

OPERATIONALIZING A MARKET IN TRANSIT

**HOW MULTIPLE ACCOUNTING CALCULATIONS MEDIATE
MULTIPLE RATIONALES OF THE MARKET**

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Operationalizing a Market in Transit: How Multiple Accounting Calculations Mediate Multiple Rationales of the Market

Abstract

This thesis aims to understand how accounting calculations are used to operationalize the market in an intra-organizational value chain. Building on a case study, TransportCo is followed in its efforts to go from a stable market towards meeting a new uncertain market. By using the concept of mediating instruments (Miller & O’Leary, 2007), we focus on the accounting calculations used by the respective functions in the value chain and, specifically, their ability to mediate a market rationale of the uncertain future for the dispersed actors. The study finds that various accounting calculations were used by the different functions in TransportCo and analyzes how these mediate different rationales of the market. The different rationales create tensions not only between the different functions but also within due to the use of multiple calculations in some. In efforts to reduce the tensions, interactive forums are used to increase alignment in the value chain. The study contributes to the literature on mediating instruments by showing that multiple calculations can simultaneously mediate different rationales of the market within an organization’s value chain. Additionally, it contributes to the literature on the interface between accounting and marketing by showing how accounting calculations can be used to mediate rationales of the market and guide functions towards practices on how they can create value for their customers and hence the market.

Keywords:

Customer Accounting, Customer Costing, Market Orientation, Customer Orientation, Mediating Instruments

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1. Introduction

Over the last decade, an increased understanding of environmental matters has significantly influenced every industry. Today, terms like global warming and pollution are widely recognized, indicating the increased visibility of these phenomena compared to what has been the case from a historical perspective. With an enhanced awareness of the potential problems and realizing that action is imperative, governments have been forced to implement substantial regulations. In 2015, the Paris Agreement was signed by 194 parties and is a significant milestone in addressing these issues (UNFCCC, 2023). One of the critical decisions was a commitment to limit the increase in global average temperature to well below 2 degrees Celsius above pre-industrial levels. The increased awareness of environmental concerns and stricter government regulations have forced many sectors to reflect on existing business models. Many industries are already undergoing a strategic shift towards more sustainable practices. The transport industry, which plays a significant role in the current global supply chain and has a business model that has historically contributed to many emissions, currently finds itself in the midst of this transformation (McKinsey, 2023).

In the transformation process, the transport industry has been forced to devote large focus and resources to research and development. This to find new alternative solutions to their existing business model to meet increased requirements from external parties. This creates a tough prioritization for incumbent firms, where existing business is challenged against new ones. Trying to enter a new market and leaving an existing business is never a secure choice and could result in a company losing all its business. The issue is not as apparent for new companies entering the new market as they do not have an existing business to consider (Henderson & Clark, 1990). This leads to new companies entering a new market being much more risk-willing, making them move faster. The issue incumbent firms face is balancing the act between trying to improve and take care of existing business while simultaneously searching for new alternatives, as described in the Explore-Exploit Dilemma (Atuahene-Gima, 2005). This helps explain firms' dilemma of exploiting existing business while exploring new opportunities to stay competitive.

In a company's effort to stay competitive and decide what strategic choices should be taken, their understanding of the market plays a vital role. By better understanding the market, it is possible to make more informed decisions (Narver & Slater, 1990). This is challenging for companies undergoing a strategic shift, as there is a need to understand the existing market while also trying to understand a future market that is often uncertain. As suggested in the marketing literature, there are various discussions about how to understand better and meet the market. Meeting the market, the literature suggests, is about understanding what creates as significant value for customers as possible. Narver and Slater (1990) have written a fundamental work in this scope and wrote that Market

Orientation is a term that describes an organization's efforts to understand what customers demand and how this is something they can derive value from. For an organization to stay market oriented, the two authors suggest that an organization needs to stay customer oriented, competitor oriented, and have interfunctional coordination in place. This means delivering value to customers is only possible if there is an understanding of customers and competitors and the organization organizes itself around the information to create value for its customers. This suggests that market orientation helps describe how various practices can help better understand the market so that it is possible to create as considerable value for customers as possible (Narver & Slater, 1990).

Applied to accounting, the links to market orientation and understanding the market have not been widely studied. Despite accounting having a vital role in organizational decision-making, there has not been much written concerning how accounting tools are used in the efforts to achieve a market orientation. Accounting is, however, conceived to be an efficient way to operationalize an organization to provide structure and a basis for decision-making. To bring the market into the organization, different accounting methods have been developed to measure the profitability of the firm's customers (Guilding & McManus, 2002). This can then work as a decision ground for where to allocate resources or, rightfully, your investment in the relationship with that specific customer. Several costing methods that try to break down what is value creating for the customer have been developed, trying to make the abstract more tangible by quantifying it or dividing it into something less abstract. However, the process for bringing in the customer needs and how this is done in practice still needs to be studied. Vaivio (1999) is an example that shows what happens inside a firm that creates a more quantified understanding of the customer but that this meets resistance.

With the fast pace and changing dynamics of today's markets, firms must know their customers; hence, the market becomes ever more important. Operating in a strategic shift, it becomes essential to have the entire firm aligned toward the same goal. How does a firm bring the customer into their organization, and how have they organized themselves around the market? From prior studies, no clear answer can be found about how the market is operationalized within a firm. Hence, this study addresses the following question:

Research question:

How is the market operationalized within an intra-organizational value chain?

The research question for this study will be answered by conducting a single company case study at an international transport manufacturer (TransportCo) that a couple of years ago decided to take the step to enter the market for battery electric vehicles (NewTech). TransportCo has historically operated in a stable market for vehicles driven by internal combustion engines (OldTech). The study was conducted during a period when the

company has heavily invested in new technology. Like many of its competitors, they are now delivering its newly developed products to the market. Even though significant efforts have been made in the organization regarding the transformation, there are still uncertainties regarding how the market will develop and react concerning the new business line. The focus of this thesis is to describe how the various parts of the value chain at TransportCo use accounting calculations to create an understanding of the new market in which they operate.

We show how several accounting calculations simultaneously mediate multiple rationales of the market in an intra-organizational value chain. Thereby we contribute not only to the field of studies on mediating instruments but also to the field of studies about the interface between marketing and accounting. The different rationales of the market create tensions both between the functions but also within functions due to the multiple uses. These tensions are, to some extent, reduced by efforts of interfunctional coordination in the different cross-functional forums that TransportCo has initiated to align the value chain.

This study is divided into six parts, including an introduction. The following section helps explain the literature domain on which the study will be based. This section includes the method theory, from which the study findings will be analyzed later. In the third section, the method that has been used to conduct the study will be outlined. In the fourth section, the empirical analysis is performed, starting with a more in-depth sector and case background, followed by an empirical analysis. The fifth section aims to analyze the empirical material by applying the method theory, and the sixth section consists of conclusions, contributions, and suggestions for further research in this area.

2. Literature Review

2.1. Market Orientation

Market Orientation (MO) stems from the marketing literature that describes the importance of better understanding customer needs when making organizational decisions. Marketing literature has provided various definitions of MO, where the researchers Kohli & Jaworski (1990) and Narver & Slater (1990) are classified as pioneering works in the field. Narver and Slater's (1990) definition is the most widely used definition that defines MO as a basis for marketing and strategic planning and orienting a company toward creating and delivering superior customer value. There are variety of studies suggesting a positive relationship between MO and financial performance (e.g., Kirca, Jayachandran, & Bearden, 2005; Y.-K. Lee et al., 2015; Slater & Narver, 1994; Wang, Chen, & Chen, 2012). This relationship is explained by a higher level of MO, creating a higher commitment to create more customer value (Narver, Slater, & MacLachlan, 2004; Slater & Narver, 2000). Narver and Slater (1990) state that MO combines three components: Customer orientation, Competitor orientation, and Interfunctional coordination. Market oriented organizations can deliver increased financial performance by learning about customers' expressed and latent needs, competitors' capabilities, and strategies and continuously sharing this knowledge through a better coordinated organization (Slater & Narver, 1998). With a better MO in place, there is an increased possibility of creating and offering new products to customers to meet existing and future needs (Cillo et al., 2010; Katila & Ahuja, 2002). Narver and Slater (1990) further distinguish between two so-called "decision criteria," namely, having a long-term evaluation horizon and profit focus. With a long-term focus, they mean that decision-making should be based on a long-term perspective, and with profit, they suggest that the rational view of an organization should be to maximize profit. For an organization to maximize long-term profitability, it is essential to have a sustainable competitive advantage, something that is created by having a market orientation in place. In brief, MO enables companies to keep current customers while simultaneously creating new customers and markets, something that can ensure profitability and stable market share over a long time horizon.

The Three Components of Market Orientation

Customer orientation can be translated into understanding the customer's wants and needs to create value for them continuously. Creating customer value increases the chance of creating a competitive advantage, ultimately driving profitability (Porter, 1985; Aaker, 1992). Day and Wensley (1988) argue that a seller needs to understand the entire value chain of the buyer, not only the current but also how it will evolve about the external and internal dynamics of the customer. Also, Kohli and Jaworski (1990) agree on this and state that customer value is created only if there is an understanding of what the customer

wants and needs, which is made available by listening to customers and having a close relationship with them. What customer value means is difficult to tell as it has a subjective element. However, the provision of Product attributes, such as (functions, features, and benefits) are important to consider when delivering customer value. Products that better satisfy the needs of their customers or reduce their acquisition costs and costs of using a product can create more customer value (Porter, 1985; Forbis & Mehta, 1981; Day & Wensley, 1988). Narver and Slater (1990) emphasize the need for companies to understand their customers' revenue and cost dynamics and, hence, have relationships with the customers to learn and provide the required attributes. The type of product attributes that create customer value is a combination of objective measures, such as physical product components, and more intangible ones, such as brand and prestige. Providing the product attributes that customers demand and that can create customer value will be reflected in the supplier's product cost and how profitable the business will be (Lindgreen & Wynstra, 2005; Ulaga & Chacour, 2001).

Competitor orientation relates to the knowledge of short-term strengths, weaknesses, and the long-term capabilities and strategies of current and future key competitors. This is linked to customer orientation, and creating superior value for customers depends on a broad understanding of their competitors' capabilities and costs to deliver similar products (Aaker, 1988; Day & Wensley, 1988; Porter, 1980; 1985). However, Levitt (1960) argues that this analysis needs to include all the technologies and capabilities that the existing and future competitor possesses to satisfy the needs of its current and future customers. Narver and Slater (1990) and the marketing domain emphasize the competitor orientation less than the customer orientation in general.

Interfunctional coordination is the united use of the organization's resources to create superior customer value. Every individual point in the customer value chain is an opportunity for the organization to create value. Hence, everyone in the organization can contribute to customer value creation (Porter, 1985). The organization must effectively integrate and enable its human and capital resources to be adaptive to create superior value. These efforts require the entire organization to be included, not just stand-alone functions (Webster, 1988). A coordinated unification of an organization's resources to create value is rooted in the knowledge regarding customers and competitors. Given this complexity of value creation, interdependencies between the various functions must be managed by incentives and collaboration and included in the firm's strategy (Wind & Robertson, 1983). Webster (1988) writes the analogy that creating value for a customer is synonymous with a symphonic orchestra being organized by a conductor and, in the end, becoming more significant than the sum of its parts by synergetic effects. Lafferty and Hult (2001) confirm this and suggest that interfunctional coordination works as the "unifying principle" where the information about customers and competitors is fully understood, impacting how the organization is governed. With better interfunctional

coordination, there will be fewer apparent barriers between different functions, enabling a significantly better opportunity to create customer value (Clark, Toms, & Green, 2014).

