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USING ADVANCED MANAGEMENT TECHNIQUES AS A COMPETITIVE WEAPON TO ACHIEVE WORLD CLASS STATUS: A CASE STUDY OF ZIMBABWEAN COMPANIES.

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ABSTRACT

Human capital is the single most critical pillar in a manufacturing environment. Without people in an organisation manufacturing becomes impossible. Even in the environment of complex machinery there is still need for human interface with machinery. This paper seeks to identify the human management techniques in the manufacturing sector which are being used by Zimbabwean companies in their effort to resuscitate an ailing industrial sector. A survey of fifty manufacturing companies was conducted throughout the major towns in Zimbabwe. Management training was found to have a prevalence of 85.7% and lean six sigma manufacturing (LSSM) is the lowest applied technique at 24.50%. Total quality control is the highest quality control technique with prevalence at 61.2%. Online electronic control is the lowest at 42.9%. Companies that aspire to achieve world class manufacturing status should seriously consider online electronic quality control.

Key words: human capital, Manufacturing environment, management training, prevalence

1.0 INTRODUCTION

The Zimbabwean economy has witnessed a downward spiral in terms of growth. The manufacturing industry has been in bad shape for some time. Every professional, social and public talk is full of debates of how and when the economy and industry in particular will make a rebound. There are several factors that have contributed to this death, some of it has been there for several years; the case here is the business models that Zimbabwean companies are using were a few top managers in the organisation are getting unrealistic perks. The modern economy requires a communist approach to remuneration in order to get the best out of the human capital. Equipment upgrade never got attention for several years, global competition has led to several companies going under or closing down, goods are coming into the country and are selling cheaper. The finance to fund the manufacturing is expensive and short term. The utility bills and the tax regimes are not giving space to any growth. The manufacturing strategies being employed are not in tandem with global trends. The worlds over companies are embracing world class manufacturing techniques as competitive weapon against companies producing similar products.

2.0 METHODOLOGY

A survey of fifty manufacturing companies was carried out. The targeted respondents were engineers working in the plant, the engineers targeted were; plant engineers, plant managers, process engineers, planning engineers, production engineers and manufacturing engineers. A closed ended tool of yes or no was used to assess the prevalence of certain management techniques which Zimbabwe

manufacturing companies are using. The questionnaires were hand delivered and collected from the respondents.

3.0 RESEARCH QUESTIONS

- Which advanced management systems are being used by Zimbabwean companies as part of world class manufacturing strategy implementation?
- What quality control techniques are being used by Zimbabwean Companies?

4.0 THEORETICAL FRAME WORK

- TQM is a motivational technique which requires commitment, communication, culture change, leadership and involvement (Early, 1995).
- TPM is considered as the medical science of machinery (Vankatesh, 2014).
- JIT, the ideal situation is purchasing enough raw materials for the day; no goods in progress at the end of the day goods produced for the day would have been taken to the customers at the end of the day (Ahmed, 2014).
- Lean manufacturing uses less; Human effort in the factory, Manufacturing space, Investment in tools, Engineering hours to develop a new product, Inventory on the site and fewer defects, but produces a variety of products (Womack et al, 1990).
- Workers are the strongest pillar in any organisation; it is assets which contribute in a big way to the success and prosperity of the organisations (Ukessays, 2014).

5.0 LITERATURE

Companies pursuing world class status may choose one or more out of the four dominant principles of manufacturing strategy which are Just in time (JIT), Total quality control (TQC), Total preventive maintenance (TPM) (Swinehart et al.,2000). Whilst other authors have identified JIT, TQM, TPM and CIM as principles, Mahadivan (1998) has identified them as characteristics of the world class manufacturing, he has also added employee involvement and simplicity to these characteristics. A JIT organisation aims to reduce all types of waste such as time, equipment, material, space and the worker's time in order to add value to the product. In TQC everyone in the organisation is involved to meet the quality needs of the customer, the rule here is to prevent defects by doing it right first time. In TPM machines are maintained to avoid breakdown during production. Computer integrated manufacturing (CIM) involves the integration of the company activities from design, production, distribution to offer sales through the use of computers and information technology. Braithwaite (2002) has come up with his generic list which he called eight core principles of world class which are: functional excellence, optimised network, visibility and accuracy, one number planning , aligned and relevant KPIs, segmentation, time compression, synchronised processes. He argued any organisation programme should be tested against one or more of these core principles. The following section will discuss in brief some of the above principles.

