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Outsourcing Core Competencies in the Mining industry: Reshaping Management Discourse to Achieve Impact

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ABSTRACT

The aim of the article is to analyze the rational for choice of suppliers and the influence these decisions have on the firm's core competencies. We examine the choice of in-house operations versus buying maintenance in the Swedish mining industry through a qualitative case study approach. The findings reveal a strong tendency to outsource maintenance. This in turn has a strong influence on the firm's core competencies, sustained competitive advantage and long-term sustainability. Based on the empirical findings, we comment on the strength and weaknesses of the different outsourcing approaches and offer recommendations to reshape management discourse to successfully integrate the trend to outsourcing and also achieve long term impact.

Keywords: Mining industry, Outsourcing, Core competencies, Resourced based view

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Outsourcing in the mining industry with cost savings purposes is becoming a common practice. As maintenance costs can be considerable, this process is one of the most common targets for outsourcing, nevertheless breakdowns can be catastrophic. Thus, like in most firms maintenance is of tactical and strategic importance (Laaksonen et al., 2009; Stremersch et al., 2001) .

The wear and spare part business in the mining sector, (maintenance), has been lucrative and often more profitable than new sales business. In addition, revenue from maintenance is more stable than that from capital equipment purchases and installations, which may be effected by fluctuations in the economy (Economist, 2013).

Outsourcing is closely related to 'make or buy decision.' The firm typically makes decisions on what to make internally and what to buy from outside in order to maximize the profit margins. By way of explanation, the *'firm'* is defined as the the buyer organization that is outsourcing maintenance and the '*supplier*' is the organization which performs the task of outsourcing or managing the maitenance on behalf of the firm. There is a trend for the suppliers to bundle the firm's maintenance into integrated solutions (Ulaga and Reinartz, 2011), which incorporate the entire maintenance cycle, including the combination of equipment from competitors and performance guarantees for entire production systems (e.g. Windahl and Lakemond, 2010).

In this manuscript we consider that maintenance includes three types of key activities: (1) service operations on installed facilities and equipment, (2) the handling of wear and spare parts and (3) specialized consultancy and service work. We examine different options of operating maintenance, aiming to achieve two key research objectives:

1. *To consider and analyze the firm's rational of the choice of in-house operations versus outsourcing maintenance.*

2. To examine the influence on the outsourcing on the development of the firm's core competencies.

Our case studies illustrate well the ability of firms to procure suppliers' abilities when decisions of outsourcing are made, in both new ventures and long tenure firms. Undeniably, firms benefit from

suppliers' abilities and their core competenices. For example, when contracts such as per-ton price are established with the addition of penalties and premiums, it is the suppliers' innovation and experience that benefits the firm. The supplier can help the firm to be able to run operations at expected or below cost. However, unless the firm establishes a team with the specific task of transferring suppliers' knowledge, they are unlikely to develop the core competencies required to deliver suppliers' offering at the standards set in their contracts. This is illustrated in the motivation of small firms who typically avoid building internal teams of people by entrusting to suppliers.Then again, big firms are also unlikely to develop these competences because they consider they already have them. However, big firms are not in reality working in close proximity with suppliers and hence cannot gain insights of any innovation that suppliers may bring to achieve the goals set in the contract. What is more, in our study, an informant from one firm reports that *'we don't want to see suppliers coming to discuss the contract, we only want the supplier to bring solutions.*' Consequently, the effects of outsourcing may well be deemed detrimental in regards to the creation of the firm's core competencies that are needed to perform the tasks that modern mining processes require.

Core competence is the knowledge set that distinguishes a firm and provides a competitive advantage over others (Leonard-Barton, 1992). Leonard-Barton (1992) identifies four dimensions of core competencies: employee knowledge and skill; technical systems; managerial systems and values and norms. The present article examines these dimensions from a mining company perspective.

We address these objectives using is the resource-based view theory of the firm (Penrose,1959), through a qualitative investigation in the context of the Swedish mining sector. In the mining industry, about 80-85 percent of suppliers' revenues come from the wear and spare parts business and almost all the rest from different kinds of service operations. The sales of different kinds of consultancy services, such as technical audits or special monitoring services, only count for a few percent of total maintenance cost.

