

# Empirical Review of Entrepreneurial Lean Operation Practices on Financial Performance of the Printing Industry

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**Abstract-** There is lack of lean practices and the future of the printing industry is full of close down threats by the digital and paperless media which poses a challenge worth serious attention and the big question lies on whether now, it is a choice or a decision printing firms need to take consideration of lean operation practices in order to survive this catastrophe. It is not clear whether the effects of the lean operation practices in the print industry affect performance of this industry. This study sought to investigate the empirical effects of entrepreneurial lean operation practices of Just-in-Time (JIT), Total Quality Management (TQM), Total Productive Management (TPM) and Human Resource Management (HRM) practices on organizational performance in the printing industry. A desktop research of 103 papers out of the total 318 previously identified was done, this purely involved secondary data sources' review and by aid of descriptive research design. The empirical findings reveal that lean operation printing practices can help to reduce cost by eliminating waste and having continuous improvement of the processes.

**Index Terms-** Just-in-Time, Total Quality Management, Total Productive Management, Human Resource Management

## I. INTRODUCTION

Over time, the discipline of entrepreneurship has become the agenda for many organizations; organizational entrepreneurship is often referred to as intrapreneurship and it has evolved in view of the axiom that firms in the 21st century have to continually identify new opportunities and turn these opportunities into revenue streams: meaning that they have to behave entrepreneurial, an option without which they become extinct. Due to increasingly short product and market life cycles, if businesses are to succeed, then they need to orient their strategic posture toward increased entrepreneurial orientation (Frank, Kessler & Fink, 2010).

Entrepreneurial Orientation's high propensity for innovation blends well with porter's low cost and differentiation strategy whereby firms will seek to have cost advantage in areas such as proprietary technology, preferential access to raw materials and other factors while focusing to be unique in their industry in terms of product attributes for which buyers will pay a premium price (Martinez-Ros, Isabel & Castro, 2005). Low cost strategy and differentiation strategies coupled with modern manufacturing practices can yield high firm performance.

## 1.1 Printing Industry

The history of the printing industry can be traced back to the 15<sup>th</sup> century. Since then many different printing technologies have been introduced. Before the 20<sup>th</sup> century printing was the only way of spreading marketing messages and information to customers in terms of non personal communication channels. Many new non printed channels for reaching mass audiences have been introduced like, radio, television and internet which have changed the way information is pushed and pulled to customers. With the global spreading of the internet, the print has been made an output channel and the print material has to compete for the same budget as for example e-mail, internet and telemarketing. Historically the industry consists of many privately owned small and medium sized companies although the situation is changing with mergers and bankruptcy (Gilboa,

Uribe (2008) observes that technological advancement in printing has been rapid and most printing houses have bought new technology with greater capacity while the old equipments are left working side by side with the new presses. Bodolay (2010) asserts that the industry is driven by economic growth, technological development, and the rising production costs in both developed and developing countries. The evolution of equipment and new printing technologies has led to better and more innovative products and services that cater for the changing needs of customers (Sandra, Hira & Tang 2006).

Acquisition of new technology in the absence of a disciplined approach to process analysis and sound strategic planning can sometimes lead to increased cost and eventual failure (Cost & Daley, 2003). Most companies in the print media take proactive measures to battle the storms they face by concentrating their energies on changing their businesses and manufacturing processes to continuously reduce or eliminate costs that do not add value to their products and services. They also continually look for opportunities to develop new products and services that leverage the capabilities of new technology (Sandra et al., 2006).

Many African publishers still order their printing abroad. Chavaka (1982) asserts that not only is printing capacity inadequate, a lot of the machinery, most of which is out-of-date, suffers from constant breakdowns, and the foreign exchange to obtain spare parts is not always available. Printing inputs such as paper, inks, films, plates, threads, and stitches have to be imported as well. As a result, printing costs are too high, partly due to the very small print runs. According to a UNESCO survey carried out in 1979–80, Africa produced only 28 percent of the paper it consumed and only ten African countries have their own

paper mills and produce only certain types of paper and boards and at higher prices than those on the world market (Chavaka, 1982).

## 1.2 Global and Local Perspectives of the Printing Industry

The printing paper industry is a global industry, which is based on renewable raw material. Printing papers made 43% of the global paper and board consumption which figure was 297 million tons in 2001 (Jaakko Consulting, 2002). Printing papers, instead, dominate in the product portfolios of the Finnish companies: that share was 84% out of 34 million tons in 2000 including foreign mill capacities. It is very difficult to unambiguously verify whether an increasing number of differentiated papers have had a positive impact on the paper firms' profitability: the profitability figures by paper grade are highly confidential and many other simultaneous measures to increase profitability have been taken.