5.1. Total quality management

Total quality management (TQM) is the management philosophy and companywide practices that aim to harness the human and material resources of an organisation in the most effective way to achieve the objective of the organisation. These objectives are customer satisfaction, business growth, profit, market position or provision of service to the community.TQM is a way of managing to improve the effectiveness, efficiency, flexibility and competiveness of the business as a whole. It is concerned with the change of behaviour, attitudes and skills so that the culture of the organisation becomes one of preventing failure first time (Dale & Auckland, 1994).

TQM is about involving everybody in the business of the company, creating a universal understanding that the company's success depends on the complete participation of everybody. It provides an opportunity for complete participation by everybody. It provides everyone with the opportunity to do their job properly. TQM is a motivational technique which requires commitment, communication, culture change, leadership and involvement (Early, 1995).

According to Early (1995) the advantages of TQM are; there are improvements in the quality of leadership, personnel are empowered through greater involvement in the company's decision making process. Personnel's confidence and their capacity to achieve targets are increased, reduction of mistakes resulting in increased pride in work done and a greater sense of achievement and increased esteem for the personnel. Workers undergo self - improvement through involvement in team work. There is improvement in cooperation between workers, team work and reduced conflict among people who are working together.

Two Primary and Secondary focus of TQM are on continuous satisfaction of customers through quality improvement. And the focus on reduction of quality related costs, which fits well with competences required in a world class manufacturing environment.

5.2. Total productive maintenance (TPM)

Whilst the previous section talks about involvement of everybody in the quality business of the organisation,

this section looks at the fitness of the machines themselves so that they are able to produce a quality product. Vankatesh (2009) has defined TPM a maintenance program as a concept of maintaining plants and equipment, with the goal of increasing production, while at the same time increasing employee morale and job satisfaction. It is considered as the medical science of machinery. TPM resembles TQM they apply similar tools such as benchmarking, employee empowerment and documentation (Stedi-Power, 2004).TPM brings maintenance into focus as an important part of business. Down time of maintenance is scheduled as part of manufacturing day in day out. TPM is done to minimise emergency stoppages and unscheduled maintenance. The objectives of introducing TPM are; avoid wastage in quickly changing economic environment, producing goods without changing the product quality, reduce cost, produce a low batch quantity at the earliest possible time and goods send to customers must be non defective.

