, ISO 15704, Rensburg, 1997), in classification frameworks (Zachman, 1987; Mathora, 1996), or used by software supplier or consultancy organization (IBM, Cap Gemini Ernst & Young, see also Arab et al., 2002). It is more common to go straight to the technical specifications of information or technical architectures. Differences between approaches can be found in the degree of specification as well as the layers

(business, information, technology) and approaches (logical, physical) that are being distinguished. Research into business architecture is scarce. There are a few case studies of Enterprise Architecture available (Besson et al., 2002; Chandra & Kumar, 2001; Richardson, Jackson & Pages, 1990; Veasey, 2001; Wolfenden & Welch, 2000). However, the application of business architecture is not limited to organizations, it is also possible to analyse Supply Chain integration using an architecture point of view (Chandra & Kumar, 2001). Many of these studies emphasize the conceptual level (Zachman, 1987; Malthora, 1996; McDavid, 1999) or modelling aspects (Bernes & Nemes, 1996; Arab et al, 2002).

The link between business and IT, strategy and operations, is also made in strategic alignment approaches (Henderson & Vankatraman, 1993). More, and increasingly large scale, studies have been conducted in this domain (Cragg, King & Hussin, 2002) shifting from case studies towards more encompassing surveys (Teo & Ang, 1999). In addition to a link to strategic alignment there is also a link to business model literature. According to Hedman & Kalling (2003) the business model concept and strategy are increasingly interchangeable. Instead of formulating a strategy, companies are designing a business model. Rensburg (1997) sees business models as building blocks for architecture: "A good business architecture consists of business models which allow the modelling of any organisational entity together with its multi-dimensional organisational views". In our view strategy and, or business models are important input for a business architecture. Wolfenden & Welch (2000) also use the concept of business architecture as the connecting link between strategy on the one hand, and business processes, roles, behaviour and information on the other. Others (Veasey, 2001) adopt a more holistic approach to realize changes in strategy and the redesign of the organization.

A business architecture is based on business strategy (strategy formulation) (see figure 1). This business architecture is the foundation for subsequent design (strategy embedding), and detailed into its various aspects and disciplines.

1. *Business strategy.* The business strategy can consist of strategy statements, business models and cases. Statements formulated by top management (or its strategic planning department) can be strategic, tactical and sometimes even operational in nature and may include a number of business models. Often the strategic statements also include the description of the "business case", i.e. the specific application of a business model.
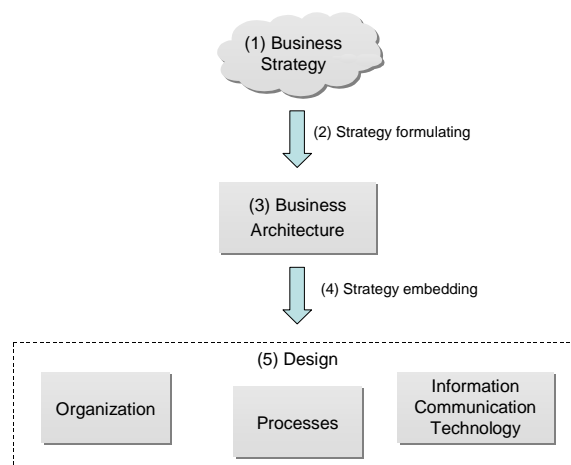

Figure 1   Relation business strategy and business architecture design

2. *Strategy formulation.* The strategic statements are analyzed and arranged hierarchically, through qualitative hierarchical cluster analysis (Miles & Hubermann, 1984). The top level statements that are the most inclusive (company-wide scope, industry positioning) are placed at the top of the hierarchy. These top level statements are often mission-like in nature. Lower level statements are more limited in scope and have less far-reaching consequences. They are specific in nature and are often based on (or implicitly stated in) higher level statements. Based on this hierarchy and starting from the top the business architecture is drawn-up, using general organizational structuring methods and theories. Examples are theories on assets and resources (Kay, 1993; Quinn, 1992; Prahalad, 1990 and others) and theories on structuring economic activity (Chandler, 1990; Powell, 1990; Child & Faulkner, 1998; Best, 1990 and others). Through the design the company gains insight into the consequences of the individual statements as well as the way they are related to one another. Supported by interaction with management, the business architecture will get more and more detail, applying lower strategy statements. During the process the strategy and its consequences will become increasingly clear.