The art of printing started with Gutenberg's invention, continuing through letterpress to today's coldset offset printing. Carolus published the first printed newspaper in France in 1605 (Kippan, 2001). Offset lithographic printing is the predominant process used in printing today. In the United States, it is currently the most prevalent printing technology. Lithographic printing is likely to remain a viable technology for the long term for static, long run jobs either as a standalone technology or as a component of hybrid production (Romano, 2003).

Digital color printing is poised to grow significantly over the next five years with the primary growth driver being cost reduction (Dalessandro, 2001). In Ghana, a survey of forty-seven (47) presses in the cities of Accra and Kumasi conducted by the author of this study shows that all of the printing houses use lithographic presses. The success of the lithographic printing is due to the ability of the process to produce high quality text and illustrations cheaply and effectively in short, medium, and high volume production runs. Lithography is used for a wide range of items from letterheads to books and magazines. Some other applications of the lithographic printing process include advertising, envelopes, labels and tags, stationery, greeting cards, and packaging. However, the ascendancy of the lithographic process may soon be challenged by both improvements in flexography and relatively new plate-less technologies, which make up the fastest growing sector of the printing industry in both developing and developed countries (Hird, 1991).

The Printing paper is an intermediate industrial material, which functions as a raw material to a publisher or to a printer to be converted into consumer products such as magazines, catalogues, newspapers and books. A current functional use of a printing paper is to collect, distribute and store information (Helbling & Page, 2001). Printing papers are the main part of commodities used in the printing industry. The standard printing paper grades such as brightness, opacity and paper gloss are on the same level at the same basis weight regardless of the Printing Company under consideration.

The end-use of a paper defines how much a buyer can pay for paper. The printing method has a dominant role as regards the physical requirements of the paper. In addition, end-use and a colour content has an impact on physical attributes of paper. However, there are also other functional requirements for a

printing paper: the paper should support the message and the image of the final product. Digitalization of all the information is a powerful change agent for publishers and printers. The quality of contents will remain the most important competitive factor whether it is printed or electronic (Rauramo, 1999; Anderson, 2003).

Suizberger (2010) says, 'We will stop printing the New York Times in the future date TBD.' This admission by the editor of one of the most leading newspapers in the world has only a small part of the widely held debate in the news media industry on the "death if print." The big question remains global as to whether the death of the print is a global phenomenon and what strategies the Printing Industry is pursuing to remain relevant despite threats by the digital revolution.

Printing industry in Kenya has grown over the past years since the establishment of the first printing press in Kenya the year 1895. The government press which established the first printing plant in Kenya, opened door for many other commercial printing firms later. Those business people who started the printing business in Kenya in early days can be a witnesses although the printing business was not well known to many was very profitable and attractive business to undertake, but of late the industry has changed and faced with a million challenges that has made the trade more difficult for the people in the printing industry, not only in Kenya but also in east Africa and other part of the world (IFRA, 2006).

In a question asked by eLearning Africa to the CEO of Kenya Literature Bureau (KLB) upon their launch of e-books on how she sees the current situation in the educational publishing industry in East Africa? Eve Obara the CEO asserts that the educational publishing industry in the region has come on in leaps and bounds. For instance, the Kenyan government's introduction of free primary education and subsidized secondary education has led to unprecedented growth in educational publishing in Kenya (Kimutai, 2012). Additionally, the signing of the East African Community protocol has also opened doors for publishers within the region to participate in the development of educational materials, not only for their nationals but also for other countries as well. This development calls for the Printing Industry to as well become digital by adopting Lean Operation Practices as much as possible for their survival.

Some of the challenging facing the printers and printing industry in Kenya entail: training of the personnel and the right people to do the same and produce the desired print, attaining the printing material in Kenya, Maintenance and spare parts of very complicated printing machines used and the printing filed and technology challenge. There are other challenges faced by the printing players in Kenya but these are just a few of the challenges. Kimutai (2012) in a paper that she wrote, 'the pain of being a Printer in Kenya,' reveals part of the challenges facing the Printing Industry in Kenya. In the paper, she argues that most of the paper used in Kenya is mainly imported despite the fact the Kenya has a paper factory - Pan Paper - that has been run down.

