THE IMPACT OF LEAN THINKING ON ORGANIZATIONAL LEARNING

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ABSTRACT

Lean management and organizational learning have been seen as two driving forces for today's business' success by contributing to competitive advantage in organizations. The aim of this paper is to explore and assess the implementation of lean from the perspective of organizational learning. By revisiting the lean concept and the relationship between lean and learning, we argue that lean has been through an evolution both in its scope and empirical application in the last two decades. We argue that the recent versions of the lean discourse open up theoretical possibilities for a better balance between exploitation and exploration. However, our empirical exploration of these issues in a single case study in a paper packaging manufacture suggests patchy evidence of organizational learning around lean thinking.

Key words: Lean, Organizational learning, Exploitation, Exploration

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1 INTRODUCTION

It is some twenty years since the ideas of lean production were first articulated in what became to be a best selling book 'The Machine that Saved the World' by Womack, Jones and Roos in 1990. The basic idea of lean production is that the expenditure of resources for any goal other than the creation of value for the end customer to be wasteful, and thus a target for elimination. Ultimately, this entails the quest for preserving value through performing less work. It could be argued that these ideas were far from new, having been accepted practice in Japanese firms for some time (Schouteten and Benders, 2004). Indeed, the quest for greater efficiency at the heart of lean is of course something that business organizations have sought since the birth of scientific management if not before. The book, however, was the obligatory passage point for the diffusion of such ideas into mainstream business practice in the west (Stymne, 1996). Subsequently, the ideas have proved to be popular and well diffused into manufacturing processes notably but not solely in the automobile sector (Cooney, 2002; Hines et al, 2004; Landsbergis et al, 1999; Lewis, 2000).

In the 1990s it was understandable to treat lean production as a fashion (Björkman, 1997; Sturdy, 2004) alongside other ideas some of which were closely related such as business process engineering and total quality management. However, lean was apparently sufficiently robust to see considerable diffusion to workplaces by the end of the 1990s (see for example Lennerlöf et al, 2000 for evidence from Sweden). The diffusion of lean had also generated considerable interest among researchers who were focusing on the implications of lean on operations management (Cooney, 2002; Forza, 1996), competitive advantage (Lewis, 2000), employee health and the quality of working life (Landsbergis et al, 1999; Schouteten and Benders, 2004), and organizational learning (Adler and Cole, 1993; Berggren, 1995; Ellström, 2000).

Today, it appears, lean production not only remains popular in manufacturing but has evolved from the operational level to the strategic level (Hines et al, 2004) and to empirical domains beyond manufacturing to areas such as shoe manufacturers (Gati-Wechsler & Torres, 2008), the supply chain for personal computers (Ben, Naim, & Berry, 1999), the food and farming supply chain (Cox & Chicksand, 2005) and healthcare (Waring and Bishop, 2010). In the words of one writer:

> "…the lean approach percolates into ever wider circles of operations, it ceases to be about best practice and starts to become a part of the fabric of doing business" (Corbett 2007: 96).

The quote that headed this paper, taken from a policy document on operations at the paper and packaging company SCA, appears to sum up the current trend of evolution from to lean production to an all encompassing business ideology of lean thinking (Womack and Jones, 2003) and even lean solutions that embrace entire value streams

rather than discrete production processes (Womack and Jones, 2005). Given this apparent evolution, diffusion and endurance of lean we see merit in recognizing lean as having survived the ephemerality of fad and fashion and thereby subjecting the claims of its adherents to renewed critical scrutiny in view of the experience of lean that has now elapsed.

A particular theme in the early studies of lean is its impact on and relation to learning in organizations. It is this aspect that we will focus on in this paper. The initial articulation of lean by Womack et al (1990), arguing that one of its benefits was that of promoting organizational learning. In essence, the argument was that a standardisation of work procedures under lean production enables the setting of benchmarks against which performance can be measured and meaningfully diffused within and across work groups. This instance of learning thus guaranteed a mechanism for organization-wide learning. Womack et al also studied alternative designs to lean production such as that introduced at the experimental Volvo car assembly plant at Uddevalla in Sweden inspired by sociotechnical systems design. They, and others, argued that such designs did not encourage learning to the same extent as their lean counterparts. This was because of the absence of codified standards against which deviations could be identified, diffused and learnt from not just within groups but across them (Adler and Cole, 1993; Womack et al, 1990: 101-2).

However, the claims of the advocates of lean presented briefly here prompted a number of questions which we believe are now worth revisiting given the changing nature of lean in both its scope and empirical application. Given two decades of experience, are lean solutions universally coherent across all production environments and levels and, secondly, how do the claims about lean's alleged facilitation of organizational learning stack up in practice? In exploring these questions we will present a case study based mainly on interviews and archival data from SCA Packaging, a Swedish multinational paper-packaging producer. Our empirical material shoes that the rhetoric of widespread diffusion and application of lean thinking falls far short of reality. In explaining why this is the case in our case firm, we develop a theoretical framework which is constructed to discuss how lean thinking might nevertheless by applied to improve an organization's ability to engage in exploitative learning while overcoming obstacles to exploration and innovation. Organizations, we will argue, need to keep a balance between lean practice and learning through exploration in order to become lean without jeopardizing the ability to innovate.

Accordingly, the aim of this paper is to explore and assess the implementation of lean from the perspective of organizational learning. We proceed by discussing the trajectory of lean to date tracking its evolution from operations to strategic management as well as noting its empirical diffusion from the shop-floor in automobile manufacturing plants to other sectors. In this section we explore and contrast lean at the operational level and lean at the strategic level notably in terms of the different types of learning that they presuppose. We then develop our theoretical approaches by drawing on the organizational learning literature, notably the work of Cook and Yanow (1993). Following a reflective discussion of the case, we conclude the paper with the implications of our analysis both for theory and practice.

