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THE ROLE OF STRONG AND WEAK RELATIONSHIPS BETWEEN CSF AND PM FOR ORGANIZATIONAL PERFORMANCE

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ABSTRACT

This study has important implications for managers. First, it motivates managers (and provides a justification) to invest time and resources to implement TQM programs. By examining TQM in relation to organization strategy, the study seeks to advance the understanding of TQM in a broader context. In this paper, we are exploring the relationship between the extent of total quality management (TQM) implementation and organization performance, and the moderation with strong and weak related to CSF and PM for organization support on the TQM performance relationship. It also resolves some controversies that appear in the literature concerning the relationship between TQM and differentiation and cost leadership strategies as well as quality and innovation performance. The empirical data for this study was drawn from a survey of 500 data with recreation analysis. The analysis was conducted using a relationship with Organizational Performance by examining two competing models that represent full and partial mediation. The findings indicate that TQM is positively and significantly related to differentiation strategy, and it only partially mediates the relationship between differentiation strategy and three performance measures (product quality, product innovation, and process innovation). The implication is that TQM needs to be complemented by other resources to more effectively realize the strategy in achieving a high level of performance, particularly innovation.

KEYWORDS: Green Manufacturing, Cement Industry, Total Quality Management, TQM, Critical Success Factors, CSFs, Quality Management

INTRODUCTION

Cement is a major part of today's construction industry which demands solutions that consider both economical and ecological aspects [1]. Cement manufacturers are continuously striving to achieve more efficient and environmentally-friendly production methods in cost-effective concepts for a more ecologically-friendly production of so-called 'green' cement. Cement is often considered a key industry for a number of reasons. To begin with, cement is an essential input into the production of concrete, a primary building material for the construction industry. Due to the importance of cement for various construction-related activities such as highways, residential and commercial buildings, tunnels and dams, production trends tend to reflect general economic activity [2] [3].

Being one of the basic elements for setting up strong and healthy infrastructure, Cement plays a crucial role in

economic development of any country [4] [5]. Having more than a hundred and fifty years history, it has been used extensively in construction of anything, from a small building to a mammoth multi-purpose project [6]. The manufacturing process of cement consists of mixing, drying and grinding of limestone, clay and silica into a composite mass [7].

The mixture is then heated and burnt in a pre-heater and kiln to be cooled in an air-cooling system to form clinker, which is the semi-finished form. This clinker is cooled by air and subsequently ground with gypsum to form cement. There are three types of processes to form cement: the wet, semi-dry and dry processes [8] [9]. In the wet/semi-dry process, raw material is produced by mixing limestone and water (called slurry) and blending it with soft clay. In the dry process technology, crushed limestone and raw materials are ground and mixed without the addition of water [10] [11]. The Beginning of Indian Cement Industry.

The attempt to produce cement in India dates back to 1889 when a Calcutta firm attempted to produce cement from Argillaceous [12]. The factory could not succeed hence it failed. However, it was in 1914 that the first commissioned cement-manufacturing unit in India was set up by India Cement Company Limited at Porbandar, Gujarat, with an installed capacity of 10,000 tonnes and production of 1000 tonnes. Subsequently two plants; one at Katni (M. P.) and another at Lakheri (Rajasthan) were set up. The First World War gave positive stimulus to the infant industry [13]. The following decades saw increase in number of plants, installed capacity and production. This period can thus be called the Nascent Stage of Indian cement industry [14].

In cement industry explaining GM accomplished by considering each operational element, including the supply and acquisition of upstream materials, research and development, manufacturing and packaging, marketing, promotion and education and recycling activities [15] [16]. Green value chain refers to the lifecycle of a product beginning with the initial sourcing, through research and development (R&D) and production all the way to the final recycling of waste and product abandonment. Green Manufacturing is a method for manufacturing that minimizes waste and pollution. It slows the depletion of natural resources as well as lowering the extensive amounts of trash that enter landfills [17]. GM technologies maintain customers in reducing their environmental unsafely and help them to be more profitable in a sustainable way. In this, technologies include variety of practices involved in reduction of material waste, including recycling, substitution of less hazardous alternatives, consumption of waste internally, and remanufacturing.

