

## Implementing Value Stream Management: A Pathway to Operational Alignment in Value Streams

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### Abstract

*This study investigates how value stream management enables operational alignment between business and software development. The present paper employs a single-case study design within a Swiss-based bank and its IT subsidiary. Qualitative data were collected, analyzed, and synthesized, offering comprehensive insights into an organization operating under the value stream paradigm. Expanding on operational alignment theory, this research introduces a revised model for the operational alignment of software value streams. The derived model includes three aggregated dimensions: Seek Value, Foster Transparency, and Enable Proximity. The findings suggest that software value streams require product-centric teams, featuring designated roles at the interface between business and development. Moreover, value streams and the product team should strive for transparency to disclose the actions and decisions driving the company's value. This study provides insights into the complex landscape of software development to align the operational dynamics between business and IT to pave the way for success.*

**Keywords:** Value Stream Management, Operational Business-IT Alignment, Case Study, Lean, Agile

### 1. Introduction

For more than three decades, the Society for Information Management (SIM) has reported the necessity of understanding the generation of IT value (Johnson et al., 2023). Moreover, IT leaders are searching for ways to provide value to their organizations and customers (Janz et al., 2016). One such way is through Value Stream Management (VSM), a practice based on the lean philosophy that combines software development methods and concepts such as agile and DevOps (development and operations) teams (Fitzgerald & Stol, 2017; Takakura,

2023). The focus lies on identifying, analyzing, and improving the flow of work items, information, and work processes from an end-to-end perspective (Rother & Shook, 2003).

Over the past 30 years, research has primarily focused on the strategic value of IT to business functions, aided by the renowned strategic alignment model (Henderson & Venkatraman, 1993). While strategic alignment research provides useful and valuable insights, further investigations at the operational level of IT value are needed to understand the customer perspective of IT functions. IT and business processes, skills, and infrastructure need to be aligned to deliver value to customers (Gerow et al., 2014; Janz et al., 2016).

IT leaders are rethinking their IT function setup and the way they operate within the organization (Janz et al., 2016). Prior research has called for a customer-focused approach in decision-making on how value is created (Kohli & Grover, 2008).

VSM has its origin in lean manufacturing and has been successfully applied in software development companies to improve flow by eliminating non-value-adding activities along the software value stream (Ali et al., 2015; Khurum et al., 2014). However, research in the area of operational business-IT alignment with a focus on VSM is desirable for a deeper understanding of generating customer value (Janz et al., 2016). This is significant, given the potential implications of VSM in software engineering. Meanwhile, alignment theory has received comparatively greater attention in IS research (De Haes & Van Grembergen, 2005, 2009; Reynolds & Yetton, 2015). However, in the context of software value streams, it remains notably understudied. Considering this identified research gap, this study is designed to answer the following research question:

*How can value stream management be leveraged to bridge the operational gap between business and IT in software development?*

The study contributes to both research and practice. From a scientific perspective, it enriches the

general understanding of operational business-IT alignment in the context of VSM. Additionally, we present a model with alignment dimensions as a guiding framework for VSM. Given the increasing importance of VSM and operational alignment in modern software development, this study also provides valuable insights for practitioners. It offers practical and actionable insights for value stream organizations seeking to improve the interface between their business and software development units.

After the introduction, this paper presents insights from the literature, followed by a single case study. We conclude with a discussion and present implications for research and practice.

## 2. Background Literature

VSM provides the overarching organizational structure of the business and IT units to deliver value through the software value stream, from ideation to software delivery (i.e., end-to-end) (Kersten, 2018; Poppendieck & Poppendieck, 2003). For leveraging the value stream concept to bridge the operational gap between business and IT, we applied the operational alignment theory. Alignment theory is an appropriate starting point for our research as it focuses on linking business with IT and has been successfully applied over the years (Gerow et al., 2014; Henderson & Venkatraman, 1993). Specifically, well-aligned business and IT units can collaborate more effectively by ensuring that the software development process is both lean and focused on delivering value to customers.

