



THE IMPACT OF INTEGRATION BETWEEN A SHARED VALUE CREATION STRATEGY AND SUSTAINABLE MANUFACTURING ON COST REDUCTION

Sadeq Dhahir Farhan Alzaidi

Imam ALkadhun College , Iraq - Wasit.

Email : sadeq.dhahir@iku.edu.iq

<https://orcid.org/0009-0006-8823-2130>

Khudhur Abbas Jabbar Aefri

Imam ALkadhun College , Iraq - Wasit.

khudhur.abbas@iku.edu.iq Email :

<https://orcid.org/0009-0005-1562-1349>.

Article history:	Abstract:
Received: 26 th October 2024 Accepted: 24 th November 2024	This paper addresses the role of integration between shared value creation and sustainable manufacturing in achieving cost reduction and improving corporate performance by analyzing how shared value creation interacts with sustainable manufacturing methods. To this end, the paper proposes that integration between a shared value creation strategy and sustainable manufacturing positively contributes to reducing costs for economic units by improving the efficient use of available resources, reducing loss, and improving technical innovations. Therefore, these actions enhance economic unit's competitiveness and achieve sustainable economic, social, and environmental benefits. Also, the paper recommends the formulation of comprehensive strategies that help create shared value with society, invest in sustainable manufacturing, and apply effective cost-cutting methods. The study was applied to Zawraa General Electrical Industries Co., with the relevant data collected and descriptively analyzed from 2015 to 2021. Furthermore, this paper contributes to the relevant literature on how to balance environmental and economic objectives. Finally, the paper aims to provide a practical framework for companies seeking to improve their financial performance through their commitment to social responsibility and sustainability.

Keywords: Shared value creation, Sustainable manufacturing, Cost reduction.

Introduction

Considering the growing economic and environmental challenges facing industrial businesses, it has become necessary to adopt strategies that balance profit and enhanced social and environmental responsibility. Shared value creation and sustainable manufacturing are recent strategies aimed at enhancing companies' role in sustainable development. These strategies seek to benefit society by improving their well-being and preserving the environment while, at the same time, delivering economic benefits to companies. The creation of shared value reflects the shift from the concept of traditional social responsibility to one that focuses on companies' investment in their societies and the promotion of mutual value. These ends can be better achieved through strengthening the local economy and achieving growth that benefits society as a whole. In contrast, sustainable manufacturing seeks to reduce the environmental impact of industrial processes by improving resource efficiency, reducing waste, and adopting environmentally friendly technologies, all of which contribute to reducing operational costs in the long term.

1. Research Design

1.1. Statement of Research

Although many economic units adopt sustainable manufacturing and value creation strategies, there are significant challenges to integrating these strategies with a view to reducing operational costs and enhancing competitiveness. The fundamental challenge is how to effectively integrate societal innovation and environmental conservation with tangible economic gains. Therefore, the main research problem is how this integration affects the reduction of



operational costs, achieving economic and environmental sustainability at the same time, and achieving economic, social, environmental, and sustainable benefits. To support this statement, two research questions have been formulated:

- 1.Can economic units integrate the strategy of shared value creation and sustainable manufacturing?
- 2.Can this integration reduce costs and bring economic and environmental benefits to the economic unit?

2.1.Hypothesis

This study hypothesizes that the integration of a shared value creation strategy and sustainable manufacturing contributes positively to cost reduction for economic units by improving an efficient use of available resources, reducing loss, and improving technical innovations. Accordingly, these actions enhance the competitiveness of economic unity and achieve economic, social, environmental, and sustainable benefits.

3.1.Significance

This study is important in that it:

- 1.Provides insights into how to improve the financial performance of economic units by reducing costs through sustainable and innovative strategies.
- 2.Helps understand how to achieve environmental sustainability by reducing the use of natural resources, reducing emissions, and promoting sustainable industrial business.
- 3.Highlights the role of innovation in integrating shared value creation with sustainable manufacturing, and contributes to the development of new technologies that can achieve efficiency and reduce costs.

4.1. Objectives

This paper is set to achieve the following:

- 1.Investigating how to integrate sustainable manufacturing and effectively create shared value in order to improve efficiency and reduce costs in economic units.
- 2.Identifying the factors that help or hinder integration between shared value creation and sustainable manufacturing. Understanding how integration can foster social, environmental, and economic benefits.
- 3.Recognizing how this integration can help economic units enhance their market competitiveness by aligning sustainability with economic efficiency.

5.1.Limits

This study is limited to the Zawraa General Electrical Industries Co., Baghdad, Iraq.

6.1.Methodology

This study has adopted an analytical descriptive approach. Additionally, the 5-point Likert scale was used to analyze the subjects' responses in order to verify study variables and develop conclusions and recommendations.

2.Epistemological Foundations of Shared Value Creation

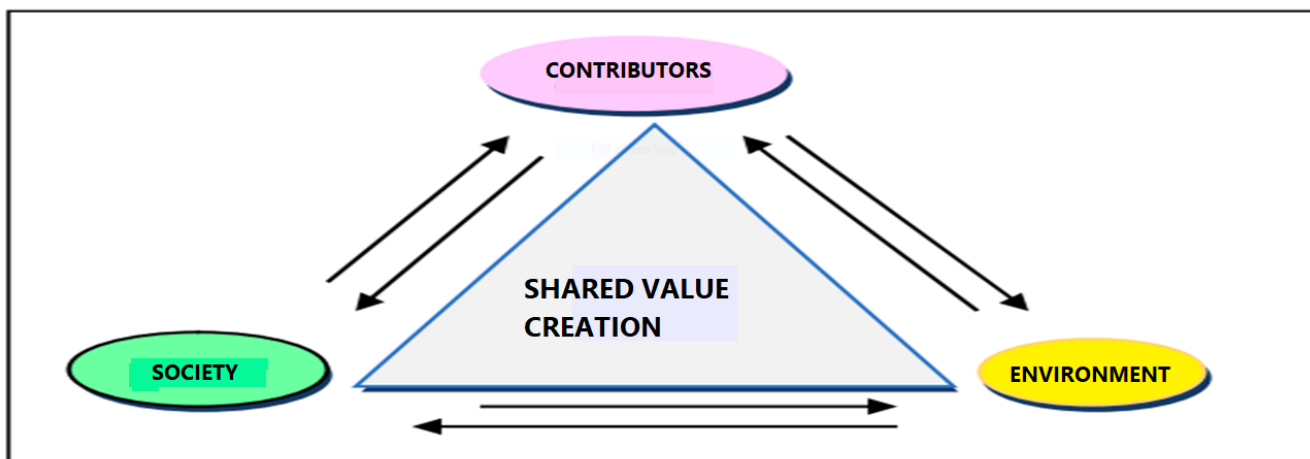
In many sectors and businesses, corporate boards are often faced with numerous strategic decisions that determine their performance in aligning with the set objectives. In this respect, the most important specific end is to make decisions about how to create unit-oriented values. The value of the economic unit is the key to the board's achievement of its objectives. Therefore, a continuous evaluation is necessary to determine the accomplishments. As maximizing value is a key principle, senior management exploits available resources to maximize the shared value of both economic unity and shareholders. These boards usually look for the best value-creating strategies and find ways to link resources to performances.

