Intelligent business transformation through market-specific value network analysis: Structured interventions and process bootstrapping in geomarketing

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When organizations aim to expand their market share by positioning a product that is well established in a certain customer segment by positioning that product in another market segment, they may need to adjust their processes accordingly. Implementing such a strategic move for growth while accounting for existing product and process knowledge requires stakeholder-centered and constructive interventions. In this paper, we demonstrate the use of value network analysis for this transformation process, reporting an example case of a telecommunications provider, which approached private households based on the customer experience in the business customer segment. Value network analysis not only enabled the removal of communication-based resentments by opening acceptance to organizational change but also helped define core processes in order to reach business objectives.

1 | INTRODUCTION

Once a product (or product line) has been established in a certain market segment, many organizations consider whether they can expand their business by approaching other market segments. For instance, products designed for business customers may be tested for private customers, a part of growth strategy that is a crucial aspect of business development. The right combination of products and markets can increase sales and market share (Welge, Al-Laham, & Eulerich, 2017). When considering growth, organizations must decide whether to stay in a specific market area or expand to new markets and novel growth possibilities.

Although there are several approaches to formulating company growth strategy, one of the most commonly applied frameworks is the product–market matrix, also known as Ansoff matrix (Ansoff, 1965). The matrix not only helps to categorize an enterprise’s future growth strategy but also facilitates decision-making about pursuing possible strategies involving its products and market segments. The matrix comprises four distinct strategic instances (Ansoff, 1957, 1965) along two axes (Figure 1). The vertical axis encodes the organizational situation, that is, whether a company delivers in current markets or plans to enter new markets. The horizontal axis describes the product range, distinguishing current products from new.

The market penetration strategy focuses on already existing markets and products with the goal to increase market share by improving performance, perhaps by bringing in new customers (e.g., through advertising) or by changing a store’s opened hours (Ansoff, 1957, 1965; Lowy & Hood, 2004; Schawel & Billing, 2011). When implementing this strategy, the company might focus on pricing strategy, in combination with advertising and promotion, to retain or increase market share and drive competitors out of the market. Finally, increasing existing customers’ product usage through loyalty schemes or added value could still further accelerate market penetration (FME, 2013).

The market development strategy tries to expand into new markets with already existing products, whether sold to new segments (e.g., new geographical markets) or different customer groups (FME, 2013; Schawel & Billing, 2011). Geographical growth involves the distribution of current products into a new country, continent, or state. Modified packaging, new dimensions, and new distribution channels (e.g., offering products via the Internet) can also open completely new market segments. In this context, distribution to different
customer segments (e.g., private in addition to business) can be categorized as market development (FME, 2013; Schawel & Billing, 2011). A new range of customers can be reached through the product development strategy, which focuses on modifying products to reach new customers in a current market. Modifications to products can either be additional features or changed features, such as appearance or quality (Lowy & Hood, 2004; Schawel & Billing, 2011). A research and development team is required to modify and develop products. This team must assess new technologies and materials to improve and refine the product line. Furthermore, it should identify and consider customer needs and wishes in the course of development (FME, 2013).

The diversification strategy entails the highest risk of the four strategies, involving the introduction of a completely new product into a new market (Ansoff, 1957, 1965). Diversification can be done horizontally, vertically, or lateral. Horizontal diversification means expanding a product line by relying on existing technology and knowledge. Producing additional components for an existing product line is known as vertical diversification. Lateral diversification implies completely changing the market and the product, thus entering a completely new field of business (Ansoff, 1957, 1965). This strategy requires a thorough risk assessment, available capital, and willingness to invest in new products (FME, 2013).

As demonstrated by review of the various implementation strategies, neither the knowledge of operational stakeholders nor the underlying business processes are considered at that stage of development. Recent studies (cf. Bianchi & Mathews, 2016; Sener, 2014) involving the Ansoff framework have relied on empirical data from field work to identify best practices and organizational capabilities. However, some authors have identified a need for more methodological rigor in research and development (Kumar, 2010; van Weele & van Raaij, 2014), recognizing the continuous and highly dynamic need for change on all levels of organizational development (i.e., strategy, tactics, and operations). Such recognition induces a learning task that involves all stakeholders, particularly when an organization puts a strategic decision into business practice.

This paper reports a structured method to support the implementation of a strategy for entering a new market segment that takes into account stakeholder needs and capabilities. Although we demonstrate its feasibility to support Ansoff’s market development strategy as an example, the approach should be applicable to other variants. We use value network analysis (VNA; Allee, 2008) and subject-oriented business process modeling, a combination already demonstrably successful in developing expert organizations (Stary, 2014). The proposed method combines structured interventions with the development of business processes through stepwise refinement and execution.

The remainder of this paper is structured as follows. Section 2 introduces the geomarketing business case, setting the stage to apply the method’s implementation in the market. Section 3 introduces VNA and reviews related studies of application. In Section 4, we detail the corresponding implementation steps, and Section 5 derives the process knowledge alongside subject-oriented examples of process. Section 6 shows pragmatic implications for other businesses than telecommunication, and Section 7 concludes the paper.

2 | THE BUSINESS CASE

A mid-sized Austrian telecommunications company faced a strategic development challenge, opening several decisions with the aim to increase sales and enhance market share. A promising sector of the business portfolio is the provision to business customers of high-speed internet over fiber optic cables. Due to increasing need in the market, the company is constantly investing in expanding their fiber network throughout their distribution area. However, private in addition to business customers are demanding fast and stable bandwidth.

The company had to decide which basic growth strategy to implement. After analyzing the market, their current products, and their customers, they decided to implement a market development strategy, identifying the fiber optic cable sector as the most promising business segment to expand market share. At that time, the company only distributed their high-speed internet to business customers; private customers had not yet been served. Ensuring delivery to private users requires the concept of fiber-to-the-home (FTTH), which describes the distribution of high-speed internet over a fiber optic cable from the main network to households themselves. This technology requires an existing and expandable network of fiber optic cables, which the company had already installed throughout their distribution area. By applying this market development strategy, the company could expand the network even further to reach every single private customer in that area, reaching over half a million households after full expansion.

In implementing the market development strategy, the company faced several changes in management. It formed a new executive department to ensure conscientious project structure. To this department, management assigned existing employees with experience in the field of fiber optic cables. Their main responsibility was to oversee the preparation and execution of existing and new FTTH projects. Furthermore, the geomarketing operations team was also transferred into the newly formed organizational structure.