3. *Business architecture.* The business architecture arranges the responsibilities around the most important business activities (for instance production, distribution, marketing, etc.) and/or the economic activities (for instance manufacturing, assembly, transport, wholesale, etc.) into domains. These "business domains" can best be looked at as "areas of responsibility". Within the business architecture a high level description is provided of how the business processes are dealt with by these domains and which domain is responsible for specific business functions or objects. Thus, a business domain is a cluster of coherent business functions and objects (concepts), over which meaningful responsibility can be taken in business processes.
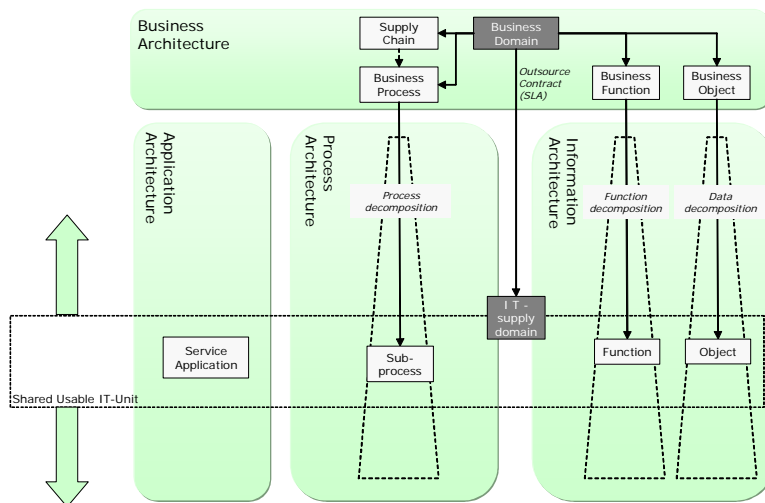

Figure 2   Basic business architecture

4. *Strategic embedding.* Based on the business architecture the construction of the organization can now take shape. The corse business processes that are described in the business architecture guide the process architecture, in which the relevant processes are further decomposed, specified and analyzed. The business architecture also structures the top-level business functions and business objects. Both provide the same guidance to the data

decomposition and the functional decomposition, which make up the information architecture. In addition, the business architecture gives direction to other constructional aspects, such as the organizational structuring (in which the responsibilities within the business domain are assigned to individuals in the organization chart) and the administrative organization (describing for instance the financial reconciliation mechanisms between business units).

5. *Design.* The way the organization is set up is described from various points of view. These perspectives have been used in the thinking on architecture for years: information architecture, technical architecture, process architecture, organizational structure (Zachman, 1987). In this paper we focus on process, information and application architecture.

In the basic architecture model (figure 2), we show the relationships between the various architectures. Based on the structuring of business functions and objects in the business architecture, the functional decomposition leads to an information architecture that includes the following elements:

- *IT-functions*, such as registering an order, handling a customer contact, generate a lead, determine sales-targets for a channel, register a customer or an agreement, and
- *Data, (objects)*, like agreements, customers, orders and credit risk.

IT-functions and data can be grouped at an intermediary level into ICT-supply domains. Because the functional decomposition is started, based on the business domains, this also aligns the ICT-supply domains to the business requirements.