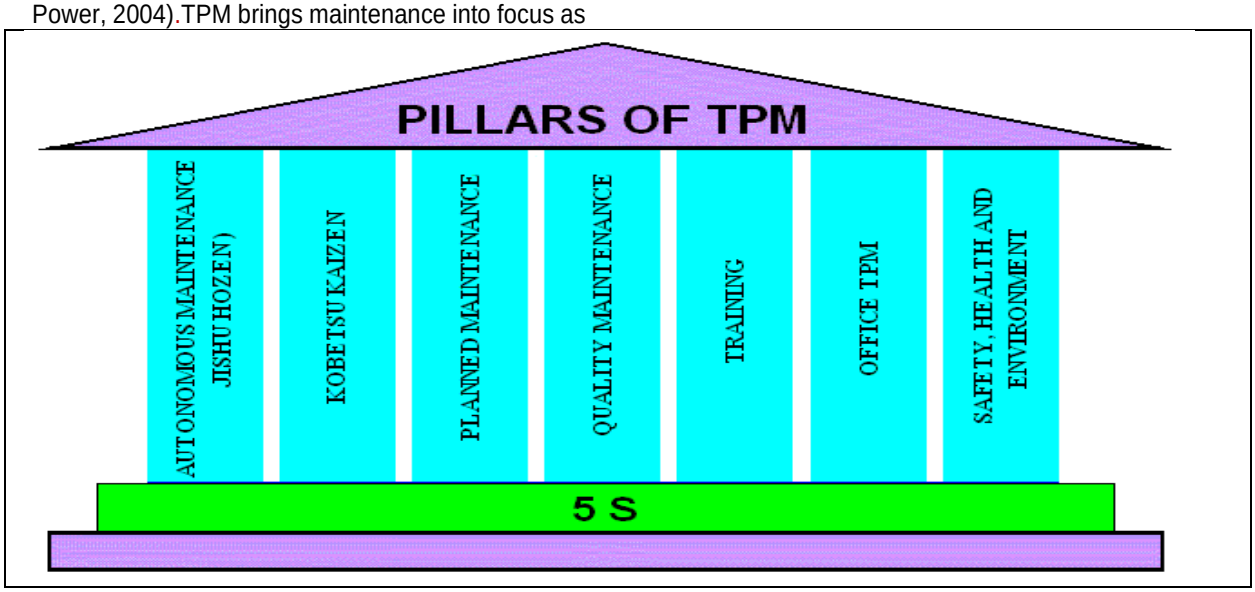

Figure 1: TPM pillars adapted from Van Ede (2010)

The aim of management pillars is the improvement of overall equipment effective (OEE) to a level above 80% in a continuous improvement way. TPM is made up of eight management pillars (see Figure 1) The TPM management pillars seat on the 5S foundation.

The eight pillars are (Van Ede, 2010):

- Continuous improvement
- Autonomous maintenance
- Planned preventive maintenance
- Training with aim of standardising the work
- Early equipment maintenance management for new equipment
- Quality maintenance
- TPM office, this the optimisation of the administration process
- Safety and environment

5.3 Just in time (JIT)

TQM and TPM tried to link the management of people and machinery to bring about the required service and quality to the customer. JIT talks about the management of resources in relation to time in the manufacturing environment, so that the customer gets the product in time**.** The theoretical wish for a company in a manufacturing environment is to have zero inventories, either as raw material, work in progress and finished products. Just in time manufacturing is a way of managing manufacturing systems that could reduce waste, and lower cost thus increasing profit. In its basic sense it means that products or raw material arrive in time hence no need for holding stock at the premises (Frazer, 2004). The ideal situation is to have raw materials into the factory when it is required and produce just what is required by real customers. Ahmed (2014) sighted the ideal situation as purchasing enough raw materials for the day: no goods in progress at the end of the day goods produced for the day would have been taken to the customers at the end of the day. Very few companies have reached this point. The benefits of JIT are that money that would have been tied in inventory can be used elsewhere to generate more money. Areas previously used to store inventory can be productively used for other purposes. Through put time is reduced resulting in faster response to customers. Defects are reduced resulting in more customer satisfaction

(Ahmed, 2014). JIT has disadvantages such as the need for money to bring organisational changes through training. The other disadvantage is that any disruptions in the supply chain affect the organisation because there is no fall-back position.

The just in time concept was explained by Henry Ford in his book titled, "My life and work'', of 1923 to quote*; we have found in buying materials that it is not worthwhile to buy for other than immediate needs. We buy only to fit into the plan of production, taking into consideration the state of transportation at the time. If transportation were perfect and an even flow of materials could be assured, it would not be necessary to carry any stock whatsoever. The carloads of raw materials would arrive on schedule and in the planned order and amounts and go from railway cars into production line. That would save a great deal of money, for it would give a very rapid turnover and thus decrease the amount of money tied up in materials* (Rouse, 2011).

5.4. Lean production

JIT emphasised time management, lean speaks of waste management in the organisation all forms of waste. Lean production combines the advantages of both craft and mass production, while avoiding the high cost of craft and the rigidity of mass production. Lean manufacturers employ teams of multi-skilled workers at all levels of organization and they use highly flexible, increasingly automated machines to produce volumes of products of different varieties.

Craft producers use high skilled workers and simple but flexible tools to make exactly what the customer wants, one item at a time. The goods produced from craft production plant are few, they take long to time to be processed and they are expensive.

Mass production uses narrowly skilled work force to design products to be made by unskilled and semiskilled workers tending expensive, single purpose machines which produces high volume of standardized products. The mass producer adds many buffers, extra supplies, extra work and extra space (Womack et al., 1990).

The term lean was coined by John Krafcik a researcher under International Program for Motor Vehicle (IPMV) which means that the system uses less of everything compared with mass production. Lean manufacturing uses less of the following (Womack et al., 1990); human effort in the factory, manufacturing space, investment in tools, engineering hours to develop a new product, inventory on the site and fewer defects, but produces a variety of products.

