

Redesigning Business Networks – Reference Process, Network and Service Map

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ABSTRACT

Driven by factors like globalization, increased competition, and declining customer loyalty, the financial industry is facing a structural transformation. Operating in a changing market, the (re)design of business models and thus also the business network is a mayor challenge for financial institutions. One way of succeeding in this endeavor is to focus on core competencies. Banks therefore adjust their business models in order to reduce their degree of vertical integration by outsourcing complementary activities. This business redesign requires an integrated approach to align the future business model with the involved processes and information systems while also taking the surrounding conditions of the company and its market into account. Present approaches show a restricted usability as they focus either on strategic aspects or process-efficiency only. Moreover, these procedures often lack methodological support so that they are rarely applicable in practice.

This paper introduces an integrated approach of business network redesign for the financial industry that covers the layers strategy, process and systems. The methodology considers the necessity for a common understanding of the underlying processes when reshaping the business model / network. Since research is still in progress, this paper concentrates on the basic instruments which are used to describe a distinct business environment: a reference network and a reference service map both derived from a reference process. As the research focuses on the financial services sector, the paper exemplifies these reference models for the investment process from a bank's point of view. Finally, the instruments are applied to a case study to verify their content and examine their applicability.

KEYWORDS

Business network redesign, reference network, reference process, service map, financial industry, investment process

1. INTRODUCTION

1.1 Motivation

The main drivers of change in the banking industry are globalization, ongoing innovation and increasing competition on the market [12]. Due to information technology (IT), today's customers are well-informed and able to access their financial asset management without the need of a nearby branch or consultancy [16]. This considerably lessens the customer's loyalty – which has been one of the barriers of competition on the banking market for a long time. Although banking is still a highly profitable industry, recent market developments have urged banks to abandon their “never change a running system” tactic [07] in order to remain competitive. The resulting transformation [22] of the banking industry is often compared to the industrialization in the automotive sector in the beginning of the 1980s.

According to Lamberti [21], the bank of the future will not only differentiate by the scope of its service offering but additionally by its (low) vertical integration. In order to become such a bank and to react appropriately to the market's evolution, banks are feverishly (re)defining their core competencies [27] and thus developing new, more networked business models [11] [01]. Consequently, market researchers (e.g. [11], [12]) predict the redesign of the whole banking value chain in the shape of increased sourcing [15] activities in terms of a Business Network Redesign (BNR) as a valid approach to simplify the banking business. They predict the rise of smaller networked institutes that concentrate e.g. on a specific production process such as payments processing or a customer-oriented task like financial planning.

To implement such business models accordingly, financial institutions have to ensure that their strategy fits with the underlying processes and information systems [27]. This alignment is necessary [02] to realize the benefits of business redesign in terms of efficiency and business agility. Present approaches show significant shortcomings – especially concerning the coverage of redesign layers and methodological elements (combined as methodological support) [02]. Thus, the research associated with this paper aims to develop an appropriate methodology incorporating a procedure model, a metamodel, techniques, and instruments to model business networks, processes, and service maps. Within this research program, this paper focuses on instruments for BNR and illustrates their design as well as their application for the investment process.

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1.2 Methodology and Structure

This paper refers to a multilateral, two-year research program that started in summer 2006 and investigates the management of flexible business networks in the banking industry. It is based on the results of a precursory two-year research program about bilateral sourcing. The research team consists of academics from three universities in Germany and Switzerland as well as practitioners from 18 companies of various sizes and roles in the banking value chain (e.g. regional retail bank, international private bank, outsourcing provider, software provider). The companies contribute to the research by playing an active role in biannual steering committee meetings and quarterly workshops to ultimately enhance the development of the envisioned methodology as well as verify its applicability.

Consequently the research program follows the paradigm of “emphasizing collaboration between researchers and practitioners” [03, p.95]. Its design follows the guidelines proposed by Hevner et al. [14] to ensure a rigorous link to existing research as well as the relevance of the generated artefacts. Besides the (re)design of business networks the research program also focuses on the assessment of sourcing options and the matching of supply and demand. This paper presents findings for the design only. Following Design Science [14], the artefacts combine to a methodological approach towards BNR.