In the basic architecture model (figure 2) we see that shared usable units of IT (like services) are organized in so-called ICT-supply domains. ICT-functionality and data are related to parts of the business process leading to the definition of an IT-unit, which is used by the business domains (demand) on the basis of an (outsourcing) contract. Other business domains can also acquire these services from these ICT-suppliers (service centres).
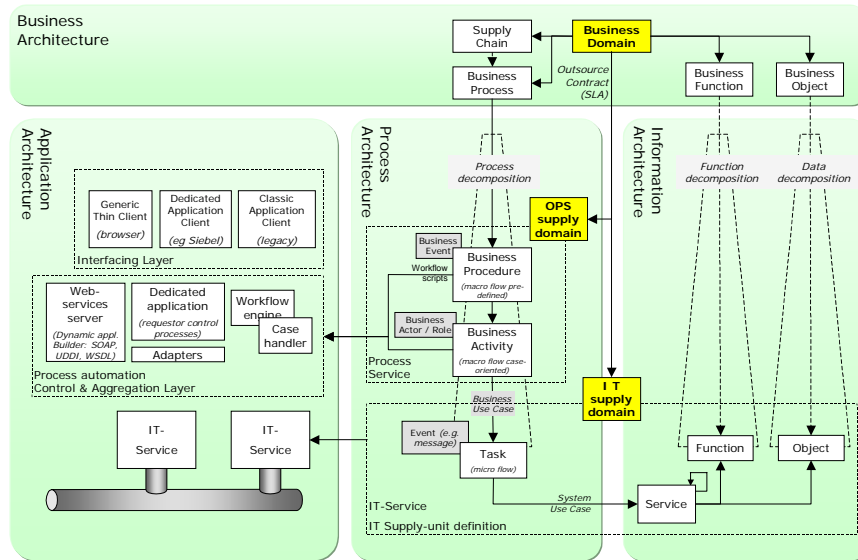
Figure 3   Cut out of detailed architectural model

As a rule, it is not very useful to carry out a complete decomposition to the level of ICT sub-functions (e.g. 'delete branch-id of a customer contact') and to the level of entity attributes (e.g. 'first name of a customer'). Architecture models target at the long term rather than at short term implementation (i.e. the design of the actual system). The same holds true with regard to the way the composition of the

processes into sub-processes, procedures, activities and actual tasks takes place. It makes little sense to continue to the individual task level. To what level of detail it is useful to carry through the decomposition in the functional and process architectures, depends on the level in which ICT-functions are linked to the business process, or in other words, on the scope of the shared IT-unit. The level at which the process is linked to the IT-functions/data in order to define a jointly usable ICT-supply is different for each organization and usually dictated by company ICT-policy.

A low-level implies that a narrow IT-function is linked to a single process task. The result is a large number of small-scale delivery units (for instance, 'IT-functions' or 'Objects'). Although joint usage at a very fine granular level increases flexibility (the ICT-delivery is useful for all kinds of processes) it is difficult to manage the resulting plethora of ICT-units. Remember for instance the re-use frustrations of a company-wide object model. A higher-level implies broader delivery units with a wider scope: more IT-functions and data are combined (examples of broad delivery units are: 'Component', 'Service' and 'E-Service'). Nowadays many organizations work with 'Services', combining several functions and objects together with a part of the business process into a 'Service'. The service can be shared through 'business messages. The E-service is seen as the broadest (least granular) delivery unit. It has such a broad delivery of functions, objects and sub-processes that they actually constitute a service with an independent business context. Such an E-service can be used directly by external parties or customers. Combining more functions and data into one shared ICT-unit, i.e. broadening the scope of the delivery unit, implies that a larger part of the business process is being frozen into that specific delivery unit. Defining and sharing ICT at a higher level, reduces the number of delivery units, which have to be managed, dramatically. Although this adds to manageability of the ICT-supply it has the disadvantage that parts of the business process are frozen in the delivery unit (which can be seen as less flexible)..

The cut-out of the detailed architectural model (figure 3) is based on sharing ICT on the level of "services". ICT-functions, associated data and incorporated business process, are defined as an ICT-service and offered as a service application. The service concept creates the link between the information (functions and data), process and application architectures. The application architecture defines the way that defined ICT-services are built into applications, offered to the end-user. Generically speaking an n-tier application consists of data-logic and business logic (combined in the ICT-service), dialog control (control & aggregation layer) and presentation logic (interfacing layer).

