

Demonstrating pro-active practices for retaining sustainability in manufacturing: Implication and development

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Abstract: Today, it is need to include critical practices in working mechanism. The inclusion of sustainable practices in working mechanism is needed to remove resilient and failures from the system and to exploit SCM factors effectually under manufacturing premises. Accordingly, in present study, seven pro-active practices are discussed and presented for retaining sustainability in manufacturing from the insights of Implication and development. In present study, seven practical elements named as Lean, Green, Kaizen, Preventive Maintenance, Digitalization of supply chain, Talent Management, and Redundancy under the zone of manufacturing are presented for advancement and retaining sustainability in manufacturing. The advance practical elements are presented for implication, development of model and devising a framework. The presented practices are critical and are discussed in detail in present study to impart knowledge based learning. The study can benefit managers of manufacturing organizations in understanding critical practices and allied metrics. The study presented tabulation of metrics related with pro-active manufacturing practices to help applicators in the development of sustainable framework.

Keywords: Sustainability, Manufacturing, Advance practices, Knowledge based study, Managerial framework

I. INTRODUCTION

Today, admirable practices named as sustainable practices are necessary to guarantee the timely completion of tasks and to access vital resources credibly, manage organizational things, enlarge business network and to contribute towards environmental balance [1-2]. A comprehensive approach is thus required to streamline logistics, manufacturing, customer satisfaction, and grievance handling [3-4]. The same is required for proper management and maintenance of organizational resources and activities efficiently [5-6]. This involves addressing all aspects of the system's boundaries to optimize performance. Developing available capabilities is crucial, along with the integration of sustainable practices to enhance overall efficiency in manufacturing systems [7-8]. By doing so, organizations can ensure that critical resources are accessible at the time of real utility, agilely and when and where needed, which ultimately are responsible for promoting long-term sustainability and operational success in today's increasingly resource-conscious environment [9-10]. Accordingly, present study is conducted to report pro-active practices, which are discussed and presented in study for retaining sustainability in manufacturing from the insights of implication and development. In present study, the following research questions are attempted by the authors:

RQ1: What are the practical elements under the zone of manufacturing that can please advancement and retain sustainability in manufacturing?

RQ2: How one can understand the importance of sustainability and how sustainability can benefit managers to manufacturing organization?

The inclusions of proactive practices are needed to eradicate resilient and failures from the organizations and to take advantage of SCM factors effectually underneath manufacturing premises. In nearby scenario, it is very important for the manufacturing industries to implicate certain practices to become more robust and to be prepared for facing significant crises and their management [11-12]. In present study, the authors tried to classify sustainable practices that can influence manufacturing organization performance and presented proper understanding of these practices to endure success and sustainability. The present study presented seven proactive practices named as Lean, Green, Kaizen, Preventive Maintenance, Digitalization of supply chain, Talent Management, and Redundancy and have endured proper discussions related to them in study for implication by the managerial staff of the manufacturing organization. The pictorial representation of seven pro-active practices can be identified from Figure 1.