2.2. Customer Accounting Practices

While the literature about market orientation has had the most impact within the marketing domain, it has increased in importance within the accounting field. Since its introduction in the 1990s, market orientation has become more popular to study, impacting the management accounting literature (Helgesen, 2007). Several articles try to widen the focus of management accounting, bringing the market into the firm. Seminal papers like Kaplan and Norton (1996, 2000, 2001) and Roslender & Hart (2003) try to widen the strategic usage of management accounting from the traditional financial objective. In their papers, the customer and the market receive increasing importance. Efforts to operationalize this in the company are done by measuring the customer using non-financial measures (Kaplan & Norton, 1996, 2000, 2001) and using different strategic management accounting techniques (Roslender & Hart, 2003). Both efforts use marketing insights to help firms navigate the dynamic business landscape.

The increasing focus on trying to set calculable values for the customer has further been studied by Guilding and McManus (2002), who reviewed different customer accounting methods. Their study looked at the relationship between the usage of several identified customer accounting methods and market orientation. These accounting techniques focus on different ways to assess customers' profitability with which organizations can have relationships. That is, namely, 1. Customer Profitability Analysis, 2. Customer Segment Profitability Analysis, 3. Lifetime Customer Profitability Analysis, 4. Customer Valuation Analysis (Guilding & McManus, 2002).

Customer Profitability Analysis is a method that compares the share of different customers' value added to the company's overall profit. In this method, a company performs Activity-based costing to allocate overhead costs to customers. Based on the resources and activities that different customers consume from the company, e.g., sales volume. This is done to better capture cost causality to the specific customers, which is not covered in traditional costing methods (Kaplan & Cooper, 1998). The Customer Segment Profitability Analysis method is the same as the Customer Profitability Analysis but done on a segment level instead of individual customers. The segmentation is often based on geography or technical distinction (Guilding & McManus, 2002; Cooper & Kaplan, 1991). Cooper and Kaplan (1991) also study the Lifetime Customer Profitability Analysis, where the lifetime revenue and costs for a customer are estimated, including the future affairs and not just the current when calculating the customer's profit. Lastly, Guilding and McManus (2002) identify the Customer Valuation Analysis, where a company treats the customer as an asset. In contrast to the other methods, this moves away from pure accounting values and instead makes a present value calculation of the

customer based on the future cash flows that the customer will generate (Pfeifer et al., 2005). Guilding and McManus (2002) added a fifth, more holistic notion of customer accounting, which included “all accounting practices directed towards appraising profit, sales, or present value of earning relating to a customer or group of customers” to their study.

Guilding and McManus's (2002) study identified that market orientation positively impacts the usage of three of the customer accounting techniques, namely Lifetime Customer Profitability Analysis, Customer Valuation Analysis, and the fifth holistic notion, “customer accounting.” This further adds to the previous literature about market orientation and performance measures, such as profitability, growth in sales, and low customer retention (Day, 1994; Narver & Slater, 1990; Slater & Narver, 1994). It is further proposed that the relationship between high performance and high market orientation can affect the positive relationship between Customer accounting and Market orientation (Guilding & McManus, 2002).

However, despite being customer oriented, the measures that Guilding and McManus (2002) identify are not focused on how a company can create value for the customer but rather on how to calculate the customer's profitability to have a basis for where to allocate the company's resources. However, a few other studies have further studied the link between specific management accounting calculations and how these are used to create more value for the customer and stay market oriented. Inglis (2008) studies several accounting and costing techniques that firms can use to become market oriented and operationalize the customer to create value. By value, Inglis (2008) means an organization's ability must provide product attributes, i.e. (features, benefits, or characteristics) that customers derive utility from and ultimately are willing to pay for. By creating a framework based on Narver and Slater's (1990) definition of market orientation i.e. (Customer orientation, competitor orientation, and interfunctional coordination), Inglis (2008) identifies how various management accounting techniques are used in providing information about a firm's costs of meeting customer needs and competitor's costs to satisfy the same customer needs. The techniques discussed in Inglis (2008) are considered “Market oriented” by nature as they help provide an organizational-wide view of how costs are taken into consideration in creating value for customers. It is not an exhaustive list, but it could be seen as a summary of a few costing methods used to take the customer into account.

Customer Orientation

Several costing techniques try to incorporate the usage of different product attribute needs. Lancaster (1979) argues that the value a customer can derive is based on the attributes a product consists of, and hence, focusing on attributes is a way to differentiate a product. Based on this, Bromwich (1990;1991;1992) developed so-called attribute-

based costing, which views the product's attributes, price, and costs from an economic perspective. The approach argues that the ultimate cost drivers in the products are the attributes they try to meet. Attributes can be tangible and intangible, e.g., reputation, image, and response time to customer queries. Hence, the model attempts to move the costing away from organizational activities like activity-based costing and instead allocate costs to the value-creating attributes for the customers (Bromwich & Bhimani, 1994). Products are seen to be bundles of attributes. Like the value for money principle, Bromwich (1991) sees efficient products as the ones that can bundle as many desirable attributes as possible for the cost the customer is willing to pay. Despite the market oriented focus, attribute-based costing has received limited real-life applications (Cravens & Guilding, 2001).

Functional cost analysis moves the focus from the softer attributes that Bromwich (1991) identified as cost drivers to the functionality of the products. The functionality should be expressed as a noun, e.g., a pen can be divided into the primary function to “make a mark,” with secondary operations such as “flow ink,” “store ink,” and “hold the pen.” These functions become the focus of the costing and provide an abstraction of what creates value for customers in the product, facilitating a cost-effective design while still reflecting the needs of the customer. The products become disconnected from the resource inputs and physical parts, but the functionalities stimulate innovation and cost-effectiveness in offering products to the market. Determining whether product functions should be developed is related to the market's value, the functionality, and the costs it takes to create it. (Yoshikawa et al., 1995).

Whole-life costing is a method where all the costs from the customer's point of view are included. The acquisition, e.g., (installation cost and price of purchase) and the cost of ownership, e.g., (repair, maintenance, and disposal costs) should be considered. Whole-life costing includes all the costs related to buying and owning the product for the customer (Shields & Young, 1991).

In performing target costing, it is suggested that there is a need for interdisciplinary teamwork between marketing and accounting functions, identifying and mapping the customer's needs and the firm's costs of fulfilling those needs (Shillito & De Marle, 1992). Kato (1993) describes target costing in a simplified way, where the targeted cost is the expected sales price subtracted by the target profit, where the target derives from commitment, as in not to be updated. Hence, the expected sales price is the basis for the calculation, where aspects such as long-term expected market price and sales volume must be considered. Additionally, Kato (1993) emphasizes that to estimate the sales price efficiently, competitors and their products must be assessed by the firm's employees. In the case of developments on existing products, the previous product works as a reference point for the costing information (Kato, 1993).

Competitor Orientation

For the second component of market orientation, Inglis (2008) suggests that Bromwich's (1990) suggestions about attribute costing can also be applied in a competitor context. With this method, the focus is on understanding cost structures, not only in the individual business but also in the whole market. Also, target costing, Kato (1993) is discussed as a competitor oriented accounting method showing that competitors' costs are of vast importance in setting the target cost.

Interfunctional Coordination

According to Narver and Slater (1990), interfunctional coordination is the most critical aspect of an organization's market orientation efforts. Several management accounting techniques emphasize that information sharing is central to establishing a competitive position. For example, the use of target costing, whole-life costing, and attribute costing all emphasize interdisciplinary work in between roles and functions to create value for the customer (Kato, 1993; Shields & Young, 1991; Bromwich, 1991), something that can be related to Porter (1985) when he argues for strategic competitive advantage and value chain analysis.

In addition to what Inglis (2008) has identified, another accounting technique that has gained importance over the last years is open book accounting. Alenius et al. (2015) describe open book accounting as a tool to manage interdependencies over organizational boundaries in an inter-organizational value chain. This accounting tool describes information sharing in a buyer and supplier relationship, both financial and non-financial (Mouritsen et al., 2001). Kajüter and Kulmala (2010) state that sharing and disclosing data on costs with the counterpart is central to open book accounting. It is an example of how organizations try to organize themselves and use accounting to become more efficient and coordinate inter-organizationally to create value for the customer.

2.3.Accounting for the Customer in Practice

2.3.1.Customer Relationships

Various attempts have been made to study the market and how this should be operationalized in the company through different accounting forms. In many cases, the focus has been on the relationship between customers and suppliers in different organizations, where some have studied the internal perspective and in markets where product development has not been crucial. Kraus and Strömsten (2016) study power's role in the relationships between customer and supplier in the telecom industry and the evolution of inter- and intra-organizational controls. The telecom industry is characterized by few and large customers, signaling that power is essential to achieve change in relationships. Kraus and Strömsten (2016) show that multiple signaling types

of power can be in a relationship between a supplier and a customer. In their case, the customer acknowledged their strong negotiation position, which resulted in the supplier reorganizing their entire R&D organization and their activities. The relationship led to changes in both the inter-firm control and, eventually, the internal control of the supplier with an increased focus on financial control to adhere to the customers' needs. Hence, taking the customer into account and understanding their needs may lead to re-organizational activities in your firm, which shows the difficulties and complexities that organizations may face when trying to meet the market.

Alenius et al. (2015) have also studied relationships with customers in a supplier network and the role that open book accounting plays in coordinating activities between the actors (i.e., supplier and customer). They identify that using open-book accounting with some suppliers affects not only the relationships with direct suppliers but also the relationships with other suppliers. Accounting was used to identify possibilities and visualize them to improve the activities and resource combination in organizations in their inter-organization relationship. Despite being in an inter-organizational context, this study shows the importance of accounting calculations in organizing a value chain and creating value for themselves and the customer.

Carlsson-Wall, Kraus, and Lind (2009) look at target costing and how it influences decisions concerning technical and organizational interfaces in developing industrial robots. The identified development projects had interactions between the technical, organizational, and financial parts of the company, where different logics for the respective guided the actors. Target costing guided the company to pragmatic decisions through its financial logic, turning down well-developed solutions that were too expensive. The financial reasoning captured by target costing took the customer and market into account in relating the functions of the products to the costs of product development. Target costing was identified to help the company in several ways in its product development efforts. Both, as a discipline mechanism to ease planning and evaluation, as well as target costing, led to a focus on solving problems, arriving at a consensus for prioritizations in the project, and knowledge integration across company borders.

Lind and Strömsten (2006) studied the use of different financial measures of customers, with the basis in customer accounting techniques identified by (Guilding & McManus, 2002). They develop a framework where different customer relationships can be related to measuring the customers with different financial measures. Their study develops a framework that describes different inter-organizational relationships between a customer and supplier to various customer profitability measures. They show how the two case companies use different profitability measures to make sense of the resources they allocate to the different customers, based on how integrative the relationships with the customers are on a technical and organizational level. Hence, they show how firms use

different accounting methods to make sense of their relationship with different customers, where larger investments are measured over a longer period and sometimes even include the potential to be beneficial for other customers to make sense of the R&D investment directed to one customer at the time.

2.3.2. Organizational Tensions

Another study that looks deeper into how to account for the customer is Vaivio (1999). The study builds on existing literature on management accounting efforts of moving beyond financial measures to include non-financial ones to bring the customer closer to the operations. In the study, the customer is seen in more quantified terms, where non-financial numbers are given a quantified meaning. Although transforming the customer into a more calculable space is suggested to be a modern and improved way of “managing by numbers,” it is suggested that it should be done with thorough consideration as it could lead to potential problems. Describing the customer in a more quantified way makes it more objective, opening for better visibility across segments and dimensions of performance. However, this makes interventions more sharply focused on the root causes of operational instances, something which is likely to impact relations between different actors. As suggested in the case study, the quantification of the customer met a lot of resistance built on local knowledge that already existed in the other functions. This resistance took tacit form in the first stage, but as soon as it entered the territory of rival organizational expertise, it was externalized. Therefore, the quantified understanding of the customer created tensions in the organization. Vaivio (1999) explains that resistance was a reaction to the difficulty in quantifying non-financial measures and that it tends to make organizational processes more standardized than they are.