It is found that more emphasis is given on minimizing environmental impact by reducing, reusing, remanufacturing and recycling technologies including source reduction, minimization of resource consumption, enhancing use intensity. To great success in green manufacturing, corporate cultures need to be urbanized in which the organization without a doubt defines its image of green manufacturing and defines its objectives for achievement, set up a plan for achieving the objectives, and be familiar with the penalty and costs of not achieving these objectives [18]. A green manufacturing financial system substitute's clean energy and low carbon technologies for fossil fuels, which deal with climate change, creates jobs, and reduces significance needs. Alongside with support of top management, a team move toward with demonstration from engineering, production, purchasing and human resources has been originate to be necessary, rather than trust on plant-level environmental connoisseur or consultants [19].

In this paper, we approach a GM model including a green design and a technique with proposed green manufacturing technique is considered for cement industry. Here, our method representing apart from those currently available is a green manufacturing economy substitute's clean energy and low carbon technologies for cement industry.

The rest of the paper is organized as follows. Section 2 describes literature review. Section 3 describes our propose model. Section 4 discusses about the performance analysis results, and Section 5 concludes and discussions the paper.

RECENT RELATED WORKS: A BRIEF REVIEW

Though a plenty of related works are available in the literature, a concise number of works are reviewed just below:

Mehmet Demirbag *et al.* [20] have determined the critical factors of total quality management (TQM) and to measure their effect on organizational performance of SMEs operating in Turkish textile industry. Using exploratory and confirmatory factor analyses, seven empirically validated dimensions of TQM were identified. The structural equation modeling technique was employed to investigate the relationship between the implementation of TQM practices and organizational performance. Data analysis reveals that there is a strong positive relationship between TQM practices and non-financial performance of SMEs, while there is only weak influence of TQM practices on financial performance of SMEs. With only a mediating effect of non-financial performance that the TQM practices has a strong positive impact on financial performance of SMEs. As the data in this study were collected from top managers of organizations on the basis of their subjective evaluations, objective performance indicators should also be employed in the analysis.

Shamsur Rahman *et al.* [21] have a method for profound impact on organizational performance. However, most empirical studies have examined the impact of each dimension of TQM on performance separately. They argued that it was more appropriate to investigate the direct impact of soft TQM on the diffusion of hard TQM, and then assess the direct impact of hard TQM on performance. Analysis of 261 Australian manufacturing companies revealed significant positive relationships between soft TQM and hard TQM elements. In addition to direct a2ects, soft TQM also has an indirect a2ect on performance through its eect on hard TQM.

Daniel I. Prajogo *et al.* [22] have presented total quality management (TQM) practices in mediating the relationship between organization strategy and organization performance. By examining TQM in relation to organization strategy, the study seeks to advance the understanding of TQM in a broader context. It also resolves some controversies that appear in the literature concerning the relationship between TQM and differentiation and cost Leadership strategies as well as quality and innovation performance. The findings indicate that TQM was positively and significantly related to differentiation strategy, and it only partially mediates the relationship between differentiation strategy and three performance measures (product quality, product innovation, and process innovation). The implication was that TQM needs to be complemented by other resources to more effectively realize the strategy in achieving a high level of performance, particularly innovation.

Sadhana Chaurasia *et al.* [23] have proposed a research work for data of the ambient air quality status of Nambahera district of Chittorgarh Rajasthan, India. The Air quality was assessed based on New National Ambient Air Quality Standard. The selected parameters were SPM, PM10, SO2, NOx. The average value of PM10 was found beyond the permissible limit at near power plant and near coal mill. The outcome of the study has been presented in the form of Air Quality Index. AQI was found moderate for PM10 and SO2 & NOx were observed in good range.