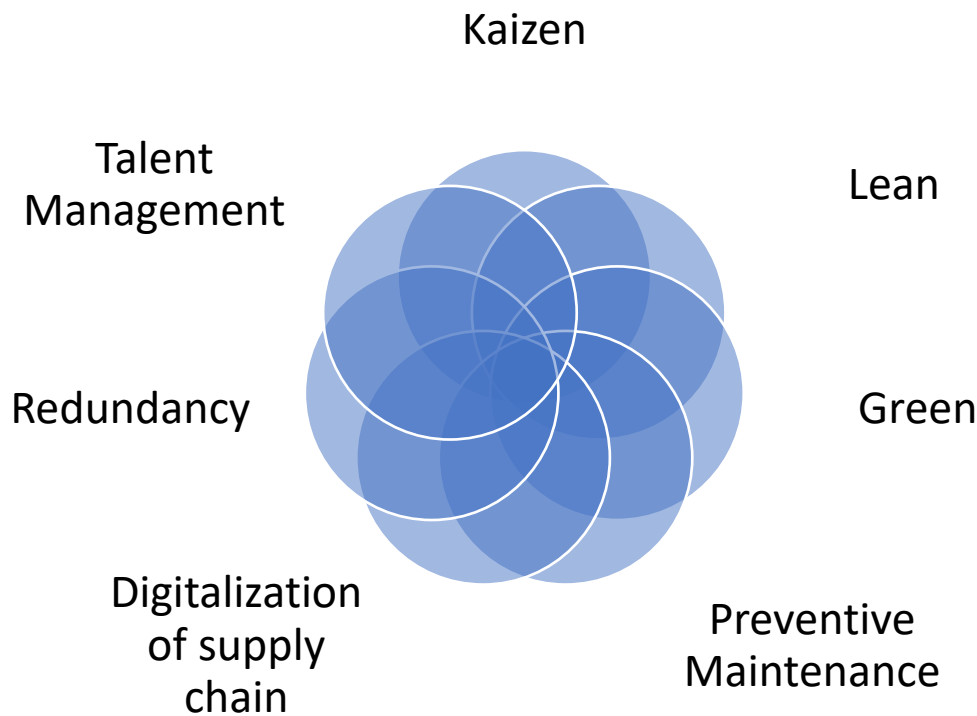


Figure 1: Pictorial representation of seven pro-active practices

II. LITERATURE REVIEW

Today, organizations rely on sustainable practices and network management activities to monitor ongoing production and manage specific projects, including new machinery development, production line optimization, and process or technology upgrades [13-14]. The inclusion of sustainable practices also plays a key role in building new production facilities [15-16]. Sustainable practices are important and become crucial, when organizations need to produce a custom product for a specific customer, which focuses on overseeing and optimizing production processes and several challenges [17-18]. These include maximizing efficiency and productivity, proper resource allocation, managing inventory levels, streamlining workflows, employee training, maintaining quality control, and effectively using technology to enhance operations [19-22].

The inclusion of effective practices are always needed and are crucial in addressing challenges in shop floor management to ensure maximum efficiency, productivity, and quality [23-24]. Incorporating strong project management practices demands sustainable practices, which are essential for building a well-functioning manufacturing system for several key reasons related with ensuring that products meet high-quality standards and customer expectations and enhancing efficiency and productivity, leading to reduced costs and increased profitability [25-27]. The same are needed to contributing to job creation and supporting overall economic growth. By streamlining processes, managing resources effectively, and maintaining quality control, project management plays a central role in optimizing manufacturing operations and driving business success [28-30].

Today, sustainable practices and network management activities are relied upon by organizations to monitor ongoing production and manage specific projects, such as the development of new machinery, production line optimization, and process or technology upgrades [31-32]. The inclusion of sustainable practices is also considered essential in the construction of new production facilities. Sustainable practices become crucial, when a custom product needs to be produced for a specific customer [33-34]. These include the maximization of efficiency and productivity, proper resource allocation, inventory level management, workflow streamlining, employee training, maintenance of quality control, and the effective use of technology to improve operations [35-36]. Accordingly, in present study, seven pro-active practices are discussed and presented for retaining sustainability in manufacturing from the insights of Implication and development.

III. METHODOLOGY

Organizations need to include effective practices to address challenges in shop floor management and ensure maximum efficiency, productivity, and quality [37-38]. Strong project management practices require the adoption of sustainable practices, which are essential for building a well-functioning manufacturing system [39-40]. This approach ensures that products meet high-quality standards, fulfil customer expectations, and improve efficiency and productivity, leading to reduced costs and increased profitability [41-42]. Here, in study seven proactive practices are scrutinized from the literatures and discussed in detail for retaining sustainability. Here the methodology start with literature review in step 1, which is followed by Identification of proactive practices for decision making in step 2. Afterwards; scrutinization of practices is done in step 3 with demonstration of scrutinized practices in step 4. The study presented discussion and implication for managers in the last step. The methodological flow chart can be identify from Figure 2.

