

Digitalization through Skunk Works Innovation – An Interactional Perspective

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ABSTRACT

To stimulate radical innovations, R&D workers are often isolated from the influence of the rest of the organization. This has become known as the Skunk Works model of innovation and is claimed to bring several advantages, including escaping organizational myopia and firm bureaucracy. However, the Skunk Works model of innovation is often seen from an intra-organizational perspective, subsequently ignoring how inter-organizational relationships are affected by the development of radical innovation. IMP theory rests on the notion that business is conducted in supplier-buyer relationships in which companies adapt their resources and offerings to each other. First-hand knowledge about established producer-user interfaces thus facilitates the achievement of innovation. Subsequently, if the *raison d'être* for the Skunk Works model is to isolate the innovation process from existing organizational structures the future adaption of the innovation into existing supplier-buyer relationships might be jeopardized. This paper examines the process of radical innovation within a large international manufacturing group called Sandvik Machining Solutions (SMS). SMS operates within the metal cutting tools industry, and consists of four product areas that operate as mostly autonomous companies, transacting with each other, as well as collaborating around shared resources. The innovation process studied within this paper is SMS's attempt to digitalize its manufacturing, supply chain management processes, and customer offerings. The paper concludes that the Skunk Works model of innovation offered SMS an initial freedom to create new organizational structures around their digitalization efforts. However, this paper also present eight problematic issues that the use of the Skunk Works model imposed on existing supplier-buyer relationships. A separation from the resource structures of product areas' core operations, as well as a shift in ownership of vital resources, became evident. Moreover, the digitalization efforts were built around a technological system that proved incompatible with existing IT structures.

Keywords: Skunk works, digitalization, innovation, relationships, Purchasing and supply management.

INTRODUCTION

To stimulate radical innovations, researchers and R&D workers are often isolated from the influence of the rest of the organization. This has become known as the Skunk Works model of innovation, and is claimed to bring several advantages (Fosfuri & Rønne, 2009). Considering the discussion on myopia in organizational learning (March 1991; Levinthal and March 1993), as well as the aspect of bureaucracy's stifling forces (Rogers, 1995), it gives developers the necessary autonomy, independence and freedom to escape the established lines of thought and to produce novel ideas (Fosfuri & Rønne, 2009; Christensen, 1994).

However, the Skunk Works model of innovation is often seen from an intra-organizational perspective subsequently ignoring how inter-organizational supplier-buyer relationships are affected by the development of radical innovation. Industrial Marketing and Purchasing (IMP) theory rest on the notion that businesses are conducted in networks in which companies adapt their resources and offerings to each other, and therefore lock each other into interdependent relationships (Håkansson & Snehota, 1995). This is a particular intricate challenge in purchasing and supply relationships in which intense interaction and collaboration between supplier and buyer involves mutual adaptations of resources and adjustment of activities (Aurajo, Dubois and Gadde, 1999). Such mutual adaptation requires substantial relationships costs for both parties, however, the potential gains offered in productivity and innovation is well above any other more arms-length supplier-buyer relationships (Gadde and Wynsta, 2017). Introducing changes into such relationships are difficult since the status quo of compatibility that has been developed over time is being challenged by the new resource structures (Håkansson & Waluszewski, 2007). Subsequently, first hand knowledge about established interfaces and past investments made in material and immaterial resources, facilitates the achievement of the desired changes (Håkansson & Waluszewski, 2007). Hence, the closer and more integrated developers of something novel are to existing intra- and inter-organizational structures the easier it will be to impose change into the established supplier-buyer relationship.

The IMP perspective entails that separation from the very structures in which you are supposed to inflict changes, increases the risk of developing an incompatible system that will be rejected upon adaptation. The strategy of isolation that the Skunk Works model of innovation suggests, might thus be questioned. Even if the Skunk Works model offers creative freedom from existing structures, an innovation or change to a relationship must sooner or later fit into resource structures enabling production, distribution and sales, and thus loose its initial freedom. In other words, if the *raison d'être* for the Skunk Works model is to isolate the innovation process from existing organizational structures, this might jeopardize the way in which the new innovation will fit into that organizations existing external and internal networks of supplier-buyer relationships. When introducing a network perspective, the merits of the Skunk Works model of innovation hence seems to become something of a paradox, both from an intra and inter-organizational perspective.