Mohsen Attari *et al.* [24] have discussed a technique “how environmental evaluation of the cement industry in Iran can be facilitated”. In this proposed method, they have developed cooperating with experts from university, industry

and policy makers. The importance of the indicators was determined with the help of the cooperating industrial partners. By using the TOPSIS method, indicators were prioritized and improvement strategies for this industrial sector were derived. 15 indicators were introduced; among them seven are for the intensity of consumptions during production of cement and emissions production, three for control of emissions to air, four for capacities of control of water pollution and one for the inefficiency level in the execution of ISO 14000.

Azad Rahman *et al.* [25] have proposed process for energy consuming and heavy polluting. In this paper summarized and reviewed on the usage of different types of alternative fuel and their impacts on the plant performance. The past research suggests that the maximum benefit can be derived by using an appropriate blend of different types of alternative fuels together with fossil fuels. However, the studies on quantification of appropriate mixing ratio of different alternative fuels to increase the plant performance are scant. Further study was required to determine the correct blending ratios. In this work, they focused on the relationship between performance and blending of different alternative fuels used by leading cement-manufacturing groups.

P. Van den Heede *et al.* [26] have investigated the available literature on every step in the LCA of concrete. The adopted functional unit, for which the environmental impact was calculated, influences the outcome significantly. When comparing different concrete compositions, this unit should incorporate differences in strength, durability and service life. Hence, a cradle to grave or modified cradle-to-gate approach is advised as system boundary. When using industrial by-products as cement replacing material in 'green' concrete, an economical allocation of impacts is recommended. Inventory data on energy use, CO2, PM10, SOx and NOx emissions were collected and assigned to the impact categories of the problem oriented CML 2002 and the damage oriented Eco-indicator 99 impact method. Compared to Portland cement, the impact of blast-furnace slag and fly ash is about an order of a magnitude lower.

SOURCES OF INPUT AND OUTPUT FACTORS FOR CEMENT PROCESS INDUSTRY

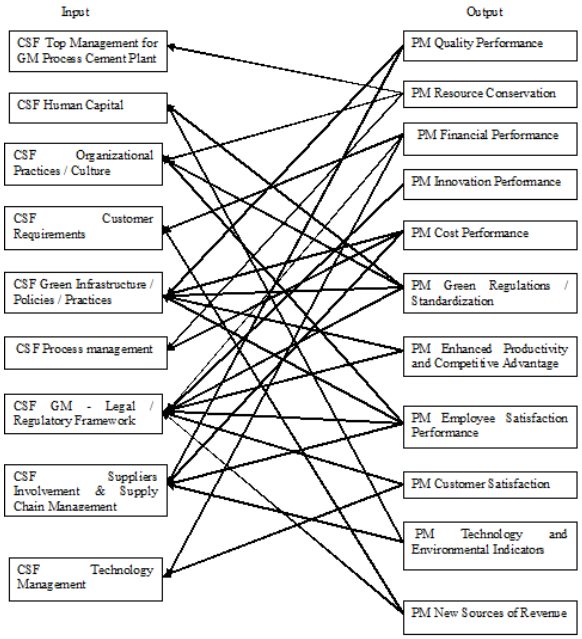

Figure 1

DATA SOURCE

The data has been collected from both primary and secondary sources. The primary source consists of a questionnaire survey 450 structured questionnaires had distributed to the respondents throughout the world for gathering needed data. The questionnaire is included questions to address the stated research objectives. All the questions have designed in such a way that the responses generated on the crucial issues, which are directly and indirectly focused on the research goals. This data helps in making projections in this research investigation in cement industry. The secondary source is also included scanning and searching of related past works in print form and electronic form on websites.

SAMPLING DATA PROCEDURE

In the present research, a sample size of 500 (collected from all over India) was chosen for the final survey. However data collection through questionnaire method has several advantages but it also have so many disadvantages like Low rate of return of the duly filled in questionnaires; bias due to no-response is often indeterminate; It can be used only when respondents are educated and cooperating; The control over questionnaire may be lost once it is sent; There is also the possibility of ambiguous replies or omission of replies altogether to certain questions; interpretation of omissions is difficult and last but not least this method is likely to be the slowest of all.

