Typologies of Manufacturer Identities in the Age of Smart Solutions

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ABSTRACT

This book chapter conceptualizes a manufacturer's new identity in a digitally connected world as a socially constructed phenomenon. We acknowledge the possibility of ambiguity in corporate identity among manufacturers' key stakeholders (personnel, customers, and suppliers) when manufacturers pursue digital servitization strategies. We typologize eight archetypes of identities for a manufacturer providing digitally enabled services and solutions. We suggest that managers should give attention to narratives, organizational culture, processes, resources and capabilities when pursuing organizational identity change.

Keywords: Organizational identity; corporate identity; identity ambiguity; digital servitization; smart solutions

1. INTRODUCTION

Recently, manufacturing companies have been digitizing their offerings to sustain a competitive advantage in the markets and differentiate themselves from their rivals (Kohtamäki et al., 2019; Porter & Heppelmann, 2015; Sklyar et al., 2019). To differentiate themselves, generate financial benefits and obtain deeper customer understanding, manufacturers have invested in building connectivity elements into their equipment to better monitor, control, and analyze the usage of their products (Hasselblatt et al., 2017). This digital development has required manufacturers to acquire new skills, namely, software development and acquisition skills (Allmendinger & Lombreglia, 2005; Iansiti & Lakhani, 2014) and sales competencies (Töytäri et al., 2018; Ulaga & Reinartz, 2011). Some people have argued that manufacturers will be reminiscent of software companies in the future. GE's former CEO Jeff Immelt famously said that *"every industrial company must become a software company"* (Porter & Heppelmann, 2015: 108). Many other executives of traditional manufacturing companies have taken a similar approach and made similar statements, such as *"...we are becoming a software company"* or *"...we are a software company"*, to foster change and communicate their digital strategies to different stakeholders.

On the other hand, personnel and customers may be confused about these types of statements because they still see firms as *"traditional engine suppliers"*. They may also view these types of announcements as similar to marketing speeches disconnected from reality and as inaccurate signals of the manufacturers' positions and initial strengths. For instance, one manager told us in an interview that *"...there is no point for us being a software company, it's better for us to be a manufacturer that adds some digital elements into our cutting-edge products"*. Therefore, changing a firm's identity is far from easy, as it is unclear whether the entire identity must be changed or if the old identity can be a basis upon which to add digital elements. Moreover, changing an identity does not happen overnight; it requires profound changes in a firm's capabilities, structures, routines, processes, boundaries, and offerings as well as in collective sense making and sensegiving (Gioia & Chittipeddi, 1991; Weick, 1995) and in managers' cognitions and mental models (Danneels, 2011; Helfat & Peteraf, 2015).

This conceptual chapter contributes to the intersection of the digital servitization and organizational identity literature by demonstrating how digital servitization affects manufacturer identity in the era of smart solutions.

Answering the question "Who are we as an organization?" and identifying the types of challenges manufacturers might face when trying to change their identities allows manufacturers to address the question "Who will we become as an organization?" We propose different archetypes to (re)define manufacturers' identities in the age of smart solutions and discuss how firm identity can be altered.

2. THEORY DEVELOPMENT

2.1 Defining digital servitization

Manufacturing companies have been embracing the opportunity to create value by digitizing downstream activities (Brax & Jonsson, 2009; Porter & Heppelmann, 2014). Studies use various terms, such as "digital servitization" (Kohtamäki et al., 2019) or "digital transformation" (Warner & Wäger, 2019), to denote the concept of a transition towards value creation and capture through product-service-software systems (PSSSs). Digital servitization can be described as a continuum ranging from sales of pure products to sales of purely digitally enabled services. Through digital servitization, manufacturers attempt to seek both economic and strategic advantages by moving away from the eroding product business and trying to provide more added value to clients, whether through decreased costs or increased revenues (Töytäri et al., 2018). Manufacturers thus try to avoid falling into a "commoditization trap" (Huikkola, Kohtamäki & Rabetino, 2016) by digitizing their offerings and processes. Through digitization, a manufacturing company can provide valuable fleet information to both its clients and focal company (e.g., productivity measures, cost information, and predictions). These collected data can enable manufacturers to develop better and more cost-efficient solutions. These digitally enabled solutions can include connectivity elements, thus leading to system-of-system effects (Porter & Heppelmann, 2014) and contributing to their customers' broader business development. Industrial equipment is thus no longer a stand-alone product but is connected to larger systems. For instance, elevators can be connected to other systems in a building and communicate with other products and systems at a customer's site, potentially leading to improved energy efficiency, process flow, and user experience.