World class manufacturing as an integrated system its intentions are to bring excellence to the whole production and logistic system through continuous improvement of all service and the involvement of everyone, workers and customers, and also the adoption of total quality, lean production and integrated factory. For such a factory to be successful the key factors to that success are (Murino et al., 2012); Reduction to lead time, quick response to market changes, reducing the cost of operation, exceed customer expectations, managing the global enterprise, manage processes in outsourcing and improving visibility of performance of the business .

5.5. Employee empowerment

Manpower is the biggest resource which the organisations have for a production to start taking place. In this vein workers need to be empowered for them to perform their duties well. The business dictionary has defined empowerment as management practice of sharing information, rewards and power with employees so that they can take initiatives to make decision for solve problems and improve service and performance. Employees that are empowered have the capacity to reach higher productivity levels they feel they are in control of their jobs. Empowerment takes place in an environment where the employee is given power, trust, and freedom. The worker is encouraged to perform jobs that are related to their tasks (Hartzell, 2011). In another way Goetsch & Davis (2010) have defined empowerment as a means of engaging employees in the thinking process of the organisation in ways that matter, put across input that is heard and listened to. The thinking is that once the employees were empowered it enhances the organisations' competitiveness, and that it motivates the workers to solve problems (Goesch & Davis, 2010).

5.6. Management training

Management training has courses and workshops which managers undergo to prepare them to face the various challenges in supervising people and the management of systems and projects within the organisation (WiseGeek, 2014). The course content of the management training should involve; effective communication, employee motivation, team building, goal setting, time management, problem solving techniques and change management. The other areas which managers should acquire skills are in the areas of delegation, handling of complaints. The managers should also acquire skills to manage the customers. The managers should also acquaint themselves with, diversity of ethics which are enshrined in emotional intelligentsia (Wise Geek, 2014). In a world class manufacturing environment it is critical for mangers to have both technical and human skills.

5.7 Customer relations

Collins English dictionary has defined customer relations as relationships that a business has with its customers and the way in which they treat them and a customer relation department in an organisation is the one which deals with customer complains. The Entrepreneur (2014) has defined customer relations as the way in which a company communicates and deals with existing companies. In a world class manufacturing setup it is critical to have customer relationships because they generate trust, other customers can be referred to for business and there is repeated business from existing customers. Such business relationships have the capacity to build certain values such as: quick response to requests, reliable follow through, correct business answers, fulfilled needs, attention to business details and no surprises for customers (Mapics, 2003).

5.8. Worker involvement

Workers are the strongest pillar in any organisation; it is an asset which contributes in a big way to the success and prosperity of the organisation (Ukessays, 2014). Price (2004) has defined employee or worker involvement as a process that involve participation, communication, decision making that leads to industrial democracy and employee motivation. The results of such commitment and employee motivation are the increase in performance of the organisation. It is common knowledge that workers support what they have helped to put in place. Increasing worker involvement in the decision making ensures that the workers knowledge is harnessed (SHEF, 2011).

6.0 RESULTS

The results show the distribution of type of engineers who participated as respondents in the survey, the advanced management technique that has been used, quality control techniques that have been employed.

Table 1: Designation of respondents

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Plant Engineer	14	28.0	28.0	28.0
	Process Engineer	8	16.0	16.0	44.0
	Maintenance Engineer	4	8.0	8.0	52.0
	Production Engineer	15	30.0	30.0	82.0
	Other	9	18.0	18.0	100.0
	Total	50	100.0	100.0	

Table 1 shows that production engineers constituted the largest number of people that were involved as respondents followed by the plant engineers who constituted 28% of the respondents and the least were the maintenance engineers at 8%.

Table 2:Type of Industry

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Clothing and Textile	2	4.0	4.0	4.0
	Food and Beverages	19	38.0	38.0	42.0
	Building and Construction	2	4.0	4.0	46.0
	Chemicals	1	2.0	2.0	48.0
	Pharmaceuticals	2	4.0	4.0	52.0
	Mining	5	10.0	10.0	62.0
	Energy	3	6.0	6.0	68.0
	Agriculture	4	8.0	8.0	76.0
	Metal and Plastic Products	12	24.0	24.0	100.0
	Total	50	100.0	100.0	

Table 2 shows that food and beverages has the highest number of companies that were part of the survey actually showing that most of the companies that are surviving are in food industry at 38% responding level and the least are chemical companies.