In order to investigate the paradox between the merits of organizational isolation and the need for an innovation's structural fit, this paper examines the process of radical innovation within a large international manufacturing group called Sandvik Machining Solutions (SMS). SMS operates within the metal cutting tools industry, and consists of four product areas that operate as autonomous companies while having a common ownership. On some aspects these product areas collaborate, share resources and trade internally, otherwise they compete for the same customers. The product areas are thus tied together by a common ownership, but have also

developed supplier-buyer relationships with each other. This makes managing joint radical innovation a rather interesting dilemma that combines both intra- and inter-organizational strategy within one orchestrated unit. Studying the intra- and inter-organizational merits of Skunk Works in this empirical setting thus offers opportunities to give interesting insights to innovation theory, as well as to purchasing and supply management.

The innovation process studied within this paper is SMS's attempt to digitalize its manufacturing processes and customer offerings. This goes well in hand with the contemporary trend within the manufacturing industry often described as Industry 4.0 (Einsiedler, 2013; Lee, Kao & Yang, 2014). This trend entails a focus on the establishment of intelligent products and production processes that rely on the gathering and use of big-data (Brettel et al., 2014; Prashant et al., 2013). As a result, the depth of added value within one firm generally decreases while the complexity of products and processes increase. Against this background, collaborative manufacturing (Lin et al., 2012) and collaborative development environments (Mendikoa et al., 2008) gain special importance. This reinforces a need for companies to develop the management of their purchasing and supply, a development that goes hand in hand with research of inter-organizational innovation processes within IMP literature as described above. This paper thus describes a phenomenon that further actualizes the need to seek knowledge regarding the merits of the Skunk Works model as used within radical innovation processes in a supply management context.

The purpose of this article is thus to analyse the benefits and obstacles to purchasing and supply management that the application of the Skunk Works model of innovation entails, especially within business networks whose actors are both subject to hierarchical governance (intra-organizational) and individual autonomy (inter-organizational).

In this paper we firstly, provide a literature review in which the Skunk Works model of innovation, the inter-organizational network perspective on innovation, and innovation in purchasing and supply management is introduced. Secondly, we present our methodology and describe our case of study. Thirdly, we portray our analysis where we firstly describe the benefits of that our studied companies enjoyed from the use of the Skunk Works model of innovation, then we describe the obstacles to a successful innovation process that such use generated. Finally, we offer our conclusions that summarise and discuss eight major obstacles to successful innovation that the use of the Skunk Works model imposed.

LITERATURE REVIEW

The Skunk Works Model of Innovation

The name "Skunk Works" derives from the official alias for Lockheed Martin's Advanced Development Programs (ADP), which purpose was to design a number of radically innovative aviation technologies, including the U2 and the SR-71 spy 'planes. The Lockheed Martin Skunk Works was set up in order to separate the project from day-to-day administrative and procedural challenges enabling the project to be creative, innovative and agile in developing new technologies. Thus, they built a small but highly capable and motivated team operating within an existing organization (Ellaway, 2014). Actually, Rich and Janos (1994:350) described the origins of the Skunk Works model, and posited that "the Skunk Works strength is the autonomy they have enjoyed from management and their close teamwork and partnership with their customers".

Since then the concept of a “Skunk Works” has been used in business, engineering, and technical fields to describe a discrete unit (typically a laboratory or workshop) within an organization that is given a high degree of autonomy with minimal bureaucracy to work on advanced or secret projects (Rogers, 1995). The Skunk Works model has since been the organizational design followed by IBM to nurture the by then revolutionary PC (Roberts 2004), by Ericsson Mobile Communications to develop the Bluetooth technology (Nobelius, 2000), and it is employed by many large innovative firms, such as Intel, HP and Apple, to develop potential breakthroughs (Fosfuri & Rønne, 2009). Essentially, the Skunk Works model has become the archetype of an institutional way in which to innovate by sanctioning unorthodox ways of working, and by relaxing organizational rules for a select group of innovators, thus alleviating the need for them to fight those rules by circumvention (Ellaway, 2014).