## 1.3 Lean operation Practices

Lean Operation Practices is one of the entrepreneurial innovations that can be used to improve organizational performance and help the printing industry compete both locally

and with foreign markets. The Lean Operation concept originated from Japanese manufacturers and has become a management philosophy that provides a way to do more and more with less and less, while coming closer and closer to providing immediate feedback on efforts to convert waste into value (Quesada & Buehlmann, 2011).

Lean a systematic removal of waste by all members of the organization from all areas of the value stream. It is called lean as it is the minimum of everything required to produce a product or perform a service. Lean practices enable a business to improve its operational performance for both large companies and SMEs. Studies by Garcia and Marin (2010) posit that applying Lean Practices enables a business to improve its operational performance for both large companies and SMEs. Hines, Holweg and Rich (2004) remark that lean has undergone a significant evolution and development and has attracted more attention to be applied in the service sector. Karlsson and Åhlström (1996) highlight that lean aims to increase productivity, reduce lead time and cost, and improve quality.

Where value refers to everything undertaken with a product or a service for which customers are willing to pay extra. Waste, conversely, refers to all activities that do not add value from the customer's point of view. Lean Practices permits an entire organization, starting product development, procurement, manufacturing process and even distribution (Karlsson & Ahlstrom, 1996). This shows that the proper utilization of Lean Practices affects the whole firm. However, Lean Practices is not only a set of practices connected to the value-creation process but rather, constitutes the pursuit of excellence based on a mixture of performance, continuous improvement and organizational change (Demeter & Matyusz, 2011). Lean thinking is also a process focused on increasing the value added to products and services and the reduction of waste.

According to subha and Jaisankar (2012) failure in lean implementation is due to lack of knowledge in sequence implementation, tools used and managerial perspective of the enterprise while the keys to success include a fundamental approach, systems thinking, leadership, flair for strategy and recognition on practical limits on resources. In a variety of industries in the US, and observed that 23% percent variation in operational performance is attributed to the use of Lean bundles.

Ferdousi and Ahmed (2009) in their study on Bangladeshi Garment Firm investigated performance improvement through lean production and noted that, the lead time ranged from 16 days to 120 days before implementation of the lean production while after implementation the minimum reduction was three days and maximum 30 days which translate to 18%-50% improvement.

Equally a study on relationship between lean production practices and performance in Taiwan by Kuo, Shen and Chen (2008) indicate that quality improved to a maximum of 80% and minimum of 10% and productivity improved by a maximum of 60% and minimum of 10%. Shah and Ward (2003) investigated the application of several Lean practices and identified two lean practices which they categorized into four bundles: Just-in-Time (JIT), Total Quality Management (TQM), Total Productive Management (TPM) and Human Resource Management (HRM). This study used the classification developed by Shah and Ward (2003) who lists four different bundles of JIT, TQM, TPM and

HRM to discuss the effects of entrepreneurial lean operation practices on the performance of printing industry.

#### 1.4 Main Study Problem

Subsequent print industries have seen the birth and death stages, the most common one in Kenya that is deep rooted to this melancholic catastrophe being the postal corporation which is surviving a delayed death. The biggest challenge facing the printing industry has become what almost seems like a "war on print" by those who produce and disseminate content. Lean Printing shop are not common in the printing industry instead most printing factories are organized with large buffers in front of and behind all of the major manufacturing operations. As such a lot of effort is expended in the plant rearranging queues of work in progress leading to rising value of inventories relative to sales volumes. The study by Kapuge and Smith (2007) on implementation and impact of lean practices in apparel companies in Sri Lanka showed that the companies with Lean philosophy have more developed quality practices than non-Lean with significant differences in customer focus, process improvement, supplier linkage and physical and financial quality measures than non-Lean firms.

The future of the printing industry full of close down threats by the digital and paperless media poses a challenge worth serious attention and the big question lies on whether now, it is a choice or a decision printing firms need to take consideration of Lean operation Practices in order to survive this catastrophe. And also, it is not clear on whether the effects of the lean operation Practices to be taken in the print industry shall affect performance of this industry consequently. This research sought to determine the effects of entrepreneurial lean operation Practices on company performance in the printing industry.

#### 1.5 Value of the Study

This study helps entrepreneurs in the printing industry to realize the potential benefits of entrepreneurial lean operation practices in the relevance of their industry. They will realize that lean practices are of paramount importance to resuscitate the relevance of this industry. It is therefore their responsibility to take lead in driving effective lean practices and ensure their organizations remain relevant in the fading era. This study is helpful to academic researchers and practitioners in provision of a rich literature that is greatly unavailable in Kenya relating to lean operation practices.

