

ZERO DEFECT MANAGEMENT – A STUDY ON THE RELEVANCE IN MODERN DAYS

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Abstract: *Zero defect management is an idea that gained its focus from 1960's. The philosophy was put together and proposed by Philip Crosby. It is a programme to eliminate defects in the industrial production, and was primarily intended for automobile production. Since then, there were many researchers and scholars come forward both supporting it and against it. However later the idea six sigma gained very much importance and attention. Nowadays the concept of twelve sigma is at its developing stage. This paper aims at creating a detailed literature based study on zero defect management and its suitability today, as an extension of six sigma programmes. At first the paper introduces the concept, its advantages and limitations, and then a model is suggested for smooth implementation of the concept. This paper has a special feature which is the treatment of zero defects from the basis of six sigma programmes which author feels justifiable.*

Keywords: *Zero defect management, Six sigma, implementation model*

1. INTRODUCTION

“Zero Defects is a management tool aimed at the reduction of defects through prevention. It is directed at motivating people to prevent mistakes by developing a constant, conscious desire to do their job right the first time.” – Halpin et al. [1]. Zero defect management is a revolutionary idea which managed to completely redesign the production philosophies of the era. Till then the idea of quality of the products was vested with the inspection team that they will not allow a faulty product reaches the customer. Before it reaches the end customer, the inspection is made and the product under question will be rejected if found

faulty. But the concept of Zero defect management (ZD) shifted the entire focus from the inspection team to the worker. If a worker is not making any mistake, then the inspection team will not find any faulty product. This philosophy is having a very potential advantage that resource expenditure on a faulty product is avoided. The idea proposed that the worker should be convinced that, he is not doing an ordinary job. Instead he is doing a job that has very far implication than he think.[1]

The credit for proposing the ZD philosophy is goes to Philip Crosby, an employee with Glen L Martin company, an American aerospace company which defunct on 1961. [3] But it is also says that the basic idea was proposed by a group of un named Martin company employees.[1]. The ZD concept was not the first in its kind. The US department of war's "E for Excellence" seems to be the forerunner .[3][4][5]

“Quality Is Free: The Art of Making Quality Certain” a work by Philip Crosby implied at the idea of ZD in a fourteen step quality improvement program and also the basics of the "Absolutes of Quality Management" [6].

The ZD concept demands that no wastage is there in a project. Here the term “waste” is used to address all the unproductive worker, process, machineries, etc. So, anything that is unproductive and does not add value to product should be eliminated. This process is known as “elimination of waste”. By applying this, the company can lessen the waste and hence cut down the cost. It also proposes that in addition to elimination of waste, there should be a process of continuous improvement. Any idea that can bring an improvement in the process should be carefully examined. This is done for the advancing towards perfection. Zero defects theory also closely connects with “right first time” phrase. This

means that every project should be perfect at the very first time itself. Here, again perfect refers to zero defects. Zero defects theory is based on four elements for implementation in real projects.

2. LITERATURE REVIEW

2.1 Six Sigma Concept

Although ZD concept was introduced before Six sigma, this paper, for the convenience of the presentation of its idea, takes the reverse order. It takes the review on six sigma before ZD.

The six sigma quality improving methodology was first proposed and practiced by Motorola Company. [7]. This was developed as an answer to the growing competition by Japanese companies which necessitated the help of a quality assurance tool which can make rapid and radical changes [8]. The six sigma tool is primarily aims at the improvement in manufacturing process and product quality. It also points towards the need of culture change in the organisation [9]. Hence it can be safely assumed that six sigma philosophies can change the entire organisation to be inclined towards quality. After the hugely successful implementation of six sigma in Motorola which gave benefits like lesser manufacturing lead time, lesser defect etc., the world started to acknowledge six sigma as the future of quality management. [10]

The Six sigma is a tool which is known to be highly disciplined and based on a statistical approach which can lessen the number of defects in products, improve the process. [11]

Six sigma provides maximum benefit to the company. It can increase the profit by reducing the wastage.[11]. Six sigma is a business programme which uses both statistical and non- statistical methods to have high improvements in the business.[13] Six sigma can make the process to near perfect state. It can also make you to cope up with ever changing conditions.[14]

2.2 Zero Defect Concept

The idea behind Six Sigma can be stated quantitatively as 3.4 defects per million opportunities, allowing for a 1.5-sigma process shift. In fact the idea for zero defects is not that clear. Imaginably ZD considers the domain beyond 3.4 defects per million opportunities. In other words, it considers the designing of processes and all,

with the aim that, defects are out of the process or product, with the help of which at least on paper, the company will consistently be able to manufacture a defect-free product.[15]

“The quality is free concept” is based on the fact that every defect has a hidden cost associated with it. It can be due to inspection, waste/scrap, rework, lost customers etc. Hence if we can reduce the defects or if we can get rid of the defects completely, we can save a lot of money due to the above facts. So Crosby proposed the concept of free quality.

ZD make it sure that all waste existing in the process is eliminated in the very first go itself which makes the way for cost reduction. So, ZD directs towards reduction in waste as well as cost cutting. So this entire process improves the services and hence, improves quality which leads to satisfied customers.