Even though its necessity has been in debate for several years, a comprehensive methodological approach to BNR has not been developed yet. Our approach combines current BNR models by incorporating different sourcing strategies and models as well as the concept of service-oriented architecture as an instrument of fostering business flexibility and standardization of IT landscapes. This research focuses so far on the instruments used to describe the static structure of a BNR scenario and neglects the mechanisms to change from one model to the other. The instruments proposed are exemplified by using the investment scenario providing a reference network, business process, and service clusters for an in-depth analysis.

The structure of the paper reflects its goals:

- Section 2 provides the theoretical foundation. Section 2.1 presents a literature review about BNR and deduces requirements for the envisioned approach. Section 2.2 describes drivers and challenges of service-oriented architectures and refers to techniques of service modelling.
- Section 3 presents reference instruments for BNR addressing the three layers business network, business process and service map.
- Section 4 examines the result documents “roles” and “service clusters” that are based on the earlier mentioned reference models by applying them to a case study (see fig. 1).
- Section 5 summarizes the results and provides an outlook.

2. FOUNDATION

This section starts by introducing Business Engineering as the frame of reference and relates it to alternative approaches to enterprise modelling. The second part discusses the current state of research in the field of BNR, highlights distinct approaches and concludes in a list of requirements for an appropriate BNR

method. The third subsection deals with a specific aspect of BNR, namely the role of service-oriented architectures as enabler of value chain redesign.

2.1 Business Engineering

Models are important instruments used to reduce complexity and distinguish various elements on several interconnected layers. Multi-Perspective Enterprise Modeling (MEMO) emphasizes for example a technique that includes internal and external actors as well as the processes and the involved Information Systems (IS) [10]. All layers aim at a high level of formalization and show a close link to software engineering methodologies. The Semantic Object Model (SOM) [09] refers to a similar but more object-oriented idea. It supports building IS by covering aspects of an inside, an outside, and a resource-view. Relationship patterns explicitly define the interrelationships between the model layers. Like MEMO and SOM, the Architecture for Integrated Information Systems (ARIS) (e.g. [30]) focuses on the business process layer and its translation into IS. Business Engineering (BE) is a less formalized technique which recognizes the business process as main lever of change and therefore as key element in shaping future business solutions and the underlying IS [28]. Similar to other approaches of enterprise modelling (cf. [17]), BE mainly distinguishes between a strategy, a process, and a system layer. The key idea of BE is to enable the systematic development of future business solutions. By aligning strategy and systems with the process, the BE approach assures consistency across all three layers. The latter approach has been used in this research to form a semantic foundation of the model elements and structure the different instruments along the three layers: strategy, process, and (information) systems. Services are regarded as an additional intermediate layer between the process and systems layers, providing the link between business processes and applications. The semantic integration of the layers is established via the process and its requirements that connect strategy layer and systems layer.

Figure 1 indicates the allocation of the three instruments as well as the roles and service clusters referred to in the case study.

2.2 Business Network Redesign

As early as in 1994, Venkatraman [32] understood the redesign of (external) business networks (BN) to be the logically next step after the redesign of cross-functional processes inside an organization in the diction of Business Process Redesign (BPR). Information technology and systems are important drivers towards increased networking and the vertical dissection of a value chain. The development of the internet, powerful standard software packages (e.g. Enterprise Resource Planning (ERP) or core banking products), and emerging technologies (e.g. Web Services) facilitate inter-organizational collaboration [02]. Malone et al. [23] describe the impact of IT on the institutional form by the electronic communication, brokerage and integration effect.

Still, since the transformation towards more networked structures in the course of value chain redesign requires an alignment of these technologies with strategies and processes, BNR is not primarily a technological issue [02]. Existing approaches are either strategy-oriented (e.g. [18], [05]) or efficiency-focused (e.g. [06]). According to Alt [02], there is a lack of complete BNR methodologies meeting the following requirements:

- The methodology should be relevant to practice.
- It should cover the redesign of strategy and processes as well as information systems.
- It should provide detailed methodological support.