1.2.Concept of Shared Value Creation

Porter and Kramar (2011) introduced the concept of shared value creation, suggesting that economic unity can reorganize priorities, particularly between business and society. In other words, by addressing the challenges it faces, shared value creation generates both economic value and society-oriented values. Shared value is a fairly new concept because societal progress is a key pillar in the continuation of competition for economic unity (Carroll et al. 2016:62). Simply put, shared value refers to the economic unit's policies and practical practices designed to foster market competition. Likewise, shared value improves the economic and social conditions of the communities in which businesses take place (Porter & Kramar, 2011:66). The ability of the economic unit to create shared value involves financing its financial needs, creating surplus value, and exploiting available resources. This is due to the link between efficient funding and the ability to convert financial potential into increased revenue, after deducting all financing process costs and optimizing its resources (Lacoun and Yousifi, 2021:238). Also, shared value is a three-dimensional sustainability strategy, meaning that economic unity is financially, socially, and environmentally sustainable in all its activities (Rendal, 2015:15). Following these premises, shared value creation strategy seeks to achieve the objectives of three key elements, namely society, environment, and shareholders. Any shared value creation strategy bases itself

on society and the environment to avoid affecting either. Businesses should consider society and the environment to ensure that neither suffers harm or damage. Additionally, businesses can achieve and preserve their social values and solve their problems, thereby creating economic value. The figure below illustrates the components of a typical shared value creation strategy (Yousif & Belquasimi, 2022:10).

Fig. (1) Components of shared value creation strategy (Based on Simatupang, T.M., Ginardy, R., & Handayat, Y. (2018), New framework for value chain thinking. *International Journal of Value Chain Management*, 9(3) p 9.)



Based on these discussions, shared value creation does not mean achieving profits without considering society-focused goals. Rather, it is the creation of a financial value of the economic unity with the social needs being met. Therefore, the economic unit cannot achieve profits unless it results in social gains.

2.2.Steps of Shared Value Creation

Porter and Kramar (2011) proposed three basic steps that a business must take to create a shared value engaging social aims with economic interests. Depending on their own policies, a business can focus on any step that increases shared value (Porter & Kramar, 2011:7). Below are these steps in detail.

Step 1: Redesigning Products and Market

In this step, research and development are given a great role by the economic unit. This is through the search for the optimal method of production and the innovation of new design and production methods to solve the problems facing society that relate to the production process. This is done by innovating new production methods capable of achieving the goals of economic unit and preserving the environment at the same time.

Step 2: Redefinition of Productivity in Value Chain

This step requires a reconsideration of the value chain and its utilization in transportation, distribution, and other related services. Also, handling and delivery processes must be streamlined. It must be borne in mind that optimal use of available resources and the use of modern technology in the manufacturing process significantly affect all steps of the value chain. Therefore, a given economic unity should create value and reduce costs in core or supporting activities in the value chain.

Step 3: Creation of Local Support Lobbies

After redesigning products and re-identifying productivity in the value chain, the economic unit must move towards creating relationships with all stakeholders in business continuity. Therefore, the economic unity must conclude agreements with stakeholders, including the state, NGOs, suppliers, investors, banks, and consumer protection associations, so that the economic unity benefits from collective impact when doing business.

3.2.Social Responsibility vs. Shared Value Creation



There is a clear difference between the concept of social responsibility, as well as the relevant periodic or circumstantial voluntary initiatives, and the concept of shared value creation, which is a strategy in itself. These differences can be summarized as follows:

1. Most social responsibility programs are based on improving the reputation of the economic unit and are not strongly linked to its core activities. This makes social responsibility difficult to justify in the long term. On the other hand, the creation of shared value is associated with its profitability and competitiveness; it leverages the resources and competencies of economic unity to generate social value concurrently with achieving economic value. Therefore, creating shared value is associated with sustainable development and achieving competitive advantage (Fallaq et al., 2018:202).
2. The shared value creation strategy modifies all economic unit operations in order to consistently achieve new value, while social responsibility is a short-term solution.
3. The concept of shared value does not encompass economic or social actions that do not directly or indirectly aim to achieve profits. However, the concept of shared value emphasizes the importance of making profits as a catalyst for growth, while also acknowledging social responsibility, which does not always prioritize profits (Risso and Testarmata, 2018:127).
4. The shared value creation strategy integrates the social and environmental dimension into its activities to achieve economic value, whereas social responsibility is based on actions unrelated to economic unity.
5. Social responsibility maximizes and invests in resources to improve the image of economic unity, as opposed to the shared value creation strategy that aims to change the main business, strategy, individuals, structures, and reward for the realization of the bottom-line triple returns (Kharchie, 2016:7).

4.2. Economic and Social Effects of Shared Value Creation

The extent to which each level contributes to creating value for economic unity can be explained by the social value of society. The table below illustrates the economic and social effects of each level of shared value creation (Porter & Kramer, 2011:6).

Table: (based on Porter and Kramer, 2011,p. 96)

	Level of value creation	Economic effect	Social effect
1	Redesigning Products and Market	-Increased productivity -Increased market share -Increased growth rate -Improving profitability	-Reduce carbon emissions -Improving health care -Improving education -Improved nutrition
2	Redefinition of Productivity in Value Chain	-Improved productivity -Reduce operational and logistical costs -Quality Improvement -Supply Insurance -Improving profitability	-Reducing energy use -Reduce the use of raw materials -Reduction of water use -Improving professional skills -Improving workers' income
3	Creation of Local Support Lobbies	-Cost reduction -Supply Insurance -Improved distribution channel structure -Improving profitability	-Improved learning -Increasing employment opportunities -Improving the level of health -Income improvement

5.2. Benefits of Shared Value Creation Strategies

The shared value creation strategy has several benefits for economic units, which can be detailed as follows (Zenger, 2013:76):

1. Increasing revenues by opening new markets, increasing market share, and providing products and services that meet customers' needs and enhance their loyalty depending on those products that carry social and environmental values.
2. Improving efficiency and reducing costs by reducing resource consumption, improve operational processes that reduce costs, and reducing environmental and regulatory risks when complying with sustainability standards.