The term “geomarketing” is mostly found in German literature, but it has no clear definition. Tappert (2007, p. 16) defines geomarketing as the “optimization of marketing and sales through the application of a geographic information system.” According to Schüssler (2006, p. 9), geomarketing includes “planning, coordination, and control of companies’ customer-oriented marketing activities through a

FIGURE 1 Product–market matrix, after Ansoff (1965)
geographic information system.” As the main focus of geomarketing is to strategically plan future areas with high revenue potential by applying analysis using geographic information systems (GIS), the term “business GIS” (Longley & Clarke, 1995) mostly overlaps this concept, which links market conditions with products, opportunities, stakeholder behavior, and trade areas and responds to changing situations (Schüessler, 2006).

Knowledge relevant to geomarketing is scattered across various disciplines, including economics, geography, informatics, and statistics. Combining knowledge from organizational studies, market development, and geographic maps, practitioners can further process relevant data to understand a geographical area. For example, they might add sales and marketing data to analyze specific stakeholder needs (Tappert, 2007).

The most important data to conduct geospatial analysis can be divided into two groups: geographical and attribute data. The former includes geographical maps—vectors, streets, and building data—and anything else that relates to a geographical area. Attribute data, on the other hand, concerns the organization, including marketing data, statistical analysis, and personal data, such as demographic, socioeconomic, and psychographic data (Schüessler, 2006; Tappert, 2007).

A GIS is used to display and analyze these data. A GIS is software that enables the display, collection, management, manipulation, and analysis of geospatial data (Cliquet, 2013). This software allows the user to conduct geospatial analysis by combining different kinds of data in one, easy-to-access display. This analysis helps decide which marketing strategies to use first in which areas. It also enables management to make faster decisions about sales activities, which increases efficiency throughout the firm.

Although the newly introduced executive department had to organize their processes according to their new customer group, the processes to design new FTTH projects were copied from the business segment to the private customer segment. The design process affected not only the new department but also other departments and even different subsidiaries of the trust. Copying the process while involving different design partners caused major miscommunication among various stakeholders, leading to project delays and finally forcing the company to rethink the design process.

3 | VALUE NETWORK ANALYSIS

VNA targets a key business concern: creating value through transactional assets in a negotiable form while appreciating stakeholder perceptions of transactions and their proposals for change (Allee, 1997, 2003a, 2003b, 2008). VNA focuses on tangible and intangible value exchange as a foundation to create value. Although VNA aims to specify operational business process, its importance as an instrument exceeds process engineering to facilitate understanding of organizational dynamics and thus the co-creative management of structural knowledge from a value-seeking perspective (Payne, Storbacka, & Frow, 2008—both for individuals and for the organization as a whole.

The core of the method is to model work and business relations as dynamic patterns of tangible and intangible exchanges, taking the perspective that any organization or social network is a living system. Tangible exchanges correspond to flows of energy or matter, whereas intangible exchanges, such as exchanges of knowledge, involve cognitive processes. Describing a specific set of participating stakeholders and exchanges allows detailed description of the structure of any specific organization or network of organizations.

Intangible exchanges comprise knowledge and benefits. Intangible exchanges of knowledge and information support the core value chain of products and services but are not contractual. Stakeholders in certain roles are accountable for the effective execution of that exchange, which they can articulate accordingly by following VNA’s structured procedure.

Value networks represent organizations as a web of relationships that generate tangible and intangible value through transactions among two or more roles. These roles may represent individuals, groups, or entire organizations. The network, instead of representing hierarchical positions, structures the dynamics of processing and delivering tangible and intangible assets. Although roles relate to the organization at hand, suppliers, partners, and consumers—regardless of their physical locations—become part of the network once they generate value or receive transactional deliverables.

When modeling an organization as a value network, several assumptions apply (Allee, 2008):

- Exchanges of value are supported by some mechanism or medium that enables that transaction to happen. Because organizations can also be considered socio-technical systems, typical enablers involve information and communication technologies. For instance, a sales briefing might be scheduled through a specific web application, like doodle.com.
- There is provided value—for the sales briefing, based on a tangible exchange of inputs of customer service—and response to inquiries between organizers and participants. Intangible goods, in the case of the sales briefing, include targeted news and offerings, as well as updates on services and customer status (knowledge) and a sense of community (benefit).
- There is returned value, which in the case of the sales briefing is tangible in terms of efficiency (short handling time of customer requests) and intangible in terms of informed customer requests, customer feedback on the latest developments (knowledge), and customer loyalty (benefits).

Value exchanges are modeled using a special type of map, called a holomap. VNA mapping from observed reality to holomap uses the following elements:
• Ovals represent stakeholders’ functional roles. These are termed Participants in the value network and represent nodes of the network.

• Participants send or extend Deliverables to other Participants. One-directional arrows represent the direction in which Deliverables move during a specific Transaction. A label for each arrow denotes the Deliverable.

Holomapping is based on the assumption that only individuals or groups of people have the power to initiate action, engage in interactions, add value, or make decisions. Hence, VNA Participants can be individuals, small groups or teams, business units, whole organizations, collectives (such as business networks or industry sectors), communities, or even nation-states but not databases, software, or other technology. The decision-making capability about which activities in which to engage qualifies only humans, or groups of humans, as VNA Participants.

Transactions or activities are represented by arrows that originate with one Participant and end with another. The arrow represents movement and denotes the direction of address to a Participant. By contrast to Participants, which tend to be stable over time, Transactions are temporary and transitory. They have beginning, middle, and end points.

Deliverables are entities that move from one Participant to another. A Deliverable can be physical or tangible, like a document or physical object, but it can also be non-physical, such as a message or request that may only be delivered verbally. Deliverables can also be intangible, such as knowledge about something or a favor.

In VNA, an exchange only occurs when a Transaction results in the return of a particular Deliverable. When something is provided without anything received in return, this is considered a gap. However, focusing on the exchange as the molecular element of value creation is a generic concept that enables the model to capture many types of organizations as value networks. Tangible and intangible exchanges establish patterns typical of business relationships. In many cases, tangible exchanges comprise exchanges of matter and energy (goods and money), whereas intangible exchanges capture cognitive and emotive exchanges, such as favors and benefits.

The holomap captures all exchanges and Deliverables, establishing a diagram of how stakeholders perceive the business. The view of an organization as value network helps highlight the roles of knowledge and intangible assets in value creation. The modeling process allows the capture of strategically critical intangible exchanges from a stakeholder perspective, thus enabling further, targeted opportunities for value creation. Analyzing the value network, as represented by the holomap (exchange analysis), allows assessment of the structure and dynamics of the represented system as a whole. The second and third analyses focus on each Participant’s role in the interactions in the value network. Impact analysis refers to the impact each value input has on the Participants, whereas value creation analysis investigates how an organization can create, extend, and leverage value, whether through adding value by Participants, extending value to other Participants, or converting one type of value to another.

