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## Kaizen Implementation and Performance of Manufacturing Firms in Nairobi County Kenya

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### ABSTRACT

*All across the world, firms are experiencing dynamic changes in their environments and this may present challenges. The Kenyan manufacturing sector is key in the development plan as envisioned in Kenya's vision 2030. To achieve this, the manufacturing sector in Kenya must therefore come up with ways to ensure their sustainability moving forward. The general objective of the study was to establish the effects of Kaizen implementation on operations performance in the case of manufacturing firms in Nairobi, Kenya. Specifically, the study sought to establish the effect of quality circles, teamwork, total productive maintenance systems and personal discipline on the operations performance of manufacturing firms in Nairobi County. The study was guided by the operations management theory, dynamic capabilities theory, the kaizen theory and the balance score card theory. The study used the descriptive research design and targeted 52 manufacturing firms in Nairobi, Kenya. Simple random sampling was used to select 175 respondents from the 52 manufacturing companies where the unit of observation was the operations manager, human resource managers, finance managers, strategic managers, marketing managers and the sales manager from each of the manufacturing companies. The researcher collected primary data using questionnaires while secondary data from the companies' financial statements was collected. Cronbach's alpha coefficient was used to determine reliability. Descriptive analysis was conducted to establish percentages, means and standard deviation. Further, inferential data analysis techniques that include correlation and regression statistics was used to draw inferences on the relationship between kaizen implementation and operations performance of manufacturing firms in Kenya. The study concluded that quality circles aim to give individual members the opportunity to contribute to problem-solving and have an emphasis on teamwork and collaboration. Teamwork is one of the most important tools when it comes to organizational efficiency as it cultivates effective communication. Total productive maintenance system helps to frame maintenance as a business advantage. Implementing total productive maintenance system enables manufacturers to decrease planned and unplanned downtime from breakdowns, equipment and maintenance cost, defects, and risk of damage or accidents. Discipline ensures individuals maintain silence at workplace and work as a single unit with their team members to achieve organization goals and objectives. The study recommended that the firms should recruit volunteers from different departments as volunteers are more likely to take their role seriously and want to see the group succeed. The management of the firm should build diverse and inclusive teams for effective decision making. The management should aim at reducing worry and stress to allow employees to stay on track with personal and professional goals and prevent them from getting behind or submitting work after the deadline has passed.*

**Key Words:** Quality Circles, Teamwork, Total Productive Maintenance, Personal Discipline

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## 1.0 Introduction

### 1.1 Background of the Study

There have been multiple methods of improving operations performance of manufacturing firms over the years. These methods include recommendations from operations research, kaizen, lean manufacturing, benchmarking processes and Business Process Reengineering (Tarigan, 2018). All of these methods vary from each other in their implementation and how improvement is achieved in organizations. Kaizen was introduced to the world in 1986 by Imai as a Japanese concept on how people approach business and work in general. Kaizen explains how management and employees can work together to enhance the productivity of the organization (Imai, 1986). Unlike the other strategies for success in management, kaizen focuses on the basics of how people carry out their work (Singh & Singh, 2009).

In Japanese Society, kaizen means “continuous improvement”. The kaizen concept therefore translates to a culture of continuous improvement from the highest levels of management down to the middle levels and finally to the workers (Carnerud, Jaca & Bäckström, 2018). It advocates for constant improvement in quality and productivity. This is achieved through a framework that involves the participation of everyone within the workforce (Pinto, Matias, Pimentel, Azevedo & Govindan, 2018). The kaizen concept does not require much investment and this makes it ideal for the improvement of productivity and quality. The theory has its origins in post-World War 2 Japan although it is a variation of the quality control methods that was popular among American firms at the time (Farris, Van Aken, Doolen & Worley, 2008). This method spread fast among companies in Japan including SMEs and inevitably find its way overseas as a result of the expansion of Japanese companies beyond their borders (Hosono, 2009).

In America, Kaizen is widely adopted and practiced in various industries such as manufacturing, service, and healthcare. American companies have adapted the principles of Kaizen to fit their specific needs and culture, while still incorporating key elements such as teamwork, employee involvement, and a focus on small, continuous improvements. It has proven to be a successful approach in increasing productivity, reducing waste, and improving overall quality (Suarez-Barraza, Miguel-Dávila & Morales Contreras, 2022). In Germany and other parts of Europe, continuous improvement is evident in various industries such as manufacturing, logistics, and service sector. Companies adopt Kaizen principles and techniques, such as 5S, value stream mapping, and standard work, to streamline processes, reduce waste, and increase efficiency (Kregel, 2019). In addition, Kaizen has been integrated with other improvement methodologies such as Lean Manufacturing and Total Quality Management to create a more comprehensive approach to operational excellence. The principles of Kaizen are also taught in business and engineering schools, contributing to the widespread adoption of Kaizen in Europe. The adoption of Kaizen has helped European companies to remain competitive in the global market, improve customer satisfaction, and increase profitability (Janjić, Bogićević & Krstić, 2019).

In Egypt, Kaizen has been adopted by some organizations as a tool for process improvement and to achieve operational excellence. Companies have implemented Kaizen in areas such as production, logistics, and customer service. It has helped organizations in Egypt to improve quality, increase productivity and reduce waste, leading to increased competitiveness (El Dardery, Gomaa, Rayan, El Khayat & Sabry, 2021).



In Zimbabwe, Kaizen is a relatively new concept and its adoption is still in its early stages. However, there has been growing interest in the use of Kaizen for process improvement in various industries such as manufacturing, healthcare, and service sector (Moso, Olanrewaju & Dewa, 2020). Companies in Zimbabwe have started to adopt Kaizen principles to increase productivity, reduce waste, and improve quality. The government has also shown interest in promoting Kaizen as a tool for industrial development and competitiveness (Maware & Adetunji, 2019). Despite the limited adoption of Kaizen in Zimbabwe, its impact is already being felt in some organizations. Companies have reported improvements in efficiency, quality, and customer satisfaction as a result of implementing Kaizen practices (Dlamini, 2020).

The kaizen approach differs from the management styles of the western organizations because it is focused on the employees and the workplace (Shojaei & Shojaei, 2020). While the top management is responsible for making decisions and guiding operations, workers are empowered since they make suggestions on how to improve and implement changes giving the kaizen framework a bottom-up approach that enhances productivity (Vo, Kongar & Barraza, 2019). Tellingly, the kaizen approach creates improvements with minimal investment because it does not need large investment in terms of capital, costly technology, and expensive research (Özkaptan, 2019). The kaizen approach uses the existing resources at a firm and enhances the internal capacity of the firm. As populations across the world grow, resources gradually become limited and hence become more expensive because competition gets stiffer as time goes on (Lang'at & Nyaoga, 2021). However, consumer market trends indicate that the prices of finished goods are expected to reduce while Customer requirements will increase simultaneously. In order to survive, organizations need to be relentless in their efforts to change their models of production (Okunade, 2018). The kaizen principles that will be discussed in the current study include quality circles, teamwork, total productive maintenance systems and personal discipline.