### 2.1 Operational Business-IT Alignment

The alignment of business and IT has been a key focus of the information systems discipline for many years, theoretically and practically (Luftman & Brier, 1999; Reynolds & Yetton, 2015). It has been among the top priorities for managers in recent years because it is considered a key source of value generation (Johnson et al., 2023). Poor business-IT alignment can lead to inadequate IT utilization, low user satisfaction, limited returns on IT investments, and suboptimal business performance (Luftman & Brier, 1999).

Alignment can be defined as “the degree to which the needs, demands, goals, objectives, and/or structure” of one component is consistent with those of another component (Nadler & Tushman, 1993, p. 119).

A large number of studies have contributed to understanding the factors that affect business-IT alignment and have established that it is positively

correlated with organizational performance (Chan & Reich, 2007; Gerow et al., 2014).

The strategic alignment model is one of the most cited frameworks in alignment theory and implies both an external view (i.e., organizations must align their business and IT strategies with trends and advancements in industry and technology) and an internal view (i.e., organizations must align organizational and IT processes and infrastructures) (Henderson & Venkatraman, 1993; Hu et al., 2023). In the light of strategic alignment, alignment occurs when two or more components of the framework interact, resulting in three different types of business-IT alignment: intellectual, operational, and cross-domain (Chan & Reich, 2007; Gerow et al., 2014). While intellectual alignment focuses on linking the business strategy with the IT strategy, cross-domain alignment is concerned with the integration of infrastructures and processes with strategies (Chan & Reich, 2007).

The third type of business-IT alignment is operational alignment, which draws on the “operational integration” perspective from the strategic alignment model (Henderson & Venkatraman, 1993). It has also been described as “internal alignment” (Chan & Reich, 2007).

Compared to intellectual alignment, operational alignment has received relatively little attention in the scientific literature (Chan & Reich, 2007; Gerow et al., 2014). However, strategies are only effective if they can be successfully implemented at the operational level (Feurer et al., 2000). Therefore, operational alignment might be equally important for creating business value, as it brings strategic plans into daily routines and creates value from day-to-day operations (Feurer et al., 2000; Wagner & Weitzel, 2012; Wiedemann et al., 2020).

Operational alignment is defined as “the link between organizational infrastructure and processes and I/S infrastructure and processes” and focuses on aligning specific activities and processes within organizations to ensure internal consistency between organizational requirements and delivery capability of the I/S function (Henderson & Venkatraman, 1999, p. 476).

### 2.2 Value Stream Management

VSM is a methodology for identifying, analyzing, and improving the flow of materials, information, and work processes within an organization, to maximize the value delivered to customers by streamlining the flow of work and reducing waste (Fitzgerald & Stol, 2014; Rother & Shook, 2003). There is a value stream behind every product delivery, which ideally starts and

ends with the customer (Rother & Shook, 2003). value stream is defined as to “identify every step in the process and categorize each step in terms of the value it adds” (Wang & Conboy, 2011, p. 3).

Taking a value stream perspective means dealing with the big picture, rather than individual processes, and improving the whole, rather than optimizing the parts of processes (Janz et al., 2016; Rother & Shook, 2003). Although originally conceived for the manufacturing context, VSM has also proven to be useful in other disciplines, such as software development (Conboy, 2009). This implements a new view of lean thinking focused on enhancing customer value, which was a novel approach in the 90s. The focus of value was no longer exclusively on cost reduction (Conboy, 2009; Hines et al., 2004).

Having a clear working definition of what value means for software development products is crucial, as improvement initiatives can only be successful if the nature of the value is clear and rigorous (McManus, 2005). The goal of VSM is to ensure that value moves smoothly and efficiently through the development process, without encountering unnecessary delays or obstacles (Fitzgerald & Stol, 2014; Petersen & Wohlin, 2011).