2 THEORY

2.1 The Lean Hegemony

The concept of leanness originated from the Japanese manufacturer Toyota Motor Corporation in the 1950s (Monden, 1983; Ohon, 1988; Shingo, 1988), and became influential because of the scarcity of resources and intensive domestic competition in the Japanese automobile market. The steady growth of Toyota, from a small company to being one of the world's largest automakers, has focused attention on how its success has been achieved. The term "lean production" was first defined by Womack, Jones and Roos (1990) in their book *"The Machine That Changed the World"*. The advocates of lean argue that lean manufacturing has greatly improved production efficiency. In the early days of lean its implementation was limited to a tool-based manufacturing approach aimed at providing high quality products with lower costs in discrete manufacturing processes. Over the next two decades, however, lean manufacturing became increasingly popular among western companies and has been applied not just by different manufacturing organizations but in some cases by their service counterparts as well.

During the 1990s, the lean concept was extended from the shop-floor operational level to a more strategic level. In their follow-up book Womack and Jones (1996) further developed the lean tool to encompass "lean principles", involving the identification of customer value, the management of the value stream, developing the capacity to flow production, the use of "pull" mechanisms to support flow of materials at constrained operations and finally the pursuit of perfection through reducing to zero all forms of waste in the production system (Womack & Jones, 1996). Lean has now been applied across a wide range of industrial settings and "has moved away from a merely 'shop-floor-focus' on waste and cost reduction to an approach that contingently sought to enhance value (or perceived value) to customers by adding product or service features and/or removing wasteful activities" (Hines et al, 2004: 995).

2.1.1 From mass production vehicle manufacture to a wider range of industries and sectors

One of the criticisms lean has received is its automotive industry-focus and the appropriateness and feasibility of applying lean in other industries and sectors. The car industry, as "the mother of lean thinking", has undoubtedly seen wide diffusion of lean ideas into its operations albeit adapted to local institutional conditions (see eg Brulin and Nilsson 1999 in relation to the Swedish context). But the characteristics of the automotive industry, i.e. mass production and the standardized assembly line, call into question whether it's appropriate to apply lean in other industries and sectors. The contingent nature required for lean implementation needs to be recognized (Hines et al, 2004). Fleury and Fleury (2001), from an organizational learning and strategy perspective, suggest that learning is an essential link between strategy and competence building and the competences should be built into a production system in accordance with different strategies. Along with this logic, lean fits better in some industries than others rather than being a universal recipe for every organization. By comparing different strategies and industries, these authors argue that lean is appropriate for implementation in the automobile industry, where the strategy is to pursue operational excellence and the objective is to offer the market a product that optimizes the quality/price ratio. This is particularly the case when production volumes are high and there is a high degree of product and process standardization.

On the other hand, when the strategy is more focused on what Fleury and Fleury call client intimacy, eg in the packaging industry, the objective is to meet the needs of specific clients in specific areas and to specialize in developing tailored solutions to manifest demands in the form of a flexible product system. Therefore the focus should be on strengthening the market and sales competence and acquiring profound customer knowledge instead of leanness in production. Customer requirements are far from standardized, not least in B2B markets. A more appropriate design choice here is agile manufacturing (ref) since it is better suited to satisfying fluctuating demand (in terms of volume and variety) while lean manufacturing requires and promotes, a level schedule (Naylor, Naim & Berry, 1999). Besides, when considering whether to adopt agile or lean manufacturing techniques, it's critical to consider the buffer needed in order to attain a balance between fluctuating customer orders or/and product variety and smooth production output, which according to the lean principle, is always considered as a non-value added activity and is therefore rejected. Both these design choices, however, can be contrasted with a third variant, a production milieu entailing scaling up that emphasizes product innovation often of a radical or breakthrough nature. This is the key to value creation in sectors such as the IT industry, telecommunications, and biotechnology. The difference in strategies, competences and manufacturing within these three alternatives can be illustrated as set out in **table 1**.

Competence strategy	Objective	Critical function & Key competence	Product development	Sales & marketing	Manufacturing	Industry examples
Operational Excellence	Offer the market a product that optimizes the quality/price ratio	Operation, including the whole logistical cycle: purchasing, manufacturing and distribution	Incremental innovations	Marketing for mass production	World class manufacturing/ ***lean production***	Automobile industry
Product Innovation	Continuously invest to create radically new concepts of products for defined customers and market segments	Research & Development & Engineering (R&D&E)	Radical innovations (break-through)	Technical marketing	Scaling up production	IT industry-telecommunications computer Internet Biotech
Client's intimacy	Concerned with the needs of specific clients in specific areas; specializing in developing solutions to manifested demands in the form of product system	• Sales and marketing • A profound knowledge about each client and its business	Development of specific solutions	Marketing service	Agile manufacturing	Packaging industry

Table 1 Types of production strategies and competences

Soures: adapted from Fleury and Fleury (2001)

2.1.2 From operations to strategic management

In the 1990s, lean was mainly viewed as a plant level manufacturing approach, including a set of operational tools that assisted in the identification and elimination of waste (muda), improving quality and reducing costs. This attracted criticism for its

narrow application on the shop-floor and the lack of strategic perspective. As the lean concept developed, its focus and scope has greatly changed and now lean embraces wider concerns and is more comprehensive in its scope. Hines et al. (2004) suggest that there are now two levels of lean approach: the operational level and the strategic level, which are different in terms of objectives, focuses, ways of achieving results, and how the results are measured, etc.

The operational level of lean stresses efficiency improvements and cost reductions in the manufacturing process with short-term goals focusing on improvements in current manufacturing. Specific techniques are identified, including just-in-time manufacturing (JIT), high-levels of employee problem-solving/automated mistake proofing, total quality management (TQM), pull-based systems and so on (Hines et al., 2004). As lean evolved it began to embrace new elements such as lean supply chains and customer value (Womack and Jones, 2003). The latter is defined on the basis of cost, product functions, etc. from the customers' perspective and is mainly captured by simply following specific customer requirements, i.e., lower price, higher quality, and shorter delivery times, etc. The objective is to leverage existing resources as much as possible and achieve "operational excellence".