2.2 Organizational identity

In 1985, Albert and Whetten (1985a) suggested that organizations have identities. In their seminal work, they defined organizational identity as *central*, *enduring* and *distinctive*. Organizational identity refers to firm personnel's self-reflective questions related to the core of the firm's existence, such as "Who are we as an organization?" or "Who do we want to be as an organization?" (Albert & Whetten, 1985b; Corley & Gioia, 2004). Therefore, organizational identity aligns with organization members' collective and shared answers to the questions "What kind of organization is this?" and "How is our organization distinctive from others?" The defining aspects of an organization's identity are based on the organization's founding and history and are typically seen as relatively stable. Although previous studies have considered organizational identity to be a relatively stable cognitive structure (Narayanan et al., 2011), an increasing number of studies discuss organizational identity as a dynamic process (Gioia & Patvardhan, 2012). Identity has also been said to address a firm's boundaries, i.e., how different stakeholders such as customers and suppliers view an organization. One way to define, strengthen, and clarify organizational identity is to describe it by addressing questions such as "What kind of organization are we not?" and "What kind of organization do we not want to be?" For instance, Apple did not want to define itself as a traditional engineering/software company ("those are nerds") but rather as a design company that develops technology ("we are cool") (Isaacson, 2011).

Identity has been approached in the literature through different theoretical frameworks. First, researchers have approached identity through an institutional theory-driven lens in which identity is seen to be more or less resistant to change, as labels never change easily. In this view, organizational leaders have an important sensegiving role in which managers provide a consistent "*narrative to construct a collective sense of self"* (Ravasi & Schultz, 2006: 434). Another stream of identity research has its roots in social constructivism, where organizational identity is seen as a shared understanding of and set of beliefs about the central attributes of an organization (Gioia et al., 2000; Vaara & Tienari, 2011). Identity is a relational construct formed through ongoing interactions with others, and sensemaking processes are carried out by all organizational members (Gioia et al., 2013). Through ongoing discussions, members build a shared understanding about the distinctive elements of their organization (Ravasi & Schultz, 2006). In this article, both institutional and socioconstructivist views are acknowledged, and both sensegiving and sensemaking are seen as important processes when manufacturing companies aim to change their identities towards smart solutions.

2.3 Creating a new identity

Constructing a new identity for a firm takes time and occurs relatively slowly because the defining aspects of a firm's identity typically have a relatively stable foundation in the organization's roots, cultural aspects, and history (Corley & Gioia, 2004). Constructing a new identity requires not only the attention of top management (Vaara & Tienari, 2011), a clear vision of the organization's future position, and active and continuous communication to different stakeholders but also a deeper understanding of the characteristics of organizational identity. Identity changes have been studied in the merger and acquisition process (Vaara & Tienari, 2011), spinoffs (Corley & Gioia, 2004), the process of diversification (Barney, 1998), new ventures (Fisher, Kotha & Lahiri, 2016), or the process of creating new divisions within firms (Brown & Gioia, 2002). Therefore, clear triggers have been identified in previous studies from which to start to investigate how firms (re)create their identities. Previous studies (see Albert, 1992) have suggested that additive changes are easier to manage than subtractive changes (Corley & Gioia, 2004). In the servitization literature, "service infusion" is reminiscent of an additive change, whereas strategic, complete renewal and "morphing" are more indicative of subtractive changes.

Identity consists of both *language* and *meanings* (Gioia, Schultz & Corley, 2000). First, language refers to how an organization's members respond to the question "Who are we as an organization?" For instance, responses such as "We are an innovative start-up" align with self-reflective labels such as "innovative" and "start-up". However, these labels have different meanings for internal and external stakeholders, as innovative and start-up can mean different things to different organization members. For some, innovative may refer to the "ability to develop cutting-edge technologies", whereas for others, it may mean the "ability to enter markets first". The term start-up may indicate being entrepreneurial and agile to some, whereas for others, it may mean that a company is still seeking a well-tested and functional earning logic.