2.3 Roles and Service Clusters

The service-oriented architecture (SOA) concept of redesigning networked information systems presents itself as a suitable option for meeting the requirement that a BNR approach should cover all three layers. It promises to improve the integration of heterogeneous application environments as well as the sourcing of entire or fractional business processes in a business network by combining individual application components following the tradition of object- and component-oriented architecture models. Core elements of any SOA are specified services which can be identified in general by two approaches: technical-driven service modelling (bottom-up) and business-driven service modelling (top-down). The identification of services following a top-down approach is based upon business processes or business events while applying widespread design principles of SOA (e.g. [04], [29]). Bottom-up refers to service modelling based upon the analysis of existing applications and their IS functionality [26] focusing on consolidating and rationalizing access to IS functionality by using services. For a combination of bottom-up and top-down, the term hybrid can be used [19], which is simultaneously the basis for the service map reached in this paper (for the procedure model see [20]). The hybrid approach assures the consistency of the different instruments by taking business processes as the main lever for change. It furthermore takes sourcing models, legal requirements, and technical feasibility into account by using guidelines and specification templates.

Since a general definition of services as part of a SOA is missing (see [08], p.756), this paper uses a business-oriented definition of services. They are defined as “independently usable and elaborately specified functional components, which enable the value performance of process activities”. Furthermore, service clusters combine services of logical and functional proximity. A service map shows service clusters along with their relationships and dependencies (cf. 3.3).

Beyond the enhancement of IT-business alignment, the concept of service orientation can be adapted to the strategy layer. Roles as used in the reference network (cf. section 3.2) imply certain criteria of SOA, such as encapsulation of business functionalities based upon core competence orientation. This simplifies the BNR method as roles are underlined with standardized and confined interfaces (e.g. the SWIFT standard for payments processing). This concept exemplifies the role of the integrator, which centralizes coordination functions within networks and therefore limits the required coordination efforts (e.g. small private banks). Since for a pure integrator role practical examples are not apparent, in the case of the investment network it can be compared with the broker’s role, which centralizes access to (non electronic) exchanges such as Swissquote (cf. section 3.2). So far, integrator, sales bank, and back office specialists had to be on the same platform. Based upon SOA the platform challenge becomes less relevant and the integrator administrates and supplies the service repository, and coordinates service level management. Besides the knowledge of the service portfolio provided by each

partner, the integrator implies the competence of network governance. Applying the integrator example to the network model, especially the flexibility of small private banks is enhanced as they can allocate their value chain to a sourcing network while simultaneously decreasing the required coordination efforts. Applying this approach to the outlined BNR method, service layer and strategy layer coalesce by roles and service clusters (cf. figure 1) while business processes continue to be the main lever for identification.

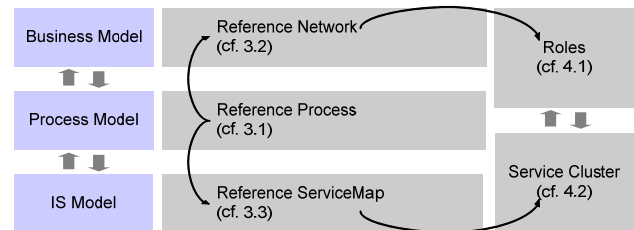


Figure. 1. Instruments and layers (following [08, p. 16])

3. INSTRUMENTS FOR BUSINESS NETWORK DESIGN

This section outlines the current state of our approach to BNR on the example of the value chain for investments and clarifies its potentials

- by presenting a reference process model as base for understanding and discussing the flow of a securities transaction,
- by deducing a reference network model (strategic layer) that enables the analysis of distinct networks as well as the determination of a company’s position, and
- by outlining a reference service map containing all services enabling / supporting the execution of a securities transaction.

According to the approach of BE, the process layer is the linking element of the business and IS / service layers. Thus, the first subsection presents the reference process.

