

Sustainability Initiatives in Manufacturing: A case Study of Maruti Udyog Ltd.

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Abstract

The present era of globalization, modernization and development is the resultant of extreme exploitation of natural and human resources in developed as well as developing countries. But the scarcity of these resources lead the business or corporate world to explore the methods of handling and exploiting them to fulfill the current and future needs without any compromise. Therefore, being sustainable is becoming the most important factor for any developmental process. As manufacturing is also viewed from broader perspective of sustainability these days, so manufacturing companies are also pushing them to achieve various dimensions of sustainability, such as social, economical and environmental. Sustainability, in case of manufacturer, is measured by evaluation of products, processes or systems that effect its operations. It requires assessment of all the factors that affect the manufacturing facilities and then developing strategies to reduce their impact. Therefore, the manufacturing companies are always under pressure to develop strategies to allocate their resources efficiently, because of increasing prices and competition. As traditional approach related to quality and price can not be ignored, the manufacturers are intensely focused on areas like energy, water, emission, waste, production, awareness, etc. This paper reviews sustainability manufacturing practices and initiatives taken by Maruti Udyog Limited in this field.

Keywords

Sustainability, resource allocation and manufacturing.

I. Introduction

Traditionally, the manufacturing system was assumed to be sound if it can provide opportunity for continuous improvement, hence results in increase in production and operational quality. In such a system, the production system was designed to improve process capability and operational performance. However, the proper attention was paid towards product nonconformities and process off-specifications [1]. The reason behind was, this kind of system resulted in lesser waste and emissions due to reduction of rejected parts [2]. The manufacturing companies were only emphasizing on good quality in lesser price and optimal use of resources. As it is rightly said, for these kinds of manufacturing units by David C. Korten that Economists know the price of everything and the value of nothing [3].

Therefore, now days, manufacturing system is viewed from different perspective. Revolutionary production-systems thinking directed at the identification and elimination of all forms of non-value added activity, or waste, from an organization [8]. The manufacturing systems need to be designed for value creation. As said by Henry Ford, "If it doesn't produce value, its waste" [2]. So, it directs an organization towards the waste elimination from all the sources. Because, manufacturing industries are additionally under the economic pressure to compensate increasing cost and create adding value [13]. So, it has become necessary to design products as well as

processes for value creation.

Besides value creation, the manufacturing systems are viewed from the broader characteristic of sustainability these days. The idea of sustainability has come to represent the rising expectations not only from economic viewpoint but also from social and environmental performances of manufacturing system [6]. So, the manufacturing system is not only limited to value creation but to sustainable value creation. That means the manufacturing companies are finding their way to sustainable development by using methodologies of increasing the efficiencies (economic, ecologic, social) into the production system by producing products with less energy, less material, and less pollution [4,13]. Some of objectives of a sustainable manufacturing system can be,

- Improving resource efficiency and waste management
- Examining the product life cycle involved in manufacturing.
- Trying to ensure economic growth minimizing environmental pollution.
- Examining how to stimulate innovation and investment to provide cleaner technology
- Providing awareness and training to employees. [11].

This paper compares quality with sustainability and reviews the concept of sustainability in reference to manufacturing and concludes with the sustainability practices adopted by Maruti Udyog Ltd.

II. Quality Vs Sustainability

According to Caplan (1990) "Quality is process dependent" which means that the quality can be attained by effective product and process design [1]. Deming, Juran, and Crosby, made the claim that quality programs would increase efficiency, rather than just raise costs. Crosby's famous words that "Quality is free." made the important point that businesses can make breakthroughs by seeking quality [5]. According to Feigenbaum (1991), "Quality is the most cost-effective, least capital-intensive route to productivity." [1]. Thus, quality and productivity objectives are not different according to traditional view. But sustainability takes quality thinking to the next level to include creating a healthier, safer society by integrating environmental concerns into manufacturing and design efforts [5].

III. Sustainability

World Commission on Environment and Development defined sustainable economic progress as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" [5]. Elgin also observes, "if we do no more than work for a sustainable future, then we are in danger of creating a world in which living is little more than 'only not dying'" [10]. It has been said because; our ecological demands already exceed what nature

can supply. This “ecological overshoot” means, the stock of natural environmental capital is depleting. Therefore, business enterprises need to grow at least enough to keep pace with the economy, but defining growth and the ways & means of growth need to change [14].

Earlier, the industries were only limited to environmental laws and regulations set by Government bodies. Traditional understanding of environmental management was limited to “cleaning up the mess” after production is completed. Environmental management in many companies is oriented to compliance, remediation of contaminated land, and reduction of targeted hazardous materials [2]. Then, they start talking only about green production which was only limited to eco friendly products and processes. It is a very proven fact that eco-factories are not only the solution if they are producing the unsustainable products [12]. Therefore, companies are proactively coming forward to develop sustainably. Many of these companies are now going beyond environmental performance and are now beginning to discuss sustainability. Sustainability pushes the environmental envelope and challenges companies to consider issues such as the environmental impact of the materials they select, the social implications of their products and operations, and in some case the need for their product at all [4]. However, successful sustainability initiatives often require fundamental product redesign and operational rethinking [7]. Therefore, achieving solutions to environmental problems that we face today requires long-term potential actions for sustainable development [11]. In long term, sustainable enterprise resilience can be defined as the “capacity for an enterprise to survive, adapt, and grow in the face of turbulent change,” and at the same time, “to increase shareholder value without increasing material throughput”. Sustainable enterprise resilience within the framework of industrial ecology creates multiple business opportunities through green technologies, reduction of raw material and energy use [14].