2.4 Identity ambiguity

Identity ambiguity refers to there being multiple different interpretations of an organization's core features, thereby leading to uncertainty and confusion among personnel and stakeholders regarding the organization's

future image (Corley & Gioia, 2004). This confusion may lead to tensions between units and organization members regarding their collective understanding of "What kind of organization is this?" Ambiguity typically stems from corporate spinoffs, acquisitions, divestments, unclear goals, and weak management communication. Even though identity ambiguity has a negative connotation, organizational resistance and inertia may be beneficial for identity renewal, as they indicate that an organization's members are interested in the firm's direction and in how its executives will try to redirect the company.

2.5. Typology of identities in digital servitization

Figure 1 presents eight ideal pure forms of manufacturer identity that are possible in the age of smart services. These "We form" archetypes are categorized as reflections of potential ways to describe a company: 1) "We are a software company", 2) "We are a manufacturer", 3) "We are a smart manufacturer", 4) "We are a service company", 5) "We are a smart service company", 6) "We are a manufacturer that provides services", 7) "We are a smart manufacturer that provides services", and 8) "It is unclear who we are". These identities are typologized based on how weak or strong a firm's manufacturing, service, and software identities are interpreted to be.

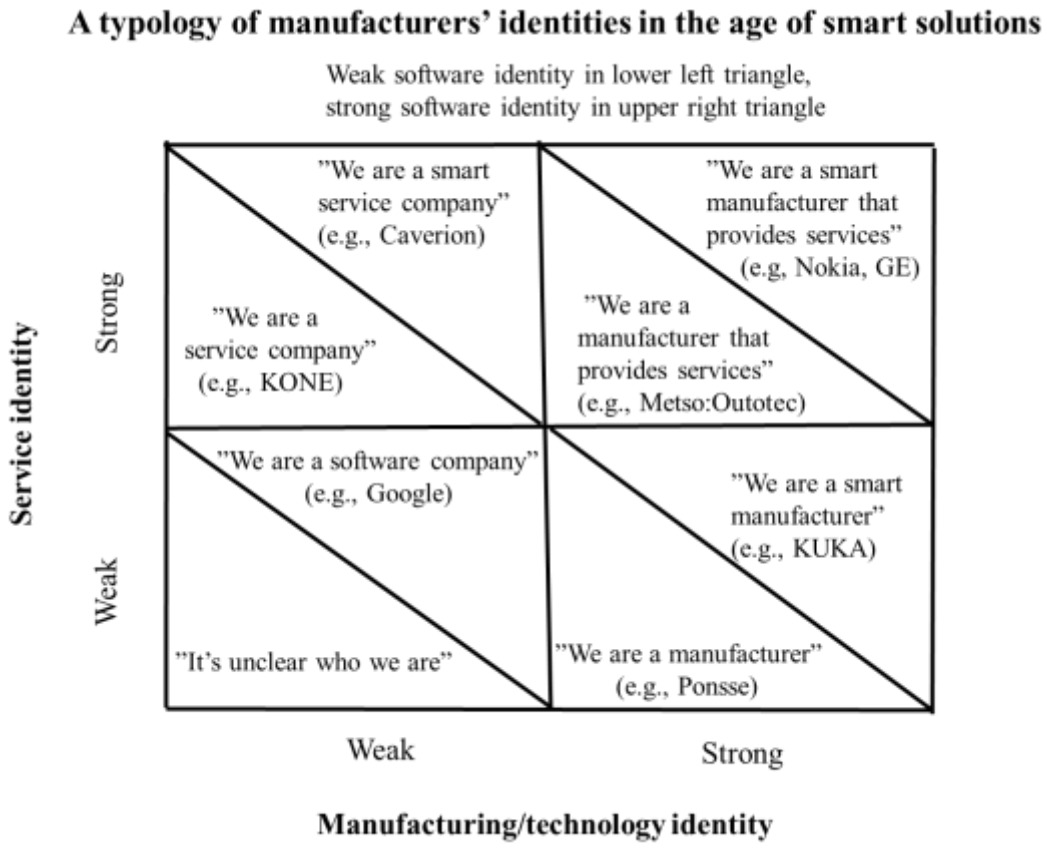

Figure 1. Typology of different identities of manufacturing companies.