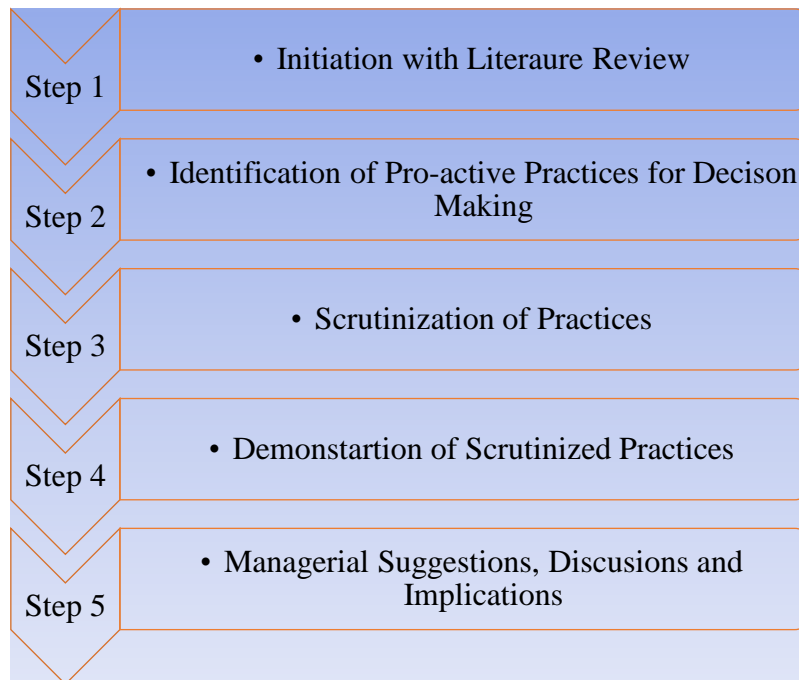


Figure 2: The methodological flow chart of study

IV. SEVEN PRO-ACTIVE PRACTICES

The sustainable practices also help create jobs and support overall economic growth. These practices are needed to streamline processes, managing resources effectively, and maintaining quality control, project management and indeed generation of revenues [43-44]. The same are needed and plays a central role in optimizing manufacturing operations and driving business success [44-45]. In study these practices are discussed to be used as a tool for strengthening manufacturing capabilities. Here, seven pro-active practices are considered, whose graphical repressions of importance can be understand from Figure 3 and discussions related to them can be identify in sections 4.1 -4.7.

4.1 Lean as a tool for waste:

The study advocated Lean as an elemental tool for waste management and presented lean metrics that can be used to induce sustainability. Table 1 presents the tabulation of lean metrics for engrossing manufacturing development.

Table 1: Tabulation of Lean metrics

Lean metrics	1	2	3	4
	Organizational culture	Best practices sharing and benchmarking	Management engagement & commitment	Vision and active leadership
	5	6	7	8
	Stimulating willingness to learn	Knowledge sharing	Employee involvement and participation	Financial capability

4.2 Green as a tool for environmental respect:

The study advocated Green as an elemental tool for environmental respect and presented green metrics that can be used to induce sustainability. Table 2 presents the tabulation of Green metrics for engrossing manufacturing development.

Table 2: Tabulation of Green metrics

Green metrics	1	2	3	4
	Green behaviour willingness	Green technology advancement	Government policy support	Adaptation of eco-friendly materials & technology
	5	6	7	8
	Concentration on eco-design	Waste recycling	Establishment of environmentally-friendly operations	Commitment towards green products



Figure 3: Graphical repressions of importance of seven pro-active practices

4.3 Kaizen as a tool for continuous improvement:

The study advocated Kaizen as an elemental tool for continuous improvement and presented metrics for kaizen that can be used to induce sustainability. Table 3 presents the tabulation of metrics for kaizen for engrossing manufacturing development.