This theoretical perspective is applied on the issues of the firm's outsourcing choice of suppliers. Furthermore, based on the empirical findings, we comment on the explanatory strength of the different approaches in regards to the impact on core competencies and in turn the firms sustainable competitive

advantage which is linked to their long-term sustainability. Our research extends prior studies by including the shift required in the mindset of managers when outsourcing services. Knowledge about how outsourced firms benefit strategically is limited (Karlsen et al., 2003). Consequently, this study addresses a real-world problem and attempts to find practical solutions.

The manuscript will proceed as follows: the next section commences with a consideration of the concept of outsourcing or 'make or buy.' This section includes an overview of the theoretical lens of the resource-based view (RBV). This is followed by a description of the methodology and the results of the five case studies decisions to 'make or buy.' Next the decision to outsource is discussed in terms of the influence on knowledge management and long-term capabilities. The conclusion includes recommendations for future research and practical recommendations for mining firms to reshape management discourse to successfully integrate the trend to outsourcing; and also achieve long term impact. By impact we refer to creating a sustained competive advantage and thus long term sustainability.

THEORETICAL BACKGROUND

The advantages of outsourcing

The advantages of outsourcing can extend beyond short term economic gains. For example, Quin, (1999) proposes that outsourcing results in higher value, more flexible, and more integrated services than internal sources can offer. He also maintains that outsourcing results in improving a firm's ability to innovate by interacting with champion knowledge sources. Quin (2000) advocates that firms who outsource maintenance can realize coordination and shareholder value gains that they could not otherwise achieve. Many high technological outsourcing service suppliers are larger and more sophisticated than the firm's that outsource to them (Gupta et al., 2008). These expert suppliers often have superior knowledge and process systems which allow them to be more efficient. Additionally these suppliers can often attract and retain well qualified staff by offering higher wages than the individual outsourcing firm (Quin, 1999).

When firms do outsource, the superior knowledge depth of thier suppliers can result in more innovative outcomes for the firm. Companies as diverse as BP and Nike exemplify this point.

Supporters of outsourcing agree that when outsourcing is established strategically it can lower costs, lower risks, and reduce fixed investments while increasing flexibility and innovative capabilities (Allen & Chandrashekar, 2000; Bettis, et al, 1992; Bertolini et al., 2004; Gilley & Rasheed, 2000; Kogut & zander, 1992; Lankford & Parsa, 1999; Tsang, 2002) and opportunities for creating long-term sustainability in terms of higher value-added and shareholder returns (Mahka et al., 2013). Evidence suggests that a growing body of research is coming to terms with the economic impact of outsourcing (Baxendale, 2004). It is argued that industry participants can be seen as part of the network of skilled resources where information is shared between organisations can be a source of opportunity (Gulati et al. 2000; Mehta & Peters, 2007).

The disadvantages of outsourcing

It has been proposed that when a firm outsources there may be a decline in internal skills and knowledge –the very essences of core competencies. Magnani (2006) argues that technological diffusion facilitates outsourcing and at the same time it reduces the specificity of internal skills and knowledge and eventually results in the convergence of core competencies. Gupta et al (2008) supports this supposition and found that in the Pharmaceutical industry, over time, core competencies of manufacturing firms erode as they become dependent on suppliers for the development of the final product. They also found outsourcing allows suppliers to develop critical expertise and competencies at the expense of the outsourcing firmou sustainable competitive advantage.

Pfeffer and Salancik, 1978 argue that as firms cannot own all the resources they need for their survival, they inevitably need to rely on other parties. This situation creates dependency towards the suppliers of these resources resulting in a dual effect of uncertainty and conflict. In addition, strategy needs to be considered at different levels such as: long-term direction of the firm and the alignment with human resource management. Huselid (1995) proposes a ‘matching model’ which fits human resource strategy to the firm’s choice of competitive strategy, although he concedes that other contingencies such as life cycle stage and structure need to be considered. Gupta et al., (2008) have identified that some factors of maintenance can be traded but there are various firm competencies that should remain core and can only be internally developed.