In Fig. 1, the holistic view of production system has been given. If the overall effectiveness of the industry has to be improved then the company has to pay proper attention towards economic, ecological and social factors of production, which in return result in sustainable production.

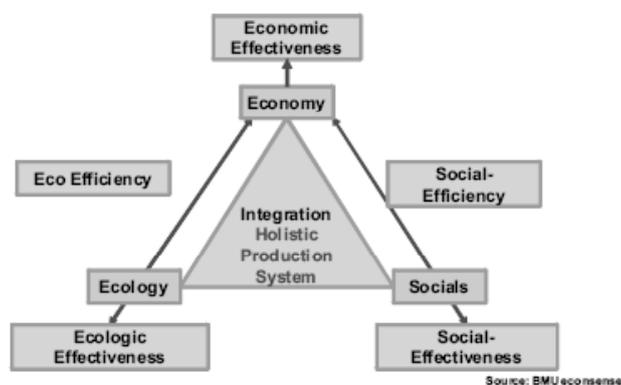


Fig.1: Efficiency and sustainability [13].

Concepts that are discussed above guide sustainability practices at multiple levels. Firms use these frameworks to motivate sustainability initiatives, to educate employees, and in decision-making. Viewed together, these frameworks can guide firms in encouraging and launching sustainability initiatives, in evaluating their success, in integrating environmental

considerations into the allocation of resources, and in designing products to gain competitive advantage from sustainable business [5].

IV. Case study of Maruti Udyog Ltd.

The products of automobile industry touch daily lives by providing personal mobility for millions. But there are some challenges that are faced by the industry such as deterioration of local air quality, global warming and the treatment of scrapped vehicle. Every automaker has worked in the direction to save environment and the considerable improvements are also made in this direction. As there are competitive pressures to reduce cost, the automakers are driven towards resource productivity and minimization of waste to achieve economies of scale [5]. A recent World Energy Council (WEC) study found that without any change in our current practice, the world energy demand in 2020 would be 50–80% higher than 1990 levels [11].

Maruti Udyog, India's leading automaker whose parent is Suzuki from Japan, has also paved its way towards sustainable development by incremental changes in few things that resulted in big savings. Last year Maruti ran program to reduce part of each component by 1 gram. Interestingly, Maruti has reduced its electricity consumption per vehicle by 20 per cent in the last nine years, water consumption by 46 per cent, and land fill waste by 67 per cent. The carbon dioxide emission has declined 27 per cent in seven years. It has become a zero discharge company and recycles all its water [2, 16]. The small car named 'A-Star', which is global car of Maruti, is designed in such a way that 87 per cent of car can be recycled as explained by European regulations about the concept of end-of-life-vehicles (ELVs) [12, 16]. Therefore company bagged an order of 35000 A-star from Nissan in Europe recently [15]. In this direction, Maruti has taken some other initiatives towards sustainability, which are,

- When the Indian market was offering only two tube light configurations i.e., 42 watts and 36 watts, Maruti tied up with a small manufacturer for 28-watt tubes. In the factory there is provision for three CFL lamps and company managers realized that the room would have enough illumination with two lamps of 36 watts in each holder. So the third lamps were taken out. This seems to be a small step but if we look towards energy savings in a year time, and then they are huge.
- In the assembly line, where axles are installed, the components are placed on an inclined bar on which they slide towards the worker due to gravity which helped in eliminating the use of conveyor belts.
- Water pumps in cooling towers were made to consume less electricity by slightly reducing the size of the impeller.
- The power supply of machines, that run intermittently, was cut to save energy.
- The compressed air used to run various tools used to go into the shop floor at 28-29 degrees centigrade allowed to rise its temperature to 32 degrees because of no harm.
- Earlier waste water from all sources was dumped into Government sewers, for which company was paying Government. But now after the improvements in treatment processes no sewer is discharged into Government sewers and all waste water is recycled by the company.
- Company has used steel crates rather than wooden or board packaging for storage and transport of components coming from Japan. After use the steel crates are folded and sent back for reuse. The thousand of parts coming

from Indian vendors are supplied in reusable plastic bins to avoid wastage [16].

The steps put forward by Maruti Udyog not only resulted in economic growth but also in environmental and social progress. It is quite obvious that if a company wants to exceed in future then it has to look its present. Maruti Udyog realized the importance of being sustainable in present. Company is proving that the journey starts from the small initiatives, but they result in big savings. No doubt, it is not easy to bring change for sustainable development. To implement sustainability principles, firms need clear objectives [5]. It is a fact that only those programs that are implemented effectively and communicated to all employees result in value for the organization [9]. So this study reveals that by combining sustainability in manufacturing system, how a company can reduced water, electricity, and general energy usage, and lowered waste disposal costs. Hence, all these activities can take a company towards sustainable value creation.

V. Conclusion

The automobile sales are increasing in India and today there is a challenge before manufacturing industries to become sustainable. It clearly shows that the raw materials are finite and there are increasing demands, therefore, companies are moving towards change in product designs, various stages of processing, consumption and use of raw materials so as to encourage optimum reuse and recycling, thereby avoiding wastage and preventing depletion of the natural resources stock. But there is nothing special that has to be created; therefore the change begins with little transformations in manufacturing system. There is no single formula which can be applied to make a company sustainable immediately. Sustainability is temporal and deals with continuous advancement in all areas. Also, sustainability is not forced but it depends upon the will of organization for a change. To protect, maintain and improve present life styles and preserve them for future, companies are voluntarily coming forward to become sustainable. Thus, sustainability in the manufacturing system is the key to address various problems of the production and operations in industry. Maruti Udyog Ltd took some steps forward to make its products sustainable, therefore other companies should also come forward to adopt sustainable manufacturing practices so as to secure the future of coming generations.

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