3. Enhancing the reputation and confidence of economic unit through society- and environment-benefitting initiatives. This helps build strong relationships with local communities and other partners.
4. Excellence from competitors through sustainable business and social responsibility in line with global pro-sustainability trends.
5. Promoting innovation by encouraging creative thinking in finding solutions to environmental and social challenges and developing new products and services that meet the needs of society and the environment.

6.2. Determinants of Shared Value Creating Strategy

Despite the many benefits of a shared value-creating strategy, there are, however, some determinants facing economic units in adopting and implementing this strategy. These determinants are (Risso and Testarmata, 2018:126):

1. High upfront costs: sustainability initiatives and investment in improved operational processes and innovation require high upfront costs, including the need to allocate substantial resources for staff training and the development of new technologies.
2. Organizational culture: Changing organizational culture in order to embrace the values of social responsibility and sustainability can have the difficulty of resisting change by employees or management that may hinder effective implementation of the strategy.
3. Difficulty in accurately measuring and determining social and environmental impact and linking it to economic unit performance: this requires the development of new performance indicators and advanced measurement tools.
4. Balancing profits and meeting social needs can be difficult because economic units will face pressure from investors to focus on short-term profits rather than long-term sustainability.
5. Supply chain challenges: There must be coordination with suppliers to ensure that they adhere to sustainability standards that require additional efforts and continuous monitoring. Therefore, to overcome these challenges, senior management must demonstrate high commitment and develop comprehensive strategies that encompass all aspects of business and society.

7.2. How to Create Shared Value

Creating shared value requires integrating social and environmental objectives in the very interest of business strategies to achieve the mutual benefits of the economic unit and society. There are several practical ways to create a shared value (Kharchie, 2020:11):

1. Analyzing the needs of society, identifying unmet needs, designing products or services that meet these needs, innovating, and increasing investment in research and development to create sustainable solutions that lead to added value to economic unity and society.
2. Improving productive processes to reduce resource and energy consumption, adopt recycling policies, reduce waste to create a more sustainable environment, and reduce costs associated with that business.
3. Developing the supply chain by collaborating with suppliers to promote sustainable supply standards, improve product quality, and reduce risk.
4. Investing in education and training involves supporting vocational education and training programs, improving workers' skills, increasing employment opportunities, and participating in the development of local infrastructure to promote the welfare of society.
5. Using green technology by adopting modern and eco-friendly technologies, improving efficiency and reducing environmental impact, and investing in renewable sources of energy such as solar and wind.
6. Developing social and environmental impact measurement indicators for initiatives and publishing transparent reports on progress in achieving social goals to increase confidence and credibility.

3. Sustainable Manufacturing

1.3. Concept of Sustainable Manufacturing

Sustainable manufacturing is a concept that has evolved over time in response to industry-related environmental, economic, and social challenges. Sustainable manufacturing has arisen and evolved over many years. The emergence of environmental awareness in the mid-1990s, spurred by increased industrial pollution and chemical leakage incidents, led governments worldwide to impose strict environmental legislation aimed at curbing this pollution. These developments prompted decision-makers to reflect on more sustainable practices and reduce the consumption of available resources. The United Nations Conference on Environment and Development in 1992 emphasized the need for sustainable development and manufacturing as part of the global agenda. The introduction of ISO 14000 standards subsequently provided the framework for economic units to adopt sustainable businesses. With the new



millennium, economic units are beginning to adopt new technologies to increase energy efficiency, reduce waste, and improve environmental performance. Economic units have begun to integrate social responsibility initiatives into their strategies. Sustainable manufacturing can be defined as "providing goods and services to meet the needs of the customer in society while accelerating economic growth and curbing environmental damage through techniques applied by individuals with a high level of education and in accordance with strict ethical laws (Ismail & Mola, 2013:4). Also, sustainable manufacturing can be defined as the design and manufacture of high-quality products and performance while improving and enhancing their functions using energy-efficient, non-hazardous, and toxic-free manufacturing techniques and methods. This is achieved by producing as few materials and emissions as possible, maximizing recovery, recycling, material use, and remanufacturing to achieve social and economic benefits (Jawahir, 2008:87). Sustainable manufacturing is a manufacturing strategy that integrates environmental, social, technical, and economic aspects (Despeisse et al., 2013: 13). Sustainable manufacturing seeks to ensure operational processes such as product design, procurement, management practices, quality control, selection of appropriate technology, scheduling, maintenance, production, and packaging without adverse impacts on natural resources and stakeholders throughout the product's life cycle (Ceptureanu et al., 2018:12).

Economic units' interest in the level of application of sustainable manufacturing practices is due to their role in improving and balancing sustainability performance dimensions, which include environmental sustainability, social sustainability, and economic sustainability, as they enable them to remain competitive in the market (Vinodh and Joy, 2012:82).

2.3. Requirements of Sustainable Manufacturing

Sustainable manufacturing is an approach to the production process that aims to reduce the negative impact of industry on the environment and the negative society of industry while maintaining the economic efficiency and profitability of economic units. Sustainable manufacturing includes a range of practices and techniques that seek to improve resource consumption, reduce waste and pollution, and promote social responsibility. The following are the key components of sustainable manufacturing (Russell & Millar, 2014:42).

- 1.Resource efficiency and reduced energy consumption through the use of energy-efficient technologies and equipment dependent on renewable sources of energy, such as solar and wind.
- 2.Waste reduction through recycling processes and waste from productive processes and design products so that they are easily recyclable.
- 3.Clean production techniques through the use of processes and techniques that reduce emissions and pollutants to air, water, and soil; control emissions through regulation; and compliance with environmental standards.
- 4.Investment in research and development to develop technologies and products that are more sustainable and less influential in the environment and are environmentally friendly products throughout their lifecycle.
- 5.Evaluation of the life cycle of products from the design stage to the end of their production life and adoption of the design of products so that they can be dismantled, reused, or completely recycled.

3.3.Benefits of Sustainable Manufacturing

Economic units often seek many benefits from sustainable manufacturing (Carley et al., 2014:5), including:

- 1.Economic benefits are achieved when applying sustainable manufacturing by reducing costs in the short or long term.
- 2.Cooperation between society and stakeholders within the economic unit.
- 3.Meeting legal and regulatory requirements through the use of lower resources and fewer emissions.
- 4.Improving the reputation of the economic unit as sustainable, thereby increasing its market share and investing that reputation to increase its profits.
- 5.Achieving customer wishes and requirements and increasing brand loyalty to economic unit products.