## II. LITERATURE REVIEW

### 2.1 Entrepreneurial Lean Operation concept

Womack, Roos & Jones (1990) first introduced the term, *Lean*, in their story about the Japanese automobile industry in their book, *The Machine That Changed the World*. The book is an in-depth description of the Toyota Production System (TPS), and explains how Toyota was able to minimize waste and to identify customers' needs (Harvey, 2004; Womack, Roos & Jones, 1990). However, Henry Ford first introduced concepts of Lean in the 1920s, as he understood the importance of process speed and how inventory slows down the processes.

Ford is considered to be the first to practice Just-in-Time (JIT) and Lean Manufacturing, even though he failed as a result of only being able to produce one product; therefore, he was not able to satisfy all of his customers' needs. The total Lean enterprise as it is known today was first successful at Toyota (George, 2002). Toyota based their production model around the manufacturing of customized vehicles. According to Cooper, Keith and Macro (2007), all of their cars were made focusing on the customers' Perspective of value. TPS learned much from Ford, but they also recognized the central role of inventory and continuous improvement for better productivity (Rizzo, 2008).

The Entrepreneurial Lean strategy aims at approaching the elimination of non-value-added activities, which are all activities that do not directly increase the value of a service or product (Cost & Daly, 2003). Lean is a way of minimizing production time and implementing changes to improve efficiency. It is often thought of as a way to reduce buffers, but it is also a multifaceted approach to operate a Lean production (Cost & Rothenberg, 2004).

Lean is focused on doing the right things, at the right place, and at the right time, throughout every step from product development to order fulfillment (George, 2002). Elimination of any type of waste is considered to be the heart of Lean Operation Practices. Lean thinking helps in specifying processes creating value and can create ways of converting waste into value (Womack & Jones, 2003).

It is important to understand that this view of waste involves much more than the traditional scrap and rework (Columbia, 2007; Cooper, Keith, & Macro, 2007). The traditional waste in a Printing company is make-ready waste and print waste. However, with a Lean perspective, waste from waiting, time wasted due to long changeovers, products waiting in queues (work-in-progress), waiting for stock, warehousing of finished products and raw material, downtime, mounting plates, people or equipment moving around more than required, conducting inspections, overproduction, underutilized resources, or waiting for payments are also considered to be waste (Huskins, 2007; Cooper, Keith, & Macro, 2007).

## 2.2 Printing Industry

The development of the Printing Industry is continuously changing, and a challenging market may force a new mindset and culture within the Printing industry. This is a consequence of new demands from the users, in addition to the development of technology in society today. Because of these changes, it is important for Printing Industries to analyze the trends and competition in order to survive in this challenging market. This is the time for the Printing Industries to make decisions for future strategies (IFRA, 2006).

The Printing industry is looking for opportunities for improving efficiency and reducing costs to survive. Over a long period of time, the typical approach has been to cut costs; looking into improving processes within the newspaper operations was a less typical approach. This is where Lean Manufacturing comes into the picture, as it is a way of thinking that takes away the focus on cutting costs and focuses more attention on a continuous improvement of processes (Womack & Jones, 2003).

## 2.3 Lean Management in the Printing Industry

Lean management focuses on making the use of all resources within a printing Industry more efficient. These are physical resources, such as paper, equipment, and employees as well as time, money, and energy that can be used ineffectively. This type of Lean management organizes the workplace and workflow in order to produce an efficient work environment and boost product quality. Lean also focuses the printing company towards leading a sustainable business life. A sustainable business uses materials and practices that are recycled or have a less harmful impact on the environment than other methods (Langen & Walter, 2006).

Lenz (2008) asserts that the end result of recycled paper can reduce total energy consumption by 27 percent, net greenhouse gas emission by 47 percent, wastewater by 33 percent, and solid waste by 54 percent and wood use by 100 percent for each ton of recycled postconsumer paper. Implementing recycled paper is sustainable for the forest environment and reduces wasted energy emissions in the form of water, greenhouse gasses, and energy consumption in the production process of virgin pulp. The chemicals used in a printing company are another area for the business to follow a sustainable practice. These chemicals are most often found in inks, press chemicals, commonly wash-up solutions and fountain solutions, and plate making processes. Volatile organic compounds (VOCs) are produced when these chemicals are used in the printing facility. Volatile organic compounds are "compounds that have a high vapor pressure and low water solubility" (Volatile Organic Compounds in Printing). VOCs have been found to be a major contributing factor to ozone, a common air pollutant that has been proven to be a public health hazard and a highly reactive gas that affects the normal function of the lung in many healthy humans (Langen & Walter, 2006).