The development of expertise and competenices with the framework of a sustained competive advantage will now be evaluated within the theorectical lens of the resource-based view of the firm (RBV).

Resource based View

RBV is a theoretical framework for understanding the capabilities of a firm's to create a sustainable competitive advantage (e.g. Barney, 2001; Wernerfeldt, 1984). Contrary to the proponents of outsourcing mentioned above and the worldview of Michael Porter (e.g., Porter, 1998), RBV stresses the importance of internal resources. Pivotal to these internal resources are core competencies. In particular the RBV espouses that core competencies or resources that are hard to imitate give value to customers; thus, RBV proposes that a distinct sustainable competitive advantage to the firm is built in-side out. To generate sustained advantage, resources must meet the criteria of value, rarity, imperfect imitability and non-substitutability. It is therefore reasonable to assume that that long and continued outsourcing may ignore the criteria of imitability and non-substitutability. In other words, long term outsourcing may result in firm capabilities which can easily be replicated and replaced by competitors. This in turn depreciates the core competenices; thus the firm loses a degree of uniqueness, and exposure to competitors and reduces the prospect of a long term competitive advantage and long term sustainability. Thus, RBV is inherently firm centric According to RBV proponents, it is better to exploit external opportunities using existing resources.

In reality, internal opportunities are frequently overlooked. For example, senior managers are often engaged in managing the bottom-line which typically invlove dynamic volatile markets and political trade-offs (Maley & Moeller, 2014). The internal core competancies are often neglected under such dynamics and volatile external conditions (Burgelman, & Doz, 2013: Maley and Kramr, 2014). Powell and Brantley (1992) argue that whilst outsourcing has proliferated in the industry, it has also resulted in competence-destroying tactics.

When intensification of competition is presented there is often an incentive to place cost control at a premium, and that the implementation of a consistent approach to managing core competencies, in particular human resources and internal permanent employees may be difficult. Nonetheless, it is

argued to be vital to fit the human resource strategy to the firm's choice of completive strategy (Wright et al., 2001) and this includes the firm's choice of outsourcing (Mahoney et al., 2011).

The RBV contends that resources are not valuable in themselves, but because they allow firms to perform activities that create advantages in particular markets. Weick and Schultz's (1976) building on the concept of enacted environment emphasise that the environment of the firm is enacted through the party's lenses and information process filters. A company in this context makes sense of its resources and dependencies, makes trade-offs in processing information and undertakes necessary actions to influence or control the environment. This implies the need to build strategic management processes, the importance of intelligent, proactive leadership and dynamic capabilities' as 'the capacity of a firm to renew, augment and adapt its core competencies over time.' Firms which combine high levels of competence in multiple modes of strategy-making appear to be the higher performers'

RBV demonstrates that sustained competitive advantage is not just a function of single or isolated components, but rather a combination of human capital elements such as the development of stocks of skills, strategically relevant behaviors, and supporting people management systems. It is therfore reasonable to suppose that the more a firm possesses internal capabilities, the more likely it has the ability to learn faster and apply its learning more effectively than its rivals, giving it a competitive advantage

An extended version of RBV, such as the dynamic capabilities approach (e.g. Teece, 2007), further stress the importance for a focal company to link themselves to competent suppliers and customers. Unlike the conventional RBV, which remains tied to the analysis of the resource choices of incumbents, an extended RBV perspective sees the firm drawing on a wide array of external resources, through various kinds of relationships (Mathews, 2003). However, Day (2014) finds such approaches sufferings from similar inside-out myopia as RBV. When addressing the the issue of outsourcing, RBV is often used to put forward the arguments to keep core-competence in-house and to outsource and source products and services that are based on complementary competences or more simply are looked upon as standard products (cf. Cox, 1996).

Although maintenance may not be perceived a core competence within a firm, decisions on whether to outsource this function are likely to have consequences on the resources that the firm can allocate to

more strategic processes. Outsourcing brings inside the firm not only resources but it also increases the complexities of interactions with the external environment.