To overcome all above difficulties following care has been taken to ensure good response. The questionnaire was mailed along with prepaid envelop in order to facilitate quick reply. Close friends and associates were identified in each area and the questionnaire was explained to them. They were entrusted with the responsibility to answer the queries of the respondents and to do follow up.

To start with, the rate of return of the complete questionnaire was very fast, but when the rate of flow slowed down, reminders were sent to them for an early reply. Telephone calls and e-mail were also made besides personal contacts with the organization. The hectic efforts and the support of the friends and institutes generated a good response representing 48% response rate, which was quite encouraging.

RELIABILITY OF EXPERIENTIAL PROCESS

In this section, the responses to questionnaire were organized, fed into a variable computer data and analyzed for internal consistency analysis (D. B. Desai, et al. 2013). The data was analyzed using IBM SPSS Software. The factor analysis of a questionnaire determines its ability to yield consistent results. Reliability was operational as internal consistency, which is the degree of inter correlation among the item which comprise a scale. Internal consistency can be established using a reliability coefficient such as recreation analysis. Recreation Analysis is the average of the correlation coefficient of each item with each other item.

This is the phase of improving the energy efficiency of the equipment by minor modification of the existing production line to provide waste heat recovery equipment and gas pressure recovery equipment or by introduction of efficient energy conservation equipment, including replacement by advanced equipment. For example, energy conservation efforts in this step include an effective use of the waste heat recovery in combustion furnaces and introduction of the gas pressure recovery generator in the iron and steel works and waste heat recovery generator in cement plant.

STRATEGIES AND POTENTIALS FOR INPUT AND OUTPUT FACTORS IN CEMENT PLANT

In general three main strategic approaches toward carbon mitigation have been mostly studied during recent decades including:

- **Strategy 1:** Critical Success Factors (Input)
- **Strategy 2:** Performances Measure Factors (Output)

Strategy 1: Performances Measure Factors (Output) vs Critical Success Factors (Input)

Reduction in fuel consumption especially Performances Measure Factors as the most Critical Success Factors can significantly contribute in abating global factors. It is clearly implicit that training centre and finishing regular curriculum is not sufficient for cement industry to be withstanding in these competitive environments and letting the next generations to utilize such valuable resources as we do. This target has been achieved by different approaches including process modification, process integration, maintenance, insulation, energy recovery, and so on.

RESOURCE CONSERVATION

Top Management, Organizational Practices/Culture and Process Management Cement Plant

These resources create asymmetry and differentiating advantages with respect to other company. In Resource Conservation is strongly related to Top Management, Organizational Practices/Culture and Process management. It is clearly implicit that training centre and finishing regular curriculum is not sufficient for cement industry to be withstand in this competitive environments but it is also required to providing knowledge beyond the syllabus and training students as per the need of stakeholders and Human Capital, Customer Requirements, Green Infrastructure/Policy/Practices, Process Management, Legal Regulatory Framework is weakly related to this model for green manufacturing process for cement industry.

QUALITY PERFORMANCE

Green Infrastructure/Policies/Practices and Suppliers Involvement & Supply Chain Management Cement Plant

These Green Infrastructure / Policies / Practices' is the common variance has loading of such items as life cycle assessment, favorable government policies, rules & regulations, spreading risk of environmental problems. The common variance has life cycle assessment, favorable government policies, rules & regulations, spreading risk of environmental problems. Top management's clarity of vision, mission, and Strategic direction for GM, Human Capital, Organizational Practices/Culture, Customer Requirements Legal Regulatory Framework is weakly related to this model for green manufacturing process for cement industry.