To eliminate this waste of materials and become a sustainable working company, the new process of Computer to Plate Imaging was developed (CTP). CTP is a Direct Imaging Technology, which focuses on environmentally responsible printing processes by doing away with the chemicals used for plate making. The production of printing plates goes directly from the computer, without requiring film as an intermediate step, then to the plate onto the press. This direct imaging technology saves prepress make-ready time, improves quality, and eliminates the need to use and purchase chemicals to produce imaged plates that were previously used when plates solely were made from film negatives making CTP imaging a sustainable and Lean practice (Lenz, 2008).

Vegetable based inks can be an effective alternative in decrease the amount of dangerous VOCs released (Lenz, 2008). Vegetable based inks are made of a mixture of renewable resources, such as soy, flax, canola or safflower. Using the renewable resources reduces VOC emissions to two to 15 percent down from 30 percent with petroleum inks. "Even though petroleum based inks produce a sharper dot, vegetable based inks have a much better ink holdout, less dry back, and as long as slightly added dot gain is allowed for in prepress, results will be just as vibrant, if not better."

The background research on the topic of Lean and sustainability reveals that the philosophy of Lean is a positive practice in the printing industry. Using the tools of Lean and

leading a sustainable printing company provide substantial positive impact on the business. Organizing the workflow with Lean techniques to eliminate waste from the process workflow within a printing company along with choosing sustainable practices such as, recycled paper and press chemicals that emit none to low VOCs will increase profits along with productivity (Langen and Walter, 2006).

## 2.4 Theoretical Literature

A theory is a set of systematic interrelated concepts, definitions and propositions that are advanced to explain and predict phenomena (Cooper & Shindler, 2011). This section covers the theories that are relevant in explaining the effect of Lean practices on performance of firms.

### 2.4.1 Institutional Theory

The institutional theory posits that the institutional environment exerts strong influence on firms' strategies and logistics. The works of Achange (2005) points out that "firms operate within a social framework of norms, values and taken-for-granted assumptions about what constitute appropriate and acceptable economic behavior". Likewise, Zukin and DiMaggio (1990) note that institutional forces affect human behavior above and beyond the principle of economic optimization that remains a central motive in managerial decision making. Thus, institutional theorists assume that managers commonly make economically non-rational choices bounded by "social judgment, historical limitations and the inertial force of habit" (Oliver, 1997). Some of the most common

### 2.4.2 Value Configuration Theory

The main focus of Value configuration theory is on firm-level competitive advantage. Its propositions argue that competitive advantage cannot be understood by looking at the firm as a whole. Competitive advantage stems from the many discrete activities a firm performs in generating and delivering value (Porter, 1985). Each of these activities can contribute to a firm's relative cost position and create a basis for differentiation. There is a fundamental distinction between primary and support activities. Primary activities deliver value to the customer. They define the firm's business model. Support activities (such as R&D, HRM, purchasing) support primary activities and impact customer value solely through their impact on current and future primary activities. As per Porter (1985), value configuration theory provides a systematic basis for analyzing and developing competitive advantage in all types of firms. A firm is broken down into value activities where costs and value generated are allocated and estimated, either using the value chain template for manufacturing firms, value network template for mediators, or value shop template for problem solving service firms. The results of this activity-directed review are used to identify the competitive strengths and weaknesses of the firm (Porter, 1985).

### 2.4.3 The Trade – off Model

The model examines the need for plants to choose their competitive priority, then design and operate the manufacturing system accordingly and finally concentrating efforts on developing assets and practices that help achieve their goals. Studies on this theory examine the need for plants to prioritize

their strategic objectives and devote resources to improving those manufacturing capabilities. For example, researchers frequently claim that plants must make choices between achieving low costs or high flexibility (Hayes & Wheelwright, 1984; Garvin, 1993; Hill, 1994). Low cost producers seek to reduce waste and improve productivity, often designing efficient line flow systems comprised of relatively fixed machinery and standardized operator tasks. In contrast, highly flexible plants may choose a job shop design, seeking rapid response to changing customer demands and product specifications.