At the strategic level, lean has a more comprehensive and wider content. It is viewed not as a tool but a way of thinking, going beyond the pursuit of production excellence and emphasizing customer value and the entire system flow. Focusing solely on manufacturing efficiency is not enough to create long-term success for a business, therefore the objective is to build not just a "lean organization" but also "lean solutions" to achieve long-term success (Womack and Jones, 2005). "Lean thinking" and "lean solutions" both entail a collective awareness of lean across the organization: its advocates call for collective cognition about lean that is commensurate with the notion of organizational culture. The development and establishment of such a culture is equivalent with what some see as organizational learning (Cook and Yanow, 1993).

The idea of "lean solutions" extends beyond the organization to include customer service and delivery. However, in recognizing that this also entails matters of brand, image, environmental issues and so on, there necessarily has to be less emphasis on standardization as different customers will consume the brand in different ways and quite possibly have idiosyncratic expectations and requirements of customer service. Here it will be far less appropriate to foreground learning through exploitation grounded in standardized and codified operating procedures. "Lean solutions" are likely to be tailor made and explored together with the customer.

In theory, therefore, a case can be made for different types of learning being associated with lean at the two levels. We summarise the main contrasts of the different levels of the lean approach in the ideal type presented in **table 2**. Above all, after more then two decades, the lean concept has thus undergone a significant evolution and expansion beyond its origins in the automotive industry and its narrow implementation on manufacturing improvement. Both the concept of lean in research and the application of lean in practice have been greatly developed. In the following section, we will discuss further the different levels of lean and the links to organizational learning.

Levels of lean	How customer value is captured	How lean is viewed	Objective	Organizational involvement	Specific techniques	Goals	Measurement of result	Possible link with leaning
Operational level	Specific customer requirements (i.e., higher quality, less delivery time, low cost/price, etc.)	A tool-lean techniques	Operational excellence; leverage the existing resources as much as possible (lower cost with higher quality)	Manufacturing only	Standardization; Design for manufacturability; Value analysis; …	Short-term	Specific KPIs are defined (i.e., quality, cost, delivery, etc.)	Lower level of learning: Adaptive learning/Single-loop learning/Exploration
Strategic level	Deep insights about customers and the market, (i.e., the strategy and development of customers, market trend, etc.)	A way of thinking-"lean thinking"	To make a "lean organization"	The whole organization (sales, design as well as other supporting functions such as finance, HR and service)	Continuous improvement culture	Long-term	Financial performance	Higher level of learning: Development learning/ Double loop-learning/ Exploitation

Table 2: A comparison of different levels of the lean approach

2.2. Lean and Organizational Learning

What, then, is the relationship between lean in its current format and organizational learning? As stated in the introduction we believe this question is worth revisiting given the evolution in lean since the debates of the early 1990s. However, before exploring the relationship empirically, some discussion of organizational learning would be fruitful.

Organizational learning is commonly within the functionalist literature seen as a way to retain and improve competitiveness, productivity, and innovativeness uncertain technological and market circumstances (Dodgson, 1993) and has been identified as that which underscores a company's sustainable competitive advantage (DeGeus, 1988; Senge, 1990; Slater & Narver, 1995). In the original presentation of the ideas of "lean production", Womack and colleagues partly based their advocacy of the idea on the possibilities for organizational learning brought into being by the new approach. These possibilities were subsequently specified further by Adler and Cole (1993) who argued from an investigation of the Toyota-General Motors joint venture at NUMMI in the US that lean designs entailed relatively short cycle times and highly standardized operating procedures. This, it was claimed, made it easy for workers to identify problems, define improvement opportunities and implement improved processes. Moreover, the engineering staff from different parts of the plant were able to meet and share ideas because of the standardized, codified methods and standards. This, it was argued, was clear evidence of organizational learning across groups, what others later were to call integration, the process whereby common conceptions could be developed and diffused in such a way that co-ordinated actions could be accomplished (Crossan et al, 1999).

However, a compelling critique of this view of learning is that it fails to adhere to the dictum of James March that organizations ideally need to combine or at least achieve balance between learning through exploitation and learning through exploration (March,

1991). The codifying of standard procedures and learning therefrom as deviations arise was clearly an example of the former. But this raised the question: what possibilities for the latter are possible? Exploitation includes processes captured by conditions such as efficiency, refinement, production, implementation and execution, whereas exploration concerns the acquisition of new behavioural capacities as a response to existing insights, incorporating terms such as search, variation, risk taking, experimentation, play, flexibility, discovery and innovation (March, 1991). Organizations, as adaptive systems, by refining their exploitation, are likely become effective in the short run but self-destructive in the long run (ibid.). Therefore under lean regimes, organizations attain refinement and efficiency through eliminating waste and leveraging resources as much as possible, which helps with refining exploitation. However, this may also lead to lack of variability and resource slack, less proneness to risk taking and experimentation, less freedom and reduced employee empowerment. These developments jeopardize the ability to explore new knowledge and thereby the capacity to innovate. Through lean practice, the tension between exploitation and exploration may result in too much focus on the former, a critique of lean that can be found in the literature on lean and innovation (Gati-Wechsler & Torres, 2008; Hongyi & Taylor, 2009; Lindeke, Wyrick, & Chen, 2009; Shu & Shi, 2010), where the argument is that lean management practice, as explorative activities, may conflict with innovation as exploitative activities. However, in the light of recent developments in lean, do these objections still hold?