Table 3: Capacity utilization of companies Descriptive Statistics

	N	Range	Minimum	Maximum	Mean	Std. Deviation
Capacity	45	95	5	100	64.12	21.761

Table 3 shows the minimum capacity utilisation at 5%, in the motor industry and maximum of 100% is found in the mining sectors mainly and the mean capacity utilization of 64.12% is achieved by the surveyed companies.

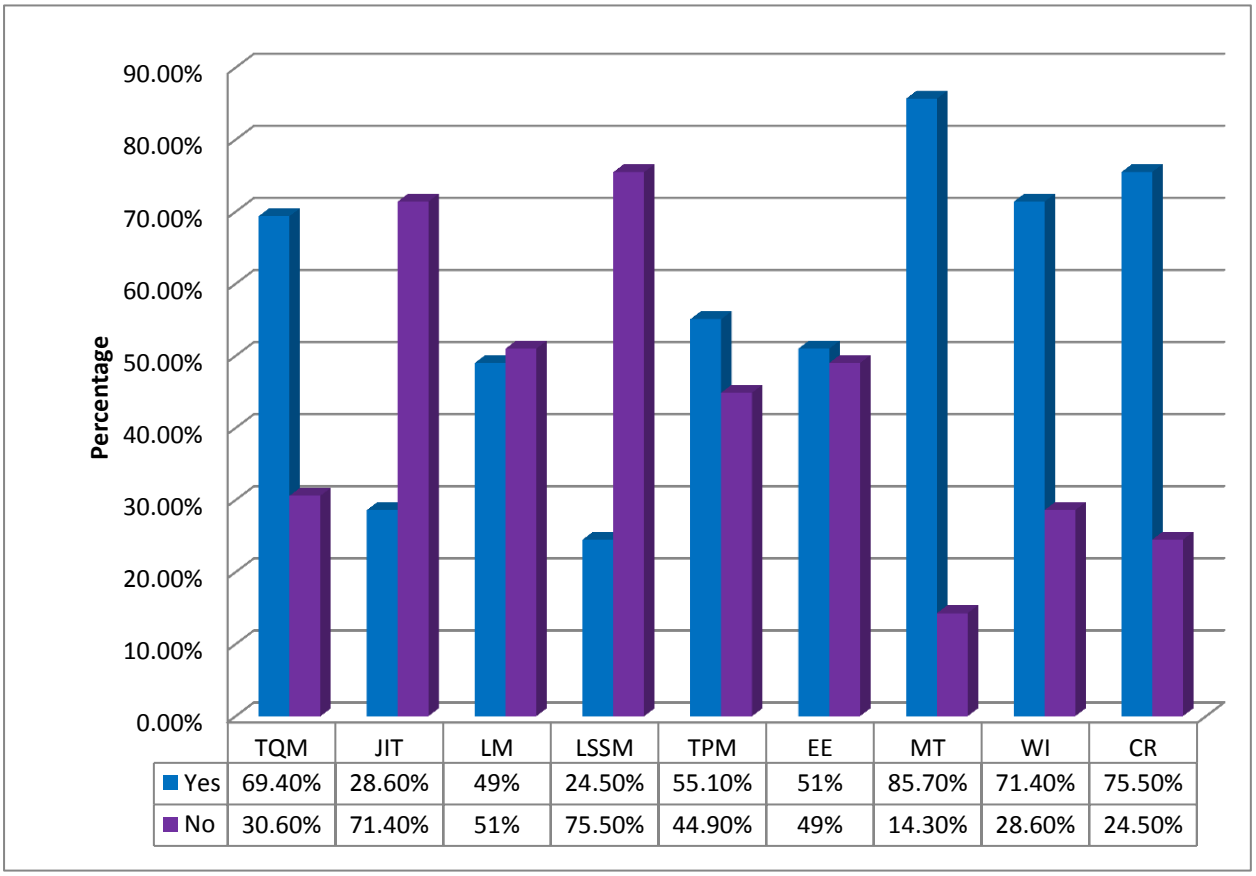

Figure 2: Prevalence of advanced management techniques in Zimbabwe

Figure 2 show that Management training (MT) has the highest prevalence at 85.7% followed by customer relations at 75.5% and then worker involvement is at 71.4% prevalence. LSSM is the lowest applied technique at 24.50% and LM at 49% which shows that most companies are not implementing waste management techniques. It should be noted that there are lot of losses which contribute to the production cost of the product. This could be one contributor to the high prices charged by Zimbabwean companies. JIT is the next in line showing that most companies' are not practising time management in their operations. In today's global world is critical for organisations to reduce the lead time of the products.