VSM supports agile software development and DevOps. All these methods benefit from the application of lean principles. The focus on flow optimization and identification of waste, such as manual and repetitive tasks for automation, are core functions of lean (Fitzgerald & Stol, 2017; Takakura, 2023). However, there are some differences between agile and lean, which we describe below.

### **2.3 Agile Software Development vs. Lean Software Development**

The concept of lean has evolved over the past few decades, and value has emerged as its key component (Wang & Conboy, 2011). The literature highlights that lean principles and lean philosophy serve as the theoretical foundation of agile software development (Poppendieck & Poppendieck, 2003). However, some researchers argue that lean and agile have different scopes and focuses (Hibbs et al., 2009; Wang & Conboy, 2011).

The term lean was labeled by Krafcik (1988). Lean software development is different from agile software development. Lean focuses on the end-to-end perspective of the complete value flow for the software development lifecycle, e.g., from the early concepts and planning to the delivery and deployment of new features (Petersen & Wohlin, 2011). To support the value flow, different practices such as the concept of value and waste, value stream mapping,

and continuous improvement (kaizen) can be applied (Fitzgerald & Stol, 2017).

Agile software development studies have a strong focus on project management and software development practices (Dingsøyr & Lassenius, 2016; Wiener et al., 2016). The business scope in which the software is applied is often neglected (Hibbs et al., 2009). In contrast, lean principles can be applied more broadly, such as to a specific product development or the entire company. Hence, the larger perspective of lean enables the generation of a broader picture of benefits (Wang & Conboy, 2011).

Lean software development aims to eliminate waste to generate higher value for the customer, whereas agile software development aims to provide new software features as early as possible to customers (Conboy, 2009; Wang & Conboy, 2011). On the one hand, agile methods provide detailed descriptions of events, roles, and practices such as stand-ups, scrum master, etc. On the other hand, lean has no strict guidelines or formalities, but is based on a toolkit with recommendations for case-based choices. Birkeland (2010) reports that software development teams that used the agile method Scrum moved to a flow-based process Kanban orientation with the result that flow-based processes improve their projects and maintenance activities.

Recent literature presents the DevOps and BizDevOps concepts (Debois, 2011; Hemon et al., 2018; Wiedemann et al., 2019). However, merely increasing the ability to produce more software through a faster flow of feature delivery does not necessarily guarantee that the resulting product will deliver more value to the end user (Murphy & Kersten, 2020). BizDev can be viewed as a complement to the DevOps concept, as it suggests a closer and continuous linkage between the business and software development units (Fitzgerald & Stol, 2017). Fitzgerald and Stol (2017) argue that continuity between business and development is required, as increasing the frequency of critical activities helps to overcome key challenges. BizDevOps aims to improve collaboration and systematic interaction between business (Biz), development (Dev), and operations (Ops), ultimately enabling a continuous and end-to-end flow of software features (Fitzgerald & Stol, 2017).

### **3. Research Methodology**

This study applies a qualitative case study approach to gain in-depth insights from a real-world example. We conducted a single-case study (Eisenhardt, 1989; Yin, 2014) to investigate the operational alignment in VSM at a Swiss bank and its

IT subsidiary. The subsidiary was created following a merger of the bank’s IT function and the previous IT supplier of the banking system. This case was particularly apt for addressing our research question as the organization underwent a transformation facilitated by the implementation of five value streams. In designing the initial structure of the value stream organization, the bank adopted a customer-centered, “outside-in” view. The five value streams identified were: client and data applications, client touchpoint applications, financing applications, investing and pension applications, and standard service applications.

We chose a single-case study design as one of the authors had the unique opportunity “to observe and analyze a phenomenon previously inaccessible to social science inquiry” (Yin, 2014). This “revelatory case” offered a distinct environment for the VSM transformation of an IT subsidiary that delivers services to the bank. Consequently, we were able to interview informants from both the bank (business side) and the IT subsidiary (IT side). We will outline the data collection and analysis in greater detail in the following sections.