Related to the different tensions and views that emerge in a value chain in developing new products, Carlsson-Wall et al. (2021) show the enabling factors that management control systems (MCS) have in new product development. They further discuss the complexity that the use of MCS leads to in new product development; having many MCSs not only enables many different decision points but also creates the need for prioritization. Their study views the MCSs and how prioritization is made concerning them. Additionally, the study shows how product development forums, in a dominant way, help reduce barriers between individual projects and help managers assess the portfolio of projects. The forums discuss information from several MCS perspectives (e.g., market specification requirements and technical specification), and the managers make the decisions together. The study addresses the interfunctional coordination in an organization through the focus on product development forums and calls for additional research on “observations of discussions and debates in empirical settings like the ‘robotics PDF,’” which they argue can improve an understanding of management control practices in complex new product development activities.

2.4. Research Gap

From the marketing literature, it is evident that firms with a higher market orientation are more profitable as they are more adapted to their market and able to deliver what their customers demand (Narver & Slater, 1990). In an organization's efforts to stay market oriented, structures and processes have been identified as efficient tools. Therefore, the management accounting literature has also started to focus more on the customer in strategy and control practices to a more significant extent than before (Kaplan and Norton, 1996, 2000, 2001; Roslender & Hart, 2003). Guilding and McManus (2002) find that firms that use different customer accounting techniques are more likely to be market oriented. This was evaluated by looking at how firms related profitability to their customers and not by looking at what their customers demanded. However, Inglis (2008) categorizes several accounting techniques that are argued to improve an organization's value creation to customers, describing how an organization can operationalize the customer in the firm.

The above studies have studied and categorized different accounting techniques but have put less emphasis on how they are used in practice. However, several studies have looked at how firms handle customer relationships across an inter-organizational value chain (Kraus & Strömsten, 2016; Alenius et al., 2015; Carlsson-Wall et al., 2009; Lind & Strömsten, 2006) and hence how they try to work more collaboratively with customers to organize the organization more efficiently. In several of these studies, tensions emerge between different functions (Carlsson-Wall et al., 2009) when prioritization is based on specific management accounting tools providing different logic. Previous studies also show how relationships with customers can cause organizations to alter their inter- and intra-organization activities to meet customer demands (Kraus & Strömsten, 2016). However, only a few have identified what happens inside a firm when trying to organize themselves to create the most value for their customers. For example, Carlsson-Wall et al. (2021) describe how the intra-organizational context of collaboration around new product development helped align different interests. In addition, Vaivio (1999) studies how the customer is operationalized within the company, seeing it in more quantified terms, and that this results in tensions.

Hence, accounting techniques play a fundamental role in an organization's efforts to operationalize the customer in an organization. Therefore, this study addresses how different accounting calculations are used in an intra-organizational value chain to create an understanding of the market they operate in. In these efforts, both customers and competitors are taken into consideration. Additionally, based on intra-organizational coordination, it becomes essential to study how the understanding of the market is coordinated within the company to create the most value for customers and the market. To analyze this, the theoretical concept of mediating instruments (Miller & O'Leary, 2007) will be used. This is a helpful tool as it helps the authors understand how different

accounting tools help mediate an understanding of an unknown future. When a new market emerges, it is central to understand the customer to stay relevant. This study aims to understand how this is done in practice, what techniques and processes are used, and what happens across an intra-organizational value chain when the customer is operationalized.

2.5.Theoretical Framework: Accounting Calculations as a Mediating Instrument

Introduction to Mediating Instruments

To describe the linkages between specific accounting calculations and how these enable an understanding of the market in the functions of the case company, the theory of mediating instruments suggested by Miller and O’Leary (2007) will be used. The authors suggest that a mediating instrument is a tool used to connect and mediate a link between different domains and actors, enabling certain trajectories to be possible and desirable. A mediating instrument can create a common analogy or point of reference that actors can act by (Callon, 1998; Miller & O’Leary, 2007). By studying capital budgeting decisions in the semiconductor business, Miller and O’Leary (2007) suggested that “Moore’s law” and a technology roadmap were considered mediating instruments as these created a common ground on which decisions could be based. Moore’s law was an idea that helped link together scientific and economic considerations, something that future decisions could be based on. The technological roadmap operationalized these ideas and was used as a tool to create a standard for evaluating certain investment decisions for the different actors in the industry. The technological roadmap made it possible for organizations in the industry to envision an abstract understanding of their industry’s future, plan for future investments, and have something to act upon in their decision-making processes. Applied to this case study, mediating instruments can help analyze how the choice and use of specific accounting calculations can mediate an understanding of the market and how this impacts decision-making in the organization.

Accounting Tools as Mediating Instruments

From previous studies about mediating instruments, it can be concluded that they are used as an instrument to facilitate a better understanding of something abstract into something more concrete. What can also be identified is that a mediating instrument can be anything from a management control practice (Kurunmäki & Miller, 2011) to an accounting calculation (Christner & Strömsten, 2015). Therefore, understanding the specific instrument and what it helps mediate can differ depending on the company and context. For example, Jeacle and Carter (2012) have studied how certain accounting practices have been used to mediate a link between creativity and commercial orientation in the fashion industry. More precisely, they find that the use of budgeting, WSSI, and a cost card were tools that made it possible to link the creative with the commercial aspects of the

organization. Using Miller and O’Leary’s (2007) way of phrasing the mediation that the accounting tools made possible, they wrote that they were able to “translate the simplified imperative” of fashion “into a framework that could guide and encourage.” Another study written about accounting tools in the context of mediating instruments is Maier (2017), who studied the TV series production business and showed how accounting tools in the form of a budgeting process can have a mediating effect. The study identifies how the use of a budgeting process can have a mediating role in linking the creative ambitions of scripts with the financial limits of a project. In more depth, they show how budgeting is tightly intertwined with processes where project leaders collectively prioritize what they consider most important. In this, budgeting becomes a central tool used to prioritize and align the organization to ensure projects are done on time and within budget.

A third study that looked at mediating instruments in an accounting setting is Christner and Strömsten (2015), who studied the role of accounting in developing a biotech innovation called pyrosequencing technology. The study identifies how accounting calculations were necessary for the company’s phases and how these helped shape development trajectories by connecting and mediating between discrete domains and dispersed actors. For example, using a market share calculation connected the scientific and economic domains in the first phase, helping set economic value for a scientific phenomenon. In the last phase, a discounted cash flow calculation enabled the organization to mediate a link to the external market, addressing analysts and investors with ideas of stock exchange. In conclusion, Christner and Strömsten (2015) argue that calculations are primarily interesting due to their connections and linkages rather than the calculation itself. In all, previous studies suggest that various accounting tools can play a key role as these can mediate between different actors while at the same time governing the actors by realizing the ideas that they envision.

An Effort to Widen the Concept of Mediating Instruments

Whereas Miller and O’Leary (2007) studied how a technology roadmap and Moore’s law could act as a mediating instrument, it does not describe how mediation is maintained in detail. However, Jordan et al. (2013) conducted a study about how using a risk map can act as a mediating instrument in that it can help an organization in its efforts to act by and be governed by risk management in projects. Like other studies on the mediating link of accounting, the reality where actors act with risk management in mind is an understanding created (mediated) using a risk map. For the case organization, the risk map thus becomes a tool (mediating instrument) in which actors can create an understanding of the future where risk management has a fundamental role. Without the mediating instrument in place, the organization would be unable to have the same understanding of risk management, which would significantly impact the decisions they make.

In Jordan et al. (2013) study, it is identified that a mediating process occurs by a mediating instrument’s ability to mediate different rationales and ability to guide actors towards

different practices, which is made possible by certain characteristics that the instrument possesses. A mediating instrument can mediate and create linkages between different actors and domains by focusing on these three systems. Applied to the case study that Jordan et al. (2013) conducted, the risk map is suggested to mediate different rationales for the actors, where its usage works as a reassurance and aligning instrument. By using the risk map, individual actors are assured to be free of blame, where an identity and alignment within the project group is formed. This enables projects to move forward despite that obvious risks are apparent. In addition, the risk map allows a better understanding of certain practices used to guide actors and help them identify potential risks in the projects. Breaking down various practices makes it more concrete, which helps guide actors and identify potential risks in projects. Lastly, Jordan et al. (2013) analyze mediating instruments based on their characteristics, e.g., how aspects are illustrated and made comparable. For example, the risk map in the case was made with various diagrams and figures, enabling its actors to understand it and draw conclusions from it more easily. Various characteristics of the mediating instrument enabled comparison and linkages between different actors, which ensured the mediating instrument's mediating role. In all, the three different components suggested in Jordan et al.'s (2013) study help categorize the mediating process that occurs using a mediating instrument more simply. It helps break down the instrument's rationales, what practices actors should act upon, and what characteristics the instrument possesses that enable its mediating effect.

Mediating Instrument Applied to this Case Study

Analyzing the case of TransportCo using the method theory of mediating instruments works as a platform to help explain what processes happen in the case organization. Like Christner and Strömsten's (2015) study, this case will look at mediating instruments in terms of multiple accounting calculations. By looking deeper at various calculations used in the organization, it will be possible to identify their purpose and how they mediate an understanding of the market for their respective actors. Based on the analytical breakdown of mediating instruments suggested by Jordan et al. (2013), this study aims to study how various parts of an organization mediate an understanding of the market using various accounting calculations. What characteristics does the calculation possess, what practices can be related to it, and what rationales regarding the market are mediated by the calculations (Jordan et al., 2013). In the analysis of this study, the concept of mediating instruments will be helpful as it helps create an understanding of accounting from its mediating effect and ability to bring together actors and domains that are otherwise dispersed. Additionally, it enables an analysis of accounting from its governing and enabling role, turning attention towards how accounting can be used to create a rationale of the market for different actors across an intra-organizational value chain. Hence, the use of mediating instruments makes it possible to see how accounting calculations are

used to understand a changing market across an intra-organizational value chain, which makes it possible to answer the research question.

Research question:

How is the market operationalized within an intra-organizational value chain?

3. Method

3.1. Research Design

A qualitative single case study of TransportCo has been conducted to answer the research question. The case company, TransportCo, was chosen since they are an incumbent undergoing a strategic shift. Having historically operated as a successful player in a stable market, they now face a new uncertain market due to an industry-wide transition. TransportCo operates in an interesting setting to understand how an organization and the various functions across its intra-functional value chain work to operationalize the new market in the company. The qualitative method was chosen as it allows for nuances and in-depth explanations of the studied phenomenon to emerge (Ahrens & Chapman, 2005). Furthermore, the method theory of mediating instruments (Miller & O’Leary, 2007) is appropriate as it enables an understanding of how accounting calculations can create links between discrete domains and actors. In the case study, the abstract idea of the customer can be linked to the economy for the dispersed actors within the intra-organizational value chain. Maintaining the study in a close engagement with the field studied qualitatively, rather than having an objective distance, is favored (Ahrens & Chapman, 2005). Hence, interviews with actors with various roles throughout the value chain were conducted to observe the field. Additionally, the study has interacted with actors involved in the functions of TransportCo that are responsible for the development of NewTech, which aligns with Hastrup's (1997) suggestions about “the contact zone.”