Table 4: Descriptive Statistics

Advanced management type	N	Mean	Std. Deviation
Management Training(MT)	49	1.14	.354
Customer Relations(CR)	49	1.24	.434
Worker Involvement(WI)	49	1.29	.456
Total Quality Management(TQM)	49	1.31	.466
Total Productive Maintenance(TPM)	49	1.45	.503
Employee Empowerment(EE)	49	1.49	.505
Lean Manufacturing(LM)	49	1.51	.505
Just in Time(JIT)	49	1.71	.456
Lean Six Sigma Manufacturing(LSSM)	49	1.76	.434

Table 4 shows that Management training (MT) has the highest prevalence at mean of 1.14 and standard deviation at 0.354 and lean six sigma manufacturing has the lowest prevalence at a mean of 1.76 and standard deviation of 0.434.

Table 5: Total Quality Management

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	34	68.0	69.4	69.4
	No	15	30.0	30.6	100.0
	Total	49	98.0	100.0	
Missing	System	1	2.0		
Total		50	100.0		

Total quality management is a management technique where everyone in the organisation contributes to the quality of the product its prevalence from the surveyed companies is 69.4%.

See Table 5.

Table : 6 Just in Time

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	14	28.0	28.6	28.6
	No	35	70.0	71.4	100.0
	Total	49	98.0	100.0	
Missing	System	1	2.0		
Total		50	100.0		

Just in time is a supply chain management tool which focuses on managing losses which deal with time. Table6 shows that the prevalence of JI T technique is at 28.6%.Which is quite low for a country which is serious about meeting lead times, high throughput time.

Table 7: Lean Manufacturing

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	24	48.0	49.0	49.0
	No	25	50.0	51.0	100.0
	Total	49	98.0	100.0	
Missing	System	1	2.0		
Total		50	100.0		

Table 7 shows that Lean manufacturing is at 49 % prevalence which is low. Lean manufacturing is a measure of how well the organisation is managing all forms of waste. All forms of waste increases the production cost of the product. High production costs increases the selling price of the product making most Zimbabwean products more expensive than the imports. The products become less competitive on the global market.

Table 8: Lean Six Sigma Manufacturing

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	12	24.0	24.5	24.5
	No	37	74.0	75.5	100.0
	Total	49	98.0	100.0	
Missing	System	1	2.0		
Total		50	100.0		

Table 8 shows that Lean six sigma manufacturing has a prevalence of 24.5%. The use of six sigma is still very low in Zimbabwe. The system thrives on measurement which is focused on the target. A six sigma company should achieve defects which are not more than 3.4 defects per million products.

Table 9 :Total Productive Maintenance

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	27	54.0	55.1	55.1
	No	22	44.0	44.9	100.0
	Total	49	98.0	100.0	
Missing	System	1	2.0		
Total		50	100.0		

Table 9 shows that Total productive maintenance is at 55.1% prevalence, TPM is a measure of how health the machine are kept in condition, the irony here is that Zimbabwean machines are old they need more systematic maintenance for them to produce quality products at minimum cost. TPM prevents frequent breakdown to machinery.

Table 10: Employee Empowerment

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	25	50.0	51.0	51.0
	No	24	48.0	49.0	100.0
	Total	49	98.0	100.0	
Missing	System	1	2.0		
Total		50	100.0		

Table 10 shows that Employee empowerment is at 51% prevalence. The employee empowerment levels are still very low in Zimbabwean companies. An empowered employee contributes to high productivity levels. Employees are empowered to think and it encourages employees to be innovative.

Table 11: Management Training

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	42	84.0	85.7	85.7
	No	7	14.0	14.3	100.0
	Total	49	98.0	100.0	
Missing	System	1	2.0		
Total		50	100.0		

Management training has a prevalence of 85.7% (table 11) .which is quite high it shows that most companies are investing in the training of managers through short courses and staff development programmes. It is critical to note that companies should give workers training skill which matches requirements of their jobs.