3.1 Process Model: Reference Process for Investments

A literature review for a description of an investment process results in a variety of proposals, but none is detailed enough to expose important aspects of sourcing decisions (e.g. the administration of pending orders) a company is facing when redesigning its securities business. Thus the authors developed a process (cf. fig. 2) fulfilling the specific requirements. Following the approach of design science the artefact is validated by business partners (cf. section 1.2) as well as related to alternatives in theory (e.g. [31], [21]) and practice (e.g. [24]). This approach ensures the integrity of the resulting reference process and its relevance for practical use. In advance to the process design, the research team formulated the following requirements:

- The reference process has to cover the complete procedure of an investment transaction respecting the order instrument (e.g. share, structured product) and channel.

- The level of detail in the reference process has to enable sourcing discussions, i.e. show a clear separation of the utilization of a service and its delivery.
- Dependencies to other processes have to be educible. In a larger research context that is achieved by relating the process to a comprehensive banking process model.

The reference process as shown in figure 2 enables the design of an economically reasonable networking between players that execute subsequent sub processes towards a common service delivery.

Furthermore, it contains the channels and instruments necessary to enable accurate sourcing decisions. The process contains seven macro process steps (A-G). These steps represent the execution of an order from its entry until its processing. Each step is detailed as far as possible into sub processes whilst staying generic over all security instruments. The cross-order process steps H to U are divided into transaction related processes and transaction spanning processes. The transaction related steps H to K are connected to the execution or result of a single transaction whereas the transaction-spanning steps base upon an aggregated view.