The study adopts an interpretive research approach that enables perspectives and social theories that embrace a view of the perceived reality through actors’ socially constructed or otherwise made meaningful understanding of events. Hence, the interpretivist approach to meanings and interpreting actors’ experiences and understandings (Putnam & Banghart, 2017). Additionally, the interpretive approach allows authors to obtain an emic understanding of the experienced events (Lukka & Modell, 2010). The study applies a subclass of the explanatory interpretative approach called abductive mode reasoning. The abductive research approach supports an iterative approach to the development of theory, empirics, discussion, and the research question (Lukka & Modell, 2017).

A single case study was deemed appropriate because it allows for an in-depth analysis and nuances, which was necessary to completely understand how the market is operationalized within an intra-organizational value chain. Furthermore, Eisenhardt (1989) points out that case studies are specifically appropriate to new areas of research where existing theory seems insufficient. As the role of management accounting in practice and the market is unstudied, it is to be considered original, making it a convenient method to choose. Additionally, the single case study is commonly preferred in most research on firms trying to operationalize the customer into the company (Inglis, 2008).

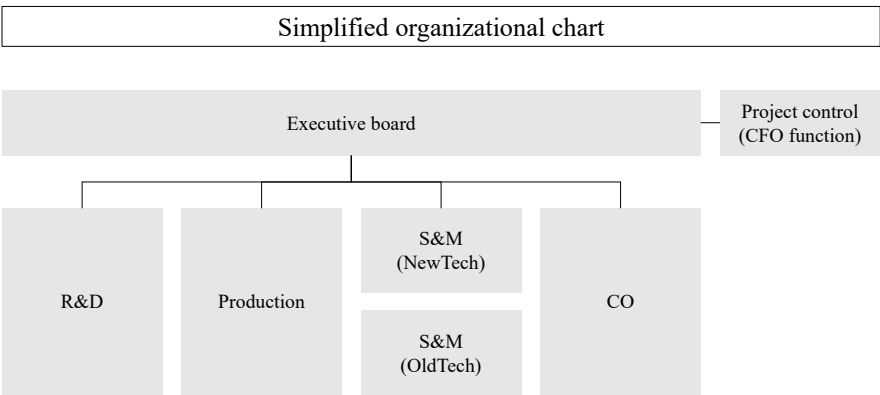
Additionally, it is a point to use a single case study to increase comparability with previous studies on how the market is operationalized within the company (Inglis, 2008). In studies with similar subjects, it is common to administer a longitudinal study (Simons & Davila, 2020). Due to the time constraint of conducting a master's thesis, it is not possible in this case. Instead, longer-term aspects were acquired from the answers and recollections of the interviewees and supported by secondary data.

To study the subject, the use of different accounting calculations in the functions of TransportCo has been studied. For this, the theoretical concept of mediating instruments has been used (Miller & O’Leary, 2007) to understand how different accounting calculations work as mediating instruments, mediating an understanding of the future market in the other functions in TransportCo. To adhere to previous studies about mediating instruments (e.g., Christner & Strömsten, 2015; Jordan et al., 2013), interviews with actors are a proper way to understand how different accounting forms can be mediating. The case consists of interviewees from other functions to be able to create an understanding of how the different actors mediate their views (Christner & Strömsten, 2015).

3.2.Data Collection

The data gathered consists of semi-structured interviews with employees at TransportCo, collected between October and November 2023. In the first stage, the organizational structure was assessed (see picture A) to identify what parts of the organizational value chain were suitable for the study.

Picture A



Semi-structured interviews were chosen to allow for flexibility and modification of the prepared questions. Flexibility was deemed crucial as the single case study approach seldom follows a linear path (Langley, 1999). One example of the need for flexibility was that it became apparent that the project control function had a key role once a few interviews had been conducted. This made us add them to the study. The semi-structured format also allowed for noticing feelings and subtle actions, such as tonal changes. To get a legitimate understanding of the interviewees' perspectives, follow-up questions were also asked regularly. Each interview began with the interviewees being asked to describe their current role and who they reported to. This was done to create an overall understanding of where they operated in the organization. Interviews were conducted with interviewees in various parts of the value chain at TransportCo. Thus, some adaptations to questions were considered appropriate to understand how the market is operationalized within an intra-organizational value chain but may have some effect on the comparability among the interviewees. However, Myers (2008) argues that questions should amend the present status of the analysis, which made it possible to update questions based on new knowledge learned during interviews or the function of the interviewee. Despite this, the questions were framed to assert how the interviewees try to understand the customer and the market in their part in the value chain. At the beginning of each interview, anonymization of the respondents and case company was explicitly communicated to receive honest answers.

In total, 20 employees at TransportCo were interviewed (See table A). The interviewees covered the whole value chain at TransportCo, with operations and controllers at each level and supporting finance functions. To understand how the market was mediated by accounting throughout the value chain, it was deemed crucial to interview people with different roles and from various parts of the organization. Additionally, it gave insights into how the various parts of the organization interact and how the various roles are interrelated. A few respondents were interviewed twice to explore further areas of interest that arose later in the process or to get clarification of topics discussed during the first interview. A table of the interviews conducted can be found in Table A. Most of the interviews were held in a digital format, with some conducted in person at the HQ of TransportCo. The interviews spanned, on average, over 51 minutes, and all the interviews were recorded after the interviewee's consent. The recordings were later transcribed and deleted. Seventeen interviews were held in Swedish, and three were held in English. The authors have translated quotes from the interviews conducted in Swedish. To ensure reliable and nuanced interpretations, both authors of this thesis were present at all interviews (Bryman & Bell, 2015).

Secondary data complemented the interviews, such as the company website, publicly available information, and examples of calculations. The secondary data was primarily used to form a general knowledge of the case.

Table A: List of Conducted Interviews

Role	Interview	Date	Minutes
S&M Employee	Interview 1	02-Oct	32
CO Employee	Interview 2	06-Oct	62
(additional interview)	Interview 21	11-Nov	20
S&M Employee	Interview 3	11-Oct	63
S&M Employee	Interview 4	11-Oct	51
Project controller	Interview 5	11-Oct	51
S&M Controller	Interview 6	11-Oct	49
S&M Controller	Interview 7	13-Oct	61
(additional interview)	Interview 19	03-Nov	21
Project controller	Interview 8	13-Oct	72
CO Employee	Interview 9	17-Oct	58
R&D Controller	Interview 10	17-Oct	55
S&M Employee	Interview 11	17-Oct	51
CO Employee	Interview 12	20-Oct	57
Production Employee	Interview 13	20-Oct	63
S&M Controller	Interview 14	20-Oct	68
R&D Employee	Interview 15	25-Oct	60
CO Employee	Interview 16	25-Oct	58
S&M Employee	Interview 17	26-Oct	52
Production Controller	Interview 18	30-Oct	56
CO controller	Interview 20	09-Nov	42
S&M Employee	Interview 22	17-Nov	27
Total	22		1129

3.3.Data Analysis

During the time the interviews were conducted, the empirics and findings were analyzed to be able to find themes and tensions that could be further elaborated on in upcoming interviews. We followed an abductive research process in our data analysis. Hence, some data analysis and data collection were done in parallel, something that helped in evaluating what direction in the literature this study was to expand upon, based on where the empirics guided us, we chose our theory to be able to provide richer explanations and theorize the observations (Lukka & Modell, 2010). Hence, the process that followed was not known from the beginning but engaged us to stay open and study several alternatives simultaneously to find interesting findings (Dubois & Gadde, 2002). Following each interview, the authors discussed the data to disclose important findings and themes. After the transcription topics, key phrases and quotes were coded in Microsoft Excel spreadsheets to be able to analyze them in a simplified way. It became clear that the different calculations that the functions used in their operations worked to inform them and guide them in the uncertainty they were facing. Later, the empirics were analyzed using Miller & O’Leary’s (2007) way of considering accounting for its ability to work as mediating instruments between dispersed actors and domains, which deepened the understanding of how themes were related and influenced each other. Maintaining the study using an abductive research approach, the theory, empirics, discussion, and research question was developed in an iterative process (Lukka & Modell, 2017).

After the study was made and the structure for the text was created, the authors discussed how the empirics should be presented in the best way. Since it was apparent that several mediating instruments were used simultaneously to generate different views of the market, a decision was made to present the empirics based on the findings in the respective functions and their use of the mediating instrument. The structure of the empirical analysis is based on how information about the customer is collected and used in an organization to create a ground for accounting calculations used to meet customer needs and produce products for customers. In the empirical analysis, each part is concluded with a thematic analysis of the consequences of the different mediations. The analysis is further synthesized in the discussion with the basis in mediating instruments and the literature domain.

3.4.Data Quality

When conducting research, authenticity is a central facet of data quality. It refers to the capability to demonstrate a genuine and powerful description of the interview experience. To enhance the authenticity of the research, the thesis has concentrated on linking observations of empirical importance to quotes. A vital step to improve a study’s authenticity is to present a complete picture through the data. To convince the reader that the submitted data is the true empirics and not only chosen to fit the narrative (Lukka &

Modell, 2010). In our study, we have aimed to provide descriptions and examples throughout the empirics while also making it nuanced by including input from the complete empirical example and the various functions in the value chain to study the question from different angles.

Additionally, Lukka and Modell (2010) argue that plausibility is achieved by the explanations and arguments provided by the researcher make sense. Further, Lukka and Modell (2010) argue that it can be built by employing abductive reasoning and that the truths are related to theory and cannot be reduced to represent the world in only one way. Hence, we use an abductive research process throughout our interviews and empirical analysis. A more detailed description of this can be found in section 3.3. We argue that our study has both a high authenticity and plausibility and hence has a high validity.

Informal observations at the office of TransportCo were also gathered to get other impressions in addition to the interviews conducted. The authors also spoke to other employees who were not subject to discussions to get a broader image of TransportCo at their office and the Stockholm School of Economics. However, as this was not a formally conducted interview and the employees were not accepted to be part of the study, this information has only been used to create an overall understanding of the case.

A non-disclosure agreement (NDA) was also signed to create trust and confidence among the interviewees. This was intended to provide the interviewees with ease surrounding confidentiality and honest views. To align with the research regulation stipulated at the Stockholm School of Economics, a General Data Protection Regulation (GDPR) form was also signed by each interviewee.

3.5. Case Company

TransportCo is a large international vehicle manufacturer that has always been at the forefront of technological development and has been conceived as a premium brand in its historically stable market. Profitability has been a synonym with their name, being considered a success story within their industry. With increased pressure from external stakeholders concerning environmental issues, TransportCo has needed to review its existing business. In 2018, TransportCo committed themselves to the Science-based Targets, setting a goal that they were going to reduce their CO₂ emissions by +90% up until 2045. With this, TransportCo faced uncertainties and questions like how the organization would achieve this and with what technology became so apparent. In line with all its competitors, TransportCo chose the technical solution that made the most economic sense for the customer: battery electric vehicles (NewTech).

Being an already established player in their market poses both a challenge and a possibility for TransportCo. In this change, TransportCo is forced to work parallel with

existing (OldTech) and potential future (NewTech) businesses. This is the change, and future growth of NewTech is completely dependent on cash flows that can be generated from OldTech. As a result, TransportCo is in a difficult position deciding where to direct focus. On the one hand, they need to secure the existing business OldTech while simultaneously devoting large resources to NewTech to stay a market-leading company in their industry in the future.