### **1.1.1 Performance of Manufacturing Firms**

Performance in the case of manufacturing refers to how well the manufacturing process transforms raw materials to the finished product. Performance in manufacturing is measured through a number of factors including efficiency (If less inputs are needed to produce a certain amount of output, then the manufacturing process is considered to be highly efficient). Other indicators include customer lead time, yields, costs, customer rejects or returns as well as quality of products (Saleh, Sweis & Saleh, 2018). Manufacturing is the transformation of inputs into outputs of goods by hand or by machine that can be sold as a finished product to a customer. The inputs in the manufacturing process include raw materials or components of a bigger product. The manufacturing process is usually opens a large-scale production line through a blend of machinery as well as skilled labor (Ghobakhloo, 2018).

The performance of manufacturing firms in Kenya has been mixed in recent years. On one hand, the country has seen a steady growth in the manufacturing sector, driven by favorable government policies, a growing middle class, and increasing demand for locally made products. On the other hand, manufacturers in Kenya face several challenges that hinder their performance, including lack of access to finance, high energy costs, and inadequate infrastructure (Job, Njihia, Maalu & Iraki, 2020). In terms of production and output, the manufacturing sector has grown significantly in recent years. Kenya is home to a range of industries, including textiles, food and beverages, chemicals, and pharmaceuticals, among others. The sector has benefited from the government's efforts to attract foreign investment, with several multinational companies setting up operations in

the country. In addition, the growth of the middle class has led to an increase in domestic demand for manufactured goods, which has further spurred growth in the sector (Cheptum, 2019).

However, access to finance remains a major challenge for manufacturing firms in Kenya. Many companies struggle to secure loans from banks and financial institutions, as they lack collateral and a strong credit history. This lack of access to capital limits their ability to invest in equipment, expand operations, and hire more workers, which ultimately affects their overall performance (Kaberia & Muathe, 2021). Another challenge facing manufacturers in Kenya is the high cost of energy, which is a major input in the production process. Kenya is heavily reliant on imported oil to meet its energy needs, and the fluctuating prices of oil have a direct impact on the cost of production for manufacturers. The lack of reliable electricity also affects the performance of manufacturing firms, as power outages are common and can cause significant disruption to production processes (Gatimbu, Ogada & Budambula, 2020). Finally, inadequate infrastructure is also a hindrance to the performance of manufacturing firms in Kenya. Poor roads, limited access to ports, and inadequate transportation networks make it difficult for manufacturers to transport goods and raw materials to and from their factories. In addition, the lack of modern telecommunications infrastructure makes it difficult for companies to communicate with customers and suppliers, further limiting their competitiveness in the global market (Mugo, Kahuthia & Kinyua, 2019). In conclusion, the performance of manufacturing firms in Kenya has been mixed, with growth in production and output offset by challenges such as lack of access to finance, high energy costs and inadequate infrastructure. The government, in collaboration with the private sector, needs to address these challenges if the manufacturing sector is to reach its full potential and contribute to the country's economic growth (Esaku, 2020).

### **1.1.2 Kaizen Implementation**

Kaizen is a Japanese word that translates to "improvement" or "change for the better." It is a philosophy of continuous improvement that is used in businesses, government organizations, and other settings to improve processes, systems, and overall performance. The aim of Kaizen implementation is to create a culture of continuous improvement that can lead to greater efficiency, higher quality, and improved customer satisfaction. Implementing Kaizen requires a comprehensive and systematic approach. The kaizen principles that were discussed in the current study include quality circles, teamwork, total productive maintenance systems and personal discipline. A quality circle is a group of workers who share a similar type of work and therefore meet often in order to identify and solve any issues affecting their work. It mostly involves a volunteer group of people meeting during work hours and are intended to make work more efficient and easier (Albayrak & Kececi, 2020). They are meant to improve job performance and focus on issues such as reducing waste and enhancing the process. Quality circles are beneficial to organizations since they enable firms to identify problems easily. In addition, the members of the quality circles are best positioned to offer solutions to these problems since they face them on a day to day basis (Goyal, Agrawal & Sharma, 2022).

Quality circles have been proven as a method of enhancing the involvement of employees as well as the job satisfaction. The relationship between the participation of employees and their performance is significant in the performance of organizations. By reducing any flaws and negotiations that may exist in the work environment, quality circles improve the conditions of the work environment and therefore affect the performance of the employees and the organization as a whole (Albayrak & Kececi, 2020). Teamwork can be defined as the process of a group of people

working together in order to achieve a common objective. In manufacturing organizations, teamwork has been adopted through assigning individual tasks that are designed to achieve the overall mission of the firm. Different individuals and different departments have different mandates wall of which are geared towards enhancing the overall performance of the organization. Teamwork improves the relationship between employees and makes the work experience pleasant therefore increasing performance levels on an individual and collective basis (Omotayo, Awuzie, Egbelakin, Obi & Ogunnusi, 2020). Teamwork creates an “all for one and one for all” philosophy within the work place that encourages everyone to share their ideas and create a culture of mutual dependence where everyone in the organization plays their role for the greater good of the organization (Omotayo, Kulatunga & Bjeirmi, 2018).

Total productive maintenance (TPM) is a strategy that operates according to the idea that everyone in an organization should take part in the maintenance of the firms’ performance. This approach uses the skills of all employees and seeks to incorporate their maintenance into the day to day performance of the firm (Mutaqiem & Soediantono, 2022). By adopting total productive maintenance (TPM), the responsibility of the firm’s performance is held by every member of the organization and as such everyone pulls their weight in the same direction to enhance the performance of the organization (Singh & Gurtu, 2021). Personal discipline in Kaizen advocates for each member of the firm including all supervisors and managers. Employees who adopt personal discipline practice accountability at work. Kaizen dictates that the firm will set a standard for every job function which all employees will be required to meet in their operations. Individual employees, supervisors and managers realize that as part of the organization, their failure to meet the set standards negatively impacts the entire process of production in the firm (Arumsari, Rachim & Aamer, 2019).

### **1.1.3 Manufacturing Firms**

The Kenyan manufacturing sector is key in the development plan as envisioned in Kenya’s vision 2030. The sector is expected to be aggressive, differentiated and drive Kenya’s socio-economic agenda (Mwangangi, 2018). To do so, the manufacturing sector must create jobs, generate revenues and attract foreign investment. The contribution of the manufacturing sector has stalled at around 10% in recent years. The percentage of the manufacturing sector in contrast to GDP is expected to hit at least 20% by 2030 (KNBS, 2018). The Large manufacturing firms in Nairobi form a big percentage of all firms in Kenya and as such are key to the 2030 development agenda (Kithinji, Rotich & Kihara, 2021). Kenyan manufacturing firms have in recent times appreciated the need for improving operations performance. The last 10 years especially has seen increased adoption of process enhancing policies (Wanjau & Kyalo, 2018). The Kenya Association of Manufacturers is made up of 14 different sectors including Agriculture, Building and Construction, Energy and Electricity, Paper, Timber, Services and Consultants as well as the Textile and Apparels Sector among others. This study focused on small manufacturing firms in Kenya.