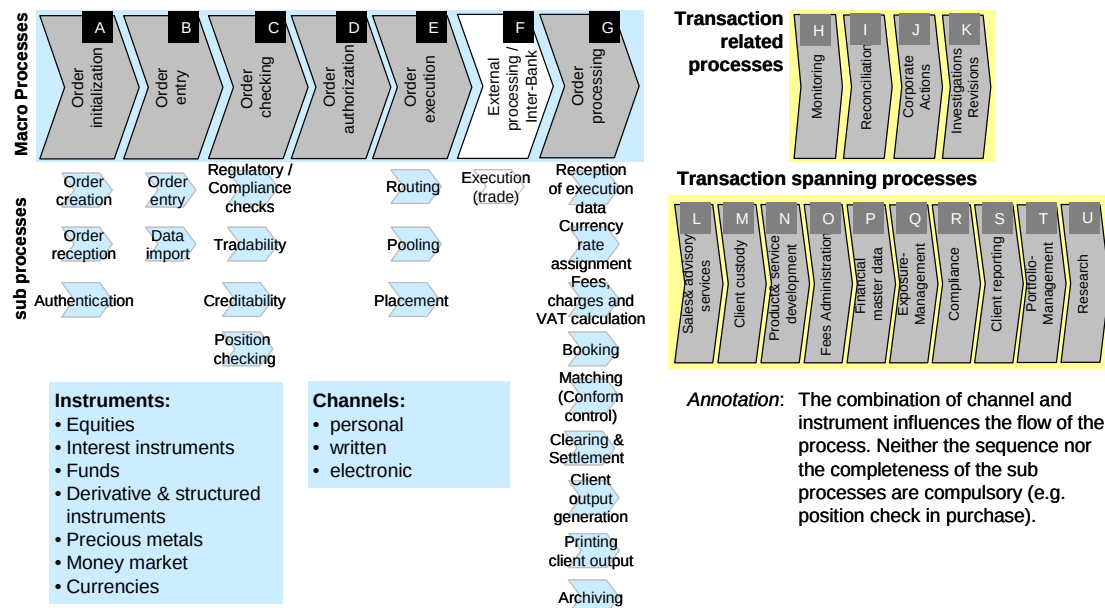


Figure 2. Reference Model for the Investment Process

Table 1, Roles in the Value Chain of the Investment Process

Role	Description	Examples
Sales Bank (Process steps: A, B, D, H, K, L, N, O, Q, R, S)	Focuses on the customer relation, namely sales and advisory services. The sales bank acquires products and processing services from specialists in the network. Differentiators are price, product and service range as well as quality of consultancy.	Bank Linth, Clientis Banken, Bank Reichmuth
Asset Manager (A, B, D, H, L, Q, S)	External asset managers purely concentrate on the customer relationship and only administer client data. As asset managers have no banking license, the customer additionally has to be client of a (sales) bank providing account and custody keeping.	MLP, AWD
Portfolio Manager (B, D, H, Q, T)	The management of client portfolios does not require direct contact to the customer. Essential are knowledge of market evolution and availability of good research data. Differentiator is performance.	VZ, MBC
Product Designer (N)	Provides innovative products, often white-labeled. Differentiators are speed, performance, and creativity.	Bank Wegelin, Vontobel
Research (U)	Offers market insights concerning companies, commodities, financial markets, and national economies.	ZKB, UBS, CS
Valor Data Provider (P)	Provides access to comprehensive data for securities administration, risk management, portfolio management, and trading departments.	Telekurs, Reuters
Valor Data Refiner (J, P)	Valor data have to be filtered and enriched in order to meet individual requirements. As these are similar for groups of banks, a concentration can create synergies (fostered by the use of common IT systems).	BEKB, Comit, Accenture
Client Custodian (Back-Office Specialist) (C, G, H, I, J, K, M, R, S)	Covers all administrative tasks of order processing as well as custody of client accounts including corporate actions, settlement of transactions and investigations (all except for client contact). The client custodian is in most cases responsible for the operative link to the trader and the (global) custodians. The question of who has the contract with the latter depends on the business model.	B-Source, RBA Service, Sourcag Vontobel, Maerki Baumann

Trader (E, F, H, I, J, O)	Receives approved orders from the sales bank or the client custodian and is then responsible for routing and placing the order. The role represents the central counterparty (CCP) for sales banks and client custodians and establishes the link to several exchanges either direct or via brokers. The trader provides reconciliation with custodians.	Maerki Baumann, Vontobel, Lombard Odier, Credit Suisse
Broker (F)	Provides access to an (non-electronic) exchange and offers know-how about local specialties.	Swissquote
Central Securities Depository (CSD) (F, I, J)	Administers all securities traded on (a) distinct exchange(s). The Central Securities Depository (CSD) just keeps relationships to institutes that are under regulatory control – no direct customer link.	SIS
(Global) Custodian (F, I, J)	Holds an account at one CSD at least and offers financial institutions to store securities. The service range also includes administration (e.g. corporate actions, legal reports) and complementary services (e.g. money market). The role is responsible for the reconciliation of its clients' transactions with CSDs.	UBS, Credit Suisse, SIS, BNP Paribas, Citibank

3.2 Business Model: Reference Network for Investments

The next step after designing the reference process is to deduce a generic role model. This artefact aims to support the design of flexible business models based on the sourcing of single services. Thus, it dissects the process into the smallest functionally reasonable roles. Literature provides several approaches for restructuring a value chain (e.g. [13]). According to Alt [02] a segmentation of competencies should consider the three distinct areas operations (back-office and infrastructure), product development and customer relationship management. The role model applied to the case study in figure 3 elaborates these ideas and dissects the reference process in a way that each role represents an isolate, reasonable business model. It therefore considers specialties of the investment process (e.g. differentiation of banking customer and market / exchange side) as well as theoretical network models (e.g. [25]).

The roles in figure 3 show how the value chain of the investment process could be dissected. Table 1 contains a description of the activities of each role as well as a mapping of the according steps in the reference process to the network roles. The column "Examples" cites examples on the Swiss market for each role.

3.3 Information System Model: Reference Service Clusters and Service Map

Being able to identify the actual position and the desired role within a network via the assignment of dedicated process steps fosters the strategic flexibility of companies. However, the business adjustments need to be supported by flexible information systems architecture in order to originate maximal benefits. SOA is attributed a 'silver bullet' status to improve flexibility in application landscapes and to foster the alignment of IT and business. As alteration is initiated on the process and strategy layer, service-orientation used in a BNR methodology should be business-driven (cf. section 2.2). Furthermore, as numerous services increase complexity, service classification and structuring methods need to be applied. The service classification scheme underlying the service map is based on prior research (see [20]) and comprises (1) process services, (2) rule services, and (3) entity services. Simultaneously the pattern approach can be applied to enhance any structure. Design patterns or architectural patterns are broadly used to structure e.g. communication elements or software systems in object-orientation. Service clusters and service maps ensure this pattern paradigm by structuring services. Classifying and consolidating