Table 12: Worker Involvement

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	35	70.0	71.4	71.4
	No	14	28.0	28.6	100.0
	Total	49	98.0	100.0	
Missing	System	1	2.0		
Total		50	100.0		

Table 12 shows that Worker involvement is at a prevalence of 71.4% showing that many companies are involving workers in the day to day running of the organisation. When workers are involved in decision making they feel part and parcel of the organisation. When workers are not involved they feel the company belongs to the management and it becomes them and us attitude.

Table 13: Customer Relations

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	37	74.0	75.5	75.5
	No	12	24.0	24.5	100.0
	Total	49	98.0	100.0	
Missing	System	1	2.0		
Total		50	100.0		

Table 13 shows that companies are embracing customers in the day to day running of the organisation. Its prevalence is at 75.5%. Customers are a critical component in the supply chain of any business.

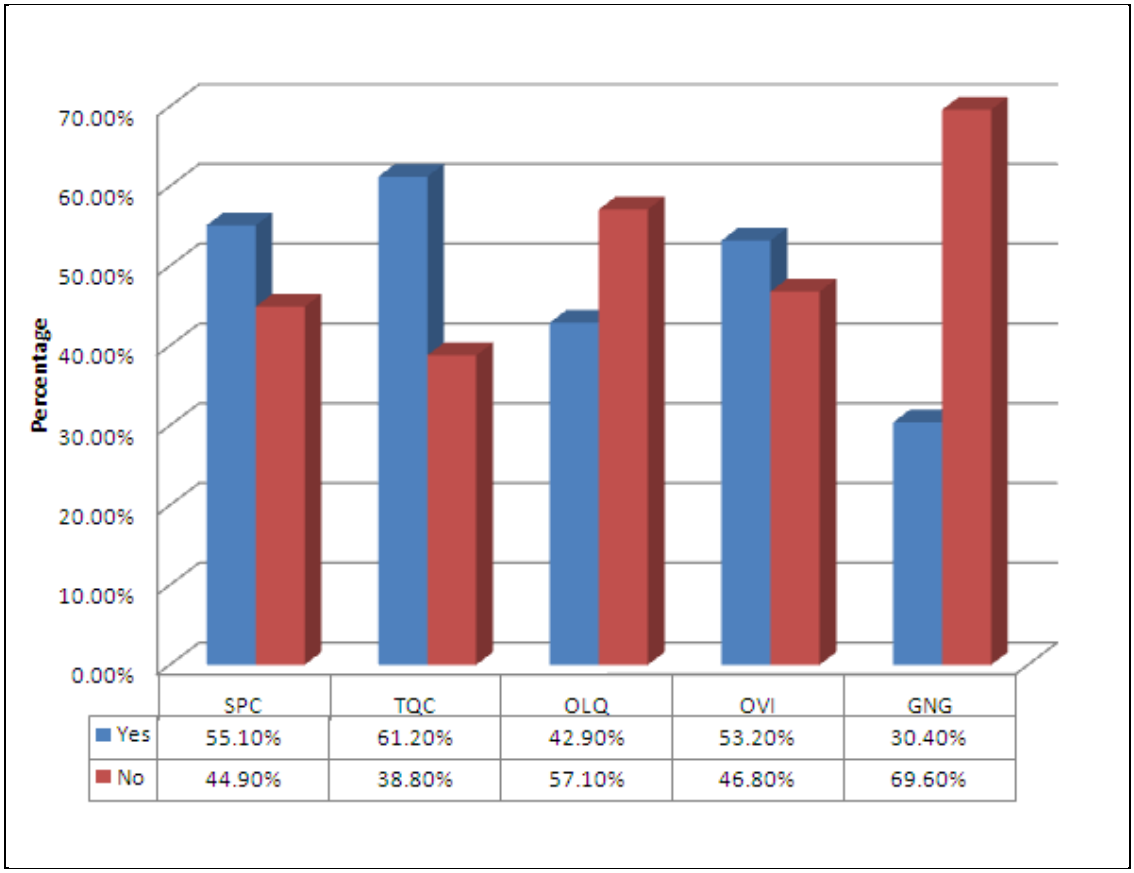

Figure 3: Prevalence of quality control techniques in Zimbabwe companies

Figure 3 shows that Total quality control is the highest quality control technique with prevalence at 61.2% followed by statistical process control at 55.10%. A quick pass through most companies would show that the later was very dominant in most of the companies. They seem to have been overtaken by the first one. Online visual inspection has prevalence of 53.2%. Which is quite high a number because this type of inspection is prone to errors made by humans. Online quality control is surprisingly low at 42.9%. In global competitive world it is critical for organisations to adopt online quality control to avoid inspections at the end or end of pipe solutions. The least used control technique is Go no Go gauge at 30.4%.