METHOD

The present scholarship is a multiple case study (Woodside, 2010) of an exploratory nature, with the ambition of identifying how different make or buy and supplier selection patterns (strategies) impact on the firm's strategic core competencies. Five buying firms –focal case studies- and six suppliers of mining equipment and services participated of the research. Data were gathered through 18 interviews with executives and managers of the eleven case companies. Data were gathered until saturation was achieved (Eisenhardt, 1989). Complementary data were also collected as a desk study.

The case companies

The five case studies of mining firms represent a majority (close to a total study) of Swedish actors. From a supplier perspective three out of four major Swedish and Finnish suppliers are included together with two smaller suppliers. Taken together, our sample covers a large proportion of the Nordic mining industry. The firms divide easily into three categories: (1) Large and established mine corporations: LKAB and Boliden. LKAB is Europe´s largest iron ore company (but still only about one tenth of the world´s largest) and Boliden (copper, zinc and other minerals) is among other things is the owner of Europe´s largest zinc mine, the Tara mine in Ireland. (2) Small and established mine companies: Zinkgruvan. Zinkgruvan is part of a larger company Lundin Mining, but is mostly run as an independent company. As the name indicates, the main minerals are zinc and copper. (3) Small start-up mining companies: Northland Resources and Dannemora. Northland Resources is starting up the exploitation of two (virgin) iron ore projects in the north of Sweden and Finland. Dannemora is reopening an iron ore mine in the middle of Sweden, which has been closed down for some twenty years.

The six suppliers also divide effortlessly into three categories: (1) International suppliers of mobile equipment: Atlas Copco. Atlas Copco is a world-leading supplier of different kinds of mobile

equipment, including drill rigs and different kinds of trucks. The other Swedish supplier Sandvik, Atlas Copco´s closest competitor, will be studied through the lenses of their customers. (2) International suppliers of installations and fixed equipment: ABB, Metso Mining & Construction, and Outotec. ABB is a world-leading supplier of electrical power infra-structure, mine hoists and electrical engines. Metso and Outotec are process equipment manufactures and especially Outotec have focus on engineering services (a buy-out from Boliden). (3) National and local suppliers of service: Monitoring Control Center (MCC) and BEFAB. MCC is a consultant in maintenance development and condition monitoring. BEFAB is a local provider of underground transportation services.

EMPIRICAL RESULTS – FIVE CASE STUDIES

The comparision of the five companies are illustrated in table 1**.**

Start-up company 1: Northern Resources (NR): NR is a start-up mining company with the ambition to become a major European supplier of iron ore. At present (first half of 2014) the company is struggling with a weak financial situation and is facing substantial operational problems when ramping up production and logistics. They outsource all maintenance and use a single supplier.

Start-up company 2: Dannemora was founded in 2005. Mining production started in 2012 according to plan. But due to recession in the mining industry, business has been slow and finances are under immense pressure. Three suppliers were selected as partners for operations. However, employees from Dannemora will also be participating in order to better learn how to operate and to do basic maintenance. From a cost perspective, when maintenance is up running, management at Dannemora regards outsourcing and in-house maintenance as about equal.

Zinkgruva: Zinkgruva is a small Swedish zinc company operating since 1857, producing zinc, led, silver and copper. Zinkgruvan outsources to a single supplier- Atlas Copco. At Zinkgruvan, the reason underlying whether to source or keep maintenance in-house is not primarily considered as a cost-issue. According to the Mine manager there are other questions asked: “Which resources do we have?”; “Are we buying a single machine or a fleet?”; and “Can we accept becoming dependent upon the supplier?” The balance between outsourcing and in-house is swinging over time. Today, the Mine manager feels

it is leaning towards in-house, to avoid the lock-in effects of suppliers. At the same time and from a maintenance point of view, solution contracts seem very attractive, but as already mentioned the lock-in effects are very obvious.

Boliden: Boliden is large Swedish MNC that is running several mines and smelters in Sweden, Ireland, Finland and Norway. Boliden has different outsourcing vs. in-house strategies regarding maintenance services in their different mines. Overall, the strategy is a mixed one and based on what is best for availability. The purchasing manager states that "our entire thinking on service issues is based on availability." Boliden also feels that they are at an advantage from having good and long-term relationships with their major suppliers. Besides availability, Boliden also sees other advantages from sourcing. One is that an external partner could be better at solving "small problems", problems that are overlooked in a large organization such as Boliden. But at the same time, the feeling of becoming too dependent on suppliers is always a problem and the balance between sourcing and in-house is always a dilemma.