services within a service cluster reduces the complexity arising from SOA implementations and provides new potential for designing business models by using specified interfaces. Applying the procedure model for business-driven service identification and clustering as discussed in [20] to the business process investments, 64 services can be confined. These services can be composed to 19 service clusters (cf. figure 4) following design principles and guidelines of the underlined procedure model. The obtained service clusters provide a direct link to processes, roles, and sourcing strategies through abstraction and composition of services with high functional and semantic proximity. They can be used to describe and exemplify the scope of any business of each business partner in a network with an altering environment, as they enhance flexible business process decomposition and orchestration. Through the incorporation of business-oriented services, the adjustment of the current position in a network becomes more effective as IT-business alignment and application landscape have gained flexibility.

As the service cut is based upon sourcing models, business processes, and business roles, the incorporation of legal requirements, such as customer data access, increases the reusability of the specified services by enhancing the ability to support diversified business strategies (scope and scale) to the same extent. The analysis of business networks is enriched by the embodiment of used services and service clusters. The instrument of the service map, exemplifying the service clusters, the contained services, the relationship and interdependencies of the services, is further structured along three domains: distribution, execution, and support proximity of the encapsulated key-functionality of the service clusters.

4. APPLICATION OF THE INSTRUMENTS IN A CASE STUDY

This section focuses on the instantiation of the concrete instruments presented on the right hand in figure 1 (roles and service cluster) that are bases on the generic instruments described in section 3. Hereby, the authors chose the case of Vontobel, a Swiss private bank, which nowadays offers also comprehensive banking services. The role model as well as the service map is based upon the reference process as indicated in figure 2. Since both instruments incorporate implicitly the business process, the case study will focus on the network layer in subsection 4.1, outlining the strategic position of the company in the investment process, and the service layer in subsection 4.2 describing which services VONSYS provides to its clients..

4.1 Business Model / Network Layer

In the last two years, the Swiss private bank Vontobel intensively extended its existing collaboration in investment fund products with the Swiss Association of Raiffeisenbanken (SVRB). Now Vontobel provides a broad range of services in the investment process and thereby enhances the market presence of SVRB by professional services (e.g. products, sales training). For example, Vontobel acts as official portfolio manager for the Raiffeisen Classic Portfolio and thus creates direct customer value at SVRB. In the sense of reciprocity, Vontobel profits from the exclusive access to the broad sales channel (SVRB has the tightest network of branches in Switzerland) and economies of scale e.g. in client custody. The collaboration was enabled by the complementary business models: SVRB focuses on sales in the retail segment while Vontobel is specialized in wealth management and private banking. Thus, the collaboration fosters the specialization of

SVRB in sales activities and enhances the core business of Vontobel.

Figure 3 clarifies that the cooperation enabled SVRB to focus on its core competencies around the customer relation. The comparison of the two snapshots highlights that both partners could reduce significantly the redundancies in their investment processes. Since Vontobel as a private bank has to cope with more sophisticated processes and products in the securities business, the requirements of SVRB could be rather easily covered. The trader is modelled in blue because Vontobel executes all the trades for SVRB. Even though, SVRB still performs proprietary trading via the Vontobel network. Roles modelled in white are performed by third parties only; some of the blue roles (assigned to Vontobel) are shared with third party providers (e.g. research provider and product designer).