Table 14: Descriptive Statistics

	N	Mean	Std. Deviation
Total Quality Control	49	1.39	.492
Statistical Process Control	49	1.45	.503
Online visual inspection	47	1.47	.504
On line quality control(electronic)	49	1.57	.500
Go and No Go gauge	46	1.70	.465

Total quality control is the frequently used quality control technique at mean of 1.39 and standard deviation of 0.962 (see Table 14). Go and no go gauge is the least used with a mean of 1.70 and standard deviation of 0.465.

Table 15: Statistical Process Control

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	27	54.0	55.1	55.1
	No	22	44.0	44.9	100.0
	Total	49	98.0	100.0	
Missing	System	1	2.0		
Total		50	100.0		

Table 15 shows that Statistical process control has a prevalence of 55.1% and is the most frequently used charting process in Zimbabwe. It requires knowledge of statistics from those that implement the control process. Its disadvantage is the techniques is historical, problems are identified when they have been taking place for some time.

Table 16: Total Quality Control

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	30	60.0	61.2	61.2
	No	19	38.0	38.8	100.0
	Total	49	98.0	100.0	
Missing	System	1	2.0		
Total		50	100.0		

Total quality control is the highest type of quality control at 61.2% that is being used by companies in Zimbabwe (see table 16). In total quality control emphasis is placed on the process and on continuous improvement. There is total participation by everyone in the organisation. The technique is good when applied to the changing market.

Table 17: On line quality control(electronic)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	21	42.0	42.9	42.9
	No	28	56.0	57.1	100.0
	Total	49	98.0	100.0	
Missing	System	1	2.0		
Total		50	100.0		

On line electronic quality control is used by 42.9 % of the companies and 57.2% are not using this kind of quality control (see Table 17). More Zimbabwean companies should run away from using visual inspection and use electronic inspection which is more reliable and accurate. Visual inspection has the disadvantage that humans get tired and not consistent.

Table 18: Online visual inspection

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	25	50.0	53.2	53.2
	No	22	44.0	46.8	100.0
	Total	47	94.0	100.0	
Missing	System	3	6.0		
Total		50	100.0		

Table 18 shows that online visual inspection is done by 53.2 % of the respondents and 46.8% do not use the quality control technique. The inspection is an examination of the product using the eye. It is only able to detect surface defects. The method is in expensive, the disadvantages are; one needs good

eye sight, it requires people to be trained, no detection of internal defects and is subject to human error.

Table 19: Go and No Go gauge

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	14	28.0	30.4	30.4
	No	32	64.0	69.6	100.0
	Total	46	92.0	100.0	
Missing	System	4	8.0		
Total		50	100.0		

Tales 19 shows that only 30.4% of the respondents uses go and no go gages in Zimbabwe. The prevalence of this type of quality control is go and no go gauge as a quality control tool. This quality control tool is can be used quickly to check measurements. It is efficient and cost effective. The gages do not need to be powered by electricity.

7. RECOMMENDATIONS & CONCLUSION

In summary, for Zimbabwean industry to be competitive there is need for all workers to participate fully in the implementation of organisational goals. Workers should participate in decision making so that they are part and parcel of the organisation. Workers need to receive training to acquire relevant skills to perform their duties. Manufacturing companies should continuously retool their factories. The machines need to be well maintained using TPM techniques to ensure that machines are in good operating conditions to produce quality products. All forms of waste need to be eliminated from the manufacturing plant, wastes increase the cost of producing a product. Companies need to keep good working relations with their customers. The voice of the customer needs to be heard when producing a product. Manufacturing companies need to use modern quality control techniques such as on line electronic inspection to shield the consumer from receiving poor quality products.

The results of research have shown that Management training has a prevalence of 85.7% which is quite high it shows that most companies are investing in the training of managers. Companies should give workers skill which matches requirements of their jobs. Total quality control is the highest quality control technique with prevalence at 61.2%. Most companies are not using online electronic control, which is more reliable and accurate than visual inspection. Companies that aspire to achieve world class manufacturing status should seriously consider online electronic quality control.

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