FINANCIAL PERFORMANCE

Customer Requirements, GM-Legal/Regulatory Framework and Technology Management Cement Plant

In Customer Requirements has loading of such items as motivation to the employees for implementing Green Environment. Practices in manufacturing, Energy Management System, Solid Waste Management System, Environmental auditing, activity assessment, Measurement of carbon footprint in organization to ensure GM. Participation in environmental initiatives, certification programs, applying product innovation, end of life (EOL), cradle to cradle and close loop approach for GM is strongly related Customer Requirements.

Top management's clarity of vision, mission, and Strategic direction for GM, Human Capital, Organizational Practices/Culture. Customer Requirements, Green Infrastructure/Policy/Practices, Process Management, Legal Regulatory Framework is weakly related to this model for green manufacturing process for cement industry.

INNOVATION PERFORMANCE

GM - Legal/Regulatory Framework

In the factor 4, 'Innovation Performance has loading of such items as Specialization of labors; Specialization of suppliers improved; Specialization of service providers is strongly related Customer Requirements. GM - Legal/Regulatory curriculum design and revision and Top management's clarity of vision, mission, and Strategic direction for GM, Human Capital, Organizational Practices/Culture, Customer Requirements, Green Infrastructure/Policy/Practices and Process Management is weakly related to this model for green manufacturing process for cement industry.

COST PERFORMANCE

Green Infrastructure/Policies/Practices, Process management and Suppliers Involvement & Supply Chain Management

Cost Performance has loading of such items as direct maintenance cost/added value; Green Infrastructure/Policies/Practices has loading of such items as life cycle assessment, favorable government policies, rules & regulations, spreading risk of environmental problems is strongly related Cost Performance. Top management's clarity of vision, mission, and Strategic direction for GM, Human Capital, Organizational Practices/Culture, Customer Requirements, Green Infrastructure/Policy/Practices, Process Management, Legal Regulatory Framework is weakly related to this model for green manufacturing process for cement industry.

GREEN REGULATIONS/STANDARDIZATION

Human Capital, Organizational Practices/Culture, Green Infrastructure/Policies/Practices and Legal/Regulatory Framework

Green Regulations /Standardization has loading of such items as better adaptability to changing environmental regulations and legislation. Human Capital includes such elements as employee Involvement. Organizational Practices/Culture, Green Infrastructure/Policies/Practices and Legal/Regulatory Framework is strongly related to Green Regulations / Standardization. Top management's clarity of vision, mission, and Strategic direction for GM, Green Infrastructure / Policy / Practices, Process Management is weakly related to this model for green manufacturing process for cement industry.

ENHANCED PRODUCTIVITY AND COMPETITIVE ADVANTAGE

Green Infrastructure/Policies/Practices and Legal/Regulatory Framework

In the 'Enhanced Productivity and Competitive Advantage has loading of such items as GM is strongly related Enhanced Productivity and Competitive Advantage. Organizational Practices/Culture, Green Infrastructure/Policies/Practices and Legal/Regulatory Framework is strongly related to Enhanced Productivity and Competitive Advantage.

Top management's clarity of vision, mission, and Strategic direction for GM, Human Capital, Customer Requirements, and Legal Regulatory Framework is weakly related to this model for green manufacturing process for cement industry.

EMPLOYEE SATISFACTION PERFORMANCE

Organizational Practices/Culture, Green Infrastructure/Policies/Practices, Legal/Regulatory Framework and Suppliers Involvement & Supply Chain Management

In the Employee Satisfaction Performance has Employees are kept up-to-date on organizational changes. This organization pays well compared to other organizations. Signify an important of role of top management and it includes management commitment, well defined long and short term goals and Organizational Practices/Culture, Green Infrastructure/Policies/Practices, Legal/Regulatory Framework and Suppliers Involvement & Supply Chain Management is strongly related to Employee Satisfaction Performance. Top management's clarity of vision, mission, and Strategic direction for GM, Human Capital, Customer Requirements, and Legal Regulatory Framework is weakly related to this model for green manufacturing process for cement industry.

