Productivity Improvement by Frugal Approach in Manufacturing Industry

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Abstract

Manufacturing industries have witnessed an outburst in productivity. For productivity improvement, manufacturing industries are taking various initiatives by using lean tools and techniques. However, in different manufacturing industries, a frugal approach is applied to product design and services as a tool for improvement. The frugal approach contributed to proving less is more and seems to indirectly contribute to improving productivity. Hence, there is a need to understand the status of frugal approach application in manufacturing industries. All manufacturing industries are trying hard and putting forth continuous efforts for competitive existence. For productivity improvements, manufacturing industries are coming up with different effective and efficient solutions in manufacturing processes and operations. To overcome current challenges, manufacturing industries have started to use frugal approaches in product design and services. Productivity improvement plays a very important role in the survival of manufacturing industries. There are different tools available and being used by the manufacturing industry to improve productivity.

Keywords:- Productivity, Frugal Approach, Manufacturing Industry

1. Introduction

To expand business for an exclusive customer base and allow a product range to be affordable. This is also a purpose driven business strategy to mitigate poverty, and this has new potential for business development. It means that a frugal approach and increased productivity go hand in hand in supporting manufacturing industries. Therefore, there is a need to understand the application of the Frugal Approach in manufacturing industries and its essence in productivity improvement initiatives. At present, manufacturing industries are facing challenges like low
market demand and unpredictable business forecasts. volatile market scenario, and products have a very small life cycle. It indicates that the manufacturing industry has only one way forward and must go with the adaption of frequent changes in production plans, on-time delivery, cost competitiveness, zero defects, and the manufacturing of customer asked variants.
In this journey of manufacturing industries, the proportion of output to input resources is becoming very competitive, and this has now become one of the key performance indicators for success. Resource availability and its meaningful conversion is the key factor associated with manufacturing industries. Tools that are popular as enablers for productivity improvement are lean tools. All manufacturing industries are aggressively utilizing these tools. Its importance is also acknowledged among the industries. The ultimate purpose of adopting lean tools is to make manufacturing processes and operations more effective and efficient. Productivity improvement lean tools which are popularly used by manufacturing industries are 5S , Live Display/Andon, Bottleneck operation analysis, uninterrupted or continuous flow, actual location of the shop floor, Heijunka (Production Level Scheduling), Hoshin Kanri (Policy Deployment), Jidoka

(Autonomy), Just-In-Time (JIT), Kaizen (Continuous Improvement), Kanban, Key Performance Indicator (KPI), Muda (Waste), Overall Equipment Effectiveness (OEE), PDCA (Plan, Do, Check, Act), Poka-Yoke (No fault forward), Single Minute Exchange of Die (SMED), Prominent Losses, Goal with SMART Approach, Standardization, Takt Time, Total Productive Maintenance (TPM), Value Stream Mapping, Visual Management etc. Productivity improvement in the manufacturing industry is a very important aspect. As the days pass, the need for productivity improvement increases for producing the right product with the right process. This makes it an integral part of continuous business systems and strategies [1]. Prominently, it has become very important to have efficient and effective productivity improvement methods to ensure the organization's growth in productivity. Therefore, this research aims to find an approach for productivity improvement to counter the challenging situation of the manufacturing industry. This research will enlighten the approach to performing in a constrained-based environment.

2. Productivity Improvement in Manufacturing Industry

Productivity improvement in the manufacturing industry is a key parameter. Productivity in manufacturing processes helps in scaling up business performance. At present, in manufacturing processes, lots of productivity improvement tools are available. These tools are predominantly popular and known as lean tools. Over a period, these tools are being practiced by industrial professionals. With this systematic approach of applying lean tools, incremental productivity improvement is nailed by industrial professionals. Day by day, resources like raw materials, space, manpower, materials, water, electricity, fuel, etc. are getting tougher and shrinking. The kind of competition in the manufacturing industry in terms of minimum manufacturing cost, best quality, and timely delivery has increased exponentially. Do more with less and deliver the best you need in an hour. To remain in business and ensure its existence, the manufacturing industry has no way to find a solution to perform in a constrained
based environment. Manufacturing industry process productivity improvement is a prominent core strategy for achieving manufacturing process excellence. This approach helps in achieving the desired business financial and operational performance. It improves the customer satisfaction index and cuts down on investment to develop, manufacture, and produce products and services. Productivity has a direct and very specific relationship with manufacturing process performance measurement in terms of the process output, process utilization, goods costs, plant inventory levels, and the right time of delivery of goods. Productivity can be increased by reducing, eliminating, restoring (repairing) old processing, realigning the process, optimizing resources, reducing process variation, maximizing throughput, cutting costs, quality improvement, set-up time reduction, downtime reduction, and maintaining a zero approach such as zero breakdown, zero production loss, zero change in plan, and so on [2]. Now a days, low productivity in manufacturing industry is a serious concern. Existence of manufacturing industry is significantly depending on level of productivity