The *"We are a software company"* statement highlights the role of software for a manufacturer and diminishes the role of manufacturing and services. This is a powerful utterance from executives and is typically used in manufacturing firms that have taken strategic initiatives towards smart solutions. The statement clearly describes the manufacturers' strategic intent but has several drawbacks and causes doubts related to the manufacturers' existing capabilities, culture, and position in the markets. First, before expressing this type of goal for a firm's future identity, executives should have a proper understanding of the firm's extant capabilities (Danneels, 2011) and of how the firm can develop digital/software capabilities (e.g., through acquisitions or hiring software developers; see Huikkola et al., 2020). Second, executives should understand a firm's organizational culture, namely, how agile and enduring it is. In software companies, organizational culture traditionally emphasizes flexibility, informality, and agility, whereas traditional manufacturers can be described as relatively inflexible, formal, and rigid (Immelt, 2017). Hence, there is potential for tensions to accrue within companies, and executives should give special attention to identifying routines to "get things done" within their organizations. Third, regarding market position, being a software company provides the

possibilities of leveraging software to enter other markets and being free from products and developing stand-alone digital offerings.

"We are a manufacturer" and *"We are a technology company"* are relatively natural descriptions for manufacturers and technology companies. However, many times, they are reflections of a company's current situation and do not provide guidelines regarding what kind of company it will be in the future. These clear identities emphasize that products and manufacturing assets are the core of the company. They do not indicate that manufacturers would not develop software internally or provide services to their clients. For instance, the Finnish forest machine manufacturer Ponsse has clearly stated that its mission is to "produce the best forest machines in the world". These machines contain many smart elements, as PCs have been embedded in them since the 1990s, and they need to be serviced regularly. It must be remembered that key stakeholders such as customers view these companies through their products, as customers use the products daily at their sites. This does not mean that services and software elements are not important, but the core of such firms is built around their equipment.

"We are a smart manufacturer" minimizes the role of services and emphasizes the role of technology and software as distinctive elements of the manufacturer. This identity description is typically used in robotics, additive manufacturing (3D printing), and smart factory contexts, where manufacturers possess deep knowhow of certain technological solutions. Typically, this identity requires capability development in areas such as big data, modeling and simulation, and intelligent automation. For instance, robotics companies KUKA Robotics and ABB are examples of manufacturing companies whose identities could be described in such a way.

The *"We are a service company"* reflection stresses the importance of services to a manufacturer. This statement has been used particularly among manufacturers who have started to provide traditional after-sales services (Cohen et al., 2006), such as maintenance and repair services, to their clients to obtain more stable income and higher margins (Neu & Brown, 2005). The idea behind this utterance is to highlight customer intimacy. One of the key ways to sell new equipment is through existing customer relationships; relevance at customer sites also facilitates sales of new products. In this identity archetype, business logic originates from service sales, e.g., how new equipment and smart elements can boost service sales. For instance, the Finnish

elevator manufacturer KONE started to describe itself merely as "a service company", highlighting that services and service contracts are seen as key differentiators and sources of income for the company.

"We are a smart service company" describes a company that stresses the role of software and services in its core business. Software and services are intertwined in this typology, thereby diminishing the role of traditional manufacturing and equipment. A key distinction emerges from a manufacturer's ability to deliver software-as-a-service types of solutions to its clients. In this archetype, products are seen merely as "add-ons" for companies, and manufacturers are reminiscent of consultancies or project companies. Schneider Electric and Caverion are potential examples of companies pursuing a smart service company identity.

The *"We are a manufacturer that provides services"* identity combines the traditional product business with a service business. Another form of this identity could be *"We are a service company that provides equipment"*. Before the Internet of Things (IoT) era, this approach became popular among technology companies, as manufacturers possessed two subidentities: 1) a manufacturing/technology identity and 2) a service identity. Those subidentities were typically even separately organized within the manufacturing companies. Many times, they were well balanced in each company in terms of proportion and strategic importance.