Impact analysis focuses on received inputs that trigger some response by the receiver. This analysis considers the activities and effort needed to handle the input and leverage the value received. Concerned stakeholders must estimate the tangible and intangible costs (or risks) and gains for each input and then describe how a certain activity is generated in response to a certain (tangible or intangible) input. Finally, stakeholders are asked to describe the estimated increase or decrease in tangible assets in terms of an overall cost–benefit or risk–benefit analysis.

Value creation analysis not only reflects the situation as it is but supports the proposal of changes to how a Participant is committed to delivery. Although the structure of this analysis is similar to that of impact analysis, value creation analysis focuses on a Participant’s capability regarding how to extend value to other Participants represented in the holomap, analyzing the tangible and intangible costs (or risks) and gains for each value output. Each value output could add new tangible or intangible value, thus extending value to other Participants represented in the holomap. By assessing each value output, a Participant determines the activities, resources, and processes required, as well as the costs and anticipated benefits of each value-creating activity.

Although value creation analysis can become very rich due to anticipated changes in the flows of deliverables, the Participants need to understand the impact of a particular output on the Participant who receives it. From the perspective of organizational development, a Participant maximizes the effectiveness and efficiency of a certain business operation by following the created value. The overall cost–benefit analysis could result in excellent data, but a closer analysis of the proposed value creation could lead to inconveniences for the involved Participants, particularly business partners and customers (Augl & Stary, 2015, 2017). For instance, collecting contextual data from interviewees when applying a product in the field could easily lead to rejection of the proposed value creation, if they consider a request to prepare such a report as a negative value input.

Before proposed value creation can become effective in business operations, the involved Participants, as well as responsible management, must acknowledge that value. In order to allow the constructive elaboration of value creation affecting the collective, each member of the organization should be empowered with an instrument that enables them to reflect on their individual values. Applying such an instrument requires stepping out of the VNA logic while providing a baseline for discussing proposals for change. By making value-creation proposals congruent with individual value systems, the resulting business operation can become coherent for the involved stakeholders.

4 VNA-DRIVEN DEVELOPMENT

As described in Section 2, the telecommunication provider in the project at hand needed to overcome deficiencies in communication to leverage the potential for stakeholders to implement the market development strategy. Intangible assets and knowledge were thus relevant, due to extensive stakeholder experience and knowledge in the business customer segment. The following Section 4.1 reviews VNA applications related to market development, and its case-specific application is detailed in Section 4.2.
4.1 | Rationale and selection

Edwards (2009) performed a VNA (2000) within the pharmaceutical industry. The case study involved market development for Viagra, revealing essential communication flows and identifying the value created within the network of involved roles. This research helped identify product innovation and specified key roles responsible for delivering value within the relevant network of stakeholders. Similar results with respect to understanding roles stem from a case study (Venezia & Allee, 2007) in the field of mobile workers. In that study, 557 participants were asked to describe roles and transactions in their work, specifying a value network. Besides the need to improve understanding of roles, the study’s large dataset also revealed that mobile workers are not supported sufficiently in their accomplishment of tasks, and actions are required to improve the efficiency of value exchange.

Stary (2014) aligned VNA with process management, generating subject-oriented business process models from VNA. Findings from health care show that the behavior of a specific role can be adjusted seamlessly without interfering with an organization’s operations. The subject-oriented approach (Fleischmann, Schmidt, & Stary, 2013) focuses on the communication between roles and may be applied seamlessly. Similarly, VNA was enriched by Solitander and Tidström (2010) with an element of competitive flow in a case concerning the natural product industry. Because the original approach lacks competitive flow, companies may not always try to achieve a common good; that is, participants in the network not only collaborate but also compete with each other.

Montemari and Nielsen (2013) contrasted casual mapping with VNA. The proposed casual mapping technique relies on two main elements: (a) drivers of value, symbolizing the main activity, object, or attribute needed to achieve success and (b) casual relationships, symbolizing the impact or influence between drivers of value. Although this casual method is suitable to represent networks diagrammatically, it does not support further analysis.

Related to the addressed application domain, Al-Debei, Al-Lozi, and Fitzgerald (2013) proposed a reference model for developing value networks within telecommunications companies. Their proposed model aims to allow telecommunications companies to identify, design, or analyze their specific value networks, making it possible to show where value is created, delivered, and captured within those networks. Shameem, Kumar, and Chandra (2015) went one step further to develop a framework to reduce communication deficiencies in global software development projects. They conducted exploratory research to identify success factors for efficient communication between team members. The framework describes how to consider relevant factors, such as geographical distance or social communication, when designing a project involving a globally distributed team.

Korkala and Maurer (2014) investigated miscommunication, conducting a case study of globally distributed agile software projects. Using “waste identification,” they identified five types of communication failures and derived strategies to avoid such given “waste” in the future. In that context, Henderson, Stackman, and Lindkeklde (2016) underlined the importance of communication norms, role clarity, and trust within global project teams. Their model helps organizations maintain effective interactions between team members. Their findings show not only that communication norms are important for global teams but also that role clarity throughout a project ensures team performance stays high.

Given these findings, we identify role clarity as an organizational asset for successful communication, and VNA can improve communication along work processes, especially when starting from an existing organization of work to explore opportunities for change. VNA puts value-creating activities by concerned stakeholders and their capabilities at the center of intervention (Allee, 2000, 2002, 2003a, 2003b, 2006, 2008, 2009, 2012). Another major advantage is its capability to integrate process modeling (Allee, 2006), which helps to increase stakeholder commitment on strategic and operational levels. Both are required when implementing a market development strategy.

4.2 | VNA application

This subsection reports on preparing the VNA and performing its corresponding analyses, including the development of possible future scenarios to overcome identified hot spots.

4.2.1 | Capturing the current process

Performing VNA for market development requires identifying people involved in the specific segment. The analysis focused on the design of new FTTH projects, specifically concerning the selection and preparation of plans for an extension area. Therefore, seven people from the newly introduced executive department were invited, representing all relevant roles in the process of the new project design. Participants were invited to an 8-hr (8 a.m. to 4 p.m.), offsite workshop in September 2016.

The seven participants represented three different roles: (a) Geomarketing, represented by one person; (b) Project Designers, comprising five people; and (c) Project Designers for Residential Buildings, represented by one person. We decided to invite all Project Designers because each performs their work in an individual way.