The control & aggregation layer combines ICT-services into a specific application to be used in specific business process, examples of types applications are:
- Legacy applications: defined in legacy, hard-coded applications or standard software package;
- Workflow-applications: users tasks that are guided through workflow or case-handling tools (whereby the scripts are based on the higher level process architecture); and
- Dynamic applications: dynamic in so-called web-services, using protocols like UDDI, SOAP and WDSL to tailor the application to the users specifications.

This detailed model can also be applied to other levels of ICT-sharing, i.e. objects, components and E-services. The principle of connecting the process and information architecture through ICT-unit definition and the link to the application architecture based on realization of these units in actual applications, remains the same.

Summarized the model shows the connections:
- between business architecture on the one hand, and information, process and application architecture on the other,
- between supply and demand responsibilities to ensure that outsourcing relationships and ICT-governance are clearly defined,
- between types of shared ICT-delivery units (i.e. "service") and types of applications building (i.e. "web-services").

The model positions business architecture in a structuring role with regard to the organization of the company by clearly indicating what the perspectives and business domains are, and at the same time defining responsibilities, and supply-and-demand relationships. In addition to this organizational structuring, the basic model (figure 1) clarifies the function of strategic statements and the business models that are used for the business architecture. Business architecture models shed light on the scantly elaborated relationships between business strategy and business design. We will illustration the value of business architectures in a case study.

3 METHODOLOGY

In the remainder of this paper we present an explorative case study. We use a case study as an 'empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident' (Yin, 1994, p.13). In this case we look at the way the business architecture model translates in practice into 1) an elaboration of business strategy in functional, information, process application architectures, and 2) into the way ICT-governance is shaped. Our research has characteristics of both a descriptive and an exploratory study, but also contains design characteristics. The case information was acquired through active involvement in the design and development of a company-wide business architecture of a large financial organization, during a two-year period (2000-2001). We do not pretend to provide conclusions of a generalizing nature on the basis of our case study, and are well aware that the case in itself cannot be considered to be representative. This case describes a development process based on the previously described model in which a business architecture was developed. Since this paper does not focus on the exact content of the business architecture, but rather on the way it was developed, and in light of the confidential nature of the business strategy and strategic statements, we have decided to present the case in an anonymous manner. The aspects that are not relevant to this paper have been changed, and sensitive, less relevant details have been omitted, without affecting in any way the overall picture of what a business architecture may look like.

4 CASE

The research object is a large, internationally operating financial service provider. On the one hand the company is an example of the kind of large and complex international organizations that are traditionally highly product-oriented, leading to a painful implementation of customer orientation (often aimed for in CRM-projects). On the other hand the organization is a fine example of a company where mergers and acquisitions have led to a growing collection of organizations that operate largely independently under an umbrella of financial consolidation but without genuine operational integration. In practice this means that the operational costs are too high, which offers a poor basis for increased profits. In anticipation of market improvements better economies of scale have to be realized by removing redundancies in business activities and realizing a shared usage of the main operational processes. In addition, the company wants to find a way to obtain greater insight into the joint customer portfolio.

The direct reason for the company to develop a business architecture were the problems that arose when the information architecture that had earlier been developed for a limited number of business units, was to be implemented on a company-wide basis. To tackle this problem thoroughly, the company decided to start developing a enterprise-wide business architecture that was acceptable to all parties concerned and then translate its consequences into the information architecture. Below we describe the method used to set up this business architecture.