### 2.4.4 Cumulative Theory

Cumulative prospect theory (CPT) is a further development and variant of prospect theory. This version of the model is a little different from the original version of prospect theory because weighting is applied to the cumulative probability distribution function, as in rank-dependent expected utility theory but not applied to the probabilities of individual outcomes (Tversky & Kahneman, 1992). Cumulative capability theory on the other hand was suggested by (Ferdows & de Meyer 1990). This model suggests that if an organization develops a path along which it will focus its improvements it may overcome the trade-off limitations. This is also known as the sand cone model where a firm focuses on quality, flexibility, speed and cost efficiency, respectively. Advocates of the cumulative model, however, claim that trade-offs are neither desirable nor necessary for two reasons. The two models tend to overlap on a number of aspects and both suggest that firms should focus on quality programs, supplier involvement, just-in-time (JIT) production, workforce commitment and involvement.

## 2.5 Empirical Literature

Lean Operations practices are traced to Ohno (1988), who was the promoter of Toyota Production System. Following Ohno, other authors have written about the Toyota Production System. Sugimori, Kusunoki, Cho and Uchikawa (1977) describe Toyota Production System as having two components, just-in-time (JIT) production system and a respect-for-human system that focuses on active employee participation, elimination of wasted movement by workers, consideration for workers' safety, and self-display of workers' capabilities by entrusting them with greater responsibility and authority. Monden (1983) is credited with introducing the JIT concept to a broad audience in the USA. His early work focused primarily on a limited set of JIT practices related to shop floor activities. He also emphasized the importance of small lot sizes, mixed model production, multifunction workers, preventive maintenance, and JIT delivery by suppliers.

The literature on JIT is very broad. For example, Inman and Mehra (1990) identify over 700 articles written between 1985 and 1990. In an effort to examine if there are robust empirical relations between managing the production process with JIT and the creation of firm value, Huson and Nanda (1995) found that after JIT adoption, firms reduced the labor content in facilities, increased inventory turnover, and enhanced earnings. Sakakibara et al. (1997) study the impact of JIT manufacturing and its infrastructure on manufacturing performance and competitive advantage. They identify six JIT practices: Setup

time reduction; Scheduling flexibility; Maintenance; Equipment layout; Kanban; and JIT supplier relationships.

The Competitive advantage of a firm or industry is measured by unit cost, quality, delivery, flexibility, and the overall advantage that is plant management's opinion of the plant's performance relative to global competition. Sakakibara et al. (1997) show non-significant relationship between the use of JIT practices and Company performance, but a very strong relationship between JIT practices and infrastructure practices. The combination of JIT management and infrastructure practice is related to Company performance; infrastructure, by itself, is sufficient to explain manufacturing performance; and manufacturing performance is related to competitive advantage. They discuss that JIT is an overall organizational phenomenon that provides a set of improvement targets and discipline for the entire organization.

In another study, Shah and Ward (2003) examine the effects of three contextual factors, plant size, plant age, and unionization status, on the likelihood of implementing manufacturing practices that are key facets of lean production systems. They define lean operation practices as a multi-dimensional approach that encompasses four lean bundles as JIT, TQM, TPM, and human resource management (HRM) in an integrated system that produces finished products at the pace of customer demand with little or no waste. They combine 22 lean practices into four lean bundles. The results indicate that lean bundles contribute substantially to the operating performance of plants.

Jayram, Vickery and Droge (2008) investigate the relationship between relationship building with suppliers and customers and lean strategy and financial performance. They propose that lean strategy should start after developing close relationships with suppliers and customers. They consider two aspects of lean strategy, lean manufacturing, and lean product design. In their study, lean operational practices include JIT production, setup time reduction, and cellular manufacturing. Lean product design principles are concurrent engineering, design for manufacturability, value analysis, and standardization. The Company financial performance consists of return on investment, returns on sales, and return on assets. They apply structural model analyses to data from the top 150 independently owned first-tier suppliers to General Motors, Ford, and Daimler-Chrysler and show positive relationships between relationship building and lean design, relationship building and lean manufacturing, and lean product design and firm performance. They argue that relationship building is more valuable for enhancing the product aspects of lean strategy as opposed to the process aspects of lean strategy.

Lawrence and Hottenstein (1995) investigate the relationship between JIT practices and Company performance in Mexico. They consider reducing setup times, reducing production lot sizes, simplifying materials flow and handling, reducing inventories, and preventing defective products from being made as key components of JIT. They measure four dimensions of plant performance: quality, lead time, productivity, and customer service. Using survey data from 124 Mexican plants affiliated with US companies, they show that JIT is associated with superior performance in Mexico.