The concept of Skunk Works also initially served as an explanation to why industry leaders often seemed to fail to capitalize on new technologies (Christensen, 1994). Christensen (1994) firstly claimed that a lack of knowledge and ingenuity was certainly not the problem since many disruptive technologies were invented but not developed by established firms. Christensen (1994) also proclaimed that it was certainly not ineffective leadership either, since the major companies discussed in his books, along with their leaders, were universally admired for their productivity and sound management. Instead, Christensen (1994) proclaimed that the key for solving this puzzle lied in the concept of "value networks". Businesses use existing technology to grow and prosper in their particular environment, and as a consequence they develop interlocking networks of suppliers, customers, and management systems that share and support the same values. It thus provides industry leaders with the ability to escape the problem with myopia in their organizational learning (March 1991; Levinthal and March 1993). Christensen (1994) describes this paradox by asserting that "The very processes and values that constitute an organization's capabilities in one context define its liabilities in another context" and thus postulated that being in the position of an industry leader will often bring favourable outcomes, but in terms of developing ground breaking technologies it may actually be detrimental.

This argument indicates that large corporations might be well suited to lead incremental innovation that will fit neatly into its organizational frames. However, developing ground breaking technology or radical innovation is more problematic. Henderson (1993) claim that available empirical work suggests that historical experience positively handicaps the firm in cases of radical innovation (Tushman and Anderson, 1986). Information filters derived from historical experience will "blind" the firm to the nature of radical innovation (Arrow, 1974). Fosfuri and Rønne (2009) similarly claim that Skunk Works are closely associated with overcoming the resistance that radical innovations meet inside large and industry dominating organizations that remains blinded by their history. Radical innovation and the position of being an industry leader thus becomes a problematic mismatch for larger corporations to handle.

Inter-organizational Networks and Radical Innovation

Even if Christensen´s (1994) concept of "value networks" involved interlocking networks of suppliers, customers, and management systems, Skunk Works has largely been defined as an intra-organizational concept. However, the hardship of achieving radical innovation and introducing ground breaking technology into existing intra-organizational network structures

have achieved some attention (Bessant, Öberg & Trifilova, 2014; Möller, 2010; Corsaro, Cantù & Tunisini, 2012).

The IMP perspective emphasises that innovation is generated in a network setting (Håkansson & Snehota, 1995), which indicates that innovation is determined by the network in which the innovating firm is embedded (Möller, Rajala, & Svahn, 2005). This in turn entails that all relationships are influenced by other relationships, which provides both opportunities as well as constraints for the focal company (Anderson, Håkansson, & Johanson, 1994). Such business landscapes are often made up of actors belonging to a variety of industries, as well as social, and technological networks (Corsaro, Cantù & Tunisini, 2012). They can be firms, suppliers, customers, universities, laboratories, technology centers, trade unions, service providers, financial institutions, and many others, all engaged in reciprocal, preferential, and supportive actions (Powell, 1990).

Scholars also claim that the aspects of opacity, complex dynamics and ambiguity are strongest in the business networks that are based on radical innovation (Brynjolfsson & Kahin, 2000; Håkansson & Waluszewski, 2002; Murtha, Lenway, & Hart, 2001; Tushman & Anderson, 1990). Such networks are characterized by dispersed and vaguely identifiable ideas about the future involving great uncertainty concerning the actors, activities, and resources necessary for their realization (Möller & Halinen, 2017). The rise of the digitalization of industries is mentioned as such an example (Möller & Halinen, 2017; Lin et al., 2012; Mendikoa et al., 2008).