The internal corporate structure can be described as decentralized, whereas TransportCo has long succeeded in perfecting the functional performance of OldTech throughout its value chain. Regarding the organizational structure, TransportCo is divided into four different units under the ex-board function. These are the Research and Development function (Hereafter: R&D), whose responsibility is to develop new and improve existing business lines; the production function, whose responsibility is to produce the vehicles; the sales and marketing function (Hereafter: S&M), whose responsibility is more strategically directed towards the long-term development of the sales and profitability of the affair. The last step in the value chain is the commercial operations function (Hereafter: CO), the national sales agents responsible for selling the vehicles to resellers and customers.

Looking at the type of organization and the setting that TransportCo is in, they become an interesting company to research. From having operated on a traditional and stable market to now being an incumbent firm conducting a strategic shift, they meet new technology and much uncertainty. In the shift, the firm conducts increased efforts to operationalize the market in the company to know how they should position themselves to continue being successful also in the new market.

4. Empirical Analysis

4.1. Background and Context of the Business Case

In TransportCo's work of operationalizing the market, all value chain functions work differently. Each function has its own prioritizations and tools, which all help in their organizational understanding of the market. These tools create an understanding of the market and facilitate decision-making. Applying the method theory of mediating instruments, a variety of accounting tools can be identified in TransportCo. These can be argued to help mediate an understanding of existing and future markets within their respective functions. In the following part of the report, the industry setting and how the various functions work with the operationalization of the market is described.

4.1.1. Industry Background

The case company (TransportCo) operates in a historically stable market with high entry barriers driven by high production costs and technical complexity. The market has been dominated by a few global players, which have always competed based on the same set of parameters of striving towards delivering more powerful and resource-effective engines.

In the last couple of years, a lot has changed in the market, which has put increased pressure on all its actors. The transport industry stands for ~10% of global CO₂ emissions, making it one of the largest polluting industries and hence external pressure to transition the industry. From a life cycle perspective, ~90% of CO₂ emissions come from the use phase by the combustion of fossil fuels. Hence, the most efficient way to reduce the industry's emissions has been to lower the emissions in the use phase. The transport industry has collectively focused on electricity as the best alternative to lessen emissions and has invested large sums in their production facilities to make the change. The market for NewTech is limited by external factors such as access to energy and charging solutions, and currently, ~1% of industry sales is NewTech.

4.2. Case Study

4.2.1. Operationalization of the Market in the S&M and CO Functions

Customer Needs are Transformed into Attribute Needs

Both the commercial operations (CO) and Sales and Marketing functions (S&M) have a significant role in TransportCo's efforts to understand the market. The CO function is the market representative for TransportCo in the respective markets that they operate in. The responsibility of CO is to sell the vehicles to distributors while supporting and organizing

them so that the affair flows efficiently. As CO is the part of TransportCo's value chain closest to customers, this part has been responsible for collecting customer demand. The S&M function has a more strategic role and acts as a link between the customer and the rest of the company.

In TransportCo's efforts to deliver products that their customers demand, a major effort is made in the collaboration between S&M and CO. In these efforts, CO receives input from customers about product improvements or new product suggestions. This information is later transferred to the product planning part of S&M, which transforms the customer needs into specific attribute needs, such as energy, uptime, and efficiency, that modules used in TransportCo's products are based on. After gathering this information, the product planning function are responsible for sorting and identifying attributes to create a solution that customers demand. Despite this translation being an abstract process, it plays a vital role in TransportCo's ability to deliver a modularized solution that has been part of their value offering since they started producing vehicles. In this process, attributes are aggregated and prioritized based on the modules that have the most volume and where the most value can be addressed. The modules they choose is later proposed to R&D, which tries to close the gap between where they currently are positioned and where they would like to be. Hence, the strong collaboration between the S&M and CO function plays a significant role in creating an understanding and delivering products that meet customers' demands.

The Modularization System in TransportCo Highlights the Importance of the TCO Calculation

Having acted in a historically stable market, customer needs have been more predictable. This has facilitated the two functions to create a sound understanding of what their customers demand, which they always have been able to deliver. In the S&M and the CO function's collaborative work and efforts to understand the market, the individual customer's affairs have been considered important to understand. As TransportCo's products have many different use cases and all customers use the products in diverse ways, e.g., construction or long-range transportation, TransportCo has been forced to understand their individual customers' business. Therefore, in their pricing efforts, rather than focusing on their own costs and adding a margin, customers' costs have been considered more essential. The two functions argue that creating a solution that makes sense from the customer's point of view has enabled TransportCo to deliver a solution that their customers demand. Historically, an essential part of these efforts has been done using a so-called TCO calculation that has translated the customers' lifetime costs of owning and operating a vehicle from TransportCo. One S&M employee suggests:

We become profitable when our customer becomes profitable. Everything starts in the TCO. -
Employee from the S&M function on the TCO calculation

The total cost of ownership calculation (TCO) tries to capture what it costs for a customer to operate the costs of a vehicle during its whole lifetime, ranging from acquisition costs, financing, fuel costs, repair and maintenance contracts, and finally, residual value. For the S&M and CO functions, the TCO calculation has played a vital role in understanding how the customers operate the vehicle. By understanding customers' costs, TransportCo has been able to price their offering in a bundle. This has enabled them to show their customers how much it costs to operate a vehicle during its whole lifetime and how owning a vehicle from TransportCo is cheaper than competitors due to its better fuel efficiency and higher uptime despite a higher acquisition cost. For TransportCo, using the TCO calculation has been a way to create an understanding for their customers, making TransportCo able to show their customers that they are an optimal player on the market that can deliver a valuable offering.

A driver to why the TCO calculation has been so widely used is that TransportCo does not deliver a standardized product. All vehicles sold result from the customers' individual preferences, which is made possible using the modularization system that enables customers to tailor their vehicles according to usage and preference. Every customer has different demands, and TransportCo historically has been able to create what an S&M employee refers to as "perfected different modules" that can be used in several different applications. This has made it possible for TransportCo to increase the volume of specific parts, resulting in lower total costs and more benefits for their customers. By using the TCO calculation, the S&M and CO functions have been able to understand their customers in a more nuanced way, something that has been essential for their strategic decision-making.

Our vehicle is a unique product when it arrives to the end customer. Many are interested in their vehicle. You work with many different things that make the purchase price the customer pays hike, but that the customer considers to be valuable. Very few vehicles are the same, it is a large variation.
- S&M employee talking about the TCO calculation's central function.

Problematizing the TCO Calculation

Although the TCO calculation has helped the S&M and CO functions understand the market, some parts of the organization suggest the opposite. An employee working in the S&M function suggests that it is difficult to understand the market as their function is not exposed directly to customers. It is therefore emphasized that the S&M function must make their own interpretation of the market by understanding accounting information, which the employee suggests can be difficult as important parameters are naturally left out. The employee, therefore, argues that the S&M function's historical focus on the TCO calculation as a proxy for the market has not created an understanding that corresponds completely with reality.

What must be understood is that the customers' affair is often something completely different from a TCO. Customers do not drive vehicles because they think it is fun. They drive vehicles because their

business model needs to transport something from one place to the other. And Transportation is waste for most companies. - S&M employee speaking about the problems with the TCO

This is suggested to explain why decisions made in the S&M might have turned out differently than they were supposed to. Another employee in the S&M function has identified the same problem and suggests that the historical usage and strong focus on the TCO calculation could have significantly impacted how predictions were made regarding the future market. For example, TransportCo's goal of its sales being 50% electric vehicles in Europe by 2030 is explained as an optimistic goal that was impacted by a strong TCO focus in the S&M function, according to an S&M employee. "The 2030 target is based on the costs and not the total economy." Based on the two examples, it is suggested that the TCO calculation has impacted predictions, decisions, and prioritizations for the future in the wrong way.

New Technological Development Forces TransportCo to Use the TOE Calculation

Looking at the electrification of the market, several things change for the customer. This has made the S&M and CO functions revise existing calculations to be able to make evaluations for the real affair. Instead of only using the TCO calculation, a larger focus has been given to the TOE (Total operating economy) calculation, which includes revenues and enables an evaluation based on earnings. Introducing NewTech, customer needs are still the same as for the traditional affair and emphasize energy efficiency, high-quality products, and high carrying capacity. However, the current battery technology has certain limitations compared to the traditional business, affecting the customers' affair.

As the vehicles driven by NewTech are heavier than the traditional alternative, and as a vehicle has weight limitations, the more batteries put on a NewTech vehicle (i.e., the longer range it can drive), the less freight it is possible to carry. This creates a trade-off affecting customers' earnings that did not need to be considered in OldTech. Also, the cost structure for the customer changes. NewTech vehicles have a significantly larger acquisition value, driven by the expensive batteries and, hence larger up-front costs. This is compensated for by the lower operational cost of driving a vehicle using batteries instead of fuel. As the tradeoff between carrying capacity and engine size has not been apparent in TransportCo's historical affair, there has not been any need to capture the earnings dynamics in an accounting calculation for which the TCO calculation effectively reflected the customers' business. Hence, new market dynamics and the tradeoff it has created for the customers' businesses have increased the discrepancy between the TCO and the TOE, making it important to reflect the customers' whole business using the TOE calculation.

Reflecting on NewTech and increased focus on the TOE calculation, one employee from the CO function suggests that it is still difficult to use this calculation to illustrate a profitable business case for customers. The employee suggests that looking at the

customers' earnings in a TOE calculation depends on the customer's business model, which is difficult for TransportCo to evaluate. This is because the business model differs for almost every customer, and there are various revenue parameters that TransportCo is not responsible for. TransportCo delivers vehicles that can be used in their customer's business to transport goods from one place to another. The employee, therefore, suggests that they can never be responsible for all logistics and internal efficiencies in their customers' businesses.

Working with TOE is much harder. That is about the customer's business and not TransportCo's business. We have spoken about this for many years but have concluded that it is much more difficult. I would say that the TCO is the only way in which we can motivate a customer to buy a vehicle from TransportCo. Except for the one tattooing the logo on their arm. They buy a vehicle from TransportCo anyway. - CO employee on the difficulties of using the TOE calculation to motivate their customers

Undergoing the strategic shift, TransportCO has increased its focus on the TOE calculation, enabling it to capture important market dynamics of the new affair. In the traditional affair, there has not been a trade-off between the vehicle's driving range and carrying capacity. With NewTech, this is something that has needed to be taken into consideration, affecting how they make business cases for their customers. Despite that there has been an increased focus on the TOE calculation because of this technological shift, there are still concerns in the organization about how difficult it is to evaluate their customers based on earnings. Parts of the organization still suggest that TransportCo can only motivate their customers to buy their products using the TCO calculation. This illustrates an internal resistance to the TOE calculation.

TCO and TOE - Two Competing Mediations in the S&M and CO Functions

For TransportCo, using the TCO calculation has historically had an important role, highlighting what their business cases look like for the S&M and CO functions. Using a simple calculation, the functions have created an understanding for themselves and their customers' businesses. The TCO calculation is an example of the WLC function (Shields & Young, 1991), which is a costing method that takes in the lifetime costs and, hence, creates a better understanding for the customer (Inglis, 2008).

As a part of TransportCo's strategic change, there has been a need to emphasize new business characteristics that were not apparent before, something the TOE calculation has helped the two functions with. This has enabled the functions to mediate a rationale of the entire business case for the customer rather than just looking at the costs as they did historically. The TOE calculation guides the actors towards practices, taking the entire economy for the customer into account and helping them better understand how they can contribute to the market and the customer less abstractly. The characteristics of the calculation, where both revenue and costs are considered, mediate a rationale of the

customer and the market for S&M and CO to better understand their customer's needs and challenges.