The person responsible for the company's Operations and ICT at an European level had selected a small core group from the main business sections to realize the business architecture. They report to and coordinate with a support group consisting of three executive managers. We started by discussing the various steps of the process that were followed designing the business architecture:

- *Inventory strategy statements.* As a first step the strategy statements of the three largest business units of the company were collected. First the ones formulated by the company's board, followed by the various business units. Duplications were removed, leading to approximately 45 statements that were subsequently validated by BU-management.
- *Analysis and structuring of the strategy statements.* In joint sessions the statements were analyzed in order to place them in a hierarchy, making use of qualitative hierarchical cluster analysis. This not only required examining the statements in terms of their operational area and scope, it was also necessary to investigate mutual relationships and interdependencies between various statements. The hierarchy was limited to three layers: the highest level contained the enterprise positioning statements and company-wide strategy statements, the second level included statements that concerned the (construction of the) supply chain, customer-orientation and market segmentation, and the third level consisted of statements that had to do with the internal construction of the various parts of the enterprise.
- *Setting up the basic design.* The basic design was developed on the basis of the top-level strategy statements. It was approached as a top-down process: the most important statements had the biggest impact on the design. Each design decision was stated as well as was documented on which strategy statements it was based. The basic design provided an overall definition of the primary business domains. In this case three business domains had been identified: (1) product responsibility (the production tier), and the commercial tier, divided into responsibility for (2) sales/marketing and (3) distribution. When the main statements were analyzed, conflicting statements occurred as well as some missing ones.
- *Extrapolating the basic design.* The choices made, were extrapolated consistently into the design, based on general organizational principles and on the lower-level strategy statements. Relevant questions concerned the added value of the production tier, the fundamental drivers that were important to the domains to accommodate for conflicting strategy statements by facilitating multiple value drivers (Treacy & Wiersema, 1995), the business activities that should be assigned to the various domains and the elements required to complete the responsibility for the domain.
- *First meeting with the board.* As a next step, the support group and company's board discussed the basic design. The board assessed the design mainly from the perspective of their own responsibilities, making it hard to achieve an organization-independent design (where the responsibilities have been determined but not yet assigned to persons in the organizational hierarchy). An important factor in obtaining the board's approval was the ability to show the link between strategy statements (and business models) and the design. Based on these initial consultations the basic design was to some extent modified.
- *Setting up extended design.* The core group to set up an extended design by slightly modifying the basic design. The various occurrences of the main business domains were determined. For instance, the business domain of the 'Marketing and Sales organization' has several occurrences related to the marketing & sales departments of daughter organizations. Another example is the business domain of the 'Distribution channel', where a classification of distribution concepts was set up to facilitate various forms of external distribution. Other business domains were added for responsibilities that had to be assigned in a broader sense, for example distinguishing the responsibility for a national 'Marketing & Sales' domain next to the various commercial sales-organizations (labels) within one country.
- *Assessment of the extended design.* In a second round of consultations the support team discussed the extended design with relevant board members and company management. Generally speaking this was done bilaterally. This second round also led to a number of modifications.
- *Adoption of the business architecture.* After modification an abbreviated (less detailed) version was written which, referring to the more detailed version, was adopted explicitly by the plenary company board as the desired business architecture. This concluded the work of the support and core groups.

The basic design is based on the most important strategic statements. These relate to cost reduction: synergy through horizontal integration; customer centricity: synergy by sharing resources within the

sector; sharing the industry: giving third parties access to the supply chain; and multi-channel approaches. The basic design closely resembles the industry supply chain. It structures the economic activities in main domains and identifies the value drivers within the domains. In this model the traditionally vertically integrated sector is divided into a production tier with production domains and a commercial tier with sales & marketing and distribution domains. The result is a business architecture with three distinct business domains with their own organization and business case.