### 3.1 Data Collection

Our research is based on primary and secondary data. For primary data collection, we conducted 12 interviews with informants from the IT subsidiary and the bank. The interviews were conducted in Switzerland during April and May 2023. Table 1 provides an overview of the interview partners and their backgrounds (Biz or IT). The interviews were semi-structured and supported by an interview guide with several standard questions (Miles & Huberman, 1994; Yin, 2014) for business and IT. Most of the questions were open-ended with the aim that the interviewees explain their thoughts and views in detail.

The interview guide had four distinct sections. The first section covered the informants’ role and their field of expertise. The second focused on the practices and challenges at the intersection of Biz and IT. The third shed light on the potential impact and measures of enhancing business understanding. Finally, the fourth section included specific questions about the skills, processes, and infrastructure required.

In the spirit of semi-structured interviews, the questions were moderately adapted to reflect the background of the individual, particularly whether the person represented the business or the IT perspective. The interviews lasted around 45 minutes each, and all were recorded and transcribed.

#	Role	Years Emp.	Biz/IT
1	Change Manager Value Stream	15	Biz
2	CEO IT Company	1.5	IT
3	Head of Transformation and Change	0.5	IT
4	Project Leader	4	IT
5	Project Leader	1	IT
6	Project Leader	1	IT
7	Product Owner; Scrum Master	14	IT
8	Product Owner; Scrum Master	21	IT
9	Value Stream Leader; Product Manager	15	Biz
10	Value Stream Leader; Product Manager	0.25	Biz
11	Value Stream Leader; Product Manager	3	Biz
12	Value Stream Leader; Product Manager	2	Biz

**Table 1. Interview participants demographics.**

The secondary data consisted of companies’ internal documents, such as strategic and organizational concepts. Furthermore, several pieces of informal information were collected since one author was able to observe the case site between January and May 2023. Hence, we obtained information from regular operational meetings, such as daily and strategic communication channels (e.g., Town Hall meetings).

### 3.2 Data Analysis

We initiated our data analysis by building a comprehensive case description to create a holistic understanding of the organizations’ context. Subsequently, we applied an inductive research approach to analyze our transcribed interviews. For this purpose, we applied the Gioia Method (GM), a qualitative research approach that balances the need for inductive development of new concepts with the rigorous standards required in research (Gioia et al., 2013). Our analysis began with an open coding approach focused on the operational alignment categories of processes, skills, and infrastructure.

The GM offers a structured research methodology and recommends a three-stage approach: (1) organizing codes and categories into a structure that incorporates 1st-order codes (focused on the informant) and 2nd-order codes (centered on theory), resulting in so-called aggregate dimensions; (2) formulating a grounded theoretical model; (3)

presenting the findings using a detailed, data-based narrative with frequent reference to 1st-order concepts to ensure the findings are firmly grounded in the data.

We commenced our coding along the operational alignment categories as the foundation for subsequent coding rounds. The 1st-order concepts were identified after analyzing the coded fragments related to skills, processes, and infrastructure. Subsequently, the 2nd-order themes were identified by examining the 1st-order categories in the context of operational alignment theory. Lastly, the aggregate dimensions were identified by synthesizing and integrating the 2nd-order themes, considering their interconnections and broader implications, to provide an understanding of the data at an aggregate level. Figure 1 presents an overview of our coding scheme using the GM.

## 4. Findings

In this section, we present our findings organized by their aggregate dimensions and 2nd-order themes.

### 4.1 Seek Value

This section outlines the importance of aligning operational efforts around a value paradigm, as it is a crucial mechanism for achieving operational alignment. The sub-dimensions “Product-Centered Thinking” and “Structured Prioritization” provide the essential concepts to center the discussion on value

before the development process, and to facilitate the alignment of Biz and Dev around a common goal.

#### 4.1.1 Product-Centric Thinking

Our findings underscore a paradigm shift from project to product thinking. There is a consensus among the experts that the implementation of product-centric teams is a prerequisite for continuous value flow. This differs from project-centric approaches, where the teams have to break down their tents after completing the project.