In an organization's effort to understand its market, the use of mediating instruments plays a fundamental role, as these can concretize and guide the actors in creating links to the discrete domain of the customer. However, with a changing market, there is a need for the functions to use a mediating instrument that can capture existing business and new technology. This is illustrated by the increased emphasis on the TOE despite it being more difficult to use. The rationale of the market that S&M and CO create using the mediating instrument is centered around the external customer needs, focusing on the entire affair for the customer. The TOE mediates practices for how they can provide value to the customers and, hence, the market. The TOE creates a rationale for S&M and CO, mediating a view of the *customer as the market*.

4.2.2. Operationalization of the Market in the R&D Function

The R&D Function from a Historical Point of View

Speaking with representatives from the R&D function about the historical business, a feeling that they knew exactly what their customers demanded was strong. This resulted in the function conducting small incremental updates and efficiency improvements primarily around the key attributes of energy efficiency, uptime and carrying capacity. The R&D function knew what needs their customers valued the most, as focusing on these helped them keep operational costs low with lower fuel efficiency and, hence, lower fuel consumption. Uptime was also a key attribute that customers demanded, as they needed a product that could spend time on the road rather than being serviced. An R&D employee mentions:

If you consider before electrification, we developed internal combustion engines, and during an extended period, it was fuel efficiency and costs that were the large focuses. It did not change from year to year. - R&D employee on TransportCo's historical business

The R&D Function's Focus on Attributes is Considered in a Utility Calculation

In the R&D function's work of bringing new products to the market, the most crucial aspect has always been developing products that fill an identified attribute gap. An attribute gap can either be identified and shared by the S&M function, or it could be an engineer in the R&D function that develops a new idea. In the R&D function's decision regarding what products should be developed, a so-called utility calculation has always played a fundamental role. By relating attributes a new product can solve to the costs it takes to fulfill them, the R&D function has understood how to create a valuable offering. Historically, this has been completely crucial for their decision-making. "We always look at what effects a project has on the attributes and then later, how they fulfill a need within the segments." an R&D employee explains. Even though the calculation is quite complex

and sophisticated, it has enabled the R&D function to understand how to improve each respective attribute and what effect this has on the segment it addresses.

These types of product attributes that we have in this early stage with batteries, that neither are future optimal good, nor future optimal cheap. We then chose based on these parameters and put together a product, based on the mixture. - R&D employee about the utility for customers

One of the employees working in the R&D function explains that addressed attributes are always set in relation to costs to develop it. For example, if a new engine is developed, the focus is to look at the attributes it addresses and what costs it takes to develop it. Optimally, the R&D function wants to meet as many attributes as possible at the lowest cost of developing products. This, as developing too-expensive products, will cause an increase in the price to end customers, creating a trade-off between attributes that are addressed and the price they will have to pay. “Move things from one place to another, with the lowest amount of energy to the lowest cost possible and make it economically as good as possible for the customer” is the purpose, according to an R&D employee.

There are many ideas that pop up from all kinds of directions, so we cannot do everything at once, hence we need to try to choose... Choose the ones that we see as the most bang for the buck. - Project controlling employee on the prioritization and utility for the customer

In the introduction of NewTech, the R&D function noticed that the utility calculation showed a trade-off between energy efficiency and carrying capacity. Additionally, the cost of the batteries was high, making it important to focus on making the batteries more energy-dense and cost less to give an economic value to the calculation. The calculation thus had gained another use point for TransportCo; it created a linkage towards the problems they faced in addressing the new market; however still on an attribute level. The calculation helped them illustrate the trade-off and see the attributes differently than they had done previously. To meet the attribute needs of NewTech, they had to find a balance between how many batteries they could put on the vehicle without taking too much from the carrying capacity and still have a low enough cost for the customer to be willing to buy it. The calculation created an understanding of the trade-off for the R&D function that they needed to align and discuss with both S&M and Production.

Technological Shift Calls for Interfunctional Coordination

In the historically stable context of TransportCo, employees in R&D believe that they, like many other industrial companies, have been quite distanced from the end customer. Developing products has always been a cross-functional process with input from R&D, production, and S&M. However, according to employees from both R&D and S&M, information shared by S&M to R&D in previous product development has mostly been about various volume estimations and has not been so customer-centered. “It is an estimate from S&M. That is also a cross-functional process,” an R&D employee explains.

It has probably been so historically, that R&D can have been a function that has had too long way to the customer, without a cross-functional alignment in place. - R&D employee

It becomes clear that the new technological shift has put much pressure on the R&D function. Apart from being a significantly larger function today, with approximately 4000 employees compared to 800 30 years ago, the function has been forced to understand their external market in a better way. As a result, there has been an increased need for more interfunctional discussions to create a better unified understanding of the market and how it changes. Employees in the R&D function believe that the cross-functional forums are better today than they have been historically. In the efforts to understand the new market, a lot has centered around battery development, as this has been considered the main problem that needs to be addressed.

Problematizing the Utility Calculation

In the R&D functions prioritization work, the utility calculation has guided them towards the attributes of the products. Hence, they have tried to identify where the gaps in attributes have been the largest and where they could find common parts to address as many segments as possible at a low cost. R&D assesses what effects a development project could have on the attributes they have tried to improve and how this can meet needs within their different customer segments. As the R&D function has been focused on delivering as many attributes as possible and volume has been a guiding parameter in these efforts, projects that meet those requirements have been the ones that the R&D has targeted. This has guided them to focus on volume. “Some have more volume than others and in an order of priority, you prioritize the ones with the most volume” - R&D employee talking about segments and prioritization.

When TransportCo has made prioritizations based on volume, it has made them target specific segments concerning the technological shift and introduction of NewTech. The long-range segment is one such example and has been important in TransportCo’s historical affair, making up a major share of their sales annually. Deciding what segments to target with regards to NewTech, it was a natural decision to target the long hauling segment, as this was expected to meet many attributes at large volumes.

With range it has always been, the more the merrier. Everything has been about getting as much output as possible. Now we have understood that if there are too many batteries, there is not a lot of room for freight, which puts pressure on the energy density. - R&D employee

However, the existing electrification market is not developed for the long-range segment of the industry, where infrastructure and technical difficulties concerning batteries have made it difficult. At the current stage, electrification is developed in the shorter transport segments such as distributional or regional transport, where TransportCo also has its focus at the time of the study. In Transport’s research processes, prioritization has caused them to focus on a product that currently cannot be sold in the market. From various roles in the organization, this is something that has caused frustration.

Another example that highlights how existing ways of making prioritizations could have guided the organization in the wrong direction was in the “special vehicle” segment. Historically, the segment has not been important for TransportCo, making them decide not to focus on this segment for the NewTech.

The Special vehicle market was 10% of our market mix, which led to it having a low prioritization at R&D and additionally, only 10% of the special vehicle market at the time was electric so the reasoning was that, why should we focus on that limited market? - S&M representative

This illustrates how TransportCo’s existing ways of prioritizing their efforts to meet a future market resulted in an inability to meet the actual market. In hindsight, employees from various functions are frustrated about not having focused on the electrification of the special vehicle market. The R&D function did not capture important external factors and was guided and made prioritizations based on existing volumes. Due to this missed business opportunity, various ideas about what has happened can be identified in the organization. From S&M’s perspective, the missed opportunity results from existing tools guiding them in the wrong way. From R&D’s perspective, on the other hand, the problem is not as apparent. An R&D employee mentions, “We were early on the special vehicles market. I have a tough time seeing that we have missed that market.” This shows how the R&D function measures itself based on the products it can deliver rather than the external customer market.

When R&D talks about how they work to address the market, they explain that some of their competitors in the electrical market have focused on offering one certain solution and only address one limited part of the market. An R&D employee says: “Our ambition is to fulfil as much as possible of a global customer need pallet as possible with as few components as possible. And we recognize that it cannot be done with just one solution.” The ambition to meet many with as few components as possible makes TransportCo’s process take time, according to an R&D employee. It is obvious from talking to the R&D employees that they are committed to participating in the shift.

We might not be the ones that are the quickest with a certain type of solution in a certain segment to a specific customer need. That is not how we make money, or anyone makes money today. - R&D employee

However, they are guided by the utility calculation addressing attributes and developing new components and modules, making the shift appear slower compared to competitors in the short term, according to the R&D employee.

Utility Calculation Mediates a Rationale of the Market in the R&D Function

For the R&D function, the utility calculation is central, enabling different value-creating attributes to be related to the costs of a project. This calculation is similar to the functional cost analysis method by Yoshikawa et al. (1995), which according to Inglis (2008), is a

market oriented accounting method. The calculation guides the R&D function towards practices to create value for the market by addressing and closing an identified gap in the form of different attributes. This creates an idea for the R&D function that the market is based on the different attributes they try to improve. The calculation, therefore, mediates a rationale between abstract product attributes and the economy by depicting abstract customer needs into more quantified attributes. This helps the R&D function to mediate a rationale of the market, based on attributes (Miller & O’Leary, 2007). For example, an R&D employee suggests that in their efforts to create value for TransportCo, they try to focus on meeting attributes that are used by a large volume of customers. In the historical affair, this has been TransportCo’s way to be cost-efficient and to improve attributes to create customer value. By using the same calculation to try to understand the new market they have been faced with trade-offs that they have needed to improve. The use of the calculation mediated a new rationale and guided them towards practices of creating value by improving the attributes. The calculation, therefore, had a similar role to that identified by Christner and Strömsten (2015), where the use of an accounting calculation helped shape the development of the technology they addressed to explain.

However, there is a risk that the calculation has made them focus on the attributes rather than the external market. This has forced actors to focus on high volume. According to Yoshikawa et al. (1995), working with attributes to solve complex problems and produce innovative solutions is beneficial in product development. It can, however be questioned how well it incorporates the external market, but instead creates a proxy for the market solely based on attributes. Hence, the rationale of the market that is mediated for R&D by using their calculation is the *attributes as the market*.

4.2.3. Operationalization of the Market in the Production Function

Traditional Market from an Internal Pricing Perspective

Compared to the other functions, the production uses several calculations in their function, but which all operate under the same domain of internal costing. This means that the function uses several calculations subordinated to one approach, the long-term target pricing for the vehicle components.

As every vehicle is unique, TransportCo has an internal transfer pricing system for each component they offer the customers. The price set for a particular component is based on a calculation consisting of several parameters. Raw material price is added with the production value add (PVA), which includes costs related to directly producing the component and indirectly through previous differentiations in the production line to deliver the component. This is then related to the estimated volume of the component, which is agreed upon between S&M and Production in a base-case scenario. A long-term target price of about five years in the future is set at a yearly evaluation. The S&M

function purchases the vehicle from the production function at the agreed-upon price of the respective components at a zero margin.

We have no margin on our price, it should only cover our costs. The only central add-on you do from production is a small add-on to collect the overhead functions within production and logistics that is not allocated to one of the production units. The thought is not that we should make a profit, but a net zero profit. - Production employee on pricing towards S&M.

According to S&M and production function employees, the model's purpose is related to two things. Firstly, TransportCo wants a predictable price that is not affected by short-term variations in prices or volumes, such as unexpected events in procurement or production lines. Secondly, it prevents the possibility of lowering the product's price to the customer, as the internal sales price is what the external sales are measured against. "The entire model's purpose is that it should be difficult to lower the price," an S&M employee mentions. It has enabled them to have a long-term focus and keep the cost of goods sold low, another S&M employee explains.