At the beginning of the workshop, participants were introduced to the concept of VNA; later, they were introduced to the different stages of analysis and the benefits of the results. They had the opportunity to ask questions; furthermore, a facilitator led the phases of the workshop and was available for questions during the examination. The selected topic and focus for analysis was to specify the flows of communication for the selection and preparation of areas for extension.

To obtain an understanding of the needs for interaction and value creation, the initial process was analyzed, revealing the situation as is. The aggregated holomap (Figure 2), capturing inputs from all participants, overviews the process of selecting and preparing plans for area extension as perceived by participants.

As shown, much communication is required to select, prepare, and commission an area extension plan. First, the project must be initiated either within the company or by external partners. The Project Designer must then gather all the information needed to plan the project from several partners. After the project is designed, Geomarketing must prepare the project for further revision. Before a project can begin, Controlling needs to check its feasibility. For large projects, the Management Committee is involved to give further approval. After
the project is approved by Controlling or the Management Committee, the commission partners are informed, and the building process can be initiated. To understand the various patterns of interaction, we detail them according to the flow of work.

According to the participants, projects can emerge in various ways (Figure 3). Projects are large and often politically motivated, which generally implies very high expectations. For projects initiated by a Project Designer, they are responsible for first contact between the company and the mayor of the community, for example. In addition, communities themselves can express a need for FTTH, or external partners can contribute extension requests or knowledge about available funding. Other departments or subsidiaries of the trust can also suggest areas for future extension. Finally, Management can be responsible for an initiative. However a project may emerge, communication is necessary between the Initiator and the Project Designer, whether only to give feedback or to send their plans for the project.
A Residential Buildings Partner can also initiate a project (Figure 4). The responsible Designer for Residential Buildings tries to identify the future extension plans of existing or new partners. Furthermore, the role stays in contact with partners to negotiate contract details and provides information on the commission status. Once the details of a project are clarified, the information is communicated to the Project Designer, who designs the project for further use.

After receiving ideas for an area extension, the Project Designer can design the project (Figure 5). The carrier of this role must communicate between several other roles. One of their first contacts is Infrastructure to obtain technical parameters. However, not all Project Designers see this as their responsibility. Some also discuss the project and technical parameters with the Construction Manager. This communication only exists because, before introducing the concept of the Network Project leader, the Construction Manager was the commission’s main contact person. If a project is requested by Management, the project plans must be sent and presented to them. If an extension of the Backbone is planned, the Project Designer sometimes communicates with the leader of Infrastructure, even though the technical parameters have already been discussed with Infrastructure. After the collection of all necessary information, the area extension plan can be prepared and sent to Geomarketing.

In this step, Geomarketing examines the project plan (Figure 6). If any information is missing, the responsible Project Designer is informed and requested to gather the missing data. Geomarketing then consults Infrastructure to receive technical parameters. In some cases, these parameters have already been discussed and taken into account at the planning stage, but sometimes, the project design requires improvement with the newly collected information. Before releasing the plan for further approval, the Project Designer requests the result of the project’s plausibility check, even though this information is not officially confirmed. Once all information has been documented and the project plan has been prepared, it is transmitted to Controlling.

Controlling will then test whether the project is economical feasible. If the project costs exceed a certain threshold, the Management Committee must make the decision. In case of approval by Controlling or the Management Committee, the decision is forwarded to Geomarketing and the Project Designer. Approval can trigger different processes (Figure 7), depending on whether approval is a sale or commission approval. For sale approvals, the Project Designers are now responsible for marketing and sales; that is, the project will only be commissioned if they can accomplish the given requirements. Because a general regulation system is lacking, many communication flows are added. A Project Designer must request the status from the Back Office to learn whether further sales are needed. Furthermore, the Back Office must send the status to Controlling for further steps. However, a Project Designer will also provide a status update to Controlling if they have not handed over all needed sales information to the Back Office.

Once all project requirements are met, commission approval is sent to Geomarketing and the Project Designer. Geomarketing now
prepares the project for the execution commission (Figure 8). First, the commission is sent to Infrastructure for planning. Furthermore, the Project Designer sends the project plan to the Network Project leader, even though that information will also be provided by the GIS Documentalist, and to the Construction Manager, even though this role is no longer directly involved in the commission process. The Project Designer also prepares the material for the Electrician, even though this is not the Project Designer’s responsibility. After receiving the commission, Infrastructure plans the actual pipe concept, which is then sent to the GIS Documentalist, who documents it and sends it to the Network Project leader. The Network Project leader then prepares the project plan and discusses it with Infrastructure.

4.2.2 Analyzing the current process and identifying change potential through hot spots

To show how the present situation developed, consider a sample analysis as seen from the Geomarketing role. Geomarketing is a key factor in the selection and preparation of extension areas. All information is gathered at this stage and prepared for further approval. The sample demonstrates how the VNA was conducted and how hot spots, which represent areas for improvement, could be identified.

As introduced in Section 3, VNA comprises three stages of analysis: (a) exchange; (b) impact; and (c) value creation. However, the network must be defined before conducting the analysis. When constructing the holomap (Figure 9), participants were asked to focus on the process of selecting and preparing area extension plans.

From the perspective of Geomarketing, a project can emerge from several roles. External partners—any communication outside of the company, whether a resident themselves or a community’s mayor—can send an extension request to a Project Designer. Furthermore, projects can also emerge from Management. This leads to a Kick-off Meeting, at which important information about the project is discussed. If a project contains any contact with Residential Buildings, contract terms are requested by the Project Designer for Residential Buildings.

Once a project is designed, the Project Designer sends it to Geomarketing. It is Geomarketing’s responsibility to examine whether or not all needed project information is available. If information is missing, the Project Designer is given feedback to improve the project plan. Once all information is available, Infrastructure may be contacted to obtain information about the technical parameters; however, the Project Designer themselves sometimes does this communication. Before sending the project for further approval, some Project Designers first want to obtain the result of the plausibility check. Because this result has not been officially approved by Controlling, false information may as a result be delivered within the company—or even to external partners.

However, because the Project Designer of Residential Buildings is not informed by the Project Designer, the project’s status is requested by Geomarketing, again leading to false information about approval requirements. Nevertheless, once a project is prepared with all information, the project plan is sent to Controlling for approval. The Management Committee is involved if the project exceeds a certain size in terms of required funding. Controlling and the Management Committee then communicate either sales or commission approval.

Once sales approval is given, a project must meet certain requirements before being commissioned for extension. The Project Designer now tries to meet these requirements, informing Controlling as soon as they are met. After receiving the commission approval from Controlling and the Management Committee, Geomarketing completes further process steps, including preparing the project for Infrastructure with all needed information. The project plan is then sent to Infrastructure, which will design the pipe concept. The pipe concept is sent to the GIS Documentalist, who documents the concept and sends it to the Network Project leader. After the project is planned, it is sent back to Infrastructure, which performs the commission.