4.3. Practices of Sustainable Manufacturing

According to the opinions and studies of researchers, there are several sustainable and common manufacturing practices that reflect the product's life cycle. These practices include the design and development of sustainable products, sustainable manufacturing, sustainable supply chain management, and the sustainable end of product life. These practices can be explained as follows:

4.3.1.Designing and Development of Sustainable Products



Sustainable product design and development practices integrate several environmental initiatives at the stage of environmental design. These practices are also known as eco-design, environmental design, or design for sustainability (Abdul-Rashid et al., 2017:15).

Ecosystems, customer requirements, economic benefits, long-term viability, and economic unity initiatives influence the implementation of sustainable product development, an important aspect of sustainable manufacturing. The design of the product is the most important stage in the product's life cycle, which will determine its behavior at later stages. The purpose of the sustainable product design and development process is to reduce or remove hazardous substances, reduce waste, improve resource efficiency and conservation, save energy, increase resource recovery by recycling, design for reuse, and remanufacture (Sultan, 2022:6).

4.3.2. Sustainable Manufacturing

Increased competition by competitors and limited resources of the economic unit are clear signals of the need to change manufacturing strategies in order to streamline processes, enhance productivity, and maintain quality. Manufacturing processes have a significant impact on the environment because they consume a large amount of energy and generate undesirable waste. Therefore, manufacturing processes must be designed and operated in a way that reduces incompatible waste and byproducts, removes hazardous and toxic substances, preserves materials and energy, and reduces physical risks (Adekunle & Dakare, 2020:14).

The manufacturing process has led to the development of numerous initiatives aimed at reducing environmental impacts. Most of these initiatives aim to reduce energy consumption, minimize unwanted waste, and restore resources. The concept of energy management aims to reduce energy consumption in order to improve sustainability during manufacturing processes. Efficient energy management greatly reduces manufacturing process costs while increasing flexibility and improving quality (Abdul-Rashid et al., 2017:18).

4.3.3. Sustainable Management of Supply Chains

Supply chain management is defined as a group of entities directly involved in the initial or final activities of products, services, finance, and information flow from source to customer. The objective of supply chain management is to integrate information and material flows across the chain as an effective competitive weapon. Examples of sustainable supply chain management include sustainable storage, sustainable packaging, reverse logistics, and environmental procurement. Sustainable storage includes proper storage and disposal of hazardous materials, appropriate warehouse location, and safe operations of warehouse equipment. In the same vein, as an operational practice, reverse logistics focuses on the recovery of materials for reintroduction into the supply chain by manufacturing new or used products through reuse, or recycling (Li et al., 2006:109).

4.3.4. Sustainable End of Products

Workers, society, and other stakeholders are deeply concerned about products that have reached the end of their life cycle due to the harm they can cause if left unprocessed. Sustainable end-of-product life cycle practices are defined as environmental operating practices implemented to recover materials or components at the end of a product's life by reusing, remanufacturing, recycling, or product recovery management. Sustainable end-of-life practices for products are a range of activities such as providing maintenance and support services to customers to extend the service life of products or materials, treating hazardous waste in products after recovering from the market, and providing and managing product warranty returns (Ibrahim et al., 2020:16).

4.4. Strategies of Sustainable Manufacturing

There are several strategies for sustainable manufacturing agencies:

1. Recycling strategy: A key concept of modern waste management that aims to return waste that will be dumped or disposed of from the waste stream to valid materials used in productive processes in order to reduce costs, open up new horizons for the economic unit, and take advantage of that waste after its conversion process (Mwanza & Mbohwa, 2017:4).

2. Remanufacturing strategy: is a series of processes that allow the re-marketing of expired products and parts as new products by dismantling, cleaning, checking, repairing, replacing, and reassembling. Remanufacturing provides the economic unit with many options that it can benefit from. The economic unit can use or combine remanufactured products with its manufacturing processes. This means that manufacturers can benefit from low costs, increased profit margins, and competitive advantages, while customers can benefit from more flexible pricing policies (Man Lee et al., 2017:133).



3.Redesign Strategy: is a common strategy adopted by companies to develop a second-generation product with existing products that are unsold or less in demand. Companies manufacture second-generation products by altering the product's shape or enhancing its functionality. The strategy of redesigning the product by changing its physical shape is one of the easiest and most common methods because it does not require advanced techniques or significant investment (Paras et al., 2018:18).

4.Reuse strategy: is to reuse the product or its components for use as a feedstock for a new product. The reuse strategy helps in the use and recycling of waste, preserving the environment, minimizing the negative impact on it, protecting it from harmful chemicals, providing the energy needed for manufacturing, and reducing the quantity of inbound materials to landfills (Houshyar et al., 2018:4).

5.Reduction or reduction strategy: This strategy works to legalize or focus on the use of raw materials rather than waste. In other words, it entails reducing the quantity of materials purchased for use. Often referred to as source downsizing, this approach is the most favored method for minimizing environmental waste (Saleh & Hussein, 2017:91).

6.Recovery strategy: The recovery strategy is interpreted as a superior concept that includes reuse and recycling. The goal of product retrieval is to restore the original value of a product when it fails to meet the user's requirements, or to retrieve obsolete units from users (Li et al., 2006:2).

4.5.Integration between Shared Value Creation and Sustainable Manufacturing

When economic units strive to achieve integration between shared value creation and sustainable manufacturing, they are after several benefits, including:

1.Resource efficiency: Improving the use of natural resources such as water, energy, and raw materials reduces loss and reduces costs because the use of sustainable manufacturing techniques reduces long-term operational costs.

2.Innovation in processes and products: Developing new manufacturing processes or improving existing processes can increase efficiency and reduce waste. Also, the design of longer-lasting or recyclable products reduces production costs and waste disposal costs.

3.Improving the relationship with communities: A shared value creation strategy means that an economic unit works with communities to improve social and economic conditions. This enhances the reputation of the economic unit, increases customer loyalty, increases sales, and reduces costs associated with public relations and marketing.

4.Compliance with environmental standards and laws: Compliance with environmental standards reduces legal risks and financial penalties. The economic unit can receive tax incentives or financial support from governments to adopt sustainable practices.

5.Reducing logistical costs: Using local resources reduces costs associated with shipping, transportation, and reducing carbon emissions. Also, reducing waste can reduce disposal and transportation costs.