Taj (2008) investigates the adaptation of lean operational practices and its practice in China. He performed a lean manufacturing assessment at 65 manufacturing plants in various industries. The results of assessments show that the petroleum industry is in lead among all industries, followed by computer, telecommunication/wireless, and electronics industries. The findings show low scores in layout design, volume/mix flexibility, setup, visual factory, and point-of-use delivery. However, plants earned better scores in materials flow, scheduling control, on-time delivery of finished goods, and overall defect rate. Many of the firms in the Printing Industry are faced by similar problems faced by SMEs in productivity improvement programme as discovered by Gunasekaran and Cecille (1998); Top management support, Involvement of managers in a team, Education and training and Empowerment of employees.

Rathje, Boyle and Deflorin (2001) found one of the leading organizations in Europe failed in lean implementation due to lack of top management commitment, lack of team autonomy, lack of organizational communication and interest in lean. Therefore, to success in lean, the organization has to plan properly with total employee involvement and clearly highlight on vision and mission. Lean is not an easy task as seen.

TQM focuses on control of business processes and customer satisfaction. Activities such as improvement, statistical control, supply control and quality engineering are ingredients of TQM. TQM as a concept emanates from the academic field and has contributors such as Feigenbaum, Juran and Deming. LM, or Lean Production (LP) which is often known simply as 'Lean', is a production practice that considers 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; basically, more value with less work.

Most of the empirical studies focusing on the impact of lean implementation on operational performance are constrained to one or two facets of lean, often JIT or TQM. Improved operational performance associated with JIT practices (Koufteros et al. 1998; Sakakibara et al., 1997; Im and Lee, 1989; White et al., 1999) has been shown to outweigh the results associated with TQM practices (Samson and Terziovski, 1999; Powell, 1995). In a study of JIT and TQM, Flynn, Schroeder and Flynn (1999) found incremental performance effects attributed to JIT and infra-structural practices common to both JIT and TQM, but not specific TQM practices. In case of TQM practices by themselves, while Choi and Eboch (1998), and Samson and Terziovski (1999) found a significant direct impact of TQM practices on operational performance, Powell (1995) found positive support for only 3 out of 12 TQM practices that he studied.

In a related study, Cua et al. (2001) investigate the simultaneous implementation of practices related to JIT, total quality management (TQM), and total productive maintenance (TPM) programs and their impact on manufacturing performance. The manufacturing performance consists of cost, quality, delivery, flexibility, and a weighted performance. They show evidence supporting the compatibility of the practices in these programs and that manufacturing performance is associated with the level of implementation of socially and technically oriented practices of the three programs. Their analyses suggest that simultaneous implementation of TQM, JIT, and TPM will

result in higher performance than implementation of practices and techniques from only one of them.

Printing businesses are continually looking for ways to conserve resources. Eliminating wasted resources is exactly what the Lean philosophy will do for a printing company. Lean Practices has often been thought of as only applicable to manufacturing industries, but as Jones and Womack said in their first literature about Lean, it is applicable to any industry. Over the last decade, more and more printers have been introduced to, and have implemented elements from Lean Manufacturing (Cooper, Keith, & Macro, 2007). Lean Practices can help printing companies to do more with less and to lower their costs by reducing the non-value-added activities.

### III. RESEARCH METHODOLOGY

This study adopted a positivism research paradigm which is an epistemological position. Positivism is an epistemology that advocates the application of the methods of the natural sciences to the study of social reality and beyond. It is characterized by a belief in theory before research and statistical justification of conclusions from empirically testable hypothesis, the core of tenets of social science (Cooper & Schindler, 2011).

The positivist paradigm contains two main themes; controlling the research condition such as human behaviour and investigating those through scientific methods (Cohen, Manion & Morrison, 2000). Because it is controlled, the positivist paradigm tends to generalize findings with one truth. As it is very structured and clear, it is easy to be objective in this paradigm. Epistemological research in the positivist paradigm is how the social world can be investigated as natural science (Koul, 2008). Hypotheses have to be tested by empirical approaches. Koul (2008) posits that since the focus of the positivist paradigm is to discover the 'truth' through empirical investigation, the quality standards under those paradigms is validity and reliability. The results of positivist research activities are expected to positively contribute to human welfare.

This study adopted a descriptive research design. According to Mugenda and Mugenda (2003), descriptive research is a process of collecting data in order to test hypotheses or to answer questions concerning the current status of the subjects in the study. For the purpose of this study, the population consisted of a desktop research of 318 research papers. After a thorough view and critical review of all chosen papers, 103 research papers were chosen as the anchoring research papers for this study. Data was collected by aid of secondary research techniques.