excellence has achieved by that manufacturing industry. To improve productivity different lean tools available and are being prominently utilizing in industries. But, in addition to improve productivity one more challenge is being faced by manufacturing industry is scarcity of resources. To perform in less resources and with low productivity is really a very tough walk for manufacturing industry. To perform in less resource a term frugal approach is used. Therefore, to understand frugal approach application in manufacturing industry, definition of frugal approach needs to understand first.

3. Need for Themes for Frugal Approach

Lean tools used for productivity improvement are structured and systematic. However, the frugal approach is non-structured and random. In order to apply the frugal approach, there is no guiding path available for its systematic application. To have effective implementation of the frugal approach, industrial problems are supposed to be segregated into different regimes. Based on these facts, themes for a frugal approach are needed for the future. This will help to tune the industrial problems into different buckets and will enable the professionals to apply a frugal approach in a very focused way. Multinational corporations have created products and services for customers at the top of the pyramid who can afford them. Whereas multinational corporations have ignored the bottom of the pyramid customers as non-targeted business areas. On the other hand, a frugal approach targets the undeserved customer and process. The frugal approach has the power to attract poor customers and opens the door to establishing processes and products that they can afford. Theme identification will help to address different sectors of business with a frugal approach. the applicability of the frugal approach evolving successful direction for roductivity improvement in manufacturing industry. The themes are developed based on the industrial problem bank data from the manufacturing industries and statistical analysis. Further, the themes are validated using Delphi technique. The proposed themes are covering all the possible fields striving for productivity improvement in manufacturing industry. These themes can be applied at various levels and based on need of the situation. In addition to it, the proposed themes are facilitating strategic decision in manufacturing activities in dynamic situation. The theme provides an opportunity for industrial professionals to view industrial resource constrain problem in much focused way. This in turn, it is expected to evolve successful themes for the applicability of the frugal approach for productivity improvement in manufacturing industry.

4. Need for Framework

The findings of the study show that, the examples for the frugal approach are delivered unknowingly. Later, different authors mentioned that example to demonstrate a frugal approach. Frugal approach has been applied to product and services. This has been done randomly and without a systematic framework. In depth application of the proposed formalized frameworks to other cases in the context of the frugal approach like manufacturing activity is missing [3]. Lean tools used for productivity improvement is structured and systematic. However, frugal approach is non- structured and random. However, the

frugal approach is non - structured and random in manufacturing industrial process. The literature review reveals that there is no authentic or practical framework presented in the literature for application of a frugal approach for industrial manufacturing process. Based on these facts, a framework for a frugal approach is needed for the future. This will help to solve the industrial resource-constrained low productivity problems with a frugal approach in an effective way. This proposed framework will enable the professional to apply a frugal approach in a much focused way.

5. Application of Framework

The synthesis of a learning framework for the frugal approach has been developed. As we know, synthesis learning means converting various pieces of information into useful knowledge. Based on previous chapters, information is converted into useful knowledge, but it is also very important to validate the usefulness of the gained knowledge. A frugal approach framework development is the output of a synthesis of learning. This framework is useful knowledge. Its validation will provide confidence in its usefulness. Hence, to apply and validate the frugal approach framework, an industrial project case study of the manufacturing industry has been done.

Conclusion

While going through literature number of tools are available to improve productivity by using lean tools. But there are no standard tools are available to improve productivity with frugal approach. Hence, there is need to develop a framework to improve productivity with frugal approach. In this chapter, study is done for current scenario of frugal approach to improve productivity in manufacturing industries.

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