LKAB: is Europe´s largest iron ore business and wholly owned by the Swedish state. The balance between handling maintenance as sourcing or in-house production is 80-20. At LKAB, sourcing of maintenance is viewed positively from a flexibility point of view. Instead of hiring 15 maintenance workers for running a new drill rig during all shifts, a sourcing contract would not extra complicate the in-house organization. Outsourcing could also be used as a capacity regulator in different phases of a business cycle. From a cost perspective, outsourcing in general is seen somewhat more expensive compared to in-house, but the difference is deemed rather insignificant. The pendulum between outsourcing and in-house is always swinging, for the moment towards in-house.

*********Insert here about: Table 1 **********

ANALYSIS

In-house operations vs. sourcing of maintenance

From an overall perspective, all five case study firms have treated the issue of in-house vs. sourcing of maintenance as strongly in favor of the sourcing alternative. Despite that, maintenance is viewed of high strategic importance since the mining companies are financially vulnerable in case of major production stops. Taking a closer look at the differences in in-house operations, there are differences between: the two large and established mining firms; the two small start-up firms and the fifth firm which is established in-between. The two large miners, LKAB and Boliden, handled about 20 percent of maintenance in-house. In comparison, the two start-up firms, NR and Dannemora, handle fewer in-house operations. The fifth firm, Zinkgruvan, also showed a low proportion of in-house maintenance. The type of equipment most reliant upon sourcing was mobile equipment; probably as a consequence of strong lock-in effects from suppliers and that mobile equipment are suitable objects for defining maintenance assignments. But also maintenance on fixed equipment was mostly operated by different kinds of suppliers.

Arguments for keeping these smaller parts of maintenance as in-house operations span over a rather broad spectrum of factors. However, these arguments were not very forcefully brought forward, which partly explains why in-house operations are not the dominant maintenance strategy. It seems that in-house maintenance is not always considered a core competence nor is it seen as an important prerequisite for creating competitive advantage.

From a cost perspective, the three established mining firms considered it to be a small advantage to keep some activities in-house. Nonetheless, the cost argument was overruled by the fact that availability is seen as a more important criterion and the sourcing option showed better results in terms of availability, or at least was percived to do so. The main arguments for keeping some operations in-house were related to the risk of the suppliers becoming too dominant. In particular, the large mining firms regarded their own competence as equalivalent to their supplier´s. This fact, objectively, or at least their expressed opinion, subjectively, had its roots in their long-term experience in the mining business. The larger and established firms emerged to have some pre-outsourcing and longstanding in-house maintenance proficiency and they reported a degree of senior management and union

pressure to utilsie this in-house know-how. For the start-up firms it was more a question of how to avoid building up an internal maintenance structure.

The large miners have been reluctant to hand-over responsibilities to suppliers in turn-key projects and large life-cycle service contracts. However, there are exceptions. Outotec provides life-cycle services to one of the LKAB mills and to the floatation cell at Boliden's Aitek mine. Especially, the larger mining companies have also tried to avoid being too dependent upon specific suppliers, one solution to this problem was to keep operations in-house and another was to source from multiple suppliers. There was a clear awareness of the risks of lock-in effects from equipment suppliers, but there were no serious criticisms towards these suppliers for misusing their single source positions, what Williamson (1985) refers to as opportunistic behavior.

Another argument in favor of outsourcing was its potential to reduce the internal firm complexity and increase internal productivity as employees focus on their core competencies. To build up specialized maintenance organizations for different kinds of equipment and other infra-structure, under and above ground, is a complicated undertaking. And to have all this differentiated maintenance organized in an internal function could be very complex. The alternative, to let suppliers set up more specialized workshops was often considered as a better alternative.