### **1.2 Statement of the Problem**

All across the world, firms are experiencing dynamic changes in their environments and this may present challenges (Janjić, Jovanović & Simonović, 2021). The Kaizen Theory has spread to institutions in many countries across the world. Establishments are looking to join forces together in order to foster notions and ventures that enable the organization to be able to adopt to the unpredictable and dynamic changes that occur in the manufacturing environment (Sonobe, 2018). Although there is a number of positive projects and developments that have been conceptualized



by establishments, most of them often split before execution of these concepts. Despite more calls for organizational progress being made, education on the challenges that may face these organizations in the internal processes of the Kaizen Systems as well as the outcomes expected remains insufficient (Kumar, Dhingra & Singh, 2018). The kaizen concept has been largely identified as an important reason for Japan's competitive success (Janjić, Todorović & Jovanović, 2020). However, many organizations outside Japan have not been able to fully adopt kaizen activities in their operations. Studies suggest that the social, economic and cultural contexts are responsible for the implementation and influence of Kaizen activities in other countries (Janjić, Bogičević & Krstić, 2019). As such, there is a need to further understand the types of kaizen activities applied in other countries besides Japan. Additionally, the extent of the implementation of kaizen as well as the effects of kaizen practices on organizational performance should be investigated in different social, economic and cultural contexts (Rossini, Audino, Costa, Cifone, Kundu & Portioli-Staudacher, 2019).

The manufacturing sector in Kenya is expected to be key in propelling the country's economy to a growth rate of 10% as envisioned in Kenya Vision 2030 (Mwasiaji, 2019). The sector will also be critical in driving Kenya's social development agenda by creating jobs, generating foreign exchange and attracting foreign direct investment (Nyoike, 2019). However, over the last two years especially after the Covid-19 pandemic, there were significant changes in the sector with regard to the cost of inputs and raw materials, supply chain issues as well as changes in working procedures, there has been a decline in production as well as an increase in the cost of production for most industries (Manyonge & Kyalo, 2020). This is as a result of high cost of labor, electricity and other inputs. In addition, the purchasing power of most households was largely reduced and families across the world had to cut down on luxury goods (Dulo, 2021). This resulted in poor performance by manufacturing firms. The Organization for Economic Cooperation and Development (OECD) (2020) projected a drop of 2.4% in 2020 in Kenya's GDP in 2020 as a result of the pandemic. In addition, stocks at the Nairobi Securities Exchange lost more than Ksh. 120 Billion in a day after foreign traders disposed holdings in Kenyan firms in favor of gold and other fixed income securities (Wanjala & Awuor, 2021).

The scale of this revenue shows that the market for good and quality products exists and as such the local manufacturing should capitalize on the existing and growing market. To do so, the Kenyan government pushed the Buy Kenya, Build Kenya campaign in order to encourage Kenyans to buy products made locally (Wolff, 2021). Analysis of multiple households showed that 91.5% of households buy second hand clothes which is why the government sought to increase local uptake of local products so as to build the local economy, create employment and improve foreign exchange (Kemunto, 2021). The manufacturing sector in Kenya must therefore come up with ways to ensure their sustainability moving forward. In order to achieve this however, the sector must become more efficient and raise per unit productivity of input particularly for capital and labour. This way, the manufacturing industry in Kenya can be able to compete with direct competition (Odollo, Iravo & Sakwa, 2018). As a result, manufacturing firms in Kenya have turned to methodologies aimed at enhancing operations performance. They include radical improvement methods such as BPR and methods of continuous improvement like implementation of kaizen (Keinan & Karugu, 2018).

Kaizen can improve manufacturing firms in Kenya in several ways. These include improving efficiency by emphasizing small, gradual improvements in processes and systems. This leads to a reduction of waste and increased productivity over time (Cheruiyot, 2022). Kaizen also improves

the quality of the products by helping to identify and eliminate the root causes of any problems in quality. In addition, kaizen encourages employee engagement. Kaizen encourages employees to participate in the improvement process, leading to a greater sense of ownership and motivation (Mathai, 2020). By reducing waste and improving efficiency, Kaizen can lead to cost savings for the firm. Finally, kaizen can improve customer satisfaction by improving the quality and efficiency which can lead to higher levels of customer satisfaction. By adopting Kaizen principles and practices, manufacturing firms in Kenya can achieve long-term, sustainable improvement in their operations (Nzisa, 2019).

While there have been studies on how kaizen affects organizational performance in countries like Malaysia (bin Maarof, Sorooshian & Hamid, 2018), France (Demirbas, Holleville & Bennett, 2018) and Nigeria (Omotayo, Kulatunga & Bjeirmi, 2018), there exists a number of contextual and conceptual gaps that this study will seek to address. This study therefore sought to establish how Kaizen implementation affects operations performance among manufacturing firms in Nairobi County.

### **1.3 Objectives of the Study**

The general objective of the study was to establish the effects of Kaizen implementation on the performance of manufacturing firms in Nairobi County, Kenya.

Specific objectives of the study were;

- i. To establish the effect of quality circles on performance of Manufacturing Firms in Nairobi.
- ii. To determine the effect of teamwork on the performance of Manufacturing Firms in Nairobi.
- iii. To determine the effect of total productive maintenance systems on the performance of Manufacturing Firms in Nairobi.
- iv. To assess the influence of personal discipline on the performance of Manufacturing Firms in Nairobi.

## **2.0 Literature Review**

### **2.1 Theoretical Literature Review**

#### **2.1.1 Kaizen Theory**

The proponent of Kaizen Theory was Masaaki Imai (1986). The kaizen theory is based on the principle that processes are improved, mastered, and further improvement is identified (Prajogo & Sohal, 2004). Kaizen is a strategy of implementing small and incremental changes to achieve better quality and greater efficiency. The theory purports that employees often suggest changes and arise due to a corporate culture that encourages employees to identify and suggest improvements (Dudin, Frolova, Gryzunova & Shuvalova, 2015). The theory assumes that the continual small improvements (Kaizen) add up to major benefits in quality management systems. This implies that they result in faster delivery, lower costs and greater customer satisfaction. The critical objective of the theory is to identify and eliminate waste in all areas that could lead to inefficiency (Riccardi, 2009). The Kaizen theory indicates that continuous quality emphasizes can determine significant quality enhancement (Sollecito & Johnson, 2013).