Table 3: Tabulation of metrics for kaizen

Kaizen	1	2	3	4
	Management support	Executive commitment	Rewards & incentives	Training and stipulations
	5	6	7	8
	Continuous assessment	Applying incremental changes	Feedback and determination	Employees and customer suggestions

4.4 Preventive Maintenance as a tool to avoid internal failures and stoppages:

The study advocated Preventive Maintenance as an elemental tool to avoid internal failures and stoppages and presented metrics for Preventive Maintenance that can be used to induce sustainability. Table 4 presents the tabulation of metrics for kaizen for engrossing manufacturing development.

Table 4: Tabulation of metrics for Preventive Maintenance

Preventive Maintenance	1	2	3	4
	Maintenance schedule development	Extending equipment lifespan	Appropriate tool selection	Sufficient inventory and spare parts management
	5	6	7	8
	Maximizing equipment reliability	Optimized production processes	Determining Failure modes	Involvement of operators and supporting staff

4.5 Digitalization as a tool for visibility and record management:

The study advocated Digitalization as an elemental tool for visibility and record management and presented metrics for Digitalization that can be used to induce sustainability. Table 5 presents the tabulation of metrics for Digitalization for engrossing manufacturing development.

Table 5: Tabulation of metrics for Digitalization

Digitalization	1	2	3	4
	Change Management	Technology Architecture and interface	Integration of IoT devices	Data optimization
	5	6	7	8
	Universal Access to Connectivity	Cloud storage, and hardware costs	Consumer confidence	Opportunities to participate

4.6 Redundancy as a tool to avoid resilience and external failures:

The study advocated Redundancy as an elemental tool to avoid resilience and external failures and presented metrics for Redundancy that can be used to induce sustainability. Table 6 presents the tabulation of metrics for Redundancy for engrossing manufacturing development.

Table 6: Tabulation of metrics for Redundancy

Redundancy	1	2	3	4
	Deploy digital improvement	Partner development & Supply chain collaboration	Adaptive capabilities	Competence and commitment
	5	6	7	8
	Technological plasticity	External integration to customer services	Degree of online solution	Flexibility and integrate-ability

4.7 Talent Management as a tool for human skills:

The study advocated Talent Management as an elemental tool for developing human skills and presented metrics for Talent Management that can be used to induce sustainability. Table 7 presents the tabulation of metrics for Talent Management for engrossing manufacturing development.

Table 7: Tabulation of metrics for Talent Management

Talent Management	1	2	3	4
	Salary and Benefits	Working Environment	Organizational Commitment	Training and Development
	5	6	7	8
	Psychological quality	Job Security	Manager-Subordinate Relationship	Talent attraction and motivation

V. DISCUSSIONS

The tabulation of metrics related with pro-active manufacturing practices is discussed in Tables 1-7 to help applicators in the development of sustainable framework. It is argued that for nurturing proper manufacturing within organizations, it is needed to drive growth by creating jobs, boosting demand for raw materials, managing talent, attributing redundancy, identifying lean, keeping green and fostering innovation. Additionally, predictive and periodic maintenance along with digitalization of assets are prime concern for proper proof and management. The same are required to not only provide direct employment but also generates numerous indirect benefits throughout supply chains. These include roles in logistics, raw material sourcing, equipment maintenance, and support services. The inclusion of said practices is needed in manufacturing to stimulate economic activity and, promoting regional development and technological advancement. By fostering innovation and improving productivity, the organizations can contribute to job creation and overall economic growth, playing a vital role in sustaining and expanding economies, which can be possible by the inclusion of discussed seven pro-active practices.

VI. CONCLUSIONS

The study presented seven practical elements for reinforcing the capabilities of manufacturing, which can be used for advancement and retaining sustainability in manufacturing sphere. The presented practical elements can be used in the development of model and for implication of framework to attain fruitful results. The practices, which are significant and can later change in manufacturing, are discussed in detail in present study. The study imparted knowledge based learning. The study can benefit managers to manufacturing organization about understanding practical manufacturing elements that can please advancement and retain sustainability in manufacturing. The study can be used to understand the importance of sustainability and to receive sustainability in manufacturing organization.

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