Enabling a New Market Through the Traditional Pricing Model

With the introduction of NewTech, there have been a lot of new pricing decisions that have needed to be considered. Even though there is much uncertainty about future volumes and prices, TransportCo has decided to continue using the internal pricing model they have used in OldTech, as it is in line with how they have introduced new components in OldTech. Having a long-term perspective in the ramping up of a new business line from low levels creates a large discrepancy between actual and internal costs in the short term. For production, a difficult estimate is to see how fast the transition will take and, hence what target volume they will have in the long term. Regarding the introduction of NewTech, TransportCo has allowed them not to be as careful in estimating the volume as they have been in OldTech. Therefore, an even longer-term target than normal has been set to decide what products should cost.

We have allowed ourselves to be really long-term in the electrical estimations. (...) if you would have asked us in 2018 how much we would be producing now, it would have been way more than we actually have. - Production employee

This long-term consideration has generated discussions within both the production and S&M functions, where they collectively believe this is the right way to go. However, it comes with certain problems and benefits, as the discrepancy in the real and target costs currently is substantial. This creates a risk that the costs can become a faulty decision base for TransportCo in the longer term but facilitates meeting the market by lowering the price in the short term. One S&M employee states that if they had used the careful volume, it would have been difficult to meet the market at all due to the higher costs of the component. Production explicates the discrepancy to create transparency in the value chain, both in the cross-functional forums and during weekly meetings conducted in the company.

Minor Changes in Products Can Have Major Impact

Being part of the product development projects, a production employee describes what has been most difficult for them with NewTech is the substantial amounts of changes on the product. Investments in new manufacturing plants have long lead times. When a product update is agreed upon in the project, production optimally needs to start a few years in advance with several types of procurement, buying machinery, material, and securing other supply resources.

And if it continuously comes changes, the entire time plan gets pushed forward and divided and there are a lot more risk of delays and similar with constant changes on the product. - Production employee

To assess if projects should be done, NPV calculations of what the investments in the factory change would mean can be weighed against the improvement of the targeted product cost (estimation of later set internal price). A change in the factory results in an increased product cost due to the PVA part in the internal pricing model, so taking this into account is central from a customer perspective, according to the production employee. As there are a lot of fixed costs related to the new products, the estimated volume is essential, according to a production employee, as a lower volume raises the real product cost significantly. "That is why it is so important that we produce the right products so they can be sold" a Production employee explained.

However, it is not only the volume estimations that are important for the long-term price of TransportCo's products. In the development process of innovative technologies, it is natural that there are improvements in products during the years following its introduction. This creates a need to update the factory, machinery, methods, and other costs. The production employee, therefore sees risks with the PVA part of the costs remaining high for many years despite the expected drop in material cost.

The production employee emphasizes the importance of their function in the project groups for product development from TransportCo's industrial perspective described above. Making a change that fulfills a customer need might have large implications for the factories. Hence, the customer need that is met must be more beneficial than the cost of a new factory, a production employee describes.

That you are going to change a small thing, which is great from a product attribute perspective, but it means that we must rebuild an entire factory to have room for it. - Production employee

According to the production employee, there is an understanding in the development groups regarding achieving a reasonable product cost and suggests that the calculations play a vital role in cross-functional decisions. Outside the development groups, it can be noted that the delays, which to a certain extent come from taking new customer needs into account, still cause frustration in the CO function.

Target Costing Mediates a Rationale of the Market in the Production Function

In the production function's work, several calculations are used, which all take a long-term perspective on costing and can be seen as an example of what Kato (1993) refers to as target costing. According to Inglis (2008) using target costing can be a way to stay market oriented, taking both customers and competitors into account. Furthermore, the calculations mediate a rationale between the economy and the market as a component. Working as a mediating instrument (Miller & O'Leary, 2007) and guiding the employees in the production function towards practices to how they are contributing to the shift the company conducts. In the product development process, customer needs cannot be met at any cost and need to be related to the investments they generate. This is done by the production function's use of calculations to provide a rationale of financial logic in the different component decisions, ensuring company resources are handled efficiently (See the discussion about this concerning Carlsson-Wall et al. (2009) in discussion 5.1.).

For the production function, their different calculations mediate a link towards the new market and provide them with practices they should act according to create value for the customer on a component level. Additionally, the calculations reduce the short-term uncertainty and move the actors towards the practice of viewing a long-term rationale for pricing the components. However, the calculations that the production function uses to mediate the market do not capture the external market, as they do not price an entire vehicle. The mediating instruments the production function uses instead rationalize the market as the components that pass through their production. Mediating a view of the *component as the market*.

4.2.4. Interfunctional Alignment

Cross-functional Forums are Used to Align Toward a New Market

Other than the cross-functional development forums, TransportCo has since 2021 initiated several decision-making forums (DMF) for their respective business areas. Every function has a senior representative in the forums, where strategic decisions regarding NewTech are discussed and decided upon. These forums have been initiated to reduce functional dependence and make more cross-functional decisions in the organization. Similar forums have existed historically, but on a more general level and without the decision-making mandate they now have received from the executive board. DMF was the first forum that was introduced for a specific business area. This was done as the S&M function felt that NewTech was different compared to the OldTech affair, something which employees acknowledge from both S&M and R&D.

I believe that there was a feeling in the S&M organization that the distance between our functions (R&D and S&M) was too long, and hence they wanted these forums. - R&D employee

Talking to people from the various functions, they believe that introducing DMFs has improved the coordination across the functions. Historically, decisions were made by the executive board after an “anthill” approach, where experts in the functions discussed potential solutions for a long time, to create well-developed products, as one R&D employee explains. Many in the value chain describe TransportCo as a “Swedish” organization where everything should be discussed before decided, seldom someone “points with their whole hand and says that this is the direction we are taking” the “American approach” according to employees from both R&D and CO.

An identified problem with the DMFs and their implementation is that TransportCo is still organized vertically in its functions with regard to the budgeting process. A production employee believes this makes it complex as both the DMFs and executive board, responsible for the budget, now have a decision-making mandate. “It becomes difficult to single out who has the decision-making power,” the production employee suggests. However, this is not suggested to be a specific problem for TransportCo but a widespread problem for larger organizations experiencing a period of organizational change. Therefore, the employee sees the double decision-making mandates as a potential source of ambiguity and hindering factor only in the short to medium term for TransportCo.

The unclear parts in this create a lot of questions, especially in a large organization. If it is unclear, it will be that for many and waste will be created in the process. - Production employee

According to a production employee, the idea behind the DMFs is to reduce the siloed work and increase cross-functional collaboration. “That we take the large decisions together” the employee explains. In the preparation work for the DMFs, the functions agree internally on what they feel are the most important strategic moves to take. “We agree internally on what we want to bring to the forum,” an S&M employee says. It can be anything from what R&D should focus on, to the internal pricing to the customer offering. A production employee describes it as many different questions competing regarding attention and believes discussions are important as some trade-offs need to be tweaked at the beginning of their journey. The production employee believes that the right things are discussed but acknowledges that it is difficult as the functions tend to see it from their perspective. The employee says: “Many questions compete regarding the attention.” What is most central in the discussions is that they bring forward a good customer offering, and the production employee continues. “A good customer offering has been the focus in the new forums.” Calculations play a role here as well to highlight and frame the questions that need answers, one example brought up by the production employee was regarding the internal pricing example and the disconnect between the real and the internal price. Discussions regarding the internal pricing were held in the forum and a decision was made to use a long-term volume. Even though the vehicles in the short term will be significantly more expensive to produce than what is internally transferred. The discussions in the forum intend to work to balance the organization towards their

common long-term goals and, after that, make decisions that can be executed. What could be noted is that the company started working with this in a more structured way for NewTech in 2021. With the long processes in industrialization, many of the decisions taken in the forums are still to be implemented.

Project Controlling Coordinate Different Functions

In creating a new development project, everything must pass through the project control function. The function is not part of the natural value chain but can be seen as a support function, formally a part of the CFO function. They aim to assist in all development projects and make profitability assessments to understand how new ideas or solutions contribute to the benefit of its customers and TransportCo's profitability.

Project controlling has a key role in objectifying all information from the various functions in the product development project. Therefore, they have a steering role between the functions but have little contact with the customers. With an internal understanding of the customer created in every function, the project controlling function's role is to stay neutral and navigate the jungle of information sent to them from the different sides of the value chain. Based on information such as driver data, the function can stay objective. The project controller mentions that they play a vital role in the creation of new products, working as a "spider in the web," mainly as there is a risk that the functions in the organization might have incentives to act in line with what is best for their function, rather than for the organization. It is explained that engineers can be narrow-minded, always framing a new solution they have produced as the most optimal one.

After having put a lot of time and effort into creating a new solution it can be difficult for the R&D function to accept that their newly developed project might be declined. - Project controller on R&D function's difficulty in getting their ideas rejected

The same relationship can be identified with the market side, as they always believe they have the best knowledge about their customers and, therefore, have difficulty getting their ideas rejected. The project controller describes that the ideas the market side or R&D creates are often very good. However, there is not always an inherent business sense in how the two functions work, for which a good business case cannot always be created. The project controlling function, therefore, needs to stay neutral in the decision-making and use all facts gathered. From other parts of the organization, they are not always popular as they "crush dreams" Despite this they are essential in creating transparency and understanding what ideas should be accepted and not.

5. Discussion

The following section discusses the empirics concerning the method theory of mediating instruments presented in section 2.5. Applying this theory, it can be suggested that several mediating instruments in the case company have been identified, which all help create a rationale of what the market is in TransportCo. Various parts of the same value chain can be argued to create different meanings of the market, which becomes challenging in a changing market environment. The following part is categorized as follows. First, the various mediating instruments are explained, and how they help shape an understanding of the market in each respective function. This is followed by describing how the different mediating instruments cause tensions. The last section discusses how collaborative efforts have been made to align and reduce tensions through various forums and control functions. As such, the study contributes to the literature on mediating instruments as well as the domain on the interface between marketing and accounting of customer accounting, customer costing, and market orientation, explaining how various accounting calculations can mediate an understanding of the market in an intra-organizational value chain.

5.1. Different Mediating Instruments Enact Different Rationales of the Market

Table B: Summary of Mediating Instruments

Functions	Accounting Calculations	Mediating Effect/ Rationale	Accounting Calculations Practices
S&M & CO	WLC (TCO / TOE)	<i>Customer as the market</i>	Life-time affair for customer
R&D	FCA (Utility)	<i>Attributes as the market</i>	Maximize number of attributes at low cost
Production	Target costing	<i>Components as the market</i>	Long-term component focus

In the empirical analysis, four different rationales of the market have been identified to get mediated in the different functions' usage of their respective accounting calculations (Miller & O'Leary, 2007; Jordan et al., 2013). The different mediating instruments are described in more detail at the end of sections 4.2.1., 4.2.2., and 4.2.3., and summarized in Table B. This study shows that the production function mediates a rationale of what the market is based on the components they are pricing. For the R&D function, the rationale of the market is based on the attributes they seek to develop. S&M and CO have two competing rationales, with the historically used TCO still being an embedded method

of the employees and where TOE has been initiated. This study shows that different calculations simultaneously work as mediating instruments for the various functions in the intra-organizational value chain. Despite all the functions being part of the same organization, all operate within different domains where different calculations create different rationales for what they see as their own market.

Applied to the case of TransportCo, rather than studying different instruments in a sequence (Christner & Strömsten, 2015) or one instrument mediating different rationales (Jordan et al., 2013), this case study shows that various functions in the same organization use different mediating instruments to simultaneously mediate their understanding of the new market. Different accounting calculations have been used by the functions and guide them towards practices in their strategic decision-making. Dissimilar to the previous research on mediating instruments (Maier, 2017; Jeacle & Carter, 2012; Kurunmäki & Miller, 2011), this study shows that rather than creating a unified way forward, the mediating instrument continues to have functions working in different domains.