Accordingly, the integration of a shared value creation strategy and sustainable manufacturing not only enhances the environmental and social performance of the economic unit but also contributes significantly to cost reduction and increased operational efficiency.

5.Data, Source, and Sample

In this section, the sample, data, and source of the study are identified. Thus, the data of the study, which is the Zawraa General Electrical Industries Co., is elaborated on as to history, structure, and products.

Zawraa General Electrical Industries Co. is a state-owned, industrial company specializing in the production of electric distribution control plates for low-pressure, industrial battery chargers, multi-form systems, printed circuit cards, and production and qualification of programmed machine control plates. Since establishment in the 1980s, this company has sought to expand its activity and develop its products to cover medium voltage systems up to 33 kV, combined distribution stations up to 1600 KVA, and cathode protection systems. Founded in 1988 on over 60,000 m² of land with a capital of 91,000,000 Iraqi dinars, the company currently employs 1,025 people. The company is located in the Zaafaraniyah industrial estate, Baghdad. Additionally, the Zawraa Co. involves six main plants, administrative departments, and technical sections.

1.Medium Voltage Plant

It consists of three manufacturing subdivisions:

1.Kiosk stations: The production of kiosk power distribution plants at different capacities and tailored to the beneficiary's requirements and in accordance with global standards.



2. Medium voltage plates (11KV): The production of medium voltage electrical distribution plates (11KV) according to the type of use in secondary stations, industrial facilities, and service establishments. Providing on-site installation and construction services.

3. Medium voltage plates (33KV): The production of medium voltage electrical distribution plates (33KV) by type of use in secondary stations, industrial facilities, and service establishments. Providing on-site installation and construction services.

2. Low Voltage Plant

This plant consists of two manufacturing subsections:

1. Motor Control (MCC): The production of fixed and moving motor control plates.

2. Capacity Centers: The production of multi-type electrical feeding plates and central operating tables for control rooms.

3. Capacity Systems Plant

It consists of three manufacturing subdivisions:

1. Industrial battery chargers: The production of battery chargers of different measurements, technical specifications, and different conveyors.

2. Power Equipment: production of capacity equipment according to standard specifications used in centrals, electroplating devices, and any other applications.

3. Cathodic protection: The production of cathodic protection equipment which is used to protect pipes, reservoirs, and metal structures against weather or work-related corrosion.

4. Electronic Unit Plant

This plant produces electronic units and it consists of three manufacturing subdivisions:

1. Electronic Printed Services: It produces electronic cards, markers, and codecs of all different kinds.

2. Electronic Units: It assembles electronic units of different types and providing maintenance services for electronic units.

3. Electrochemical paints: It provides electrical and chemical painting of all kinds.

5. Self-Control Plant

It encompasses three sub-departments:

1. Software: here, the preparation, designation, and selection of operational software and applications are determined according to the self-control schemes, working conditions, and proper equipment.

2. Manufacturing: Master schemes of manufacturing are prepared by the company. Control systems are produced according to the preset designs, codes, and plans.

3. On-site operation: This is concerned with the installation of software being developed to control and jointly with the Software Division in the operation of these systems following their on-site construction.

6. Metal Structure

This plant produces metal structures and it involves seven subsections:

1. Mechanical Design: In this subsection, all equipment is designed, operational software is prepared, and operation schemes are created in order to manufacture products.

2. Metal Structures: In this subsection, mechanical structures for electrical equipment are manufactured according to technical schemes issued by the Mechanical Design Division and using devices and equipment set for cutting, drilling, and alloying of metal plates.

3. Mechanical Assembly: Using welding of all kinds, such as MIG and point welding, this division assembles the manufactured parts in the Manufacturing Division, moves them to the coating division, and gathers them in post-coating assembly.

4. Thermal Paint: All manufactured products are painted after being cleaned.

5. Brass Panels: In this subsection, copper panels are formed, designed, and shaped according to measurements using cutters, punchers, and benders, subject to work type, panel splicing, and global standards.

6. Mechanical Operation: In this subsection, lathing, milling, metal molding, and surface smoothing are conducted.

7. Machine Maintenance: This subsection is concerned with the periodic maintenance, service, and repair of mechanical, metal, and software-related devices, equipment, and tools.



Data Collection

The practical part involves collecting data for subjects who are employed in the company by distributing questionnaires to them. 50 questionnaires were distributed, all valid for transcription and statistical analysis. Excel was used to collect data obtained through questionnaires. The data has been processed in SPSS as follows:

- The use of repetitions and percentages to describe the demographic characteristics of subjects.
- The use of means and standard deviations.

Questionnaire: It consists of two sections:

Section I: Information relating to personal data of subjects (sex, age, and qualification).

Section II: A 16-item elaboration on the impact of the integration between shared value creation and sustainable manufacturing on cost reduction.

In order to answer the statements required in section II of the questionnaire, 5-point Likert scale has been adopted, so that subjects are required to agree or disagree to each statement contained in the scale according to the following table:

Table (1) Levels of agreement based on 5-point Likert scale

1	2	3	4	5
Strongly disagree	Disagree	Neutral	Agree	Strongly agree

As shown in Table (1) above, the value (1) indicates strongly disagree, (2) indicates disagree, (3) indicates neutral, (4) indicates agree, (5) indicates strongly agree. The mean is determined by calculating the range ($5-1 = 4$), then dividing it by the largest value in the scale to get the length of the item ($4/5 = 0.8$), after which, adding this value to the lowest value in the scale is (1) to determine the minimum item. Thus, the length of items becomes as illustrated in the table below.

Table (2) Levels of agreement of items and research sections

Mean	Lower than 1.80	1.80 to 2.59	2.60 to 3.39	3.40 to 4.19	Higher than 4.20
Scale	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Assessment	Very poor	Poor	Medium	High	Very high

Questionnaire Reliability

The reliability of questionnaire statements has been tested using the Cronbach-Alpha coefficient to calculate reliability. Reliability refers to the absence of errors in a scale due to inadequate comprehension, misinterpretation of questions, or reliance of sample subjects on random responses that do not accurately reflect the intended situation, which can lead to varying results when reused. Therefore, with a reliability coefficient of (0.845) and a high statistical significance, this scale meets the research objectives. The validity indicator was calculated using the square root of the reliability coefficient. As a result, the overall validity index has reached 0.92, which is a high reliability coefficient, indicating that the questionnaire is highly valid.