At first sight, managing innovation in such diverse and complex situations might be a daunting if not impossible task. Many scholars offer support to such notions and postulate that, by causing conflicts, communication problems, scarce social integration, and reduced trust, heterogeneity and variety can have negative effects and limit the innovative performance of individuals, groups, and firms (Hambrick, Cho, & Chen, 1996; Miller et al., 1998). However, it has been shown that business relationships among companies with homogeneous acquisition experiences are less successful than those characterized by heterogeneity (Corsaro, Cantù & Tunisini, 2012). Thus, heterogeneity and complexity in networks may foster creativity (Amabile, 1996) and can make group interaction more effective (Corsaro, Cantù & Tunisini, 2012). Homogeneous networks might subsequently be easier to manage and thus to prefer, however, riding with the uncertainty and complexity of heterogeneous networks has often proven to be more rewarding in the end. Moreover, empirical experience shows that anything new must fit into the structures and networks that enable its utilization in order to achieve widespread use (Håkansson & Waluszewski, 2007; Van de Ven, Polley, Garud & Venkataraman, 1999). Dealing with the complexity of the networks might thus be the only way in which to impose changes into an existing resource structure or network. Especially if one wishes to adapt to networks associated with the digitalization of industries, since such networks are governed by dispersed and vaguely identifiable ideas about the future (Möller & Halinen, 2017).

Innovation in Purchasing and Supply Management from an Interactive Perspective

Purchasing and supply management involves different types of interaction between buyers and suppliers, ranging from the day-to-day activities undertaken to reduce costs and improve performance (rationalisation), to the acquirement of resources vital for the core competences of the buying firm (development). Also, the buying behaviour of large companies may affect the structure of the whole market, thus affecting all of the relationships existing within the

networks of buying and supplying firms (structuring) (Axelsson & Håkansson, 1984). Relationships of such varying form and importance often co-exist within a network of supplier-buyer relationships, and constitute the market in which a firm operates. The most important aspect of purchasing and supply management within such network contexts are according to Aurajo, Dubois and Gadde (1999) the interactive interface in which intense interactions and collaborations between buyer and supplier involves mutual adaptations of resources and adjustment of activities. Within this interface, the mutual adaptation requires substantial relationships costs for both parties. However, such interfaces offer potential gains in productivity and innovation well above any other more arms-length supplier-buyer relationships (Gadde and Wynsta, 2017).

As a result of Industry 4.0 the depth of added value within one firm generally decreases while the complexity of products and processes increases. Against this background, collaborative manufacturing (Lin et al., 2012) and collaborative development environments (Mendikoa et al., 2008) gain special importance. If collaborative manufacturing and developing will become more prevalent in the future, it is evident that the need for interactive interfaces within the supplier buyer relationship will also be elevated. The intricacies of developing such interfaces will subsequently be heightened. Moreover, the complementarities that are sought in developmental supplier-buyer relationships, in which vital resources are acquired, also entail higher degrees of heterogeneity within the network since complementarity implies diversity (Corsaro, Cantù & Tunisini, 2012). Imposing change into such heterogeneous networks is described as a particularly delicate challenge (Hambrick, Cho, & Chen, 1996; Miller et al., 1998), and the development of interactive buyer-supplier relationships will hence be a managerial issue of increased difficulty.

METHODOLOGY

Qualitative approach was used because it is the most appropriate data collection method to study innovation from an interactive and inter-organizational network perspective. Thus enabling a deep understanding of the actors, interactions, sentiments, and behaviours occurring for a specific process through time (Borghini et al. 2010).

A major premise that guided the research design is the interpretive nature by which the aim is directed. This implies a focus on subjects' interpretations regarding what they viewed as significant in their organizational life. To achieve this, in-depth interviews were conducted with informants who viewed the transformation process from strategic and business perspectives (Eisenhardt & Graebner 2007). Material for the case studies was both retrospective and real-time, digitalization projects investigated were on-going during the time data collection took place, and as far as the authors are aware, when writing this article these projects were still in progress. Eighteen semi-structured interviews were conducted with managers holding key positions and responsibilities in the studied digitalization projects, lasting between 1h and 1.5h.

The data collected was analysed in three steps: data reduction, data display, and conclusion drawing (Miles & Huberman 1994). Data reduction entails selecting and filtering data in order to focus, discarding and organizing data in such a way that conclusions can be drawn and verified (ibid.). Main themes were extracted by using the main elements of the theory as a framework to give the research findings an appropriate structure.