Accounting Calculations Mediating a Market Unintentionally

In their study, Christner and Strömsten (2015) show that several calculations that were not intended to work as mediating instruments functioned as mediating instruments by connecting broader economic ideas and the development process. Similarly, it can be shown in the case of TransportCo that the utility calculation intended to guide the R&D function toward what attributes should be addressed in their development process also worked as a mediating instrument to provide practices of how the R&D function contributes to TransportCo meeting the new market. The same can be identified for the production function, where the target costing calculations not only helped the function to make long-term decisions but also had an enabling role in mediating a market with guiding practices for the production function.

Questioning Inglis Categorization and Relating to Previous Accounting Literature

However, one could argue that the calculations that the R&D and production function use, which, according to Inglis (2008), are categorized as accounting tools that can be used to achieve a market orientation, do not help mediate TransportCo's external market. The calculations are neither designed nor intended to be used as methods to achieve market orientation but as tools used to account for the development of components or attributes (Kato, 1993; Shield & Young, 1991; Yoshikawa et al., 1995). However, as the accounting calculations are used to structure and operationalize what is demanded from the specific function, they help each function to mediate practices of what they are expected to deliver. The accounting tools can, therefore, rather than mediating an understanding of the external market, be said to mediate an understanding of an individual market based on attributes for the R&D function and components for the production function. In contrast, the TOE calculation used on the S&M and CO functions is the only

calculation that focuses on the external market and is the only calculation that mediates the external market in a sophisticated way.

Previous Studies on Efforts to Operationalize the Market

In contrast to Kraus and Strömsten (2016), this study shows that despite no single customer having any apparent power in relation to TransportCo, some calculations, and internal processes have been altered to better understand the customer needs in the new market. The study did not find any signs of customer accounting methods to assess the historical profitability of individual customers, as in Lind and Strömsten (2006) rather every individual sale is evaluated on its profitability by S&M and CO. Unlike the unifying effects using accounting described in Alenius et al's. (2015) study, the different accounting calculations create tensions in the relationship between the functions in the intra-organizational value chain, working divisive rather than unifying.

5.2. Concurrent use of Mediating Instruments Create Tensions

Different Accounting Calculations in Different Functions Cause Tensions to Arise

One obvious tension between the functions is between R&D and (S&M and CO). As R&D creates its rationale of the market by looking at the various attributes that a certain product includes, the function will always strive to deliver as many attributes as possible at the lowest possible cost. On the other hand, the S&M and CO functions create their rationale of the market by looking at the individual customer's business case holistically, always striving towards maximizing the customer's affair. As the market that is mediated in the two functions will not be the same, tensions will arise. This is illustrated in the case of the missed "special vehicle" market opportunity described in section 4.2.2.

For the R&D function, it was natural to decide not to enter the "special vehicle" market as this had historically been a market with low volume. Therefore, a decision was made to focus on other segments where they could deliver more attributes at lower cost. However, for the S&M and CO functions, the use of the TCO and TOE calculations has, in retrospect, made obvious that the "special vehicle" market is not a market where TransportCo can deliver vehicles. The S&M and CO function's rationale of the market, captured by the TCO and TOE calculations, therefore, has made clear to them that this is a missed market opportunity, something they blame the R&D function for. Applied to what Vaivio (1999) suggests, quantification of the customers is likely to cause tensions. However, in contrast to Vaivio's findings, conflicts have not been created due to resistance from local knowledge that already existed in the company. Instead, tensions arise in TransportCo when multiple functions try to account for the same thing (market), in diverse ways. By setting the market in more quantified terms using a calculation, it has become obvious that the S&M and CO functions missed a great market opportunity. The

mediating instruments that are used in TransportCo have thereby made functions more aware of decisions that have been made, something that has resulted in conflicts.

Tensions Arise in Functions Using the Same Accounting Calculations

In addition to the tensions that arise between different functions, tensions also arise within functions using the same calculation. As the example with the change from TCO to TOE calculation in the S&M and CO functions illustrates, tensions arise when a function has to switch from one calculation to another. TransportCo has historically used the TCO calculation to mediate its understanding of the market. This has worked well and has enabled them to create profitable businesses for their customers. However, changed market dynamics, e.g. tradeoff between the battery capacity and carrying capacity, has put pressure on the TCO calculation that cannot account for this. This has caused the S&M and CO functions to direct focus to the TOE calculation that considers the new dynamics. However, as suggested by an employee, the TOE calculation is more difficult to use in practice as the customers' revenue is not something TransportCo can control as easily as their customers' costs. The employee, therefore suggests that the only way that TransportCo can account for their customers is by using the TCO calculation, illustrating a resistance to the use of the TOE calculation in the S&M and CO function. In relation to Vaivio (1999), this can be seen as an example of how the quantification of customers meets resistance in an organization. However, in contrast to Vaivio, who showed a general resistance towards a quantified understanding of the customer, this example illustrates how resistance can be created when one quantification must be changed for another. What Vaivio describes as local knowledge being resistant to the quantified understanding of the customer is illustrated by the TCO calculation in the case of TransportCo. The organization has used the TCO calculation for a long time, which has caused it to be embedded in the organization. When a new calculation now has to be used, it creates frustration among employees, ultimately resulting in tension in the functions.

5.3. Forums for Interaction Work as Efforts to Create a Unified Understanding of the Market

Previous studies about mediating instruments show that they work as tools that enable better coordination and unify actors within different domains (Miller & O'Leary, 2007; Christner & Strömsten, 2015). In contrast to prior studies, this study has shown that various mediating instruments that simultaneously try to mediate the same thing in various parts of an organization cause tensions. Hence, despite them mediating a rationale in the functions, on an organizational level, they work divisively rather than unifying due to the multiple rationales causing tensions to arise, as described in detail in section 5.2.

To reduce these tensions, various forums have been initiated to reduce the barriers between the various functions to discuss problems and create an aligned understanding.

Linking back to Narver and Slater (1990) and Inglis (2008) both suggest that interfunctional coordination is one crucial tool organizations must use in their market orientation efforts. For TransportCo to deliver in accordance with market expectations, there is a need to have interfunctional coordination in place to create a unified understanding. To guide the functions, the project controlling function is key in assessing that the functional assumptions are meeting the market at a profit. The project controlling function has a unifying role in that it aligns and helps create links between the various functions that are dispersed due to the different mediating instruments they are guided by.

Similarly to how the product development forums helped the case company in Carlsson-Wall et al. (2021) study, TransportCo has also used cross-functional forums to align their product development process for some time. All actors agree that the importance of the forums has increased with NewTech due to the larger uncertainties. In addition, S&M has received an increased role in the forums, ensuring that decisions are made with the external customer considered. Overall, this process has improved over the past years. However, with a long time to industrialization, it is difficult to assess the success of how well the forums manage to mitigate the different mediated markets in the company at the time of this study.

In addition to the development forums, efforts have been made to create a better workflow in the decision-making for NewTech. In 2021, a decision was made to move decision-making concerning NewTech from the executive board to several senior executives into Decision-making Forums, (DMF). This was made to increase alignment throughout the organization, although many employees believe it has made the decision-making structure even more hazy. After the restructuring, the DMF regarding NewTech have the decision-making authority for the affair but do not have any budgetary control, which is still in the functional silos. This is a problem as decisions made in the DMF also must be accepted in functional budgeting, making it difficult to make decisions. The DMFs, therefore, become more of discussion forums where every function tries to get their view of how to meet the market to be accepted in the group. Unlike Carlsson-Wall et al. (2021), the case of TransportCo, therefore, shows that the unifying effect of organizational forums can be limited, as the identified mediating instruments still guide the functions to act by their own rationale.

6. Conclusion

The study aimed to research how different actors across an intra-functional value chain view the market in an organization undergoing a strategic shift. This was done using the method theory of mediating instruments that helped explain how the various functions created their understanding of the market using different accounting calculations. The study has been based on the following research question:

How is the market operationalized within an intra-organizational value chain?

What can be found in the case study is that various functions across the intra-functional value chain create their own rationale for what the market is. All functions use different accounting calculations, identified as mediating instruments, to facilitate and mediate the understanding and rationale of the market for them, respectively. While the S&M and CO functions create their rationale of the market by looking at the customers' entire business case, R&D and the production function create a more product-based rationale of the market by looking at attributes and components, respectively. Using different accounting calculations to create an understanding of the same thing (the market), it becomes apparent that the organization does not have a unified understanding of what the market is.

In contrast to previous literature on mediating instruments, this case study identifies how the use of mediating instruments does not always have an enabling role for the organization as a whole. Previous studies have suggested that mediating instruments can open a better understanding of certain technical developments (Christner & Strömsten, 2015) and provide more ground for decision-making (Miller & O'Leary, 2007). Mediating instruments have not been considered a tool that makes it more difficult for an organization to link dispersed actors active in different domains together. However, as is illustrated in the case of TransportCo, the use of accounting calculations makes clear that the different actors in the organizational value chain rationalize the market in several ways. By using accounting calculations, the functions can create better structure and clarity for their own view of the market. However, similar to what Vaivio (1999) shows when these quantified understandings are set in relation to each other on the organizational level, it becomes evident that the understanding is not the same in the various functions, resulting in tensions.

To reduce the tensions, various cross-functional forums have been introduced. However, creating a unified understanding across the value chain is still challenging due to the different rationales that still guide the functions. This helps illustrate that it can be difficult for an organization to bring together the various rationales created by different mediating instruments.

Overall, this study contributes to the literature written in the domain of mediating instruments, as well as the domain of the interface between marketing and accounting, such as customer accounting, customer costing, and market orientation.

Contributions

Two contributions have been made by conducting this study. First, it contributes to the literature written in the field of mediating instruments. The study shows how several accounting calculations simultaneously mediate different rationales of the market within one organization. Hence, unlike previous studies on the mediating instruments, this study shows that as the calculations mediate a rationale for the respective functions, the effect of the mediation on the organizational level can be divisive rather than unifying. Secondly, the study contributes to the literature on the interface between accounting and marketing, by showing that accounting calculations can be used to mediate rationales of the market. The study also shows that accounting calculations guide the functions towards practices on how value can be created for customers and hence, the market.

Limitations

The study is conducted as a single company case study of a company going through a strategic change toward a new market. The organization is in a period of uncertainty and continuous improvement. As suggested by one of the interviewees, TransportCo is constantly challenged by new situations and constantly learns new things. Consequently, it can be assumed that the setting and the view of the actors shift continuously as their knowledge develops. The study has been conducted for a limited period (September 2023-December 2023), which is only a snapshot of TransportCo's strategic change. It would be beneficial to extend this period through a longitudinal study to gain a more complete view of how the actors in the value chain operationalize the market.

Additionally, the collected interview data has been centered around two functions in the organizational value chain. With limited access to the other two functions, the ability to draw too generalizing conclusions regarding the large functions should be considered. The data could have been improved by conducting additional interviews with the functions where a limited number of interviews have been conducted. This could have given more perspectives from these functions, for which more conclusions could be drawn.

Future research

Several themes that would be interesting to learn more about have been identified by studying this topic. First, studies linking accounting and market orientation are quite limited, and more studies are encouraged to understand better the role of accounting in an

organizational effort to understand and create value for customers. As this study is conducted at a large company, it would be interesting to see if similar observations could be made in smaller firms and what different methods are used to operationalize the market in that setting. Additionally, it would be interesting to see studies on a similar topic with a more centered customer base to see if similar methods are used or if the findings suggested in this case study, are unique for TransportCo with its many small customers. Lastly, the authors address further research on how firms operationalize their competitors into their firm as that facet of market orientation historically has been less emphasized in both marketing and accounting literature.

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