Exchange analysis

After creating the case-specific holomap, the analyses were executed. First, exchange analysis documents the holomap to obtain an overview of which steps are performed. Each step is explained in Table 1.
Deliverables are marked as tangible or intangible to easily detect any extra effort provided.

The overall exchange analysis clearly shows an unbalanced network. Exchanges between certain roles are one-sided or contain little-to-no information at all. Furthermore, too many and even unnecessary roles are involved in the process. Much communication occurs due to misleading or poorly communicated guidelines, often originating from a lack of information about the responsibility of the roles themselves or outdated guidelines.

Impact analysis
For the next step, impact analysis, a template was provided to standardize the analytical process. For impact analysis, the Participants analyzed their network with respect to the inputs each role receives.

![FIGURE 9 Holomap geomarketing. GIS: geographic information systems](image)

**TABLE 1 Exchange analysis**

<table>
<thead>
<tr>
<th>Sender</th>
<th>Recipient</th>
<th>Deliverable</th>
<th>Tangible or intangible</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Designer</td>
<td>Geomarketing</td>
<td>Area extension plan</td>
<td>Tangible</td>
<td>—</td>
</tr>
<tr>
<td>Geomarketing</td>
<td>Project Designer</td>
<td>Information beforehand</td>
<td>Intangible</td>
<td>Only needed if Project Designer requests it</td>
</tr>
<tr>
<td>Geomarketing</td>
<td>Project Designer</td>
<td>Improvements</td>
<td>Intangible</td>
<td>—</td>
</tr>
</tbody>
</table>
Activities were detailed with respect to their tangible and intangible nature and the costs, risks, and gains for each role.

Table 2 represents an example communication between Geomarketing and the Project Designer. In the first row, the Project Designer delivers the area extension plan. This transfer triggers the project plausibility check, and the project is created in several systems. Furthermore, the impacts on financial and non-financial resources are described. The impact on financial resources is that the deliverable enables approval by Controlling. The non-financial impact is the information itself. The overall costs, risks, and benefits are high. The costs are high due to the overall effort required to prepare the project with all needed information. The overall risk is also high, because wrong or missing information can lead to more work later. Nevertheless, the benefit of the deliverable is high, because, without the plan, no further steps on the project—or on any project—could be executed or realized.

The second row represents transfer of the commission approval by the Management Committee to Geomarketing. This deliverable generates a status update in several systems and enables Geomarketing to send information to the execution commission. The costs of this deliverable are described as medium, because only a status update is needed. However, the benefit of the information is high, because the execution commission requires this information to proceed.

The next question, how to add value, shows where value creation happens. In this case, Geomarketing does not want conversation or upfront information in order to avoid circulating information that is not officially approved, which could result in misinterpretation. Upfront communication is also unneeded, because Controlling sends the official statement. This decision is also justified by the overall costs, risks, and benefits. The costs are declared medium, because the information must be prepared with all eventualities to prevent any misinformation. The risks of this communication are also medium, because the official statement and the provided information can differ from each other. Furthermore, the overall benefit is low; the provided information creates no value, because Controlling sends it anyway.

The next example shows the deliverable of improvements to the Project Designer. This deliverable creates the activities of a plausibility check and analysis of whether all information is available to complete

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**Value creation analysis**

After analyzing the inputs to roles, Participants captured and evaluated the outputs of roles. Outputs are compared with costs, risks, and benefits and inspected for their value addition. Table 3 shows an example of value creation analysis, done by Geomarketing.

The first deliverable to the Project Designer is information beforehand, which generates the activities of creating a project, calculating the feasibility, and preparing the information for the Project Designer. The next question, how to add value, shows where value creation happens. In this case, Geomarketing does not want conversation or upfront information in order to avoid circulating information that is not officially approved, which could result in misinterpretation. Upfront communication is also unneeded, because Controlling sends the official statement. This decision is also justified by the overall costs, risks, and benefits. The costs are declared medium, because the information must be prepared with all eventualities to prevent any misinformation. The risks of this communication are also medium, because the official statement and the provided information can differ from each other. Furthermore, the overall benefit is low; the provided information creates no value, because Controlling sends it anyway.

The next example shows the deliverable of improvements to the Project Designer. This deliverable creates the activities of a plausibility check and analysis of whether all information is available to complete

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**Note.** FTTH: fiber-to-the-home; GIS: geographic information systems.

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**TABLE 2** Impact analysis

<table>
<thead>
<tr>
<th>Transactions</th>
<th>Impact analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deliverable</td>
<td>From</td>
</tr>
<tr>
<td>Area extension plan</td>
<td>Project Designer</td>
</tr>
<tr>
<td>Plausibility check; creation of area in GIS and FTTH database</td>
<td>Enables approval from Controlling</td>
</tr>
<tr>
<td>Information</td>
<td>High; high effort to prepare the area extension plan with all needed information</td>
</tr>
<tr>
<td>Overall cost</td>
<td>High; wrong or missing information produces more work later on</td>
</tr>
<tr>
<td>Overall risk</td>
<td>High; without the preparation, no further steps can be made</td>
</tr>
<tr>
<td>Overall benefit</td>
<td>High: without the information, no execution commission would be possible</td>
</tr>
</tbody>
</table>

**Commission approval**

<table>
<thead>
<tr>
<th>Transactions</th>
<th>Impact analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deliverable</td>
<td>From</td>
</tr>
<tr>
<td>Status update in GIS and FTTH database</td>
<td>Enables execution commission</td>
</tr>
<tr>
<td>Information</td>
<td>Medium; only status update necessary</td>
</tr>
<tr>
<td>Overall cost</td>
<td>Low</td>
</tr>
<tr>
<td>Overall risk</td>
<td>High: without the information, no execution commission would be possible</td>
</tr>
</tbody>
</table>