In this paper, however, we are trying to link different levels of lean approaches and differently types of learning. Based on what has been discussed in the previous session, lean approaches at the operational level can be seen as exploitative activities, eliminating redundancy and waste as well as emphasizing control and performance measurement, and drawing the attention of organizational members towards quality and efficiency rather than thinking about and experimenting with new ideas and ways of working. In contrast, lean at the strategic level, potentially has a more explorative nature since it calls much more attention on customer value and long-term growth but less on leveraging current strengths and less attention to the current organizational strategy, and lower conformity to current organizational practices (Burgelman, 1991; March, 1991). Accordingly, we believe there is a theoretical argument that the bias in the earlier versions of lean towards learning through exploitation may now have been balanced out by greater possibilities for learning through exploitation as the lean discourse has come to encompass strategic issues.

In addition to exploration and exploitation, similar dualities exist in the organizational learning literature: single-loop, double-loop and deutero learning (Argyris & Schön, 1978), lower level and higher level of learning (Fiol & Lyles, 1985), as well as adaptive learning and developmental learning (Ellström, 2000), where exploitation has been referred as single-loop, lower level, and adaptive learning; while exploration has also been referred as double loop, higher level, and developmental learning. Although coined with different labels, these dualities all, arguably, refer to similar content but notably see learning types as occurring in a hierarchy. The latter part of the couplet is invariably a “higher level” and thereby better form of learning. Organizations achieve long-term growth through achieving these higher levels of learning (i.e., exploration and double-loop learning). A capacity to engage in such learning is thus a desirable status to achieve, since an emphasis limited to current routine improvement and refinement benefits exploitation but will suppress exploration (Benner & Tushman, 2003). This in essence was the basis of early critiques of lean. But does the increasing strategic focus of lean now offer us prospects of organizational learning that is more balanced?

As stated, the early ideas of lean production argued for the idea on the basis that it promoted organizational learning. It did so because standardization facilitated shared meanings and understandings around easily codifiable texts. However, mass production implies a pre-given task. The ongoing quest for quality in processes necessitated a largely pre-given set of methods or at least shared idea of best practice. Finally, standardized procedures also compelled the evaluation of outcomes according to set criteria. Accordingly, learning under early conceptions and practices of lean was necessarily restricted to what Ellström calls reproductive learning if the arguments for lean production (on standardization) were to hold. The question we wish to explore in this paper is the extent to which a more a strategic emphasis in the more recent lean discourse has generated a shift towards more developmental types of learning. To do this we will present a case study of learning in the paper and packaging firm SCA. Before doing this, however, we will briefly discuss our methodology.

3 METHOD

The method applied in this paper is an explorative case study (Eisenhardt, 1989; Yin, 2003) in SCA Packaging, a Swedish multinational paper-packaging company. According to Yin (2003), case studies are the preferred strategy when "how" and "why" questions are being posed, which fits into the research purpose in this paper. A single case study based on mainly interviews and archival data is conducted to explain the relationship between lean and organizational learning. Although the single case study has shortcoming such as its uniqueness or artifactual condition surrounding the cases, which may further lead to scepticism about generalization of the results, here we chose to use an exploratory single case study because the objective of this paper is to provide a general overview of the studied phenomenon, that is, to illustrate how lean program is planned and how it is implemented in practice, and how it is related to organizational learning in the context of the multinational company in paper-packaging industry.

3.1 Case Company

The case company SCA Packaging (SCAP) is a separate business unit in the Swedish multinational forestry-group SCA (Svenska Cellulosa Aktiebolaget) established in 1929. SCAP offers a range of packaging-related products in 25 countries across Europe, with corrugated paper boxes being the dominant product group account for some 90% sales turnover. It has 250 production units across Europe, and each being a profit centre run by a general manager. Operations are structured geographically, based on five regions (Nordic and Russia, Central Europe, Western Europe, Southern Europe and UK and Ireland), each being the responsibility of a managing director. Hence, each region reflects the diversity of the products and services. The annual turnover is approximately 3.5 billion euros, and the company has around 20000 employees. The case study was done in SCAP Hungary, one of profit centres of SCAP Europe. SCAP Hungary was established on a greenfield site in 1996 and has one headquarter/commercial centre and a design centre in Budapest, as well as several production sites including one box plant in Nagykata and several service centres and other facilitates. One reason for conducting this study in SCAP Hungary partly was its growing market and promising financial performance in recent years. Besides, this study is also a part of a wider project on studying innovation management within a learning partnership between Lund Institute of Economic Research and SCA Packaging.

3.2 The Lean Programme in SCAP Europe

SCAP is now undergoing a transformation to move from being "an undifferentiated, cyclical raw material pusher" to "a European market and customer driven full-service packaging provider with growing and differentiated core business offering customers increasing value". Five transformation themes have been identified by the headquarters of SCAP Europe in order to drive this transformation, including " A high-performing system", "World-class sales and marketing execution", "Driving an innovation culture", "Lean" and "Appropriate assets". As one of the five transformation themes, the Lean programme was initiated in two pilot plants in the Netherlands at the beginning of 2007 and has rapidly spread into other countries and plants. SCAP Hungary has been implementing the Lean Programme at the Nagykata box plant since September 2007 and the company claimed it enjoyed many positive results. For instance, in 30 weeks after lean was implemented, the stock coverage of finished goods and raw materials were reduced from 7% to 2%, and the production accuracy has been increased from 89% to 98%. Open sale order, open purchase orders, and unplanned production orders have all been greatly reduced. Now SCAP Hungary is also trying to implement lean in one of the service centres in Gyor.

When collecting data in case studies, Yin (2003) strongly suggests that data collection should be from multiple sources of evidence, which is also the main strength that the case study offers. This is also referred to "triangulation", which entails using more than one data source in the study of the social phenomenon (Bryman & Bell, 2007). Since single source of evidence leads to limited results, the use of multiple sources allows us to address a broader range of historical, attitudinal, and behavioural issues. Within case research, this approach is fairly common and data collection is typically a combination of interviews and archival data (Eisenhardt, 1989). The data collected was as follows:

- Interview data: semi-structured interviews with people from manufacturing and service centres who are directly involved with lean programme, including plant manager, service centre manager and strategic development manager, as well as people from other business functions, i.e., sales manager, design manager and designers.
- Archival data: including internal newspaper, corporate reports and documents, etc.