The Kaizen methods are globally accredited as continuous improvement systems through small steps. The small improvements applied to key processes create major success for an institution



(Ferreira & Saurin, 2019). The theory indicates there is an improvement in the organization that emphasizes the little change done consistently over some time while applying Kaizen standards in a working environment (Carnerud, Jaca & Bäckström, 2018). Kaizen helps by streamlining workflow, improving organization, increasing safety and ensuring that resources are used effectively (Schuring & Luijten, 2001). The key feature of the Kaizen is that it is continuous and becomes part of the workplace culture when it is practised every day by everyone (Abdulmouti, 2015). The role of the kaizen approach is streamlining workflow, improving organization, increasing safety and properly using resources (Vieira, Balbinotti, Varasquin & Gontijo, 2012).

### **2.1.2 Dynamic Capabilities Theory**

The dynamic capabilities theory was first developed by Teece, Pisano and Shuen (1997). The theory focuses on how valuable capabilities such as financial resources and human skills can be used to enhance the growth of an organization. The dynamic capabilities theory stipulates that organizations should use their capabilities to their advantage. These capabilities can be used as assets to enable the firm to maintain any advantage they may have over their competitors and help a firm to create the right balance and mix of the resources that are available to them. By doing so, the theory posits that the firm can sustain their advantages (Teece, 2018). The dynamic capabilities theory can be beneficial to organizations when entering new businesses or extending existing ones. It enables the firm to make the best use of the capabilities available to them. In addition, the theory helps to create new and unique services and products especially during periods of change and transition. It enables the firm to come up with innovative ways to serve their clients in the existing markets as well as in additional ones (Kapoor & Aggarwal, 2020). However, critics of the theory argue that dynamic capabilities, their relationship with firm performance as well as the underlying operational procedures can be difficult to measure empirically. In addition, dynamic capabilities cannot effectively satisfy the needs of potential customers in every aspect of the world (Pigola, da Costa van der Poel & Yamaçake, 2022).

### **2.1.3 Operations Management Theory**

The operations management theory was first developed by Frederick Taylor (1911). It refers to a set of practices that are used by companies to increase the efficiency of production. It focuses on controlling the process of production and making business operations efficient. Operation management includes a number of responsibilities to ensure that the business runs smoothly and efficiently in terms of minimizing resources while maintaining maximum standards in quality (Meredith, 1998). The theory highlights the management of the processes used to convert raw materials, labor and energy into goods and services. The skills of the people, creativity, rational analysis as well as technical knowledge are some of the factors that make operational management successful (Schmenner & Swink, 1998). In the history of business and manufacturing operations, division of labor and technological advancements has benefited company productivity. Systematically measuring performance and calculating with formulas was a somewhat unexplored science before Frederick Taylor's early work in the field. The principles of operations management theory include the division of labour and technological advancement (Holweg, Davies, De Meyer, Lawson & Schmenner, 2018). This is useful in enhancing the productivity of the company. It leads to development of management as a true science, the selection of effective and efficient workers training and development of workers as well as intimate cooperation between the employees and management of the company. Operations management theory is beneficial to manufacturing firms since they enhance the management of profitability. It makes the flowing of revenue more stable



and predictable (Roth & Menor, 2003). In addition, operations management leads to better management of organizational resources. Moreover, the organization gains competitive advantage over their competitors. This can be gained through timely delivery, quality goods as well as reduced production time (Meredith, 1998). However, the operations management theory can create multi-level dependency leading to the firm needing more coordination between different parts of the coordination. Moreover, there is a chance of human error occurring within the manufacturing process. While this error may occur during the transition between manufacturing and sale, it requires a great deal of coordination in different areas including marketing, finance, accounting, engineering and human resource. The operations of all these departments provide an opportunity for human errors (McCutcheon & Meredith, 1993).

### **2.1.4 Balance Score Card Theory**

The Balanced Scorecard is a management framework that provides a holistic view of an organization's performance by measuring its progress against four perspectives: financial, customer, internal process, and learning & growth. The financial perspective focuses on the organization's financial performance and measures such as return on investment, revenue growth, and profitability. The customer perspective considers how the organization is perceived by its customers and measures customer satisfaction, customer loyalty, and market share (Hansen & Schaltegger, 2016). The internal process perspective evaluates the efficiency and effectiveness of the organization's internal processes and measures such as operational efficiency, quality, and innovation. The learning & growth perspective focuses on the organization's ability to learn, adapt and improve, and measures factors such as employee satisfaction, training & development, and technology adoption (Hoque, 2014). The Balanced Scorecard helps organizations to align their strategy and objectives with their performance measures and provides a balanced view of their performance by taking into account both financial and non-financial aspects of the business (Krylov, 2014).

## **2.2 Empirical Literature Review**

### **2.2.1 Quality Circles and Performance of Manufacturing Firms**

Shojaei, Ahmadi and Shojaei (2019) sought to investigate the implementation of productivity management cycle with operational performance. The study targeted 120 employees of the Pars Khodro Company's Brilliance Body Production Unit. A questionnaire was issued to the employees after the implementation of 9 Kaizen steps including quality circles. The questionnaire of employee performance evaluation was filled by the direct supervisor both before and after the application of Kaizen. The collected data was analyzed using descriptive and analytical statistics with the help of SPSS software. The study used a significance level of 0.05. The findings show that Kaizen practices including quality circles significantly affect the functional areas of the staff. The study established that without significant investment and new technologies, firms can use existing facilities and rely on the capabilities and creativity of the organization staff can be made more efficient. A contextual gap exists because the study was conducted in Iran.

Peralta-Abarca, Salgado-Delgado, Cruz-Chávez, Cruz-Rosales and Alonso-Pecina (2021) sought to investigate the effect of kaizen in eliminating downtime, improving productivity and reducing the cycle time of the process. The study used a case study research strategy to identify the operations that generated downtime, bottlenecks and low productivity. The study revealed that standardization of the process and the reduction of the displacement pattern as well as the reduction

of the time cycle. The study used a case study of automobile manufacturing. The study designed a new displacement pattern that reduces downtime, enhances and productivity and reduces cycle time. The study found that reducing cycle time as a kaizen methodology improves operational performance in manufacturing firms. The study was conducted in Mexico and therefore constitutes a contextual gap. The use of the case study research strategy constitutes a methodological gap. According to Darmawan, Hasibuan and Purba (2018), competition in manufacturing firms increases the need for these firms to reduce defect rates and maximize savings. The study was conducted to reduce the defect rate in the pasting process with the Kaizen approach. Kaizen implementation including quality circles involves all parties in the company both management and employees in order to obtain optimal results. Kaizen implementation includes quality circles and the study established that kaizen implementation lowered the defect rate below the target set by the company's management. A conceptual gap exists because the study sought to establish the effect of quality circles on the defect rates of manufacturing firms as opposed to operational performance.