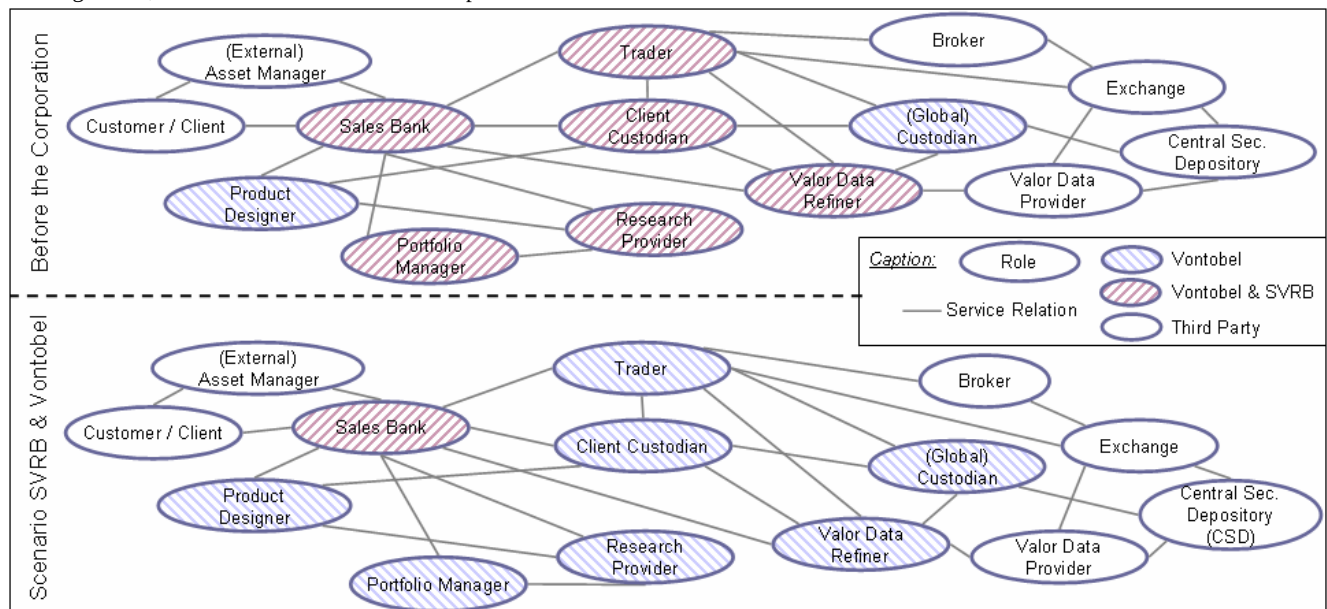


Figure 3. Customized Role Model¹ for the Cooperation Vontobel – SVRB

4.2 IT / Service Layer

As its host system is not multi-client capable, Vontobel introduced the third-party platform Avaloq for the client-custody services. Because their own customers are still administrated on a host system, Vontobel currently runs the client-custody processes on two separate systems. The planned consolidation of the platforms is expected to create significant synergies. Trading and global custody are already executed on a single platform (OTMS of IBM) for both partners. The consolidation of the two brokerage and custody networks has created significant cost savings, even though a few duplicate broker relations are retained due to reciprocal business deals (e.g. research for brokerage purchase).

The reductions in terms of redundancies are also apparent in the service map in figure 4 exemplifying the service offerings of Vontobel. Due to space limitations, the model abstains from exhibiting relationships, dependencies, and services and concentrates solely on the service clusters. The 19 presented service clusters imply 64 specified services based upon the investment process and were identified by using the procedure in [20]. The service cluster order execution contains e.g. following process services: execution service, placement service, and pooling service, underlined by the routing and pooling rule services as well as by the order data service providing the transaction data. By having the service offering implemented on this system, as Avaloq is a popular software platform in Switzerland, Vontobel reaches a competitive advantage. For strategic analysis and acquisition terms, the service map provides furthermore a more detailed outline of the service offerings than roles and processes. Simultaneously, the service clusters provide

¹ The “Support” roles at the bottom of figure 3 represent functions that are not specific for this business area. They are enablers and are therefore not part of the role description in table 1.

the interface to the encapsulated functionalities of the Avaloq platform. Since the IT services and the maintenance of systems like Avaloq are not part of the core business of Vontobel, the private bank decided to establish a partnership for the securities