CUSTOMER SATISFACTION

Legal/Regulatory Framework and Technology Management

In the Customer Satisfaction has Techniques for Measuring Customer Satisfaction. In the legal, ethical and societal responsibilities for bring tangible and intangible benefits to the cement community is strongly related to Customer Satisfaction. Top management's clarity of vision, mission, and Strategic direction for GM, Human Capital, Organizational Practices/Culture, Customer Requirements, Green Infrastructure/Policy/Practices is weakly related to this model for green manufacturing process for cement industry.

TECHNOLOGY AND ENVIRONMENTAL INDICATORS

Human Capital Suppliers Involvement & Supply Chain Management

In the Technology and Environmental Indicators Technology Strategy is strongly related; Import or In-House Development; R & D Expenditure; Number of Production Plants; Product Differentiation (brands); Grades of Ordinary Portland Cement Produced is strongly related to Human Capital Suppliers Involvement & Supply Chain Management. Top management's clarity of vision, mission, and Strategic direction for GM, Customer Requirements, Green Infrastructure / Policy / Practices, Legal Regulatory Framework is weakly related to this model for green manufacturing process for cement industry.

NEW SOURCES OF REVENUE

Customer Requirements and Legal/Regulatory Framework

In the New Sources of Revenue has Financial and environmental performances; Reduced financial and environmental liabilities; GM opens new sources of revenue through market opportunities is strongly related to Customer Requirements and Legal/Regulatory Framework. Top management's clarity of vision, mission, and Strategic direction for GM, Human Capital, Organizational Practices/Culture, Green Infrastructure/Policy/Practices, Process Management weakly related to this model for green manufacturing process for cement industry.

Table 1

Sr. No.	Organizational Performance Measure (Output Factors)	Relationship With Performance Improvement Factors (Input Factors)	
		Strong	Weak
1	Resource Conservation	Top Management, Organizational Practices/Culture and Process management Cement Plant	Human Capital, Customer Requirements Green Infrastructure / Policy / Practices Process Management, Legal Regulatory Framework
2	Quality Performance	Green Infrastructure/Policies/Practices and Suppliers Involvement & Supply Chain Management Cement Plant	Top management's clarity of vision, mission, and Strategic direction for GM Human Capital, Organizational Practices / Culture, Customer Requirements Legal Regulatory Framework
3	Financial Performance	Customer Requirements, GM - Legal / Regulatory Framework and Technology Management Cement Plant	Top management's clarity of vision, mission, and Strategic direction for GM, Human Capital, Organizational Practices / Culture. Customer Requirements, Green Infrastructure / Policy / Practices, Process Management, Legal Regulatory Framework
4	Innovation Performance	GM - Legal / Regulatory Framework	Top management's clarity of vision, mission, and Strategic direction for GM, Human Capital, Organizational Practices / Culture, Customer Requirements, Green Infrastructure / Policy / Practices, Process Management
5	Cost Performance	Green Infrastructure / Policies/ Practices, Process management and Suppliers Involvement & Supply Chain Management	Top management's clarity of vision, mission, and Strategic direction for GM, Human Capital, Organizational Practices / Culture, Customer Requirements, Green Infrastructure / Policy / Practices, Process Management, Legal Regulatory Framework
6	Green Regulations / Standardization	Human Capital, Organizational Practices/Culture, Green Infrastructure/Policies/Practices and Legal/Regulatory Framework	Top management's clarity of vision, mission, and Strategic direction for GM, Green Infrastructure / Policy / Practices, Process Management
7	Enhanced Productivity and Competitive Advantage	Green Infrastructure/ Policies/ Practices and Legal / Regulatory Framework	Top management's clarity of vision, mission, and Strategic direction for GM, Human Capital, Customer Requirements, Legal Regulatory Framework
8	Employee Satisfaction Performance	Organizational Practices/ Culture, Green Infrastructure/ Policies/ Practices, Legal/ Regulatory Framework and Suppliers Involvement & Supply Chain Management	Top management's clarity of vision, mission, and Strategic direction for GM, Human Capital, Customer Requirements, Process Management, Legal Regulatory Framework
9	Customer Satisfaction	Legal / Regulatory Framework and Technology Management	Top management's clarity of vision, mission, and Strategic direction for GM, Human Capital, Organizational Practices / Culture, Customer Requirements, Green Infrastructure / Policy / Practices
10	Technology and Environmental Indicators	Human Capital Suppliers Involvement & Supply Chain Management	Top management's clarity of vision, mission, and Strategic direction for GM, Customer Requirements, Green Infrastructure / Policy / Practices, Legal Regulatory Framework
11	New Sources of Revenue	Customer Requirements and Legal / Regulatory Framework	Top management's clarity of vision, mission, and Strategic direction for GM, Human Capital, Organizational Practices / Culture, Green Infrastructure / Policy / Practices, Process Management