*“Before, we had the challenge of staffing, which was always a hurdle until we had all the people we needed in a project and could start off. In the value stream organization, we no longer have that. So, if we are talking about ‘Investing and Pension’, for example, we know exactly which people to involve from the business and IT side.” (Expert 1)*

These findings indicate that skills are now developed and maintained around the products to establish their stable nature, and Biz and Dev units build a history of collaboration over time. A major advantage of moving away from a projects-driven approach is that members of more stable, product-oriented teams naturally develop a deep understanding of the artifact in question.

Furthermore, product-centric thinking requires a shared understanding of the customer to whom value is provided. This is crucial because product teams can only meet customer needs when they understand who

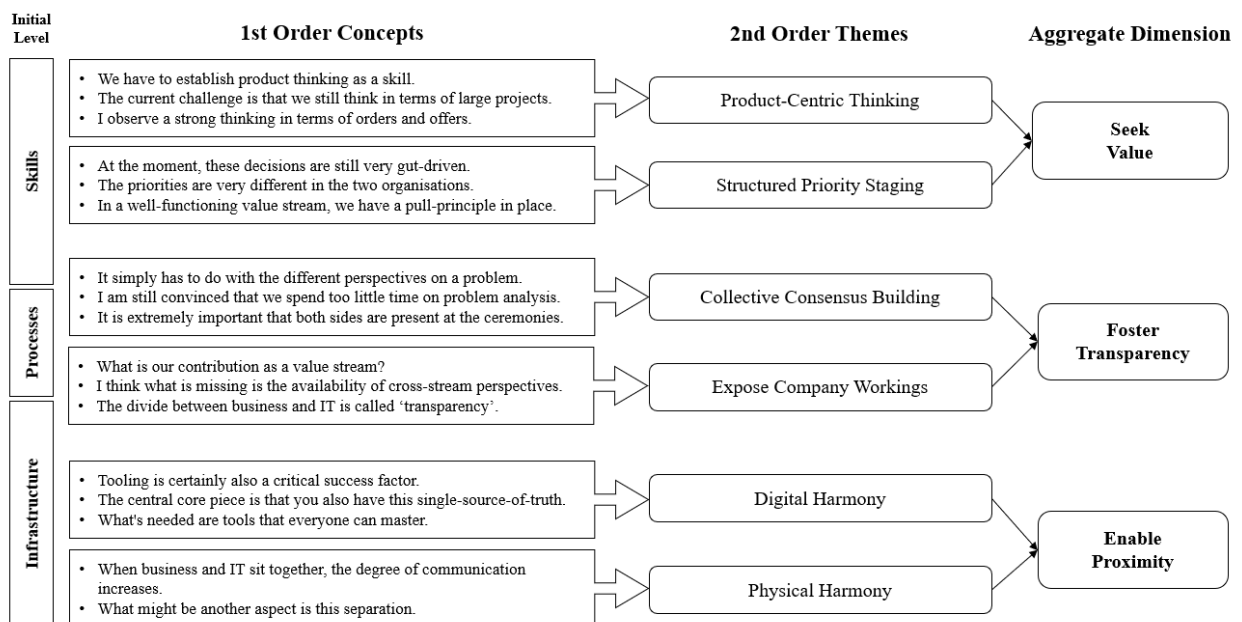


Figure 1. Summary of concepts and aggregated dimensions.

the customer is. Once Biz and Dev have defined the customer, the team can concentrate on assessing the customer's needs. Integrating IT into idea generation enriches the discussion with another perspective and fosters the synthesis of business and technical considerations. This results in the emergence of more comprehensive and viable ideas, drawing on a broader pool of creativity and expertise.

*"It is possible that a new idea comes from a client. It may be brought forward by a client advisor. It can be that you discover something yourself. But it can also be that a software developer introduces an idea." (Expert 11)*

#### 4.1.2 Structured Priority Staging

This section illustrates how structured priority staging directs operational resources towards the most valuable tasks. Clearly defined priorities are one of the most important mechanisms for the efficient functioning of a software value stream. Consequently, the team is supported and guided by reducing ambiguity and establishing indicators for success.