Case Description

Sandvik Machining Solution (SMS) is the metal cutting tools business area of the Sandvik Group. It is the largest of the company's business areas, generating respectively 40 and 50% of its revenues and operating profits (Sandvik 2017). SMS has a multi-brand strategy with four brands, or product areas, namely Sandvik Coromant, Seco Tools, Walter and Dormer Pramet (ibid). Product areas are profit centres, and each product area is responsible and accountable for its own businesses, costs and revenues. Product areas have overlapping industry and geographical markets. They have similar product portfolios, belong to the same group, and are competing with each other.

ANALYSIS

Benefits to Implementing the Skunk Works Model of Innovation

| In order to initiate the process of digitalization within the SMS a new organizational unit called Center of Digital Excellence (CODE) was established. A choice was made to separate this new R&D specialized unit from the existing organizational structures of the established product areas. CODE should thus work in collaboration with all the product areas, and subsequently create a new avenue for joint R&D, much in line with the Skunk Works model of innovation.

It was an explicit strategy to separate the resources involved within CODE from the existing resources structures within the product areas, and that product areas should remain independent when it comes to handling their customer relationships. A Business Development Manager at SMS explained that the SMS group had "strong product areas working on selling their products", and that it was "necessary to have a different brand or product area such as CODE". The interviewee thought that CODE should eventually become a product area, or brand, in its own right, and create its own business relationships, both internally with the different product areas, and externally with its own customers.

CODE was established distanced from SMS's own joint IT-department, and instead has been hiring external consultants, such an IT software firm from the Czech Republic. This enabled CODE to break loose of the structures and procedures usually enforced by the IT-department and freely dictate its own requirements. SMS's Head of Business Development claimed that the IT-department is too concerned with aspects regarding data privacy, security, and other internal processes and routines, which could stifle the innovative spirit of CODE. The respondent assessed that "CODE is more entrepreneurial, they run, they do, and they create, while SMS applies more risk management."

Within CODE an R&D project called Smart Supply was developed. The goal of the Smart Supply project is to develop a common smart industrial vending cabinet solution for the product areas to sell to their customers. Smart vending cabinets function has tools inventory managers and ordering operators. They can transmit product consumption data from the customers back to SMS, such as which tools and to which amount, is the customer consuming or storing, and they can be set to automatically pass orders to SMS when certain tools are running out. Product area can use this information to better adapt their product offerings to their customers' needs. Smart Supply includes the creation of a common pilot software for the vending cabinets, the defining of the specific hardware requirements of the product areas, and

establishing a common global Service and Support network. Managers in charge of Smart Supply explained that product areas should be free to choose what elements of the Smart Supply solution to adopt into their existing operations.

Another R&D project developed within CODE is a digital tool data library for the use of all product areas, called Adveon. The goal of this library is to catalogue all product data, such as material specifications and assembly methods, for metal cutting tools sold by all product areas. It is built on a specific metal cutting tool industry ISO. The product areas' customers can use such database in computer-aided manufacturing and design (CAD/CAM), to virtually choose tools that will be included in their manufacturing processes. The requirements for Adveon are the same for all product areas, and coordination between them needs to be standardized, even if such standardization is developed outside of product areas' own internal operations.

Obstacles to Implementing the Skunk Works Model of Innovation

SMS made the choice to drive their general digitalization efforts through a separate organizational unit, instead of solely focusing on digitalization activities directly within the different product areas' existing operations. This is in line with their multi-brand strategy, and a Business Development Manager described this strategy, by citing current Sandvik's CEO Björn Rosengren "You have your full accountability and if you want to go somewhere else for sourcing your solution, you are free to do so. It's up to you. You're product areas now." However, the respondent added that their CEO had made this remark after stating that "smart managers cooperate". The product areas thus enjoy a large portion of autonomy, SMS's VP for Business Strategy and Development assessed that "All our product areas are competitors on the market place (...) and there is hesitation on how much and on what they do want to cooperate". The competitive attitude of product areas towards each other, is a barrier to back-end collaboration". SMS has been focused on selling metal cutting tools, which the same interviewee described as a "hardware goldmine", and investing into digitalization might not be as attractive. A Business Development Manager explained that "we (SMS) have realized that in this area there are a few years where no profit can be done". It takes longer to yield return on investment for digitalization, than for their usual hardware. It is thus evident that the digitalization efforts have not been integrated into the resource structures that enable and further product areas' core business activities. It is thus seen as something outside of their core business, and thus not of central importance for product areas' profit generating activities. Also, the competitive mindset of the product areas seems to make them hesitant in integrating the solutions developed within CODE into their operations; they seem to want to "keep the devil at bay" as the saying goes.