"We are a smart manufacturer that provides services" indicates that the manufacturer is attempting to excel in three different arenas (manufacturing, services, and software). This is perhaps the most challenging initiative to accomplish in practice, as there exists a danger of identity ambiguity. Moreover, developing capabilities and culture to facilitate positioning has become increasingly difficult. Integrated solution providers (see Davies et al., 2007; Wise & Baumgartner, 1999), such as Alstom (mobility provider) and Nokia (network provider), are examples of companies that could credibly pursue such an identity.

The *"It is unclear who we are"* category refers to manufacturers who do not stress or communicate enough about any of the three distinctive features, as all of the distinct identity elements are minimal or ambiguous. In these situations, organizations typically have unclear goals and measures, which causes different organizational levels and units to compete against each other and aim towards different goals, resulting in

ambiguity. This archetype is sometimes observed in manufacturers that are struggling towards smart services while also aiming to increase their profits from traditional manufacturing activities.

The eight identity archetypes presented above are illustrations of possible identities for manufacturing companies in an era when services, solutions, and software are complexly intertwined. We acknowledge that these pure forms rarely exist in real life, but they are important for managers to consider when evaluating what type of company their organization is or what direction their company will potentially take in the future.

2.6 Creating a new identity

To create a new firm identity, executives should have a proper understanding of the firm's current identity, its strengths, and its weaknesses. Furthermore, they need to draw a picture of the firm's desired future position in the industrial ecosystem. This position may be far from the firm's current position, and firms rarely have the capabilities necessary to obtain that position. In the beginning, managers need to understand the current organizational culture and its three levels, namely, 1) artifacts, 2) beliefs and values, and 3) basic assumptions (Schein, 2010), which are interrelated with organizational identity. Organizational culture is perceived to have a dynamic relationship with identity and image (Ravasi & Schultz, 2006) in which identity expresses cultural understandings (Hatch &Schultz, 2002) and is socially constructed (Gioia et al., 2000). These organizational beliefs, structures and basic assumptions potentially hinder organizational identity change. Some level of resistance may even be beneficial for an organization because it indicates that the organization's members are interested in the firm's position and strategy. For executives, it becomes relevant to identify key internal rigidities that potentially hinder that change. Moreover, they must identify possibilities and weaknesses related to the desired position and identity in the market. For instance, if a manufacturer wants to become "a software company", it must decide what role equipment and services will play related to that position—will the manufacturer develop software for other equipment, including its rivals' products, and will it sell software as projects or services (SaaS)? A manufacturer must also decide on an organizational structure for the software business—will software be a profit-and-loss responsible unit within the organization or will it be integrated with the product and service units? In addition, companies need to have a clear roadmap related to personnel and routine development—i.e., how to hire, retain and train software engineers and developers who could be employed by world-class software companies such as Google, Apple, Amazon, and Microsoft.

In the moving, transitioning or changing phase (Lewin, 1951), change becomes reality and may be viewed with fear and uncertainty by organization members. In this mode, employees need to learn new routines, processes, and modus operandi. In this phase, communication from executives and managers is vital—what does the firm want to achieve with this new identity, and why is this change required? Both sensegiving and sensemaking are needed. This change does not happen overnight, and managers must continuously communicate about the new identity to the key stakeholders—this communication can take place through e-mails, management letters, shareholder speeches, annual reports, personnel info, development discussions, letters from the CEO, media interviews, investor meetings, etc. All of these actions are part of the sensegiving process, which needs to be ongoing, active, and repetitive to be effective. In the sensegiving process, managers should present the changes in ways that relate the changes to the previous experiences of the organization's members to facilitate a collective sensemaking process (Gioia, 1986). Other ways to facilitate organizational sensemaking processes are to ensure that members have time to discuss, debate, ask, and build shared understandings about the identity change. Production meetings, team meetings, weekly meetings, and even coffee breaks are important arenas for the sensemaking process. Furthermore, firms typically take many actions to pursue a new identity. For instance, firms may hire software engineers, build new digital organizations, appoint Chief Digital Officers (CDOs), or craft new vision/mission statements regarding the desired new identity.