4 CASE DATA

As the lean concept has developed as an espoused theory at SCA it has undergone this process from the operational level to a more strategic level. As is stated in SCA documents, the purpose of lean programmes is to create value by aligning activities with the following lean principles:

- Specify value from the customer's point of view
- Identify the value stream
- Make value flow
- Pull at customer's rate of demand
- Seek perfection through continuous improvement

4.1 The Lean Programme at SCAP as Planned

The intention of the Lean Programme at SCAP is to apply lean principles on both operational and strategic level. Lean is more than just a tool to achieve production efficiency but a way of thinking which should be applied to different aspects of the organization. As stated in the SCAP Lean Programme documents:

> *"(Lean is) A way of thinking, not a tool, used to look at your business whether it is manufacturing, service or any other activity where you have a supplier and a customer."*

The scope of lean implementation is not limited to manufacturing but also sales, design and other supporting functions such as HR, finance and service centres to make a "true lean organization". Again as the lean programme stated:

> *"Since a true Lean organization applies Lean principles everywhere, the scope has now been expanded to business processes in supporting functions such as HR, Finance and the SCA Containerboard Service Centre."*

At the heart of the lean thinking is the customer value,

> *"The focus of a Lean organization is on the Customer. Improvements are targeting four areas: Safety, Quality, Delivery and Cost. A Lean organization looks at eliminating wastes, reducing variability and increasing flexibility to improve in these four areas."*

Eventually, the aim of lean is not only to pursue short-term results, i.e. better quality of products, lower price and shorter delivery time, but rather to create a lean organization, that is, to cultivate a continuous improvement culture, to make lean a way of thinking in people's daily work.

> *"The ultimate goal of a Lean organization is to have a continuous improvement culture. In other words, we want to have Lean in the DNA. In such a culture, everybody is engaged to seek opportunities for improvement and to implement changes to improve."*

Not only the lean strategy makers at the SCAP European headquarters but also people working in the frontier of lean in different plants consider that lean is more than production excellence in manufacturing. A further illustration is given by the strategic development manager at the Nagykata box plant:

> *"Lean is not only about manufacture. Lean can be applied to any process or activity. It can mean that we should focus our activities on value creations. You generate value in your daily work not on the manufacture. So sales, designers can*

also create value, what they can do in terms of lean is really to optimize your processes and your communication flow, to have the proper transparency in the workflow. This is what we miss today. And this is also a part of lean: do things as simply as possible and in the most efficient way. It's about way of working, no matter what kind of activities you are doing." (Strategic development manager, Nov 4, 2010)

In this sense, even designers, working as the most creative innovators in the organization, could be involved in lean programme to improve the efficiency of their daily work. The Strategic Development Manager again:

"As designers…, definitely nobody is working the most optimized way. All the time we can do something to improve. That's lean. If we want to do something better, less costly, less time, more efficiently, then it makes sense to investigate, and lean can support and allow you to do that… You can identify what can be improved. That's lean." (Strategic Development Manager, Nov 4, 2010)

4.2 The Lean Programme at SCAP In Practice

According to what is stated by the headquarters of SCAP Europe and managers who are working on the lean programme in practice, lean is more than a tool to achieve production efficiency rather than a way of thinking diffused in every part of the organization, focusing on customer value and aiming at cultivating a continuous improvement culture to make a lean organization. However, how it is implemented in reality is far from where the intention is. The problems existing are identified as follows:

Firstly, lean was initiated in manufacturing and this is where lean has been implemented so far. It hasn't spread to other functions yet. Take sales people for example, as a key element in lean thinking, value is defined based on the customer's perspective in terms of cost, quality, time efficiency and so on. As stated by the Sales Manager:

"…lean also investigate the value chain, so what is important for the customers, what is the value for the customers, and decisions and work flows should be deigned to be able to keep these." (Sales Manager, Nov 6, 2010)

And

"…If they don't understand the profitability or total picture of that customer they make wrong decisions and priorities, and the whole value stream is then questionable." (Sales Manager, Nov 6, 2010)

However, working directly with customers and sales people could therefore be the main source of the information to identify and understand about customer needs, sales people are not involved in the lean programme so far, which calls the value capturing in lean into question.

"…because lean also investigates the value chain, so what is important for the customers, what is the value for the customers, and decisions and work flows should be designed to be able to keep these. So it was not always on the right track. There was a mistake… lean was introduced in Göyr and then Nagykata. And in Göyr they did not invite the sales people and the management from the very beginning, so they absolutely disregarded the customers' different wishes." (Sales manager, Nov 6, 2010)

A further illustration could also be found in the words of the strategic development manager:

"Unfortunately sales are not involved in the lean project. That will be improved. There are some trials to do, so certain lean teams are already asking for sales people's support as well, I think they will be involved more and more, and hopefully their thinking about lean will change as well, because my assumption is that sales people still believe that lean is just for manufacturing and nothing else, and that has to be changed." (Strategic Development Manager, Nov 4, 2010)

This situation has started to change at the time of writing - some sales people are now involved in the lean team and participating in the kick-off meetings, which is an improvement compared with previously, but the result is not known yet. An illustrative comment here:

"We can't pay the price. Who will pay the price for our work? The customer. So we are working for the customers. So don't forget who we are working for, not for ourselves. That is the responsibilities of the sales people sitting in the Lean team. Just recently we did it. It can be a solution, but I don't know how it will work in practice." (Sales Manager, Nov 6, 2010)

Secondly, people from manufacturing like lean and are satisfied with the outcomes that lean has brought. In contrast, there are many complaints about lean from sales and design, implying a great difference in understanding of lean and the gap between the intention of lean from the headquarters and its implementation in different plants in reality. A quote from the Design Manager illustrated this:

"Lean has a very short-term focus. You can only see few meters ahead. It only focuses on one thing. But we have lots of functions in our organization, such as design, sales, together working for achieving the goal, but lean only focuses on one thing." (Design Manager, Nov 5, 2010)

A continuous improvement culture, which is stated in the vision of SCAP Lean Programme, however, seemed not to have materialised at the time of the case study. As stated by the Sales Manager:

"…I don't really believe (in lean) in total. I don't know how to believe in lean. Because when there is a good entrepreneur, that's also important to have an entrepreneurship culture or… in everyone's mind, in the individuals' mind…If they don't understand the profitability or total picture of that customer they make wrong decisions and priorities, and the whole value stream is then questionable. (Sales Manager, Nov 6, 2010)

5 DISCUSSION

Our task in this paper has been to reassess the relationship between lean and organizational learning as the former has undergone a discursive shift from lean production to lean thinking and subsequently to lean solutions (Womack et al, 1990; Womack and Jones, 1996, 2005). We have attempted to see lean thinking in the terms advocated by its protagonists, that is, as a whole way of thinking that should encompass the entire organization. In other words we have sought to investigate in SCA whether the organization has accepted lean thinking. In effect this is the same thing as being socialized within a new culture (of leanness), a process that can be seen as an instance of organizational learning (Cook & Yanow, 1993). Further, we have argued in our earlier discussion that more recent versions of lean do theoretically make a better balance possible between exploration and exploitation than in earlier versions such as the implementation of lean production at NUMMI (Adler & Cole, 1993). But was this possibility borne out in our case data?

Our analysis suggests that such learning around a new culture of thinking and total quality improvements has not taken place at SCA. Many of our respondents did not identify with the ideas of lean thinking on either cognitive or emotional levels. Lean thinking was accepted and was seen positively, but only within operations and not at the strategic level. In other words, there was a clear gap in the rhetoric of the company policy or espoused theory on lean thinking and the reality. The company policy on lean thinking from 2008 explicitly extended lean ideas from production to include the entire customer delivery process. We were struck by how the policy had lifted the five principles of lean solutions from Womack and Jones' 2005 text almost word for word.

One reading of this is that organizational learning around lean solutions – like all other cultural change programmes - will take time to come to fruition (Alvesson & Sveningsson, 2008). It is therefore too early to make a definitive judgement on the programme. This suggests that firms experiencing the lean evolution will take time to arrive the final destination – lean solutions. This view finds support in the work of Hines et al (2004) who link the evolution of the lean concept to organizational learning, both for the lean movement itself and the firms who are going through different stages of lean thinking. Their model of evolution is closely related to the developmental stages of organizational learning proposed by McGill and Slocum (1993). From its implementation in cells and assembly lines on the shop-floor, to the value stream and system, the organization implementing lean undergoes a learning process from adaptive or single-loop learning to developmental and double-loop learning. At the early stage when implementation is focused on the shop-floor, organizations often claim that they are applying lean organizationally, although they are in practice only doing so in limited islands on the shop-floor. They are not open to further change and expanding their learning experience. However, at the value systems stage, organizations take active approaches to capture the customer needs and actively use contingent strategy

deployment and policy deployment. This lean value system is likened to the last phase of McGill and Slocum's model in the learning organizations, wherein learning opportunities of different parts are sought, such as employees, suppliers, customers and even competitors. Such approach facilitates learning and double-loop learning or learning through exploration is expected.

To summarize the relationship between different levels of lean and learning could be illustrated as follows in **figure 1**:

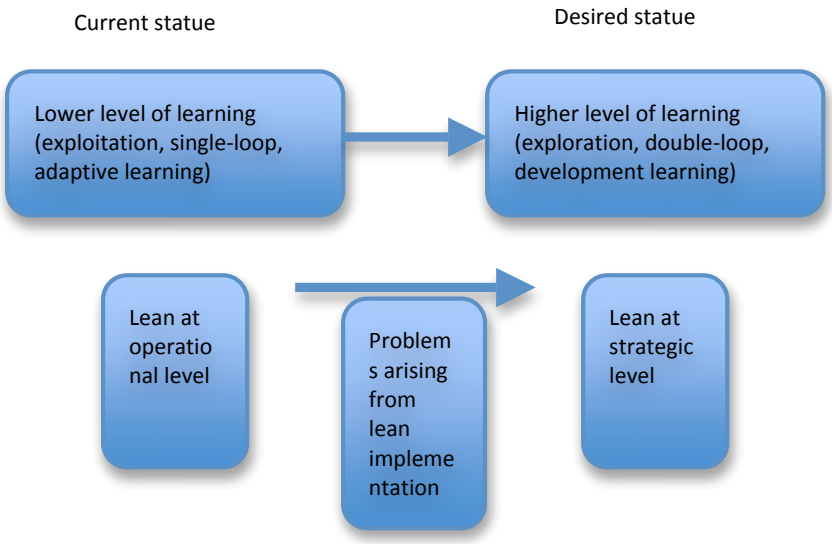

Figure 1: Gap between lean at operational level and strategic level

As illustrated above, the desired situation of lean implementation is to apply lean at strategic level to make a lean organization and achieve long-term growth through higher level of organizational learning, i.e. exploration and double-loop learning. However in practice, lean is only limited at operational level in many cases, focusing on cost reduction and quality improvement and pursuing production excellence, limited to lower level of organizational learning. Some problems might emerge from the gap between the desired statue and situation in practice, one of which might be the conflicts between operational functions (i.e. manufacturing and supply chain) and other business functions in the organization (i.e. innovators and sales people). Lean implementation at the operational level stresses the importance of maintaining a higher level of efficiency and quality by placing a set of standardized rules upon the organization to prevent all forms of non value–adding activities. This might, however, result confusion among a group of innovators, since they know that to test and realize new ideas, significant resources including people, time, and capital investments are required.