---

**TABLE 3** Value creation analysis

<table>
<thead>
<tr>
<th>Transactions</th>
<th>Value creation analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deliverables</td>
<td>To</td>
</tr>
<tr>
<td>Information beforehand</td>
<td>Project Designer</td>
</tr>
<tr>
<td>Create project; calculation of feasibility; information to Project Designer</td>
<td>No more information beforehand, because the information will be provided by Controlling</td>
</tr>
<tr>
<td>Overall costs</td>
<td>Medium; information beforehand with all eventualities, to prevent giving wrong information</td>
</tr>
<tr>
<td>Overall risks</td>
<td>Medium; the official statement is only given by Controlling; geomarketing’s information can differ from official statement</td>
</tr>
<tr>
<td>Overall benefit</td>
<td>Low; information will be provided by Controlling</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Improvements</th>
<th>Project Designer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plausibility check; analysis if all information is available</td>
<td>Use checklist and guidelines for Project Designers on how to prepare area extension plans with all needed information; plausibility check before transfer to Geomarketing</td>
</tr>
<tr>
<td>Overall costs</td>
<td>High; projects need to be checked and revised every time</td>
</tr>
<tr>
<td>Overall risks</td>
<td>Medium; unnecessary time of work is spend</td>
</tr>
<tr>
<td>Overall benefit</td>
<td>High: no more further steps can be done without all the information</td>
</tr>
</tbody>
</table>
the check. Because improvements are necessary, value can be added by using checklists and guidelines for the Project Designer's preparation. This could prevent redundant communication, because all information should be discovered before sending the plan to Geomarketing. Furthermore, once the Project Designer gather all information, they can perform the plausibility check on their own. The overall costs, risks, and benefits confirm the value conversion done by Geomarketing. The costs are declared to be high, indicated by the time required to check and revise each project every time new information arrives. Even though the risks are described as only medium, unnecessary work time is spent. However, the benefits show that the value conversion is necessary, because without all information, no further steps can be done.

Hot spot identification
After examining the Participants' diagrams and analyses, hot spot analysis can be conducted (Figure 10). To call attention to the main focus, the diagram comprises the main roles, with the affected communication highlighted in red.

Three main areas were noticeably affected, namely, Geomarketing, Project Designers, and General.

Within the Geomarketing team (Figure 11), two hot spots were found: (a) no more information beforehand about the results of the plausibility check and (b) checklist of important information.

As Figure 11 shows, the communication between Geomarketing and Project Designers encloses an intangible asset, namely, information beforehand about the plausibility check. This communication contains information that will be provided by Controlling anyway. Even if Geomarketing transferred the result of the plausibility check, the information is not guaranteed to be correct. At this stage of the process, the next control mechanism has not yet been applied. Furthermore, assuming all information is available, the Project Designers can estimate the result of the plausibility check on their own.
The other main hot spot found for Geomarketing was the preparation of the area extension plan. Communication is crucial to all following process steps, because if information remains undelivered to Geomarketing, it cannot properly design the project for the following departments (Controlling or Infrastructure). There were no guidelines for how to prepare the area extension plan. Most miscommunication occurs due to a lack of information. Therefore, a checklist of important information for project design must be prepared and implemented in the process. In this way, the Project Designers will know what information is important and what they need to ask to find out, and Geomarketing can prepare all projects in the same way with all information.

Other hot spots were found for the Project Designers (Figure 12): (a) cooperation with Infrastructure; and (b) providing all information to Commission Partner (this role is held responsible for implementing a customer-ready solution).

The first hot spot shows that cooperation is needed between Infrastructure and Project Designers. To prepare the plans for area extension, Infrastructure's insight is necessary to know if a network can be built at a certain place or if there is still free fiber to design a new project. Even though this communication sometimes occurs, Geomarketing needs reassurance of the technical feasibility, even though they are not responsible for making any changes. Although information from Infrastructure is needed to prepare extension plans, the process does not explicitly define this delivery. Therefore, infrastructure's insight must be provided as additional information by Geomarketing to the Project Designer to improve the project plan, even though any problems could have been solved earlier. Therefore, communication between Infrastructure and the Project Designer is needed to correctly design the project so that Geomarketing can prepare further steps without requiring additional confirmation.

Another hot spot was identified in the communication between Project Designers and Network Project leader. This communication is intangible, because the initial process defines no communication at all between these roles. Even though the Project Designers have detailed insights about their project, only some Participants deliver this information to the Network Project leader. This communication proves crucial to the whole commissioning process. The Project Partner plans the project using only the information from the GIS Documentalist, which is a source of errors it might be late to correct. To avoid possible errors in the future, the Project Designer should communicate all information about a project to the Network Project leader. In this way, the role carrier ensures that all involved parties have the same information.

The next group of hot spots reflects communication potential in general: (a) an enterprise-wide information system and (b) new Commission Partners.

Much additional communication occurs because Participants in the process lack information they need to complete their work, showing that an overall system is needed that provides all information. Even though the company uses an enterprise resource planning system, the Participants were unaware that the system contains all the desired information. This implies that, even though some information may need to be added to the enterprise resource planning system, Participants require access to the system and need an introduction so they can find the necessary data on their own. This would make redundant communication flows obsolete.

Both parties expressed a wish for a single commission partner. The analysis showed that Project Designers hand their extension area plans over to more than one partner, following a change that officially adjusted the commission partners. Some Project Designers still transfer their information to the Construction Manager, even though they are no longer involved in the process. Therefore, the company needs to assign one partner as their official contact person and set their responsibility. However, all involved parties do need the information and must be able to obtain it.

5 | PROCESS PROTOTYPING AND VALIDATION

We first detail the novel process design in Section 5.1, before reporting its expert evaluation in Section 5.2.

5.1 | Process specification

The hot spot analysis revealed problematic area, from which an aspirational situation can be derived as captured in the following process diagrams. As seen in Figure 13, the number of roles were reduced to seven from the initially identified 16 by condensing exchanges to the important parts of the task. The combination of roles also allows condensing but only if these roles follow the same communication pattern as before. The analysis allowed the elimination of miscommunication and communication throughout the whole value network without effect on the accomplishment of the task.

Only active roles required for completing the selection and preparation of extension plans remained: (a) Geomarketing; (b) Project Designers; (c) Project Designers for Residential Buildings; (d) Controlling; (e) Management Committee; (f) Infrastructure; and (g) Commission Partner.

Step 1

Whenever a project emerges, the Project Designer first prepares an extension plan (Figure 14), in communication with Infrastructure. In this way, Infrastructure becomes the main source of information for Project Designer about technical parameters. Consequently, Geomarketing need not check with Infrastructure whether all parameters are available.

![FIGURE 12 Hot Spots for Project Designers](colourfigure can be viewed at wileyonlinelibrary.com)
However, the Project Designer of Residential Buildings can also trigger a project (Figure 15). In that case, all project data are transferred to the Project Designer, who prepares the project plan, including all information from the Residential Buildings Partner.

Step 2
After confirming any technical parameters with Infrastructure, the area extension plan is sent to Geomarketing (Figure 16). The analysis showed that this communication often entails problems with the transferred information. Implementing checklists and guidelines for how to prepare extension plans can help this communication reach its potential, completely eliminating other redundant communication (e.g., enhancement and feedback loops).