- The case for the production domain is based on the development and production of standardized high-quality white-labeled products with a large volume and low profit margin. The value driver *operational excellence* plays an important role here (Treacy & Wiersema, 1995). With regard to the overall company, the strategy aimed at creating synergy between its various parts can take shape, duplications in production activities are removed to increase economies of scale and to be able to provide high-quality service at a small margin. Horizontal integration takes place on the basis of the commoditizing patterns of the various financial products and geography leading to further occurrences of more specific business domains.
- The case for the marketing & sales domains is aimed at customer centricity and focus, based on the value driver *customer intimacy.* In this tier, horizontal integration of the current business parts will take place based on customer group, brand or market. In the basic model a sharp distinction has been drawn between the production tier and the commercial tier, and within the latter between marketing & sales and distribution, in order to disconnect potentially conflicting value drivers and to facilitate various distribution concepts.
- The final case is distribution, where a scope that goes beyond the financial sector is not unlikely: leading to distribution through other channels than the ones that are normally used within the sector. The focus is aimed especially on access for and to customers, and on facilities for providing services to customers. Business domains are organized on the basis of business channel type and geography.

The basic structure facilitates the three most important top-level strategy statements. On the one hand *share the industry*, for which explicit cuts have been placed in the supply chain based on organizational structuring theories. These theories are discussing vertical disintegration, in order to create an open business architecture that allowed for outsourcing and third parties in the financial supply chain., and networked (Powell, 1990 and Thompson et al., 1991) and virtual organizations (Child & Faulkner, 1998). On the other hand the two above-mentioned potentially conflicting strategy statements (value drivers) had to be covered.
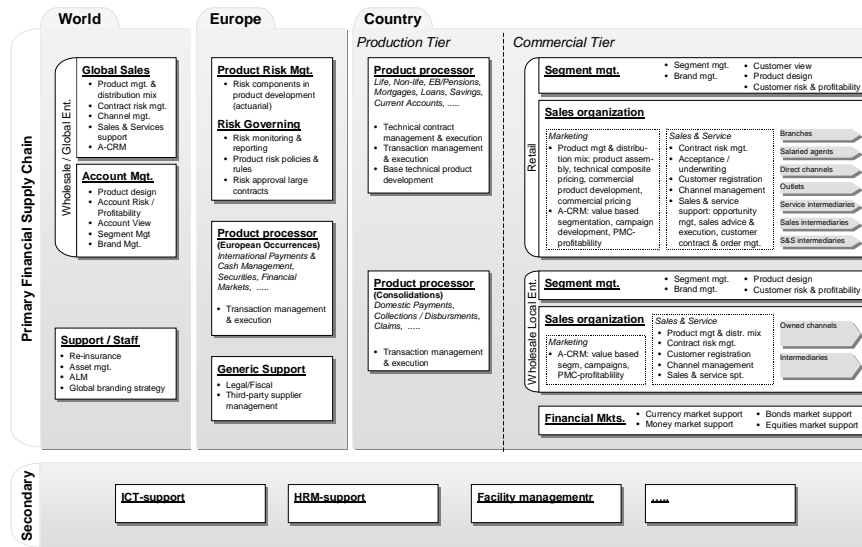
Figure 4   Final Business Architecture

The consequences of the basic design have also been dealt with. The division between production and commercial tier, for instance, has a number of consequences. Both production and commercial tiers will have to maintain their own financial products, based on radically different definitions. Production supplies white-labelled standardized products to the commercial tier, which will use them as building blocks. A subsequent consequence is that there are also two kinds of agreement that have to be distinguished: technical and commercial agreements.

On the basis of consultation with the support group additional important choices were made in the design, especially based on company-political motives. The most important problem in this respect is the tendency on the part of managers to prematurely map their department onto the business architecture. In the business architecture, organizational changes were also indicated. With as a consequences that managers immediately started demarcating their responsibilities. This led to less pure business structures. After all it is the business architecture that in the final analysis should lead to the organization's design and the attribution of responsibilities. The production tier, for example, was renamed 'Operations' at an early stage, anticipating future organizational embedding.

After an initial round of revisions the modified basic design is further elaborated on the basis of the more detailed strategic statements. This resulted in business architecture example presented in figure 4 representing the responsibility structure in a country, and containing four tiers. More details have been added to the commercial tier. It now includes all the new domains, the main structure per country containing a division into Retail, Wholesale and Financial Markets. The main domains in the national commercial tier have been further divided into sales organizations (also called labels) and a domain for managing market segments. In the design the sales organization each have their own responsibility with regard to the profits of their contracts, while the responsibility for the customer-related profits lie at the domain segment management level. Distribution channels have been made directly dependent on the sales organization domains, to which channel management was assigned as a business function. Third parties can be allowed to take on the distribution role. On the basis of an extensive analysis and classification of distribution concepts business functions have been divided into a channel organization and a sales organization.