DETAILED ITEM ANALYSIS

In this paper, we have discusses the method to evaluate the assignment of items to scales. The method considers the correlation of each item with each scale. Specifically the item-score to scale score correlation are used to determine if an item belongs to the scale as assigned. If an item does not correlate highly with any of the scales, it is eliminated.

RESULTS

The data analysis is conducted at three steps:

- Performing an exploratory factor analysis (EFA) with varimax rotation to determine the underlying dimensions of TQM.
- Testing of the measurement models for TQM construct using confirmatory factor analysis (CFA) as well as the TQM context in order to determine if the extracted dimensions in step 1 offered a good fit to the data.

- Measuring the impact of critical factors of TQM on business financial performance.

KEY ISSUES AND CHALLENGES OF GREEN MANUFACTURING FOR INDIAN CEMENT INDUSTRY

- Modeling sustainable, environmentally conscious manufacturing processes systems and analytical tools for assessing the impact of processes.
- Energy, transport, medical/health, life style, dwelling, defines and food/water supply systems based on increasingly precise elements for an energy and environmentally aware consumer.
- Issues beyond the designing process like Green purchasing, marketing, and packaging are more focus. Aspects like Process planning rev logistic, Green disposal are further explored.
- It promotes Green culture in organization by conveying advantages of being Green. Manufacturers and designers are forced to adopt environmental directives.
- Issues that need more emphasis with reference to GM operational technologies are Green innovation of product and process, material reclamation, optimisation of raw material selection and manufacturing process.
- Dust emissions during cement manufacturing have long been accepted as one of the main issues facing the industry. The industry handles millions of tones of dry material.
- Key components of a supply-side strategy include remanufacturing for example of vehicle components – and the recycling of heat waste through combined heat and power installations.
- Green-investment-scenario modeling for manufacturing suggests considerable improvements in energy efficiency can be achieved.

DISCUSSIONS

The results of this study suggest that in general, the elements of strong relationship are significantly related to the measures of organizational performance. These are Workforce commitment, Shared vision, Customer focus, Use of teams, and Cooperative supplier relations. In other words, a factor such as cooperative supplier relations could be more relevant for manufacturing than for service organizations. We are dealing with deployment of different GM tools insight process. An integrated assessment of green cement production processes under green, but also under technical and economic aspects requires specific methods with minimum energy efficiency during the product's manufacturing.

CONCLUSIONS

In this paper, we have performed an extensive survey about green manufacturing techniques used in the cement industry. The most important quality practices were found to be training, employee relations, and quality data and reporting. Hence, companies should be suggested to develop formal reward and recognition systems to encourage employee involvement and participation, support teamwork and provide feedback to the employees. There are many purposes for gathering data in quality management. First, data can be collected to understand current processes. Almost a third of respondents are not collaborating with their extended supply chain on green practices. In this paper,

we assist data analysis and interpretation which may also help cement industry to develop a learning environment, which may enhance innovation and a better enterprise culture. Management by facts requires management decisions to be based on relevant data and reports. Most of the research highlight on material substitution, product innovation and cost reduction. Here I have intended to propose a proper changed in perspective of GM.

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