2.2.1 Limitations of Zero defects

Here is the list of limitations or disadvantages of ZD.

1. Cost – ZD is known to be extremely costly, in meeting the standards. As the need and pursuit for perfection is on the extreme, more and more personnel are after each process which makes the cost to be on the higher side.
2. Employee perception – Employees might not be ready to cope up with increased “strictness” levels, which is one of the pre requisite for ZD implementation. Also employees tend to demoralised due to the excessive pressure the ZD applies to them.
3. ZD is alleged to be a non – achievable goal by many experts. Realistically having zero per cent of defect is somewhat ridiculous, as according to some experts.
4. If ZD is implemented without sufficient preparations and plans, it can even cause defects because of the extra stages of increasingly rigorous and expensive inspection and handling of the products.
5. One of the pioneers of lean manufacturing, Deming’s 14 points theory is against ZD. It is said that the 10th point ie. “Eliminate slogans, exhortations, and target for work force asking

for zero defects and new levels of productivity” is clearly aiming at ZD.

2.3 Comparison of Six sigma and Zero defects principles

The following table shows the comparison.

Table 1: Comparison between Six sigma and ZD [16]

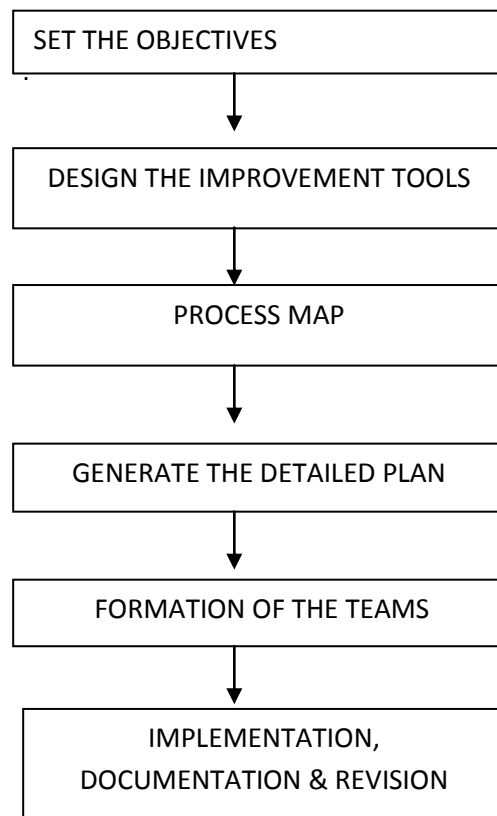
Parameter	Six Sigma	Zero defect concept
Objective	Managing defects	Prevention of defects
Key idea	Three defects per million opportunities.	Work right the first time and every time
Associated cost	Comparatively less	Comparatively higher cost
Instruments	Statistical quality control tools plus problem solving algorithms	Continual improvement through leadership
Performance standards	Few defects are acceptable	No defects are acceptable
Scope	Limited to quality of the product or service	Applicable to every job in the organisation
Involvement of the worker	Moderate worker involvement	Worker can and should identify the problem
Workforce needed	Moderate number of green belts and black belts are needed	Very limited number of additional employees needed.

3. PROPOSAL FOR A MODEL OF IMPLEMENTATION FOR ZD

In this phase the paper is trying to propose a simple model for the implementation of ZD concept.

- **Set the objectives:** It is the phase in which we set the target quality objectives.
- **Design the improvement tools:** in this phase identify the instruments for achieving the goals and also training plans for the workers
- **Process Map:** Do a thorough process map and identify the scope and areas for improvement. Also prioritize the opportunities for improvement.
- **Generate the detailed plan:** Here with the above steps as inputs, generate a detailed plan for implementation.
- **Formation of the teams:** here in this phase formation of the mid and low level teams should be made.
- **Implementation, Documentation and Revision:** After the implementation carefully document it and watch it very closely. I there are any discrepancies, revise the plans.

Fig 1: Implementation model



4. CONCLUSION

As the philosophy name 'zero defect management' points towards a defect free product or process in the immediate future, it might not leave time needed for continual improvements to happen. It is also known to have slowed down the improvement process a bit due to the massive resources it uses. ZD message was not associated with true success because of various reasons like lack of proper guidance tool for implementation, employee perception as a stringent standard and above all the image of an "impossible to achieve" or "unrealistic" philosophy. But in the modern times, as there are many companies deals with six sigma or tools like it we can surely think of the ZD concept, or at least a 12 sigma concept which is very much nearer to ZD, if not ZD. This paper suggested a model for implementation. It can be used as a basis for trial.

The researcher of this paper feels that, if the concept of ZD is seem to be unrealistic to people, they can see it as a goal to achieve, which will make them to believe that "miles to go before I sleep, miles to go before I sleep".

5. FUTURE RESEARCH

The scope of future research is very much there in this topic as the ZD concept didn't met with its destiny. This paper suggested a possible model but it was based only on a theoretical frame work. The exact viability of the model can be evaluated with real life implementation experience.

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