Scenario SVRB & Vontobel before the cooperation

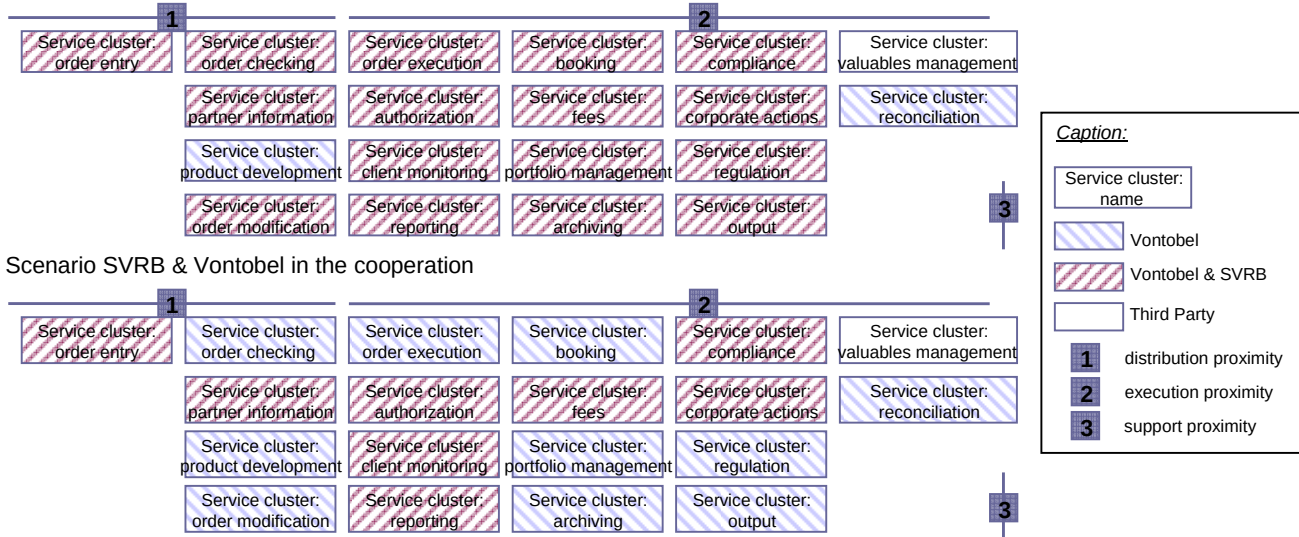


Figure 4. Service map for the Cooperation Vontobel – SVRB

5. CONCLUSIONS

5.1 Summary

Swiss banks are currently facing a fundamental transformation towards more networked structures (cf. 1). In order to reach high efficiency and flexibility, the redesign of networks should be supported by an integrated methodology implying procedure model, guidelines and instruments. Though BNR is in debate for several years, a holistic methodology has not been reached yet (cf. 2.1). This paper introduced instruments on the three layers: strategy respectively business network, process and systems respectively services (cf. 3), as part of such a holistic methodology that is currently research in progress. Coinstantaneous, the service-oriented architecture concept has been integrated as it promises to enhance the required flexibility of the application landscape. Therefore, service modelling strategies have been confined (cf. 2.2) and the instrument of the service map has been deduced (cf. 3.3). The two instruments network model and service map have been applied to the case study (cf. 4).

Table 2 presents the contribution of the three instruments presented in this paper for a BNR methodology:

Table 2, Benefits of the instruments for BNR.

Process	The reference process can be used as methodological support to BNR. It enables a company to map their process steps to the reference process in order to identify gaps as well as possible business cuts in sourcing discussions. Furthermore, it provides a consistent way to illustrate the investment business and therefore supports network partners to analyze and optimize their architectures by standardizing to a common and reusable model.
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Network/Strategy	By deducing the reference network from the dedicated process, process steps can be assigned to each role in the network. Using this approach, a company is therefore able to identify its actual position in a business network as well as its desired role by comparing it to the according roles in the reference network and their characteristics.
Services	The service map allows mirroring of the network to the IS layer and thus realize the consequences of the redesign on the IT landscape.

5.2 Outlook

Further research should focus simultaneously on the application of the proposed instruments to other business processes (in the financial industry) as well as on the formulation of the mentioned procedure model, guidelines and techniques. The holistic methodology is furthermore based upon a meta model. Moreover, the service-orientation paradigm is intended to be applied towards the strategy layer by converging network roles and service clusters as indicated in figure 1. This should facilitate to model consistent enterprise architectures.

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