Step 3
The next step involves the communication of the details of the area extension plan to Controlling, including all the data from the
Project Designer. If the data were completely transferred to Geomarketing, there would be no need for Controlling to revise the data with Geomarketing or Project Designers. Controlling can now check the economic feasibility without any further demand for information.

Step 3a
If a project exceeds a certain cost threshold, the Management Committee is informed. Further approval is sent from Controlling to the Committee, and Feedback is given (Figure 17).

Step 4
After Controlling or the Management Committee declare a project economically feasible, efficiency approval is sent from Controlling to Geomarketing and all the Project Designers (Figure 18). After this communication, the different roles take further steps. If a project is only approved for sales and marketing purposes, all Project Designers take further steps to finish all sales required to achieve execution. This is only needed if Controlling demands a prerequisite. For example, a project might only be approved for execution if 20 of 50 residents in an area sign a contract. Without these contracts, Geomarketing will deny approval for the execution commission.

Step 5
Once all information the Management Committee requires for approval is stored in an enterprise-wide information system, the decision can be sent out immediately without involving any other role (Figure 19).

Step 6
After the Management Committee has decided to approve the execution of a specific project, Controlling can inform Geomarketing and all the Project Designers about this decision. However, only Geomarketing can now authorize the execution to Infrastructure and the Commission Partner. Nevertheless, the Project Designer can now pass their extension plans on to the Commission Partner, as identified in the analysis (Figure 20).

5.2 Expert evaluation
To evaluate the findings and show the applicability of the process, a process survey was conducted. A questionnaire was distributed to one person in each role (i.e., seven people). Because the Management Committee and Controlling roles are handled by the same person (i.e., Controlling is part of Management Committee), and because the Commission Partner is a new, as-yet unfilled role, only five questionnaires could be completed.

Each item of the questionnaire concerned one of the hot spots found in the analysis. Interviewees were asked to answer the questionnaire as the defined role. The questionnaire was pretested with several persons familiar with the domain but outside the organization to ensure the items’ understandability and measurability. The version of the questionnaire that was eventually distributed is provided in Appendix A.

Item 1: Project Designer–Geomarketing interface and use of resources
The first hot spot revealed some misconceptions and miscommunication between the Project Designer and Geomarketing because information about project plausibility was sent beforehand. As detected by the analysis, this often leads to misinterpretation and creates high workload without significant effect on results. Because the new process design removes the delivery of information prior to the final results of the plausibility check, the interviewees were asked whether the new pattern of communication would more efficiently use resources.
Most Participants considered this upfront information to be a key location for errors. They stated that because information from Geomarketing is not officially confirmed by Controlling, it could lead to misinterpretations. Furthermore, Project Designers were able to use a tool to generate an estimated value on their own. However, Project Designers considered this information to be a reference point, not an official statement, so they would keep this information to themselves.
From the perspective of process optimization, communication flows would be more efficient if information were not delivered before completing the plausibility check. Project Designers can calculate the desired information on their own, without the consent of Geomarketing, thereby reducing the chances of errors or miscommunication between Geomarketing and Project Designers.

Item 2: Restructuring project information

As shown before, reaching consensus about the information required for a new project design is a major problem. Additional communication between Geomarketing and Project Designers or even other parties is required if the acquired information is incomplete. In order to standardize the collection of relevant information about new projects, a checklist was suggested to guide which data to collect from which party. Therefore, Interviewees were asked whether introducing a checklist would help to increase the quality of conveyed information.

The Interviewees believed this proposal would valuably improve the flow of communication. Using a checklist, Project Designers could collect all relevant information. The checklist would help standardize the process of acquiring relevant data. Furthermore, all projects would be handed over to Geomarketing in the same state. Misinterpretation of the conveyed information would be eliminated, as would the need for further questions from another party.

Item 3: Establishing a New form of cooperation between Project Designers and Infrastructure

Another hot spot in the evaluation showed that some collaboration or cooperation between Project Designers and Infrastructure should be introduced. In this regard, a Project Designer would gather all needed information from Infrastructure during the design phase. This would eliminate the need for Geomarketing to acquire technical parameters. Interviewees were asked whether this communication flow could prevent additional communication between other parties.

The Interviewees stated that this measure would help to clarify all information during the project design phase. Infrastructure could better plan projects by considering all discussed parameters. Furthermore, projects could be halted during design without further waste of time if, for example, no more fibers were available. Moreover, once this communication is implemented, Geomarketing need not reconfirm the information with Infrastructure, making still further feedback loops obsolete.

Item 4: Redesigning communication between Project Designers and the Commission Partner

The new process relies on a defined pattern of communication between Project Designers and the Commission Partner. All project plans would be sent to the other party to ensure every new project is based on the same information. The Commission Partner would then be able to plan the project. Interviewees were asked whether this measure could leverage the information content of the new communication flow.

Interviewees consider the additional content in this communication to be an improvement. It is easier for the Commission Partner to plan the work in a specific area if they know all the ideas and plans of the Project Designer. Furthermore, they can adjust their plans using the new information and need not raise the same issue again, with no need for further queries about the project.

Nevertheless, the interviewed Project Designer did not think this communication necessary, because it had not yet been designated. However, he recommended all involved parties to be part of the project design phase.

Item 5: Rethinking distribution of basic project information

The analysis often showed many acts of communication to collect basic information about a project. To limit this communication flow, Participants suggested an enterprise-wide information system providing all required information. Such a system would help stakeholders look up needed information about a project. Interviewees were asked whether such a change would help in increasing the efficiency of interaction.

The Interviewees considered such a system to be one of the most important mechanisms to increase efficiency, allowing them to access all project-relevant information at any time without need to ask anyone further questions. This also would reduce the risk that only a few people have insight into the project. Overall, the system would save a lot of time by presenting all information in a single place.

However, the system must be designed properly in order to avoid misinterpretation of data, especially in the future, when external customers can access the data.
Item 6: Introducing a new Commission Partner

The final hot spot analysis suggested introducing a new Commission Partner into the process as the only party to receive information about a project from a Project Designer and responsible for the overall commission process. Therefore, the Interviewees evaluated whether a concise role definition of a Commission Partner could help communicate previously missing information.

Interviewees expected the clarification of the role of Commission Partner to increase potential communication. With only one defined partner, all communication will center around that role and not with parties uninvolved in the case. Feedback and information will thereby become available in one place. Furthermore, this party would be involved from start to end of a project, able to collect all information at the right time. Finally, clear definitions of roles, including responsibilities, are required for processes to work.