### **2.2.2 Teamwork and Performance of Manufacturing Firms**

Chiarini, Baccarani and Mascherpa (2018) conducted a study to compare principles from the original Toyota Production System and Kaizen philosophy with principles derived from Japanese Zen Buddhism. The study analyzed Taiichi Ohno's book dedicated to the TPS and the Toyota Way 2001 regarding Kaizen. The principles that emerged from the study were then compared to similar principles from Japanese Soto Zen Buddhism. The literature concerning Zen philosophy was methodically analyzed and categorized through content analysis. The results of the study showed that theoretical parallelisms and lessons for practitioners. Results and analysis are mainly based on existing literature and provided food for thought regarding the lessons learnt from Japanese culture, Toyota principles and management style so as to avoid learn implementation failures. Given the study was conducted in Japan, it offers a contextual gap.

According to Georgise and Mindaye (2020), continuous improvement strategies are a way of making constant incremental improvements in the process of organization. Manufacturing organizations must constantly improve their operations in order to remain competitive. Companies in developing as well as developed countries are adopting Kaizen as well as to focus on a strategy that is focused on customers. The study examined the acceptability and feasibility of Kaizen among organization in Southern Nation sand Nationality and People Regional State. The study targeted 71 stakeholders and 24 enterprises and issued questionnaires and interviews. The study established that participants demonstrated willingness to implement Kaizen. The study revealed some challenges confronting the feasibility of Kaizen practices. The study established that kaizen practices and teamwork in particular is vital for improvement of the firm and encourages front line workers to work as a team in order to achieve the organizational objectives.

Suárez-Barraza, Miguel-Dávila and Morales-Contreras (2021) sought to explore, study, analyze and implement Kaizen-Kata methodology in food organizations. The study adopted a case study in the research to understand the effects of Kaizen-Kata methodology understand effect of Kaizen-Kata procedures on operational service process including teamwork. By doing so, issues such as customer's complaints, process reworking and delays, extra-cost among others. Other companies can use the Kaizen methodology to solve any kind of operational problems. Manufacturing methodology of small continuous and incremental improvements. The study established that kaizen practices help to reduce delays, handle complaints by customers, process reworking as well

as extra costs. In addition, the study established that Kaizen applications in manufacturing companies enhance organizational performance. The use of a case study approach constitutes a methodological gap. According to Nakamori, Takahashi, Han and McIver (2019), the main purpose of Kaizen is to ensure that a company is stable with long perpetuity. The study sought to highlight how the working environment can be created for effective and successful Kaizen deployment. The study collected data from 7 overseas Japanese manufacturing subcontractors that have adopted Kaizen practices since their inception. The study established that a secure climate and team spirit must be present in order for Kaizen to be successful. Given the study was conducted on Japanese firms, it presents a contextual gap.

### **2.2.3 Total Productive Maintenance Systems and Performance of Manufacturing Firms**

Habidin, Hashim, Fuzi and Salleh (2018) conducted a study to determine the relationship between total productive maintenance, kaizen and innovation performance for the Malaysian automotive industry through structural equation modeling (SEM). The samples were selected from the list of Proton and Perodua automotive industry. The study targeted 238 respondents and conducted reliability analysis, exploratory and confirmatory factor analysis. The study showed that kaizen does not affect the relationship between total productive maintenance and innovation performance. The study showed that the impact of total productive maintenance and innovation performance. The study was conducted in Malaysia and as such it provided a contextual gap. In addition, the use of structural equation modelling presents a methodological gap.

According to Agustiady and Cudney (2018), total productive maintenance is a holistic approach to maintaining equipment in a bid to achieve perfection in the process of production. Improved processes and continuous improvement are key fundamentals of Total Productive maintenance (TPM). The process results in less breakdowns, stops and defects and results in lowered costs and more engagement of staff. The study showed that effective communication and support from the top management of an organization enhances the functionality of TPM. TPM improves the operating conditions of equipment and improves effectiveness at optimal performance levels. In addition, TPM increases the life expectancy of equipment, reduces breakdowns and eradicates small stoppages. The study concludes that TPM enhances productivity and lowers costs of production for manufacturing firms.

### **2.2.4 Personal Discipline and Performance of Manufacturing Firms**

Limpo and Kamase (2022) conducted a study to investigate the application of kaizen philosophy to organizational performance including outcomes on human resource. The study was conducted at Toyota Pettarani dealers and used a questionnaire to collect data. 60 questionnaires were delivered of which 43 were dully filled and returned. Descriptive analysis was conducted and multiple linear regression analysis was used to assess the impact of kaizen philosophy on performance. The findings established that kaizen philosophy in form of continuous improvement, focus on customers, developing personal discipline as well as employee empowerment significantly affected organizational performance. As a result, the study recommended that leaders should come up with mechanisms for implementing the Kaizen philosophy to ensure sustainability in the organization and improve organizational performance. Since the study was conducted in Pettarani, then the study presents a contextual gap because the current study will be carried out in Nairobi.



Bayu (2021) investigated the effect of kaizen practices on organizational performance at Dashen Brewery in the City of Debre Berhan. The study used descriptive and explanatory research designs. A quantitative approach was adopted and data was collected through questionnaires. The study used stratified random sampling to select a sample size of 160 of which only 148 responded to the questionnaire. Stata was used to analyze the data. Descriptive statistics were employed to determine the respondent profile and how much kaizen had been implemented. Pearson correlation as well as multiple linear regression was used to show the relationship between kaizen tool implementation and organizational performance. The study established that personal discipline, waste minimization, quality management and total productive maintenance had a positive and significant effect on the organizational performance. Given the study was conducted in Debre Berhan rather than in Nairobi, it provides a contextual gap. In addition, the study focused on waste minimization and quality management as the other kaizen practices and therefore presented a conceptual gap.