6 CONCLUSION

In this paper we have sought to revisit the relationship between lean production and organizational learning in view of the former's evolution beyond shop-floor operations in vehicle manufacture. Critics of lean in the early days pointed out that its promotion of learning was based on assumptions of the unproblematic diffusion of uncontested objective knowledge that was codifiable from standardized work processes (Berggren,

1995; Ellström, 2000). Indeed, the logic of learning under lean production, with its emphasis on standardisation, could be said to hinder certain types of learning as the encouragement of conformity to norms was clearly in conflict with the challenging of such norms. The latter, of course, is an essential aspect of double-loop learning (Argyris and Schön, 1978) and learning through exploration (March, 1991).

We have argued in this paper, however, that recent versions of the lean discourse do open up possibilities for a better balance between exploitation and exploration, at least in theory. Lean management and organizational learning have been seen as two driving forces for today's business' success by contributing to competitive advantage in organizations. Organizations, it seems, aspire to be lean in order to be efficient and at the same time want to learn and innovate in order to adapt to the environment and remain competitive. However, some lean management practices contradict with learning because they have different focuses and require different conditions to achieve. Lean thinking, focusing on cost reduction, efficiency improvement, standardization, prior planning and on-going direct control, might become an obstacle to certain forms of learning, which on the other hand requires organizational slack, employee autonomy as well as motivation and willingness to learn. Traditional lean approaches have arguably jeopardized organizational capacities to learn and innovate. On the other hand, more recent versions of lean appear to downplay the need for standardization with a stronger focus on delivering value to customers. In theory this should entail more flexibility and innovation in the quest for unique solutions. In turn this might plausibly entail learning from cases of one or fewer (March et al, 1991) rather than learning from standard operating procedures.

However, the desired state of balance between exploration and exploitation was not particularly evident in our case study. We have suggested that this might be because the case company was still at any early stage of the organizational learning associated with the cultural change process on lean thinking (Cook & Yanow, 1993; Hines et al, 2004). Yet there is we feel a more compelling reading, namely that the lean programme at SCA is flawed because lean thinking is not well suited to the production and value delivery systems at SCA and elsewhere in the paper and packaging industry. Returning to our typology of production systems in **table 1** it is clear that SCA is not in the business of mass production. Contracts with customers, overwhelmingly in B2B markets, are individually negotiated to precise specifications. Lean solutions will not only vary between customers, they may also vary for the same customer over time. No one can argue with the need to eliminate unnecessary waste, however, it makes little sense to aspire to standardize in the value delivery system. Moreover, the demand for products is likely to fluctuate in unpredictable ways. For these reasons it seems that the most appropriate set of contingencies for SCA is that associated with agile rather than lean production or lean thinking. It may thus be misguided for SCA to pursue a policy of organizational learning based on lean thinking, and this may be a reason too why our respondents had a decidedly lukewarm response to the policy.

REFERENCES

Adler, P. S, Cole, R. E. (1993), 'Designed for Learning: A Tale of Two Plants', *Sloan Management Review,* vol. 34 no. 3, pp. 85-94.
Alvesson, M. & Sveningsson, S. (2008) *Changing Organizational Culture: Cultural Change Work in Progress,* London: Routledge.
Argyris, C., & Schön, D. (1978), *Organizational Learning: A Theory of Action Perspective,* Addison Wesley, MA.
Ben, N., J., Naim, M. M., & Berry, D. (1999), 'Leagility: Integrating the lean and agile manufacturing paradigms in the total supply chain - Strategies for enriching', *International Journal of Production Economics*, vol. 62 no.1- no. 2, pp. 107-118.
Berggren, C. (1995), 'The Fate of the Branch Plants - Performance Versus Power' in Sandberg, Å (ed), *Enriching Production*, Avebury, Aldershot.
Benner, M. J., & Tushman, M. L. (2003), 'Exploitation, Exploration, and Process Management: The Productivity Dilemma Revisited', *The Academy of Management Review*, vol. 28 no. 2, pp. 238-256.
Björkman, T. (1997), '"Management" - en modeindustri' in Sandberg, Å. (ed), *Ledning för alla? Om perspektivbrytningar i företagsledning (3rd edn),* SNS, Stockholm.
Bryman, A., & Bell, E. (2007), *Business Research Methods* (2nd ed.), Oxford University Press, Oxford.
Brulin, G, & Nilsson, T. (1999), 'The Swedish Model of Lean Production: the Volvo and SAAB Cases', in Durand, J. P, Stewart, P, Castillo, J. J. (eds) *Teamwork in the Automobile Industry – Radical Change or Passing Fashion?* Routledge, Basingstoke.
Burgelman, R. A. (1991), 'Intraorganizational Ecology of Strategy Making and Organizational Adaptation: Theory and Field Research', *Organization Science*, vol. 2 no. 3, pp. 239-262.
Cook, S. D. N, & Yanow D. (1993), 'Culture and Organizational Learning', *Journal of Management Enquiry*, vol. 2, pp. 373-90.
Cooney, R. (2002), 'Is "lean" a universal production system?: Batch production in the automotive industry', *International Journal of Operations & Production Management*, vol. 22 no. 10, pp. 1130-1147.
Corbett, S. (2007) Beyond manufacturing: The evolution of lean production. *The McKinsey Quarterly.* Vol 3, pp. 95-105.
Cox, A., & Chicksand, D. (2005), 'The Limits of Lean Management Thinking', *European Management Journal*, vol. 23, no. 6, pp. 648-662.
Crossan M. M, Lane, H. W, & White, R. E. (1999), 'An Organizational Learning Framework: From Intuition to Institution', *Academy of Management Review*, vol. 24 no. 3, pp. 522-537.
DeGeus, A. P. (1988), 'Planning as Learning', *Harvard Business Review*, vol. 66 no March/April, pp. 70-74.
Dodgson, M. (1993), 'Organizational Learning: A Review of Some Literatures'. *Organizational Studies*, vol. 14 no. 3, pp. 375-394.
Ellström, P-E. (2000), 'Lärande och kompetensutvecklingi "magra organisationer": problem och möjligheter', in Lennerlöf, L. (ed.), *Avveckla eller utveckla? En antologi om verksamhetskonsekvenser i magra organisationer',* Rådet för arbetslivsforskning, Stockholm.
Eisenhardt, K. M. (1989), 'Building Theories from Case Study Research', *Academy of Management Review*, vol. 14 no. 4, pp. 532-550.
Fleury, A., & Fleury, M. T. (2001), 'Alternavtives for Industrial Upgrading in Global Value Chains: The Case of the Plastics Industry in Brazil', *IDS Bulletin*, vol. 32 no. 3, pp.116-126.
Fiol, M., and Lyles, M. (1985), 'Organizational Learning', *Academy of Management Journal*, vol. 10 no. 4, pp. 803-813.