*"You don't know what you're dealing with and what actually should be developed. (...) There are a lot of ideas. Ideas arrive from everywhere, but it is not defined what idea has the highest priority." (Expert 5)*

Once a value stream organization has mastered priority setting, it has established an important precondition for implementing the "pull" principle. Under this principle, instead of assigning work in a directive manner, individuals pull work independently based on its priority. The idea of "pull" is at the core of lean thinking and VSM: *"So, in a well-functioning value stream, we have a pull principle in place. If, let's say, the development team is not working to capacity, it pulls the next task, thus achieving continuous flow." (Expert 9)*

The pull principle poses some challenges for value stream organizations, as various critical factors (one of them being priorities) must be aligned simultaneously. Hence, an overview of work for all value stream is needed, and planning must be discussed between the leads.

#### 4.2 Foster Transparency

Fostering transparency is essential for achieving operational alignment. The sub-dimensions, "Collective Consensus Building" and "Expose Company Workings", are key concepts needed to promote shared understanding and agreement on processes during development cycles.

#### 4.2.1 Collective Consensus Building

Our findings indicate that in value stream organizations, the process of solution definition supports the collaborative effort and capitalizes on the different perspectives of Biz and Dev. This represents a shift from the traditional order-execution dynamic between business and IT, breaking down silos and encouraging both parties to actively engage in the creative process of finding solutions.

*"Since we started with the value stream concept, we have a closer cooperation. Let's say we, the developers, are now also on board with product planning and can better contribute our impressions, our ideas (...) of what is possible." (Expert 7)*

Regular events are an important part of agile software development, serving as platforms to synchronize and collaborate. Both parties need to be involved in these events to align their efforts. Active engagement from the Biz side in these events can reduce the reluctance of developers to reach out to those experts when needed.

*"These individuals need to have a face, be the direct point of contact for the team, so that developers can directly approach them. (...) and perhaps also as a way to demonstrate to the business side, now is the time to be accessible and engaged." (Expert 7)*

Aligning process expectations between business and IT is essential. This alignment ensures that individuals on the product delivery team have a clear understanding of the deliverables.

#### 4.2.2 Expose Company Workings

Furthermore, the product teams must understand their contribution to the value proposition. This fosters mutual understanding between Biz and Dev, ensuring that each party has information about what is happening in the other's domain.

*"(...) but in the informal conversations, one simply hears who is working on what, who is currently in a release, where things are a bit challenging, where things are going smoothly, etc." (Expert 11)*

In agile environments, work-in-progress is often visualized using boards (e.g., Kanban boards). Maintaining a high degree of transparency can effectively enhance understanding.

*"Of course, we can also visualize the work with tools, like Jira boards or other Kanban boards. The danger is simply, these boards, they must be actively visited to see it." (Expert 3)*

Another way to enhance transparency is by synchronizing critical activities across all value streams. While it is essential to give each value stream the autonomy to develop its unique operational

approach, activities that impact other streams should be standardized and made transparent. Establishing a common work rhythm can foster cross-stream alignment and collaboration.

*“Especially if you have several value streams that all want to access – under certain circumstances – the same Dev team. Then, of course, those value streams must know how we prioritize them.” (Expert 8)*

### 4.3 Enable Proximity

Our results indicate that the effect of proximity can facilitate operational alignment from an infrastructure perspective. The two sub-categories, “Digital Harmony” and “Physical Harmony”, represent complementary approaches to establishing proximity between Biz and Dev.

#### 4.3.1 Digital Harmony

Digital harmony refers to the potential of digital technology and tools to bridge the operational gap and foster alignment between Biz and Dev. Our findings suggest that a common toolkit for both parties resolves interdependencies, ensures seamless workflows, enhances collaboration, and avoids communication gaps.