Table (3) Questionnaire reliability based on the Cronbach-Alpha coefficient

Sample subjects	Employees in Petrochemical Plant
Cronbach-Alpha coefficient	0.845



As Table (3) above demonstrates, the Cronbach-Alpha coefficient has reached 84%, indicating a highly significant level of validity and reliability that aligns with the study's objectives. This indicates that the questionnaire results exhibit a high degree of reliability, remaining unchanged even after multiple redistributions among the subjects. The results related to the questionnaire statements (the impact of integration between the shared value creation and sustainable manufacturing on cost reduction) will be presented. The following tables indicate the means, standard deviations, and average mean values.

Table (4) Item (4) along with subjects' responses, standard deviation, and mean

#	Statement	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Standard Deviation	Mean
4	There is an importance for shared value creation strategy between the company and society	2	4	10	12	22	3.71709	4.76
	Percentage %	4%	8%	20%	24%	44%		

The table above shows that the mean value of item (4) is 4.76, which exceeds 4.20 based on the response scores specified in Table (2). This indicates a high level of approval for item (1) and a standard deviation of 3.71709 for mean responses.

Table (5) Item (2) along with subjects' responses, standard deviation, and mean

#	Statement	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Standard Deviation	Mean
2	Corporate strategies focus on meeting societal needs and achieving profits in the same time	5	2	9	11	23	3.78099	4.90
	Percentage %	10%	4%	18%	22%	46%		

The table above shows that the mean value of item (2) is 4.90, which exceeds 4.20 based on the response scores specified in Table (2). This indicates a high level of approval for item (2) and a standard deviation of 3.78099 for mean responses.

Table (6) Item (3) along with subjects' responses, standard deviation, and mean

#	Statement	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Standard Deviation	Mean
3	The company contributes to societal development by creating job opportunities and developing skills	2	3	1	17	27	4.1129	5.68
	Percentage %	4%	6%	2%	34%	54%		



The table above shows that the mean value of item (3) is 5.68, which exceeds 4.20 based on the response scores specified in Table (2). This indicates a high level of approval for item (3) and a standard deviation of 4.1129 for mean responses.

Table (7) Item (4) along with subjects' responses, standard deviation, and mean

#	Statement	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Standard Deviation	Mean
4	The company is effectively improving workers' living conditions and the surrounding community	3	1	11	14	21	3.66723	4.58
	Percentage %	6%	2%	22%	28%	42%		

The table above shows that the mean value of item (4) is 4.58, which exceeds 4.20 based on the response scores specified in Table (2). This indicates a high level of approval for item (16) and a standard deviation of 3.66723 for mean responses.

Table (8) Item (5) along with subjects' responses, standard deviation, and mean

#	Statement	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Standard Deviation	Mean
5	The company engages stake holders (such as local community, employees, and customers) in decision making	3	3	5	20	17	3.38237	3.82
	Percentage %	10%	6%	10%	40%	34%		

The table above shows that the mean value of item (5) is 3.82, which exceeds 3.40 and 4.19 based on the response scores specified in Table (2). This indicates a high level of approval for item (5) and a standard deviation of 3.38237 for mean responses.

Table (9) Item (6) along with subjects' responses, standard deviation, and mean

#	Statement	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Standard Deviation	Mean
6	The company uses principles of sustainable manufacturing in its production processes	4	4	13	10	19	3.46316	5.72
	Percentage %	8%	8%	26%	20%	38%		



The table above shows that the mean value of item (6) is 5.72, which exceeds 4.20 based on the response scores specified in Table (2). This indicates a high level of approval for item (6) and a standard deviation of 3.46316 for mean responses.

Table (10) Item (7) along with subjects' responses, standard deviation, and mean

#	Statement	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Standard Deviation	Mean
7	The company is committed to decreasing environmental effects through the manufacturing techniques used	6	4	14	34	42	3.68942	3.92
	Percentage %	12%	8%	28%	68%	84%		

The table above shows that the mean value of item (7) is 3.92, which exceeds 3.40 and 4.19 based on the response scores specified in Table (2). This indicates a high level of approval for item (7) and a standard deviation of 3.68942 for mean responses.

Table (11) Item (8) along with subjects' responses, standard deviation, and mean

#	Statement	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Standard Deviation	Mean
8	The company is interested in using eco-friendly materials and reducing waste	1	9	16	9	15	3.17998	2.78
	Percentage %	2%	18%	32%	32%	30%		

The table above shows that the mean value of item (8) is 2.78, which exceeds 2.6 and 3.39 based on the response scores specified in Table (2). This indicates the selection of "neutral" for item (8) and a standard deviation of 3.17998 for mean responses.

Table (12) Item (9) along with subjects' responses, standard deviation, and mean

#	Statement	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Standard Deviation	Mean
9	The company is improving energy sources to achieve sustainability requirements	4	3	7	12	24	3.85947	5.78
	Percentage %	8%	6%	14%	24%	48%		

The table above shows that the mean value of item (9) is 5.78, which exceeds 4.20 based on the response scores specified in Table (2). This indicates a high level of approval for item (9) and a standard deviation of 3.85947 for mean responses.

Table (13) Item (10) along with subjects' responses, standard deviation, and mean



#	Statement	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Standard Deviation	Mean
10	Programs and initiatives affect sustainability within the company	2	4	13	15	16	3.2422	3.78
	Percentage %	4%	8%	26%	30%	32%		

The table above shows that the mean value of item (10) is 3.78, which exceeds 3.40 and 4.19 based on the response scores specified in Table (2). This indicates a high level of approval for item (16) and a standard deviation of 3.2422 for mean responses.

Table (14) Item (11) along with subjects' responses, standard deviation, and mean

#	Statement	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Standard Deviation	Mean
11	The company is effectively reducing costs without affecting the quality of products	7	3	8	19	13	3.00177	3.56
	Percentage %	14%	6%	16%	38%	26%		

The table above shows that the mean value of item (11) is 3.56, which exceeds 3.40 and 4.19 based on the response scores specified in Table (2). This indicates a high level of approval for item (11) and a standard deviation of 3.00177 for mean responses.

Table (15) Item (12) along with subjects' responses, standard deviation, and mean

#	Statement	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Standard Deviation	Mean
12	The company is adopting effective approaches in the management of raw materials and in manufacturing	4	9	7	13	17	3.30738	4
	Percentage %	8%	18%	14%	26%	34%		

The table above shows that the mean value of item (12) is 4, which exceeds 3.40 and 4.19 based on the response scores specified in Table (2). This indicates a high level of approval for item (12) and a standard deviation of 3.30738 for mean responses.