Forza, C. (1996), 'Work organization in lean production and traditional plants: What are the differences?', *International Journal of Operations & Production Management*, vol. 16 no. 2, pp. 42-62.

Gati-Wechsler, A. M., & Torres, A. S. (2008), 'The influence of lean concepts on the product innovation process of a Brazilian shoe manufacturer', *PICMET '08 - 2008 Portland International Conference on Management of Engineering&Technology,* pp. 1137-1144.

Hines, P., Holweg, M., & Rich, N. (2004), 'Learning to evolve: A review of contemporary lean thinking, *International Journal of Operations & Production Management*, vol. 24 no.10, pp. 994-1011.

Hongyi, C., & Taylor, R. (2009), 'Exploring the impact of lean management on innovation capability', *PICMET '09 - 2009 Portland International Conference on Management of Engineering&Technology,* pp. 826-834.

Landsbergis, P. A., Cahill, J., & Schnall, P. (1999), 'The impact of lean production and related new systems of work organization on worker health', *Journal of occupational health psychology*, vol. 4 no. 2, pp. 108.

Lennerlöf, L. (ed.) (2000) *Avveckla eller utveckla? En antologi om verksamhetskonsekvenser i magra organisationer'.* Stockholm: Rådet för arbetslivsforskning.

Lewis, M. A. (2000), 'Lean production and sustainable competitive advantage', *International Journal of Operations & Production Management*, vol. 20 no. 8, pp. 959-978.

Lindeke, R. R., Wyrick, D. A., & Chen, H. (2009), 'Creating change and driving innovation in highly automated and lean organizations: The Temporal Think Tank(TM) (T3(TM))', *Robotics and Computer-Integrated Manufacturing*, vol. 25 no. 6, pp. 879-887.

March, J. G. (1991) 'Exploration and Exploitation in Organizational Learning', *Organizational Science*, vol. 2 no. 1, pp. 71-87.

March, J. G., Sproull, L. S., & Tamuz, M. (1991), 'Learning from Samples of One or Fewer, *Organization Science*, vol. 2 no. 1, pp. 1-13.

McGill, M. E., & Slocum, J. W. (1993), 'Unlearning the organization', *Organizational Dynamics*, vol. 22 no. 2, pp. 67-79

Monden, Y. (1983), *The Toyota Production System,* Productivity Press.

Naylor, Ben J, Naim, M. M., & Berry, D. (1999). 'Leagility: Integrating the lean and agile manufacturing paradigms in the total supply chain - Strategies for Enriching', *International Journal of Production Economics*, vol. 62 no.1-2, pp. 107-118.

Ohon, T. (1988), *The Toyota Production System: Beyond Large-Scale Production,* Productivity Press, OR.

Schouteten, R., & Benders, J. (2004), 'Lean Production Assessed by Karasek's Job Demand-Job Control Model, *Economic and Industrial Democracy*, vol. 25 no. 3, pp. 347-373.

Senge, P. M. (1990), *The Fifth Discipline: The Art and Practice of the Learning Organization,* Centry Business, London.

Shingo, S. (1988), *Non-Stock Production: The Shingo System for Continuous Improvement,* Productivity Press, Cambridge, MA.

Shu, J.-y., & Shi, X.-g. (2010), 'Study of integration innovation of modern industrial engineering technologies based on lean thinking'. *2010 IEEE International Conference on Advanced Management Science(ICAMS 2010)*, vol 1, pp. 276-281.

Slater, S. F., & Narver, J. C. (1995), 'Market Orientation and the Learning Organization', *The Journal of Marketing*, vol.59 no. 3, pp. 63-74.

Sturdy, A. (2004) ' The Adoption of Management Ideas and Practices Theoretical Perspectives and Possibilities', *Management Learning,* Vol 35 no. 2, pp. 155-179

Stymne, B. (1996), *International Transfer of Organisational Innovation (final report),* IMIT, Stockholm.

Waring, J. J. & Bishop, S. (2010) Lean Healthcare: Rhetoric, Ritual and Resistance. *Social Science & Medicine.* Vol 71, pp. 1332-1340.

Womack, J., & Jones, D. T. (1996), *Lean Thinking: Banish Waste and Create Wealth for Your Corporation,* Simon and Schuster, New York.

Womack, J., & Jones, D. T. (2003), *Lean Thinking: Banish Waste and Create Wealth for Your Corporation (2nd edn),* Simon and Schuster, New York.

Womack, J., & Jones, D. T. (2005), *Lean Solutions,* Free Press, New York.

Womack, J. P., Jones, D. T., & Roos, D. (1990), *The Machine that Changed the World*, Harper Perennial, New York.

Yin, R. K. (2003), *Case Study Research: Design and Methods'* (3rd ed.), Sage Publication, Thousand Oaks.