*“A key point here is the tooling. I’m very glad we could agree on Jira/Confluence, a tool where both perspectives are represented. Both the bank works with the tool, as well as IT, and then even in the same ‘Spaces’.” (Expert 12)*

However, the key does not lie solely in the tool itself; both parties need shared understanding and knowledge for its correct usage. Training on the tools’ functionalities for operations can help reduce obstacles in its usage. This supports the successful integration of tools in their workflows. For example, considering that collaboration tools such as Jira/Confluence are standard tools in agile software development, it might be beneficial to promote training among business-related functions because not everyone is familiar with them.

*“It’s important that you not only provide people with the tools but also train them and create a common understanding of how to use this tool.” (Expert 9)*

Nevertheless, tools can also be a source of distraction and inhibit workflow. Therefore, the general approach should not be to accumulate an excessive number of tools, but rather to focus on a selection of the most effective ones.

*“Tools should support us. And sometimes, or often in my observation, even in our organization, we primarily think in terms of tools and too little in terms of communication and interaction.” (Expert 3)*

#### 4.3.2 Physical Harmony

Physical harmony emphasizes the importance of physical closeness and the potential of shared infrastructure to encourage collaboration and achieve alignment through real-world proximity. Over the past few years, remote working has gained popularity. However, our study indicates that physical proximity can facilitate better alignment between Biz and Dev. An environment that encourages open dialogue naturally builds trust and strengthens the connection between business and IT.

*“So, when business and IT or business and Dev sit closer together, then communication automatically increases, the degree of communication becomes higher. People automatically speak more with each other.” (Expert 3)*

Creating office spaces that promote teamwork among product-oriented teams enables operational alignment. By developing a shared environment, the barrier to collaborative work is reduced, enabling individuals from both business and IT to interact efficiently.

*“We also have a room reserved for half a day per week, (...) where employees from both IT and [name business] have the opportunity to work face-to-face in the same room.” (Expert 12)*

## 5. Discussion

This study aimed to explore the potential of VSM to bridge the operational gap between business and IT in software delivery. Our case study research presents three aggregated dimensions that lead to such alignment, namely: Seek Value, Foster Transparency, and Enable Proximity.

Our findings contribute to the existing body of knowledge regarding operational business-IT alignment in the context of VSM. Previous literature primarily focuses on strategic alignment (Gerow et al., 2014) and operational alignment in the realms of software delivery (Martin et al., 2008) and DevOps (Wiedemann et al., 2020). However, there is a paucity of research on the role of VSM in operational alignment. Only a few studies have examined VSM and called for further research in this area (Janz et al., 2016; Kersten, 2018). Therefore, this study improves our limited understanding of achieving operational alignment in value stream-oriented organizations, which we discuss below.

### 5.1 Theoretical Implications

Our study provides theoretical implications in operational business-IT alignment and VSM,

proposing three core mechanisms for achieving VSM that extend the operational business-IT alignment literature.

*Seek Value* presents insights into the skills development needed to align Biz and Dev in the pursuit of shared value creation, establishing a unified approach for the creation and prioritization of tasks. This study confirms that product-centric teams embrace agile and lean principles (Fitzgerald & Stol, 2017). Product-centric teams also serve as an important element in bridging the divide between business and IT units at an operational level. The stability of these teams fosters an environment of ongoing dialogue, thereby reinforcing the link between Biz and Dev units.

Contrary to the original lean principles, which suggest that value is solely defined by the customer (Womack et al., 1990), the picture in software delivery is more nuanced. Our research supports Kersten's suggestion that value can also come from internal sources, such as mitigating risk or addressing technical debts (2018).

*Foster Transparency* focuses on processes and emphasizes aligning business and IT units to enhance openness and collaborative decision-making. Our study highlights that continuity is a crucial factor for operational business-IT alignment. Prior research has also highlighted the magnitude of continuity between Biz and Dev, suggesting the concept of BizDevOps (Fitzgerald & Stol, 2017). Particularly, it is necessary for business experts to actively participate in events with agile software development methods. These events and meetings play a crucial role in fostering an environment that encourages continuous feedback and transparency at the BizDev interface.