The small mining companies, especially the two start-ups, were even more reliant upon suppliers. They also involved fewer suppliers and defined broader scopes for the maintenance assignments. The largest turn-key project was defined by NR when sourcing its process plant from Metso. The other start-up, Dannemora, was themselves involved in the development and construction of a similar processing plant, but selected ABB as supplier of maintenance for the entire plant. Also, Zinkgruvan, the third small mining company keeps down the in-house maintenance operations, especially maintenance that demands high competence is sourced from the equipment suppliers; as in the case of the powertrain of the scoop tram where maintenance is done by Catepillar.

DISCUSSION AND FUTURE DIRECTION

This study has investigated different options of operating maintenance in the Swedish mining sector, such as in-house operations vs. sourcing of maintenance decisions and supplier selection criteria. The mining industry maintenance and the long-term sustainability of the firm can be understood in terms of the resource-based view (RBV).

RBV, and the extended resource based view (ERBV) have specific relevance for the mining industry maintenance dynamics. Whilst, the RBV explains that the larger firms put some importance on maintaining a degree of service in-house to upkeep form capabilities and pacify a wider range of stakeholder (management and unions for example); the ERBV helps elucidate why the firms draw on a wider range of external resources, through various kinds of relationships. In line with the arguments of ERBV, it is senior management and unions who argue that it is important to keep some core-competence in-house. It is evident then that the larger firms do see maintenance capabilities as part of the firm's core competence that should be kept in-house.

Smaller firms, on the other hand, do not perceive maintenance as a vital strategic component. Although outsourcing decreases risk for the small firms, it also allows other firms to develop critical expertise and competencies. This raises important implications for the small firm. For example, can the small firms flourish and expand without building their core competencies? How can they realize a sustainable competive advantages and thus long-term sustainability?

As such, there is an increasing need for strategies that help firms to build new core competencies such as managing the relationship between alliances (McDermott & Coates, 2007), managing employee relations within alliances (Quinn, 1999), and practicing a balanced approach when outsourcing non-core activities (Rothaermel, Hitt & Jobe, 2006). Our empirical evidence from the mining industry provides broad support for balancing activities within firms and network partners.

While this body of research provides a good foundation, we suggest that future research should examine how core competencies can be developed and how they can benefit firms or individuals that outsource and become horizontally integrated. Research should also address how high technology outsourcing firms from different industries develop business models to gain competitive advantage.

The arrival of the knowledge intensive, service-driven economy has forced massive change on firms worldwide and the need to reshape management discourse. The shift in strategic imperatives over the past 25 years constantly necessitates new battle plans. Outsourcing is a natural step in a global competitive system, strategically managing outsourcing within the confinds of the long-term sustainability of the firm will be among the greatest and most rewarding challenges of the new era.

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Table 1 abridges data from the case companies of this study and their suppliers.

Table 1: A comparison of the case companies

	NR	**Dannemora**	**Zinkgruvan**	**Boliden**	**LKAB**
	Start-up Swedish MNC	Newly started: Reopen Swedish National	Small Swedish National	Large Swedish MNC	Large State owned Swedish MNC
Mineral	Iron-ore	Iron-ore	Iron ore, Zn	Zn, Cu	Iron Ore
2013 Revenue	10 M Euro	50 K Euro	100 M Euro	6 BN Euro	2.6 BN Euro
Financial state	Weak-loss	Weak- loss	Positive	Positive	Strong
Supplier/s	Few key suppliers	Many suppliers	Few key suppliers	Many suppliers	Many suppliers
Contracts	Open book	Open book	Atlas: Open book Metso: close book	Closed book	Closed book
Contracts Measurement	Performance based: Cost per ton	Not entirely performance based	Ho Cost per ton	Performance based: Cost per ton, bonus and penalty clauses	Performance based: meters drilled. Flexible
Maintenance	Outsource	Outsource	Mixed strategy	Mixed strategy	Mixed strategy
Comments	Metso maintenance staff of 17 on-site & office at mill. Spare parts on site.	Employees taught basic maintenance	Moving towards in-house. Maintenance not first priority	Good relationships with suppliers. Can “by-pass delivery times”	The pendulum always swinging, moment tendency in-house.