### IV. FINDINGS AND CONCLUSIONS

Fuller (1986) explains that the use of Lean techniques improves quality without adding cost to the company. Poor quality increases complexity which in turn increases cost. Improving quality reduces complexity, and higher productivity and lower cost follows (Fuller, 1986). A non-Lean print company has high complexity within the workflow; therefore non-value added activities exist leading to wasted resources.

Printers have been learning fast, and printers implementing Lean are often bringing tools into both office and print operations (Cooper, Keith & Macro). Lean implemented in a newspaper printer can make the operations more efficient and cost effective, in addition to changing the focus to look for answers and improvements (Brady, 2008). According to Michael Brady, formally with the Newspaper Association of America, three of the main benefits for a newspaper printer to implement Lean Operation Practices are: Outsourcing of functions for increased efficiency and cost reduction and better customer service, Reduction in the geographic area of distribution resulting in reduced newsprint and transportation cost thereby allowing more targeted focus on the core audience and the use of common operational systems to optimize communication between departments.

Some Printing Industries in United States have already been successful with implementing Lean. For instance, the '*The Milwaukee Journal Sentinel*' has used Lean Practices and Six Sigma to achieve ISO 9000 certification. *The Wall Street Journal* has used Six Sigma to identify problems, to analyze causes of problems, and to determine customer preferences (Columbia, 2007). Southern print is one printing company that successfully managed to implement Lean Practices; it obtained a better working environment and a significant improvement in reducing overruns.

Applying Lean methods reduces this complexity issue allowing for a smooth process to evolve. This smooth process eliminates non-value added activities, which in turn reduces cost for a print company. The high costs are due to wasted resources within the workflow process from defects, work-in-progress, or left over inventory, which are then eliminated when Lean practices are put into place (Fuller, 1986).

Among the existing literature on the effects of entrepreneurial lean operational practices on company performance, there is critique that there exist no such related study that has been conducted in Kenya to prove if really the lean practices of TQM, JIT, TPM and HRM do yield expected company performance in the printing industry despite that part of these ecstatic studies have some been conducted in developing nations (Cua et al., 2001). This study sought to find out these effects and thus create room for an open scholarly research on this field more so to the ways the Printing Industry of Kenya and of the entire world can be resuscitated and saved from dying a sudden death.

The study established that lean printing shops are not common in the printing industry instead most printing factories are organized with large buffers in front of and behind all of the major manufacturing operations. As such a lot of effort is expended in the plant rearranging queues of work in progress leading to rising value of inventories relative to sales volumes. The study by Kapuge and Smith (2007) on implementation and impact of lean practices in apparel companies in Sri Lanka showed that the companies with Lean philosophy have more developed quality practices than non-Lean with significant differences in customer focus, process improvement, supplier linkage and physical and financial quality measures than non-Lean firms (Bhat & Jagadeesh, 2009).

This problem of the lack of lean practices and the future of the printing industry full of close down threats by the digital and paperless media poses a challenge worth serious attention and the big question lies on whether now, it is a choice or a decision printing firms need to take consideration of lean operation Practices in order to survive this catastrophe. And also, it is not clear on whether the effects of the lean operation Practices to be taken in the print industry shall affect performance of this industry consequently (Brady, 2008).

Use of JIT in developing countries is also discussed by Ebrahim and Schonberger (1984). They suggest that JIT would help solve many of the problems companies face in developing countries and that its basic simplicity makes it particularly well suited for use in these countries. They argue that a lower skilled workforce represents the only obstacle to successful JIT implementation in developing countries and that this could be overcome through employee training.

Most of the studies that have been conducted on the effects of lean operation practices have been conducted on the vicinity of developed nations. It is only a few of those studies that have been conducted in the context of developing nations but with a biased view on all industries as well. In fact, there exist up to date some industries that have remained un researched as yet Lean Practices having been proved to flourish in almost all industries (Anderson, 2003). These studies are not common both in developing nations and in the Printing industry.

The study concludes that the printing industry has survived several rivals, and the print is still a dominant medium. However, the development of Printing Industry is continuously changing, and a challenging market is forcing a new thinking within Printing Industry. This literature review has shown that, as a response to the challenges, lean operation printing practices can help to reduce cost by eliminating waste and having continuous improvement of the processes. This is the time for the printing industry to determine its future strategies by adopting operational lean practices which shall see the future of the printing industry not only survive in the foreseeable future but dramatically improve as well into yielding positive results

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