Value stream organizations need to be transparent not only about their value proposition but also about what is currently driving the organization. This can be achieved by visualizing work-in-progress tasks through boards that are accessible to everyone. Poppendieck and Poppendieck (2003) propose minimizing waste coming from unresolved and waiting tasks. This is consistent with our findings that an effective tool is to establish "information radiators" in the physical workspace to ensure consistent engagement and consultation with all team members from business and IT simultaneously.

*Enable Proximity* demonstrates that digital collaboration tools, such as Jira, have become an indispensable cornerstone in aligning the operations between Biz and Dev units. Although digital tools were already addressed in the "Infrastructure" dimension of the SAM (Henderson & Venkatraman, 1999), their relevance and dynamics have changed significantly in the past twenty years. Therefore, we

enhance prior research with concrete implementation examples. Especially during the COVID-19 pandemic, digital tools have become indispensable for enabling efficient connection and collaboration between Biz and Dev. They facilitate both the artifact flow (i.e., the flow of work items) and information flow (i.e., the knowledge required to perform the value-adding activity).

As essential as digital collaboration has become in recent years, physical proximity still has its unique importance and can play a critical role in fostering operational alignment in value stream. The physical closeness promotes a natural exchange of ideas, encourages cross-functional learning, and provides valuable insights into the operational tasks of other units. This effectively addresses the information flow dimension (Bin Ali et al., 2015). Furthermore, it fosters systematic interaction between business and IT units, as proposed by the BizDevOps concept (Fitzgerald & Stol, 2014). In addition, it addresses waste, which appears in the form of motion/task switching (Poppendieck & Poppendieck, 2003), as people can more quickly identify and access the knowledge they need.

## 5.2 Practical Implications

The proposed model offers guidelines to support the different dimensions of alignment; this can serve as a blueprint for real-world implementation. Essentially, value stream organizations can implement specific actions within the proposed overarching meta principles.

Our study recommends three practical guidelines that enable VSM and operational business-IT alignment. First, the transition from product-driven to product-centric teams is essential. Within stable product teams, the BizDev interface requires people who understand the importance of their role. Second, we suggest that IT managers focus on enabling collaboration and exploration in the problem-solving phase by adopting flexible policies, such as acceptance criteria, rather than prematurely locking in a specific solution. Third, collaboration must be enabled both digitally and physically. This facilitates the information flow of value stream organizations by providing common tools, structuring those tools, and equipping people with the knowledge they need. This research provides IT managers with initial insights into how VSM can be achieved.

## 5.3 Limitations and Further Research

Like any research, this one must be considered with some limitations. Single-case studies, while often



rich in detail and context, are typically less generalizable than larger samples; hence, further research might consider multiple-case studies for achieving greater validation. The present papers focus on one bank, other cases from other industries might significantly differ. In addition, quantitative research approaches can help to further extend and validate our model. Furthermore, the proposed synthesis reflects the findings from a single organization that has recently transitioned to VSM. This may not fully capture the long-term implications of this approach, as this case may not accurately represent the full potential of VSM in software delivery. Future research should include more cases to provide more insights into such long-term effects.

## 6. Conclusions

In this research, we aimed to identify how VSM can be leveraged to achieve operational alignment between business and IT in software development. The study proposes an alignment model, which addresses three key principles: (1) Seek Value, (2) Foster Transparency, and (3) Enable Proximity, each containing several distinct, actionable alignment dimensions.

First, designated business and IT roles must collaborate to identify and prioritize value. They must unite all members of a product-oriented team around this shared value proposition. Second, it is critical to strive for transparency at all levels – organizational, value stream, and product team. In this way, all stakeholders beyond the product delivery team can understand the driving forces behind the company's tasks, such as work-in-progress. Finally, providing Biz and Dev with common IT collaboration tools and physical office workspaces is essential to ensure a seamless flow of artifacts and information throughout the value stream.

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