Overall, the questionnaire confirmed the proposed, newly developed process design. Information flows between Geomarketing and Project Designer that did not generate value could be eliminated. The content of several communication flows could be improved by introducing guidelines and checklists of collected information. Role definitions clarified responsibilities assigned to the communication partners involved in the process, raising the overall value of communication.

The enterprise-wide information system enables universal access to information, thus helping to eliminate any remaining loose ends.

6 | PRAGMATIC IMPLICATIONS FOR BUSINESSES

In this section, we reflect on what we learned from the presented VNA application as applied to future market developments and considering underlying business operations. VNA not only helps organizations to identify patterns of communication but also considers stakeholder needs and capabilities, adapting these to develop market- and business-relevant transactions of value.

After kicking off a market development project, a preparatory stage involves identifying stakeholders relevant to the concerned market segment. This allows relevant parts of an organization and its environment to be accurately identified, thus scoping the project in terms of involved roles. Stakeholders can then reflect on existing structures and patterns of behavior from specific perspectives, capturing not only current processes but also developing knowledge required to transform business operations in a novel market segment. According to our findings, the following structure facilitates market development while recognizing and incorporating existing operational processes.

- **Articulate and explicate knowledge of existing product(s) and processes:** This phase requires guiding stakeholders to effectively present and represent their knowledge of business transactions, referring to current processes and existing products using a modeling notation. This should enable the identification of hot spots in business processes in terms of stakeholder interactions that could be relevant when exploring business operations for market development.

- **Explore the explicated knowledge to operationalize market development:** This phase details tangible and intangible transactions establishing segment-relevant interactions between stakeholders and evaluating their utility in terms of value exchange in both directions—input received from and output to other stakeholders—which could provide added value when developing a market segment.

- **Prototype novel business operations:** This phase must be supported by work process models that can be executed (i.e., prototyping), allowing involved stakeholders to gain direct process experience.

Stakeholders have substantial articulated knowledge, as contained in the transactional relations addressed by all value network analyses. Explication leads to externalized mental models, which allows individuals to reflect on their perceptions of operational situations. Next, incoming and outgoing deliverables (as represented by interacting stakeholders) are considered and evaluated in terms of the effort required from stakeholders and the risks and benefits for the organization. Although modeling represents the process, stakeholders cannot be assumed to know how to represent (i.e., model) their knowledge. Hence, stakeholders must agree to use the holomap network representation scheme of VNA and must agree on the rules for identifying formal and informal relations (i.e., tangible and intangible transactions).

Exploring the relations for novel market development should lead to a simple but effective understanding of tangible and intangible deliverables. Exchanges that are not explicitly contracted between stakeholders should be considered intangible. Implementing a market development strategy does not necessarily mean turning intangible value into tangible value. Sometimes, tangible value should become intangible, if no added value can be identified. However, in most cases, intangible value indicates services that contribute to high-quality results.

Finally, hands-on experience of business processes involves simulated implementation before the actual implementation of a strategy. Hence, the envisioned market development can be analyzed from the perspective of those roles that are considered relevant for implementing the strategy. Each role should encapsulate activities leading to major deliverables, as these require communication with other stakeholders to complete business processes. Taking the nodes of the holomap as a point of departure should help to identify the level of abstraction that fits stakeholders' capabilities of articulation. Because the models also document the process, their development can be traced to avoid re-inventing existing patterns and proposals for market development.

7 | CONCLUSION

This paper focused on implementing a market development strategy involving expansion of a well-established product to a new customer segment. Rather than copying existing work procedures from another market segment, existing product and process knowledge should be taken as the point of departure for a stakeholder-centered development process. In the described Geomarketing case of a telecommunications company, this process led to introducing a new department to
implement the strategy. Because processes had not been redesigned to explore the novel segment, misconceptions and thus miscommunication occurred frequently between several teams, departments, and even subsidiaries.

In order to overcome these deficiencies and leverage the potential of the new segment, we adopted a VNA approach, which allows the current communications behavior of the involved stakeholders to be captured, thus representing overall workflow from a role-specific perspective. The analysis enabled stakeholders to collect the exchanged tangible and intangible deliverables, which were used as a basis for transforming existing processes to suit the novel segment.

The captured value network of the telecommunications company showed many relations of communication involving a variety of roles. Through the example of the Geomarketing Department, we demonstrated how the application of VNA and hot spot analysis enabled the involved stakeholders to recognize relevant paths of interaction within their network to successfully complete tasks. Furthermore, stakeholders proposed several actions needed to overcome information deficits and miscommunication. An ideal process was proposed that eliminated several roles and communication flows to increase the efficiency and value of the remaining transactions.

Simple measures revealed that overall communication could be improved. Clear responsibilities of roles and partners led to more efficient exchange of information. In addition, guidelines and checklists could improve the overall value of offered communication, and an enterprise-wide information system could provide information whenever needed, leading to more effective and efficient handling of data and communication.

Future research activities aim to establish a structured, VNA-based procedure that includes the introduction of communication-centered analysis in order to improve the outcomes of VNA applications. Once participants become aware of the potential of the method, they will engage more deeply in role-specific adaptations of work processes. The concept of tangible and intangible requires clarification before conducting analyses with stakeholders. However, the first-time application of the VNA and hot spot analysis in this case reveals the potential of this multidimensional technique, which has already led to meaningful results for all stakeholders. The actions taken as a result could increase the company’s efficiency and decrease problems of misconception and misinterpretation.

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**REFERENCES**


**APPENDIX A**

**EVALUATION ITEMS**

Item 1: Do you think communication flows would be organized more efficiently if the Project Designer received no information beforehand about the result of the plausibility check?

Item 2: Picture a checklist containing all information required to design projects for area development. Would such a list help to improve the quality of communication? (Yes/No) If yes, why? If no, why not, and how could the quality of communication be improved?

Item 3: Could we reduce communication overhead by clarifying all technical parameters between Project Designer and Infrastructure? (Yes/No) Please provide the rationale for your answer.

Item 4: Could we increase the quality of information by transmitting all project data from Commission Partner to Work Partner? (Yes/No) If yes, why? If no, why not? How could the quality of information be improved?

Item 5: Imagine you have access to an enterprise-wide information system containing all relevant information about a project. Would such a system help to increase the efficiency of communication by reducing unnecessary communication flows? (Yes/No) If yes, why? If no, why not? How could the quality of communication or information be improved?

Item 6: Would clarifying the responsibility of the Commission Partner help to increase the quality of exchanged content? (Yes/No) If yes, why? If no, why not? How could the quality of exchanged content be improved?