Table (16) Item (13) along with subjects' responses, standard deviation, and mean

#	Statement	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Standard Deviation	Mean
13	Cost reduction policies contribute to profit improvement and	5	11	9	11	14	3.00958	4.06

	competitiveness boosting							
	Percentage %	10%	22%	18%	22%	28%		

The table above shows that the mean value of item (13) is 4.06, which exceeds 3.40 to 4.20 based on the response scores specified in Table (2). This indicates a high level of approval for item (13) and a standard deviation of 3.00958 for mean responses.

Table (17) Item (14) along with subjects' responses, standard deviation, and mean

#	Statement	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Standard Deviation	Mean
17	Cost reduction impacts customer satisfaction and product quality	4	2	4	12	28	4.12414	4.46
	Percentage %	8%	4%	8%	24%	56%		

The table above shows that the mean value of item (14) is 4.46, which exceeds 4.20 based on the response scores specified in Table (2). This indicates a high level of approval for item (14) and a standard deviation of 4.12414 for mean responses.

Table (18) Item (15) along with subjects' responses, standard deviation, and mean

#	Statement	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Standard Deviation	Mean
15	The company has clear policies to balance cost reduction with achievement of sustainability	3	2	3	16	26	4.03935	5.70
	Percentage %	6%	4%	6%	32%	52%		

The table above shows that the mean value of item (15) is 5.70, which exceeds 4.20 based on the response scores specified in Table (2). This indicates a high level of approval for item (15) and a standard deviation of 4.03935 for mean responses.

Table (19) Item (16) along with subjects' responses, standard deviation, and mean

#	Statement	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Standard Deviation	Mean
16	The company is committed to achieving sustainability requirements compared to	6	2	3	10	29	4.15044	5.28



other companies in the same sector in order to reduce costs								
Percentage %	12%	4%	6%	20%	58%			

The table above shows that the mean value of item (16) is 5.28, which exceeds 4.20 based on the response scores specified in Table (2). This indicates a high level of approval for item (16) and a standard deviation of 4.15044 for mean responses.

Table (20) Level of means of subjects' responses according to the items

Item 1: Independent Variables: Shared Value Creation Strategy and Sustainable Manufacturing									
No.	Statement	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Standard Deviation	Mean	Level
1	There is an importance for shared value creation strategy between the company and society	2	4	10	12	22	3.71709	4.76	10
	Percentage %	4%	8%	20%	24%	44%			
2	Corporate strategies focus on meeting societal needs and achieving profits in the same time	5	2	9	11	23	3.78099	4.90	11
	Percentage %	10%	4%	18%	22%	46%			
3	The company contributes to societal development by creating job opportunities and developing skills	2	3	1	17	27	4.1129	5.68	12
	Percentage %	4%	6%	2%	34%	54%			
4	The company is effectively improving workers' living conditions and the surrounding community	3	1	11	14	21	3.66723	4.58	8
	Percentage %	6%	2%	22%	28%	42%			
5	The company engages stakeholders (such as local community, employees, and customers) in decision making	5	3	5	20	17	3.38237	3	3
	Percentage %	10%	6%	10%	40%	34%			
6	The company uses principles of sustainable manufacturing in its production processes	4	4	13	10	19	3.46316	9	9
	Percentage %	8%	8%	26%	20%	38%			

7	The company is committed to decreasing environmental effects through the manufacturing techniques used	6	4	14	34	42	3.68942	6	6
	Percentage %	12%	8%	28%	68%	84%			
8	The company is interested in using eco-friendly materials and reducing waste	1	9	16	9	15	3.17998	4	4
	Percentage %	2%	18%	32%	18%	30%			
9	The company is improving energy sources to achieve sustainability requirements	4	3	7	12	24	3.85947	13	13
	Percentage %	8%	6%	14%	24%	48%			
10	Programs and initiatives affect sustainability within the company	2	4	13	15	16	3.2422	2	2
	Percentage %	4%	8%	26%	30%	32%			

Item 2: Dependent Variable: Cost Reduction

No.	Statement	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Standard Deviation	Mean	Level
11	The company is effectively reducing costs without affecting the quality of products	7	3	8	19	13	3.00177	3.56	1
	Percentage %	14%	6%	16%	38%	26%			
12	The company is adopting effective approaches in the management of raw materials and in manufacturing	4	9	7	13	17	3.30738	4	7
	Percentage %	8%	18%	14%	26%	34%			
13	Cost reduction policies contribute to profit improvement and competitiveness boosting	5	11	9	11	14	3.00958	4.06	5
	Percentage %	10%	22%	18%	22%	28%			
14	Cost reduction impacts customer satisfaction and product quality	4	2	4	12	28	4.12414	4.46	14
	Percentage %	8%	4%	8%	24%	56%			
15	The company has clear policies to balance cost reduction with achievement of sustainability	3	2	3	16	26	4.03935	5.70	11
	Percentage %	6%	4%	6%	32%	52%			



16	The company is committed to achieving sustainability requirements compared to other companies in the same sector in order to reduce costs	6	2	3	10	29	4.15044	5.28	15
	Percentage %	12%	8%	6%	20%	58%			
Average							3.60797	72.78	

Table (20) above demonstrates that the subjects' responses were high. The general mean is 1.7998, which is less than 1.80 based on the response scores specified in Table (2). Additionally, the results of the statistical analysis indicated that the most agreeable statement was "The company is effectively reducing costs without affecting the quality of products," as it placed first with a mean (3.56) and a standard deviation (3.00177). The statement, "Programs and initiatives affect sustainability within the company," achieved a mean of 3.78 and a standard deviation of 3.2422. The statement "The company engages stake holders (such as local community, employees, and customers) in decision making" received a mean of 3.82 and a standard deviation of 3.38237. The statement, "The company is improving energy sources to achieve sustainability requirements," ranked thirteenth with a mean of 5.78 and a standard deviation of 3.85947. The statement "Cost reduction impacts customer satisfaction and product quality" placed fourteenth with a mean of 4.46 and a standard deviation of 4.12414. The statement "The company is committed to achieving sustainability requirements compared to other companies in the same sector in order to reduce costs" came in last, with a mean of 5.28 and a standard deviation of 4.15044. Finally, the table displays a general mean of 1.7998, signifying the subjects' level of approval, and a standard deviation of 3.60797, suggesting a narrow distribution of answers around the general average value.