## 2.5 Conceptual Framework

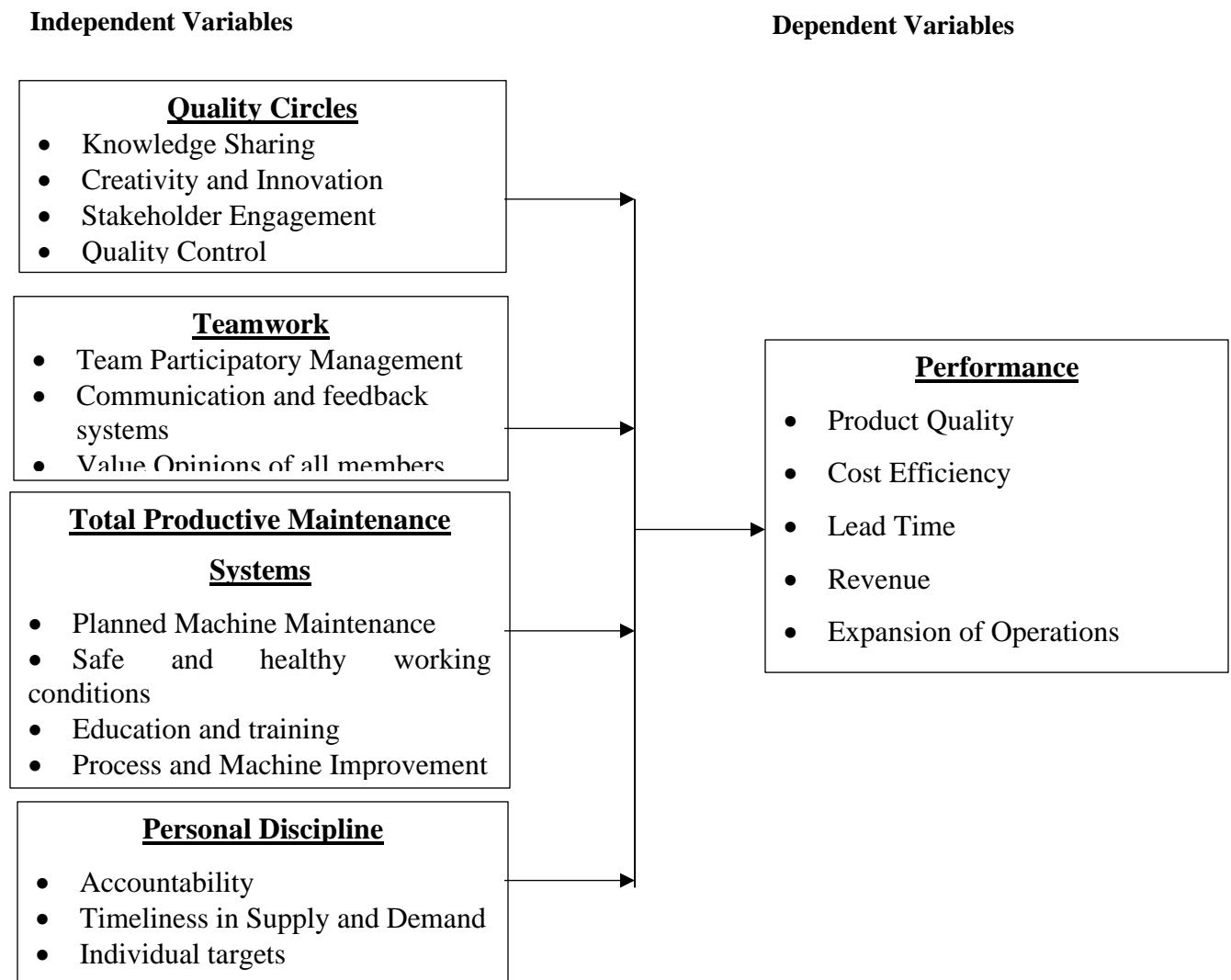


Figure 1: Conceptual Framework, Source: Author (2023)

### 3.0 Research Methodology

Research design is a ‘blue-print’ that allows the researcher to come up with solutions to problems and guides in the process of collecting, analyzing and interpreting the data and observations (Bell, Harley & Bryman, 2022). According to Mugenda and Mugenda (2003) a descriptive research design is a process of collecting data in order to answer questions about the current status of the subjects in the study. This study aimed at collecting information from respondents on their attitudes, perception and opinions in relation to innovative banking and its effects on financial inclusion. The study targeted the 52 small manufacturing firms in Nairobi, Kenya as listed by the Nairobi City County (Nairobi, 2021). From each of the 52 firms, the study targeted the operations manager, human resource manager, strategic manager, finance manager, marketing manager and the sales manager. This resulted in a target population of 312 managers. These managers are selected because they are well positioned to answer questions regarding kaizen implementation and operational performance. The target population of the study is as shown in Table 1.

**Table 1: Target Population**

No.	Department	Sample Size
1	Operations Managers	52
2	Finance Managers	52
3	Strategic Managers	52
4	Human Resource Managers	52
5	Sales Managers	52
6	Marketing Managers	52
	<b>Total</b>	<b>312</b>

**Source: Author (2023)**

The study used stratified random sampling to select the sample size. A sample is a subset of a population (Desu, 2012). This study adopted Yamane (1967) simplified formula to calculate the sample size which provided the number of responses that need to be obtained using the equation;

$$n = \frac{N}{1 + N(e)^2}$$

Where:

- $n$  = The sample size
- $N$  = The population size
- $e$  = Level of precision
- 1 = Constant

This formula assumes a degree of variability (i.e. proportion) of 0.5, the level of precision of 5% and a confidence level of 95%.

$$\begin{aligned} n &= 312 / 1 + 312(0.05)^2 \\ &= 175.28 \approx 175 \text{ respondents} \\ n &= 175 \text{ respondents.} \end{aligned}$$





The sample size was obtained by apportioning from the target population of the study. Table 3.2 shows the summary of the sample size. The sample size of 175 respondents is as shown in Table 2 below. The study therefore had a sample size of 175 respondents from 52 manufacturing firms in Nairobi, Kenya.

**Table 2: Sample Size**

No.	Department	Sample Size
1	Operations Managers	30
2	Finance Managers	29
3	Strategic Managers	29
4	Human Resource Managers	29
5	Sales Managers	29
6	Marketing Managers	29
	<b>Total</b>	<b>175</b>

**Source: Author (2023)**

This study used a structured questionnaire to collect primary data from the managers of the large manufacturing firms in Nairobi. The study also used a secondary data collection template to examine the financial statements of the manufacturing firms between 2015 and 2020. Quantitative data was collected through the administration of structured questionnaires. These helped the researcher to be able to explain, understand and explore the opinions, behaviors, experiences and phenomena according to the study’s research subject. A questionnaire was used since it enabled the researcher to collect data from multiple respondents over a short period of time. In addition, data collected by the questionnaire made it easier for the researcher to determine the relationships between the variables under study.

**Table 3: Results of Reliability Test**

Variable	Alpha Value	Remarks
Quality circle	0.823	Reliable
Teamwork	0.796	Reliable
Total productive maintenance system	0.716	Reliable
Personal discipline	0.811	Reliable
Performance	0.799	Reliable
<b>Aggregate score</b>	<b>0.789</b>	<b>Reliable</b>

**Source: Pilot Study (2023)**

The results in Table 3 indicates the 0.7 threshold was met by all the variables while the overall reliability was 0.789 which was evidence that the questionnaires were reliable as recommended by Mugenda and Mugenda (2003). Data analysis is a practice in which raw data is ordered and organized so that useful analysis as the process of computation of certain indices or measures along with searching for patterns of relationship that exist among the data group. Mugenda and Mugenda (2003) added that the data must be cleaned, coded and analyzed so that the researcher is able to make sense of the data. Mölder, Jablonski, Letcher, Hall, Tomkins-Tinch, Sochat and Köster (2021)views data analysis as the application of reasoning to understand the data that has been



gathered with the aim of determining consistent patterns and summarizing the relevant details revealed in the investigation.