The production tier (operations) has more detail. Two types of product centres have been identified: product centres that operate as cost centres without financial risk and product centres that operate as profit centres supplying financial products with a certain risk margin. Furthermore, occurrences have been determined. Production depends on the right scale. The minimum economic scale is a relative concept that above all depends on the possible operational area of a financial product. If the operational area were to expand from a local to, say, a European scale, the minimum required economic scale increases immediately. Since the various financial products have different timing with regard to this scaling process, we had to design the possibility to set up separate domains for product types (occurrences) in the production tier. Another example of a further elaboration of the design is the recognition of a separate tier for product risks, assigning responsibilities for supply chain management and responsibilities at a national, continental or global level, etc. During the second round of consultations with the board of the company a fourth tier surrounding support and staff was added. In the ICT-layer the services have been identified, varying from channel and CRM-services to support services for the fourth support and staff tier.

Ultimately, these considerations and decisions lead to the fully elaborated design. Finally, the business architecture is adopted and is in the process of being implemented. The business domains are seen as the 'demand' domains where the responsibility for the demand for shared process services and ICT-services is found.

5   CONCLUSION AND DISCUSSION

First of all, designing a business architecture helps to clarify the relationship between the strategy of an organization and the way it is organized, both in terms of business processes, business domains, and business functions. The business architecture provides a far more sturdy framework to design the organization than individual strategic statements that lack structure, coherence and balance. In addition, business architecture sheds light on the structure of, and overlap between various business domains, making it possible to identify the value chain within the organization more clearly and to re-assign responsibilities within the organization accordingly. Furthermore, a business architecture helps to distinguish activities within an organization related to technical support by ICT, production-related and commercial activities and management activities. This distinction makes it possible to use other coordination mechanism, for instance by incorporating internal and external market mechanisms, both within the primary value chain (white label products and distribution by third parties) and with regard to supporting ICT-processes (supply and demand, outsourcing of activities). In addition, sub-responsibilities (risk management, segment management) can be assigned to other levels. As a result, the relationship between the various sub-domains becomes explicit. It is clear that a business architecture is an important tool to gain insight into the complexity and coherence of an organization. Elements of a business model, like scope, organization and arrangements (the structure of the network organization), and technical architecture are included, albeit at a highly operational level. The business processes as well as functional and information architecture receive a great deal of attention. The strategic element, in particular the resources and capabilities that contribute to long-term innovation, are not directly included in the business architecture. Resources and capabilities are approached from a product innovation perspective with an outlook of two to five years. Business models focusing more on the possibilities offered by new technologies appear to play a less explicit role. This can partly be inherent to the nature of the organization. Technologies as such, do not appear to be a value driver. Supply and demand within the organization, both in the primary process and in terms of ICT-support, become explicit. We also see that all kinds of outsourcing possibilities emerge. The question whether this will lead to accountability can as yet not be answered. Although it is to be expected that accountability will increase thanks to clearer responsibility relationships and identification of profit responsibility, it is too early to tell whether this will result in improved performance.

This brings us to the limitation of our analysis, which is based on a single case where the business architecture is being implemented as we speak. The focus has been on the design of the business

architecture rather than performance. If we want to have a better idea as to how that performance will develop, we need to examine a larger number of cases, as well as look at the organizational performance before and after implementation of the business architectures. This is complicated by the fact that we will then be dealing with a real-life case, where all kinds of interfering circumstances and effects are interfering with the research design. Although for the time being we cannot assess performance improvements, we can say that business architectures increase our knowledge of the complex relationships between the business, information and ICT-domains.

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