When looking at how the CODE's projects have become integrated into the product areas' operations, there still seems to be a lot of resistance. Regarding Smart Supply, the Project Manager for Smart Supply explained that they saw "a lot of frustration among product areas", that product areas "would prefer to keep doing things in the same way", and that they were "very conservative". The respondent added that Smart Supply is "shifting the ownership of vending machines from product areas to the group level", and because the Smart Supply team is having a hard time getting product areas trusting the group, it is difficult for these to understand the benefits of Smart Supply. Also according to this respondent, SMS might encounter potential frictions when dealing with current vending cabinet suppliers. The person cited a supplier, and said that there would be "future difficulties". Smart Supply's in-house software should replace the costlier previous software solution, and the loss of income for the supplier could cause difficulties in the relationship between them and SMS. It is thus evident

that moving the ownership of the vending machines to “the group level” will cause major changes within product areas’ existing resource structures. Thus, Firstly, a relationship with an important supplier will be disturbed; secondly, important resources will change ownership, which surely will impose changes in the relationships between product areas. It is subsequently evident that the Smart Supply application will not easily fit into the established resource structures that govern product areas’ current business endeavors.

Besides struggling to fit into product areas’ structure, the Smart Supply application do not fit into the whole business model of Sandvik Machining Solutions. Because SMS has traditionally set up its sales structure around selling hardware there does not exist a common ERP or CRM system for all product areas to sell software solutions through as of yet. SMS thus needs to integrate their ERP in order to start selling Smart Supply both among themselves and to external customers.

The technical properties of Adveon was originally developed by a particular product area, and for other product areas according to an SMS Business Development Manager “it would be a little like supporting (a competing brand)” to adopt this technology. However, according to several interviewed Business Development Managers, Adveon’s customer value is proportional to the amount of product that are catalogued in it. The Head of Digital Machining for a product area explained that his organization had kept it has a product under their own brand name, and that other brands were free to use it if they wanted to. According to the same respondent, there could be a “conflict on how product areas want to develop it. We may have different ideas”. It was thus evident that the ownership of the software within the producing setting caused product areas to be hesitant towards supporting the new tool library system since they had already invested in their own software systems. Moreover, even if product areas’ current product libraries had once been developed as a single system, past separation of software systems had made them incompatible. It was therefore impossible to merge existing systems together, enforcing a choice to be made between different software. In the case of Adveon, it is thus evident that it was designed as a result of one product area’s resource structures, and it thus did not fit the other product areas’ prior investments in their own infrastructure. This caused several problems of incompatibility and a feeling of “not invented here” among several product areas.

Despite getting the specific digitalization projects to fit with product areas’ existing resource structures and established business relationships, SMS had a problem of corporate coherency regarding internal processes and rules and regulations. The internal IT department had raised some concerns that CODE did not comply with rules and regulations on data privacy and security, but also with integrating CODE’s solutions to existing internal IT systems. Their concerns with such risks clashed with CODE’s drive to go to market quickly. The Head of Business Development at SMS claimed that there was also a little bit of friction between SMS’s corporate governance and it’s primary concerns for complying with rules and regulations, and with CODE driving developments faster than the traditional corporate agenda. This respondent explained that due to the size of SMS’s financial interest, a lawsuit would be costly. Even if CODE’s own operations are very small, a fine would be based on SMS’s operation and turnover as a whole. It would be much heavier than if CODE really was an independent actor. The respondent adhered this to the corporate Risk Management strategies of the SMS concern, and mentioned the example of potential competition regulation breaches that may arise in their complex environment.