Quantitative analysis of data from the questionnaires was analyzed to provide descriptive and correlation statistics of demographic information and coded then the data was analyzed using descriptive categories such as central-tendency measures. A regression analysis was also conducted to establish the effects of kaizen implementation on operational performance of large manufacturing firms in Nairobi. The data was analyzed using SPSS software. The particular inferential statistic was multiple regression modeling. The analysis of variance (ANOVA) was checked to reveal the overall model significance. The coefficients of the equation was checked to establish the influence of kaizen implementation on manufacturing firms in Nairobi. A critical p value of 0.05 was used to determine whether the individual variables are significant or not. Result output was presented using graphs and tables. The regression model used in the study is shown as;

$$Y_{it} = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \epsilon_{it}$$

Where;

Y = Operational Performance among Large Manufacturing Firms in Nairobi

X<sub>1</sub> = Quality Circles

X<sub>2</sub> = Teamwork

X<sub>3</sub> = Total Productive Maintenance Systems

X<sub>4</sub> = Personal Discipline

In the model,  $\beta_0$  = the constant term while the coefficient  $\beta_i = 1 \dots 4$  was used to measure the sensitivity of the dependent variable (Y) to unit change in the predictor variables X<sub>1</sub>, X<sub>2</sub>, X<sub>3</sub> and X<sub>4</sub>. The error ( $\epsilon$ ) term captures the unexplained variations in the model.

#### 4.0 Data Analysis Results

##### 4.1 Results of Descriptive Statistics

###### 4.1.1 Quality Circles

**Table 1: Quality Circles**

Statements	M	SD
The circles enable the sharing of knowledge within the firm.	4.75	0.25
Creativity and Innovation in the firm is actively encouraged by management.	4.05	0.95
All the stakeholders are represented in the circles and their views and needs are listened to and addressed.	4.28	0.72
These circles ensure that the quality of products is maintained and improved constantly.	4.36	0.64
Quality Circles have open communication channels with management and other teams within the firm.	4.50	0.50
Quality Circles have helped to improve the performance of manufacturing firms	4.51	0.49

**Source: Survey Data (2023)**

The results presented in Table 4.4 shows that the respondents strongly agreed on the statements that; the circles enable the sharing of knowledge within the firm (M=4.75, SD=0.25), quality Circles have helped to improve the performance of manufacturing firms (M=4.51, SD=0.49) and that quality Circles have open communication channels with management and other teams within



the firm (M=4.50, SD=0.50). The results agree with Albayrak & Kececi, 2020) who observe that quality circles have been proven as a method of enhancing the involvement of employees as well as the job satisfaction.

#### 4.1.2 Teamwork

**Table 2: Teamwork**

Statements	M	SD
Management encourages all members to participate in the operations of the firm.	4.58	0.42
The roles of each person are clearly defined within the firm in line with the collective objective of the firm.	4.65	0.35
The opinions of each team members are considered when making changes and decisions.	4.30	0.70
Management works with all staff on a personal level regarding their individual performances and objectives.	4.14	0.86
There are open feedback channels between all team members in the firm.	4.52	0.48
Teamwork has helped to improve the firm performance	3.76	1.24

**Source: Survey Data (2023)**

The results presented in Table 2 shows that the respondents strongly agreed on the statements that; the roles of each person are clearly defined within the firm in line with the collective objective of the firm (M=4.65, SD=0.35), management encourages all members to participate in the operations of the firm (M=4.58, SD=0.42) and that there are open feedback channels between all team members in the firm (M=4.52, SD=0.48). The findings concur with Omotayo, Awuzie, Egbelakin, Obi and Ogunnusi (2020) who observe that teamwork improves the relationship between employees and makes the work experience pleasant therefore increasing performance levels on an individual and collective basis.

#### 4.1.3 Total Productive Maintenance System

**Table 3: Total Productive Maintenance System**

Statements	M	SD
Frequent maintenance of machines is carried out in the firm.	4.11	0.89
The working environment is safe and healthy for the workers and the necessary precautions are taken to prevent any occupational hazards.	4.69	0.31
Education and training on the production process and use of machinery is conducted regularly.	4.43	0.57
There is constant and continuous improvement of the production process as well as the machines and their usage.	4.41	0.59
In the operations of the firm, the quality of the process and the products is strictly adhered to during production.	4.57	0.43
The adoption of total productive maintenance systems has enhanced the performance of the firm	4.09	0.91

**Source: Survey Data (2023)**

The results presented in Table 3 shows that the respondents strongly agreed on the statements that; the working environment is safe and healthy for the workers and the necessary precautions are taken to prevent any occupational hazards (M=4.69, SD=0.31) and that in the operations of the



firm, the quality of the process and the products is strictly adhered to during production (M=4.57, SD=0.59). The results agree with Habidin, Hashim, Fuzi and Salleh (2018) who conducted a study to determine the relationship between total productive maintenance, kaizen and innovation performance for the Malaysian automotive industry through structural equation modeling (SEM). The study showed that the impact of total productive maintenance and innovation performance.

#### 4.2 Performance

**Table 4: Performance**

Statements	M	SD
The quality of our products is of the highest possible standard.	3.59	1.41
The process of production in our firm is efficient in terms of cost and amount of inputs relative to the outputs produced.	4.16	0.84
The lead time between the start and end of the process has been reduced.	4.23	0.77
Our firms have low inventory levels because products are dispatched to the market as soon as possible.	3.70	1.30
We have witnessed growth in the revenue of our manufacturing firm.	4.42	0.58

**Source: Survey Data (2023)**

The results presented in Table 4 shows that the respondents agreed on the statements that they have witnessed growth in the revenue of our manufacturing firm (M=4.42, SD=0.58), the lead time between the start and end of the process has been reduced (M=4.23, SD=0.77), the process of production in our firm is efficient in terms of cost and amount of inputs relative to the outputs produced (M=4.16, SD=0.84), their firms have low inventory levels because products are dispatched to the market as soon as possible (M=3.70, SD=1.30) and that the quality of our products is of the highest possible standard (M=3.59, SD=1.41). According to Tarigan (2018) there have been multiple methods of improving operations performance of manufacturing firms over the years. These methods include recommendations from operations research, kaizen, lean manufacturing, benchmarking processes and business process reengineering.

#### 4.3 Results of Regression Analysis

**Table 5: Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.770 <sup>a</sup>	.806	.795	1.117

**Source: Survey Data (2023)**

The results in Table 5 show that the value of R square was 0.806(80.6%) which indicated that the data was closer to the fitted regression line. Therefore, the model accounted for all variations in response data around its mean. The adjusted R-square value was at 0.795 (79.5%) indicating the extent to which independent variables (quality circles, teamwork, total productive maintenance systems and personal discipline) influenced the dependent variable (performance). Therefore, it can be concluded that the remaining 0.205(20.5%) could account for other variables not studied.

**Table 6: Analysis of Variance**

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	201.132	4	50.283	825.706	.000
Residual	10.048	165	.061		
Total	211.180	169			

**Source: Survey Data (2023)**

The results as presented in Table 6 show that the significance value was at 0.000 which was below the assumed level of significance value at 0.05. The results further indicate that the statistical F value was at 825.706 which was greater than the statistical mean square value at 50.283. The fulfillment of these conditions justify that the model was significant in determining the effects of Kaizen implementation on the performance of manufacturing firms in Nairobi County, Kenya.