After these continuous actions, communication initiatives, and sensegiving and sensemaking processes, the changes must be reinforced and stabilized. In this phase, the new identity will be cemented, and executives must ensure that organizational processes and members' ways of doing things (routines) are systematically employed. In practice, goals, measures and rewards must be established, and executives need to verify that the changes have taken place through mutually accepted measures. For instance, if a manufacturer's goal is to become "a service company", it most likely will begin to measure its 1) sales of services, 2) services' profitability (e.g., service margins and customer-based profitability), 3) customer lock-in (e.g., customer retention rate), and 4) number of installed base/service contracts. To establish this service identity, executives must verify through such measures that the organization's actions support and convey the new identity. Figure 2 outlines organizational identity as a socially constructed process (Gioia & Chittipeddi, 1991; Schein, 2010).

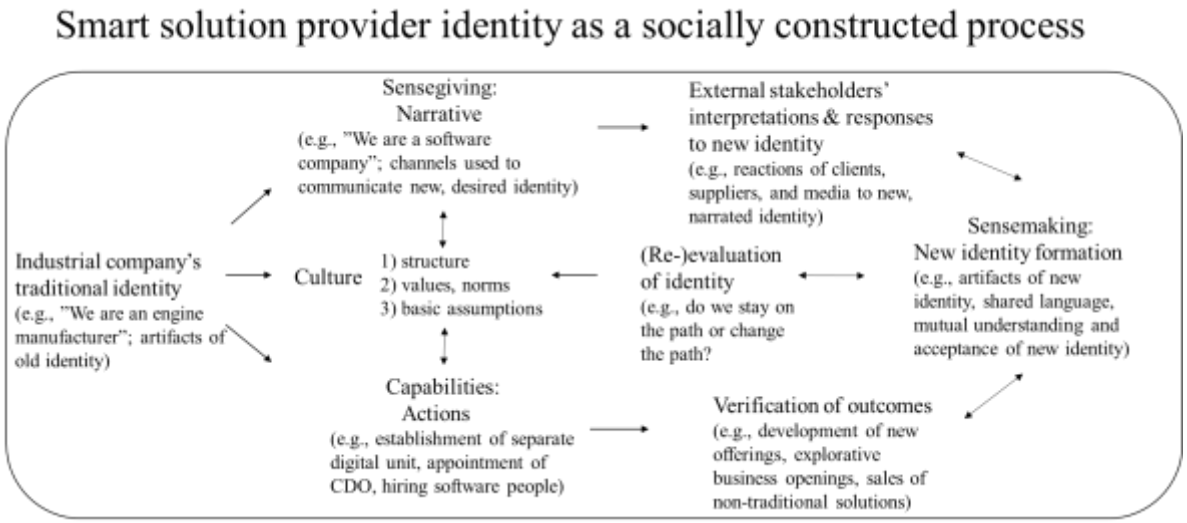

Figure 2. Smart solution provider's identity as a socially constructed process.

Based on the actions described above, a new identity is created or a firm starts to re-evaluate its identity (do we continue or attempt to change our identity?). The reflections of the new identity formation include artifacts (How can the new identity be depicted in practice through visualizations?), shared language among organization members, and acceptance of the new identity among internal and external stakeholders. In particular, customers and users are important when evaluating how a new identity is established. For instance, in 2008, Nokia's then CEO, Olli-Pekka Kallasvuo, publicly stated, "Nokia is a service company". However, large audiences, consumers and operators probably did not understand or believe that statement because they only viewed Nokia through its products and powerful "connecting people" mission statements. In contrast, the public and operators were more easily convinced that Apple, Microsoft and Google are real software companies. However, these companies would encounter difficulties in being viewed as manufacturers even though all of them also produce devices.

3. DISCUSSION

As the world and industrial equipment are becoming increasingly connected and Industry 4.0 and IoT are becoming more relevant to both manufacturers and their customers, new technologies and digitization provide opportunities to increase sales and decrease costs. To thrive in this era of smart services, manufacturers need not only new capabilities, structures, offerings, and processes but also redefined corporate identities. This

redefinition is far from easy, as a manufacturer's new identity should not be too similar to its existing identity, it needs to motivate internal and external stakeholders, and it needs to be inspiring yet realistic to achieve. Establishing a new identity may also lead to mixed identities and identity ambiguity among organization members (Gioia & Corley, 2004).