CONCLUSIONS:

- 1.Shared value creation between the company and the community is key to achieving long-term growth by focusing on improving society, increasing profit together, and promoting financial and social sustainability.
- 2.When the company contributes to integrating the needs of the local community into its strategies and improving its relationship with customers and stakeholders, it enhances loyalty and reputation.
- 3.Sustainable manufacturing is no longer merely an option but a strategic necessity. A company that adopts sustainable manufacturing practices can reduce long-term costs by improving resource efficiency and minimizing losses.
- 4.Sustainable manufacturing techniques, such as the use of renewable energy and recyclables, improve productive efficiency and reduce environmental impacts. These factors contribute to creating added value for both the community and the company.
- 5.Strategically integrating these three dimensions enhances the company's ability to innovate and excel. A company that can achieve this integration can adapt to environmental and economic variables better, which contributes to enhancing its competitiveness.
- 6.Cost reduction has a positive impact on profits but requires careful balance while maintaining quality and customer service.

RECOMMENDATIONS

- 1.Companies must adopt comprehensive strategies, including creating shared value with society, investing in sustainable manufacturing, and applying effective cost-cutting methods.
- 2.The company must be flexible in adjusting its strategies based on environmental and economic variables to remain competitive in the market.
- 3.Partnerships with the community and NGOs must be expanded to promote shared value. The company must focus on businesses that contribute to improving the quality of life in local communities, such as job creation and skills training.
4. Adopting sustainable manufacturing policies at a wider level is necessary, including the use of recyclables, reducing energy consumption, and adopting green manufacturing techniques that reduce environmental impacts.



5. The company must develop training courses for employees to enhance their efficiency in resource management and modern production techniques, as these practices enhance the company's ability to reduce costs.
6. Consumers should be encouraged to interact with sustainable products through awareness campaigns, as these actions help the company increase the demand for green and sustainable products.

REFERENCES:

- Abdul-Rashid, S.H., Sakundarini, N., Ghazilla, R.A.R., & Thurasamy, R. (2017). The impact of sustainable manufacturing practices on sustainability performance. *International Journal of Operations & Production Management*, 37 (2).
- Yousif, A. & Belqouasimi, F. (2022). The economic intelligence-Shared value creation dichotomy under the Corona pandemic: A case study of Nestlé company. *Journal of North African Economics*, 18 (28) 157-180.
- Carley, S., Jasinowski, J., Glassley, G., Strahan, P., Attari, S., and Shackelford, S. (2014). *Success paths to sustainable manufacturing*. School of Public and Environmental Affairs Indiana University.
- Carroll, A.B., Brown, J.A., & Buchholtz, A.K. (2016). *Business and society: Ethics, sustainability, and stakeholder management*. Cengage Learning.
- Ceptureanu, E.G., Ceptureanu, S.I., Bologa, R., & Bologa, R. (2018). Impact of competitive capabilities on sustainable manufacturing applications in Romanian SMEs from the textile industry. *Sustainability*, 10(4), 942.
- Despeisse, M., Oates, M.R., & Ball, P.D. (2013). Sustainable manufacturing tactics and cross-functional factory modeling. *Journal of Cleaner Production*, 42, 31-41.
- Fallaq, M., Hadou, S.A., & Kharchie, I. (2018). Shared value creation contribution to building sustainable economic development using the Nestlé shared value creation model. *Nama Journal of Economics and Trade*, 1, 200-220.
- Ibrahim, Y.M., Hami, N., & Abdulameer, S.S. (2020). Assessing sustainable manufacturing practices and sustainability performance among oil and gas industry in Iraq. *International Journal of Energy Economics and Policy*, 10(4), 60-67.
- Jawahir, L.S. (2008). Beyond the 3R'S: 6R concepts for next generation manufacturing: Recent trends and case studies. *Symposium on Sustainability and Product Development*, Chicago.
- Kharchie, I. (2016). Towards a new business model for Algerian economic companies to create economic value and social benefit: A proposed model. *12th International Forum on the Role of Social Responsibility of Small and Medium Enterprises in Strengthening the Sustainable Development Strategy*. University of Hassiba Benbouali of Chlef, Algeria.
- Lacoun, A. & Yousify, A. (2021). Value creation in the enterprise using the added economic value: A case study of the Eurasie Enterprise. *University of Ferhat Abbas Journal of Economic Studies*, 15(2) 234-251.
- Li, S., Ragu-Nathan, B., Ragu-Nathan, T.S., & Rao, S.S. (2006). The impact of supply chain management practices on competitive advantage and organizational performance. *Omega*, 34(2), 107-124.
- Porter, M. & Kramer, M. (2011). Creating shared value: How to reinvent capitalism and unleash a wave of innovation and growth. *Harvard Business Review*.
- Rendal, J.P. (2015). *How Creating Shared Value is taking corporate social responsibility one step further: Google as a case study*. Universidade de Coruna.
- Risso, M. and Testarmata, S. (2018). *Value sharing for sustainable and inclusive development*. IGI Global Publishing.
- Russell, S.N. & Millar, H.H. (2014). Exploring the relationships among sustainable manufacturing practices, business performance and competitive advantage: Perspectives from a developing economy. *Journal of Management and Sustainability*, 4, (3), 37-53.
- Simatupang, T.M., Ginardy, R., & Handayaty, Y. (2018), New framework for value chain thinking. *International Journal of Value Chain Management*, 9(3) 7-23.
- Vinodh, S. & Joy, D. (2012). Structural equation modeling of sustainable manufacturing practices. *Clean Technologies and Environmental Policy*, 14(1), 79-84.
- Zenger, T. (2013). What is the theory of Your firm: Focus less on competitive advantage and more on growth that creates value. *Harvard Business Review*, pp. 72-78.
- Man Lee ,Choon ; Sik Woo , Wan & Hwa Roh , Young, (2017),Remanufacturing: Trends and Issues, International Journal, of precision engineering and manufacturing green technology , Vol: 4, No:1, pp: 113-12.
- Paras,Manoj Kumar; Wang,Lichuan;Chen, Yan ;Curteza,Antonela ;Pal,Rudrajeet & Ekwall, Daniel,(2018),A Sustainable Application Based on Grouping Genetic Algorithm for Modularized Redesign Model in Apparel Reverse Supply Chain,College Engineering, Soochow University, China.
- Saleh, Nida Mahdi& Hussein, Intisar Hadi,(2017), The Role of Green Manufacturing Strategy in Reducing Costs Using the Value Stream Map, Al-Technical Magazine, Volume: 30, Issue: 4.
- Houshyar, Afsaneh Nouri; Houshyar, Azadeh Noori & Sulaiman , Riza bin ,(2017),Review Paper on Sustainability in Manufacturing System ,Journal of Applied Environmental and Biological Sciences,Vol:4,No:4.p.p:7-11.