**Table 7: Coefficients**

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	.709	.207		3.425	.000
Quality circles	.694	.170	4.061	4.082	.000
Teamwork	.767	.226	1.674	3.394	.001
Total productive maintenance systems	.801	.310	3.006	2.584	.000
Personal discipline	.749	.119	1.615	6.294	.000

**Source: Survey Data (2023)**

The results as demonstrated in Table 7, holding quality circles, teamwork, total productive maintenance systems and personal discipline to a constant the performance of manufacturing firms in Nairobi would be at 0.709. In addition, the study revealed that a unit increase in quality circles would lead to an increase in the performance of manufacturing firms by 69.4%. A unit increase in teamwork would lead to an increase in the performance of manufacturing firms by 76.7%. A unit increase in total productive maintenance systems would lead to an increase in the performance of manufacturing firms by 80.1%. A unit increase in personal discipline would lead to an increase in the performance of manufacturing firms by 74.9%. Therefore, the resulting regression equation was as follows: Performance = 0.709 + 0.694 (quality circles) + 0.767 (teamwork) + 0.801 (total productive maintenance systems) + 0.749 (personal discipline).

## 5.0 Summary, Conclusions and Recommendations

### 5.1 Summary of Findings

The study sought to establish the effects of Kaizen implementation on the performance of manufacturing firms in Nairobi County, Kenya. Kaizen implementation was conceptualized in terms of quality circles, teamwork, total productive maintenance systems and personal discipline. Data was collected using questionnaires. The analysis of data was done using descriptive analysis and inferential statistics using regression analysis. The following is the presentation of findings in



summary. The first research objective sought to establish the effect of quality circles on performance of Manufacturing Firms in Nairobi. The study examined that quality circles had a positive and significant the performance of manufacturing firms. The circles enable the sharing of knowledge within the firm, quality Circles have helped to improve the performance of manufacturing firms, quality Circles have open communication channels with management and other teams within the firm, these circles ensure that the quality of products is maintained and improved constantly and that all the stakeholders are represented in the circles and their views and needs are listened to and addressed.

The second research objective sought to determine the effect of teamwork on the performance of Manufacturing Firms in Nairobi. The study found that teamwork had a positive and significant the performance of manufacturing firms. The roles of each person are clearly defined within the firm in line with the collective objective of the firm, management encourages all members to participate in the operations of the firm, there are open feedback channels between all team members in the firm and the opinions of each team members are considered when making changes and decisions. The third research objective sought to determine the effect of total productive maintenance systems on the performance of Manufacturing Firms in Nairobi. The study revealed that total productive maintenance systems had a positive and significant the performance of manufacturing firms. The working environment is safe and healthy for the workers and the necessary precautions are taken to prevent any occupational hazards, in the operations of the firm, the quality of the process and the products is strictly adhered to during production, education and training on the production process and use of machinery is conducted regularly and that there is constant and continuous improvement of the production process as well as the machines and their usage. The fourth research objective sought to assess the influence of personal discipline on the performance of Manufacturing Firms in Nairobi. The study identified that personal discipline had a positive and significant the performance of manufacturing firms. The firm ensures that the production is conducted on a timely basis so as not to affect the supply chain in terms of demand and supply, all the workers at the firm assume accountability for their actions and their performances and that the employees at the firm take it upon themselves to ensure they keep improving on a personal level as well as on an organizational level.

## **5.2 Conclusions**

The study concluded that quality circles aim to give individual members the opportunity to contribute to problem-solving and have an emphasis on teamwork and collaboration. Quality circles are effective in improving quality control in the workplace and are easy to set up. They are an excellent problem-solving strategy that involves front-line employees. Quality circles allow employers to utilize the strengths and talents of employees, foster cooperative working and team spirit in the workplace and encourage employees to consider different perspectives to solve problems. The study concluded that teamwork is one of the most important tools when it comes to organizational efficiency as it cultivates effective communication. Teamwork improves brainstorming by involving individuals to work together by communicating ideas for a number of initiatives. Teamwork encourages a common goal which is very essential when it comes to prioritizing projects and new initiatives. With multiple team members working on individual tasks, a project goal helps keep deliverables aligned and ensures objectives are met.

The study recommended that total productive maintenance system helps to frame maintenance as a business advantage. Implementing total productive maintenance system enables manufacturers



to decrease planned and unplanned downtime from breakdowns, equipment and maintenance cost, defects, and risk of damage or accidents. Total productive maintenance system enables manufacturers to minimize production costs, including expenses related to equipment stoppage time and unplanned repairs. Total productive maintenance system empowers all plant personnel to take ownership and gain confidence in their machines. The study concluded that discipline ensures individuals maintain silence at workplace and work as a single unit with their team members to achieve organization goals and objectives. Discipline is in fact the lifeline of an organization. Without discipline, employees would not only misbehave but also do whatever they want to do. Discipline is crucial at workplace as it ensures employees behave in a decent way and also maintain the decorum of the workplace. Individuals who are disciplined are not only successful professionally but also in their personal lives. Disciplined employees are liked and appreciated by not only their superiors but also other fellow workers.

### **5.3 Recommendations**

The study recommended that the firms should recruit volunteers from different departments as volunteers are more likely to take their role seriously and want to see the group succeed. Ensure management is supportive because they are the group that the circle will meet with to get approval for the circle's solutions. They're also responsible for the funding required to implement the changes. It is important that group members choose the issue because they're likely to be the most passionate about finding a solution. Allow members of the circle to choose a leader by allowing interested members to nominate themselves as leader, either vote as a group or anonymously to choose the leader. The study recommended that management of the firm should build diverse and inclusive teams for effective decision making. The management should clearly define roles and responsibilities for every team member so that there is no overlap in projects. Build trust within the team either participating in simple team-building activities, or simply eating lunch together. Encourage clear, frequent communication ensure that all team members are on the same page, leading to more accurate work being completed on a shorter timeline. Strong communication also helps to build trust between team members, thus improving the overall performance of the team.

The study recommended that the organizational management should everyone within the organization understands the main objectives of total productive maintenance system and the value it brings to the table. Identify suitable systems, machinery or processes which could be a specific item of machinery or a system, or even part of a production process that is not running particularly smoothly. Introduce a proactive maintenance program by paying particular attention to fragile systems, machinery, or parts and tooling and planning a monthly audit to update your logbook and check that scheduled maintenance is on track. The study recommended that the management should aim at reducing worry and stress to allow employees to stay on track with personal and professional goals and prevent them from getting behind or submitting work after the deadline has passed. Increase employee self-esteem and confidence. Enhance personal and professional relationships through keeping track of tasks and goals to make employees highly motivated, creating a positive workplace environment. Introduce rewards and recognition programs and also praise and recognize the employee and make sure the idea/suggestion is implemented.

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