3.1. Theoretical contributions

This book chapter makes two theoretical contributions. It 1) typologizes eight distinct archetypes of manufacturer identities using three perspectives—(a) manufacturing/technology, b) service, and c) software)—and their dichotomies and 2) describes organizational identity change as a socially constructed process.

For its first theoretical contribution, this article conceptualizes and categorizes eight possible identities for manufacturers in the age of smart services. Specifically, this article contributes to the literature on digital servitization (Kohtamäki et al., 2019; Sklyar et al., 2019) by describing how new smart identities are socially constructed (Gioia & Corley, 2004; Gioia et al., 2013). Based on three distinct identity elements (technology provider/manufacturer, service, and software) and configurations of how strong or weak the elements are considered, we typologize eight distinct organizational identities that are possible for manufacturing companies to adopt. Although these pure forms are far from the forms taken by manufacturers in reality, these archetypes enable manufacturers to identify both their existing identities and their desired future identities, hence giving them direction. Pure forms help executives identify possible alternatives and redirect companies when altering their identities, even though the pure identities are far from real.

For its second theoretical contribution, this article describes the identity change process as a socially constructed process, thus contributing to the literature on identities and digital servitization (Huikkola et al., 2020; Keränen, Salonen & Terho, 2020; Kohtamäki et al., 2019; Salonen & Jaakkola, 2015). Building a new corporate identity requires changing the executives' narratives about the company ("Who are we as an organization?), organizational culture (structures, norms, values, and basic assumptions), and corporate resources and capabilities (reallocating resources, building new capabilities, and unlearning). We propose that when an organization changes its identity, its executives and managers need to identify the existing and desired future identities in the beginning, communicate the new identity when taking actions, and verify the new

identity. Each process has its own challenges. When identifying the old identity and establishing a picture of the desired new identity, the most difficult challenge is to understand the sources of resistance among organization members and create a credible identity that is both ambitious but realistic. When changing the identity in practice, the most difficult challenge is to communicate the message and change the personnel's way of doing things because changing routines is perhaps one of the most challenging tasks for managers to execute (Gilbert, 2005). When stabilizing the identity, the managers should pay attention to artifacts, shared language, and perceptions of the new identity among the key internal and external stakeholders.

In sum, particularly in larger companies, many identities may coexist. Executives should be aware of possible subidentities and define their companies' "master identity". The challenge is to define the identity and what kind of organization the company wants to become. In changing that identity, there is danger of identity ambiguity and confusion among personnel and stakeholders. To avoid this identity ambiguity, we suggest that executives and managers could benefit from implementing identity identification, communication, and verification phases. Moreover, identity is socially constructed and requires active dialogue and communication between managers, personnel, and other key stakeholders (Gioia et al., 2013; Vaara & Tienari, 2011)

3.2. Managerial implications

For managers, the present article shows the elements involved in the process of identity change that should be considered when aiming to alter organizational identity. This article does not give special attention to any specific change process triggers, such as mergers and acquisitions, alliances, spinoffs, or divestments, but reviews the strategic change process in general. In particular, to facilitate new identity formation, executives and managers should give attention to identifying the new organizational identity, communicating the identity, and verifying the organizational actions' outcomes. Thus, we suggest that executives should be aware of the typical bottlenecks during the different phases of the identity change process.

3.3. Future research directions

Future studies could delve deeper into the processes and practices related to specific digital servitization triggers and actions, such as software firm acquisitions and the establishment of separate digital units. Future studies could investigate in-depth how those special triggers and actions affect firms' (software) identities.

Studies could also investigate how a manufacturer's identity facilitates digital servitization. Moreover, more studies are needed about how "storytelling" and "antenarratives" are applied when facilitating organizational identity change towards smart services (Vaara & Tienari, 2011). We suggest that future studies investigate artifacts as reflections of corporate identity formation and how identity change can be depicted through visualizations.

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