CONCLUSION

This paper investigates the paradox of the Skunk Works model of innovation as it aims to isolate innovative developments from existing operations, even if, innovations also needs to be integrated into existing structures in order to be utilized. SMS has clearly chosen to use a Skunk Works strategy since CODE is set up as an isolated unit and as a future independent product area within the SMS group. A unit isolated not only from existing product areas' operations, but also from SMS's standard IT resources and established systems of enterprise planning and selling.

The decision to use a Skunk Works strategy might also be influenced by SMS's multi-brand strategy, which offers product areas a lot of autonomy. Enforcing changes to product areas' internal structures might be outside of the managerial control of SMS, and they subsequently needed to set up new organizational structures that product areas could choose to be a part of or not. Thus, the multi-brand strategy of SMS has also made it harder for them to integrate the innovation that has been developed within the Skunk Works unit, since they lack the authority to enforce change into the existing resource structures of the product area. This actualizes the fact that the SMS group can be seen as an entity that entail both intra- and inter-organizational traits, it is thus both a unit that has internal hierarchal control but also has to rely on fostering inter-organizational business networks of interdependent relationship between its product areas. The new brand or product area called CODE is thus both forming its own buyer-supplier relationships with existing product areas, but is also affecting the relationships that these organisations have with their customers, since both Smart Supply and Adveon involves the sorting and use of customer related data.

The Skunk Works model did create benefits that are associated with how the strategy model is described in previous literature. It made for a more creative and fast moving environment (Fosfuri & Rønde, 2009), alienated knowledge myopia (Levinthal and March 1993), circumvented internal bureaucracy (Ellaway, 2014) and broke away from existing inter-locking technology (Christensen, 1994). It is safe to assume that these benefits would not have occurred if SMS digitalization effort had been undertaken within product areas existing organizational structures.

Still, it is evident that the choice to use a Skunk Works strategy alienated CODE and its R&D projects from the operations of product areas, and affected the relationships between them. The issues hindering the adoption of the radical innovation developed within SMS's Skunk Works is;

1. Infused a "not invented here" mentality creating a cognitive distance to the innovation.
2. Separated the innovation from the resource structures of the core operations making the financial benefits of the innovation hard to foresee.
3. Altering the ownership of resources thereby obstructing structures of power within existing supplier-buyer relationships.
4. Introduced new competitive resources into existing structures upsetting the status quo of developed supplier-buyer relationships.
5. Clashed with established business models and ERP systems hindering existing and future monetary flow.
6. Created resource structures that directly competed with existing structures leaving investments into present resources threatened.
7. Caused incompatibility between technological systems making integration between existing systems impossible.

8. Ignoring established formal rules regarding corporate risk management such as data security and privacy, thereby risking future legal problems.

The eight hindrances listed above all correlates well with how previous IMP literature has described the problems radical innovation meets when something new is supposed to be adopted into existing resource structures and supplier-buyer relationships (Möller & Halinen, 2017; Beckman & Haunschild, 2002; Corsaro, Cantù & Tunisini, 2012). When those structures are challenged the interdependent relationships that makes up the market needs to change causing often unforeseen confrontations (Håkansson & Snehota, 1995). However, if widespread utilization is to be enabled, an innovation must become adopted into existing structures (Håkansson & Waluszewski, 2007; Van de Ven, Polley, Garud & Venkataraman, 1999). This study suggests that the use of Skunk Works might therefore only support the development of an innovation. An innovation's adoption, and its subsequent use within existing supplier-buyer relationships, will rather be hindered by the initial use of a Skunk Works model. Especially, when the network of future adoption is identified as governed by dispersed and vaguely identifiable ideas about the future, as often is the case regarding radical innovation endeavours (Möller & Halinen, 2017; Corsaro, Cantù & Tunisini, 2012), which in turn are indicative for digitalization efforts (Lin et al., 2012, Mendikoa et al., 2008). It is evident that the supplier-buyer relationships between the PAs was negatively affected by the incompatibility, as well as the resource altering nature, of the Smart Supply and Adveon applications. Such resource altering effects could have been foreseen and maybe jointly managed if the development of the applications were made in close interaction between the product areas. Changes are probably better received if they are developed within the supplier-buyer interaction in which it is supposed to create value for the directly involved parties.

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