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Analysis of Employee Feedback on ERP Implementation in ACC Limited, Coimbatore

by

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of

Department of Management Studies

Kumaraguru College of Technology

Coimbatore

A Project Report

submitted to the

Faculty of Management Sciences

in partial fulfillment of the requirements for the award of the degree of

Master of Business Administration

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Department of Management Studies

Kumaraguru College of Technology

Coimbatore

BONAFIDE CERTIFICATE

Certified that this project report titled "**Analysis of Employee Feedback on ERP Implementation In ACC Limited, Coimbatore**" is the Bonafide work of **Mr. M. Senthil Kumar (71206631050)** who carried out the research under my supervision. Certified further, that to the best of my knowledge the work reported herein does not form part of any other project report or dissertation on the basis of which a degree or award was conferred on an earlier occasion on this or any other candidate.

Faculty Guide **Director**

Evaluated and vice-voce conducted on .....2.7.2008.....

Examiner I **Examiner II**

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TO WHOMSOEVER IT MAY CONCERN

This is to certify the Mr.M.Senthil Kumar student of final M.B.A, Kumaraguru College of Technology has undergone project on Analysis of Employees Feedback on ERP in our organization from Jan 2008 to Mar 2008.

Sr. Manager – HR & Admn.
Madukkarai Cement Works.

Declaration

I, **M. Senthil Kumar (Reg. No.71206631050)** of Department of Management Studies, Kumaraguru College of Technology, hereby declare that the project entitled "**Analysis of Employee Feedback on ERP Implementation in ACC Limited, Coimbatore**" has been done by me under the guidance of Mr. S. Mohanavel, Senior Lecturer, MBA submitted in partial fulfillment for the award of the degree of Master of Business Administration of Anna University, Chennai, during the academic year 2007-2008.

I, also declare hereby, that the information given in this report is correct to best of my knowledge and belief.

Place: Coimbatore

Date: 2.7.2008

Signature of the Candidate

(M. Senthil Kumar)

Acknowledgement

It is inevitable that thoughts and ideas of other people tend to drift into subconscious when one feels to acknowledge helping derived from others. I acknowledge to all those who helped me in the preparation of this project work.

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Executive Summary

The evolution of Enterprise Resource Planning (ERP) systems has been a highlight in the information systems arena. In the implementation of ERP system the post implementation stage is very important. ACC plays an important role in production of cement in India. Last year the company implemented SAP ERP system to improve the efficiency of its operations. So now the company needs to analyse the benefits and effectiveness of the ERP system. The effectiveness of the system mainly depends on the employees. To determine the level of utilization of the ERP system by the employees is a challenging and complicated issue for management.

The major problem faced during implementation of the system is change management. To overcome this problem, the management has to get proper feedback from the employees, who are using the ERP system in the company. The Project was primarily to get the feedback from the ERP users in the Manufacturing unit.

The study of employee feedback on ERP implementation provides an insight into effectiveness of the ERP system in ACC Coimbatore. The effectiveness of the ERP system is analyzed on the data collected from the respondents through a structured questionnaire. In the study only the authorized user are selected.

The project is descriptive in nature as it is concerned with a sample of employees from those who are using the ERP system in the Company. This study is based on Population survey. In the Madukkarai Cement works, only 85 authorized employees are using the ERP system. So the total 85 is taken for the study.

The data was collected from these 85 users and that was analyzed by statistical tools. It was found that ERP system implemented in the company is effective. The overall productivity of the employees has been increased and the users of the system are satisfied.

Table of Contents

List of Tables

List of Charts

Introduction

CHAPTER 1

INTRODUCTION

1.1 Background

The evolution of Enterprise Resource Planning (ERP) systems has been a highlight in the information systems arena. In recent years, most ERP system suppliers have increased their focus on small or medium sized organizations. There are some reasons for this trend including a saturation of the market as most large organizations have already implemented an ERP solution, increasing the possibilities and need for the integration of systems between the organizations and the availability of relatively inexpensive hardware and Software.

To effectively manage a company, it is necessary to have control over all data related with suppliers, subcontractors, clients, production, marketing, personnel performance, legal issues, etc. Software selection is never an easy task especially in the manufacturing and processing industry.

Enterprise Resource Planning is a term derived from Manufacturing Resource Planning (MRP II) that followed Material Requirements Planning (MRP). ERP systems typically handle the manufacturing, logistics, distribution, inventory, shipping, invoicing and accounting for a company. ERP software can aid in the control of many business activities like sales, delivery, billing, production, inventory management, quality management and human resources management.

The ERP is not expensive but also requires high attention in its implementation efforts. The ERP implementation can be split in the following three stages, these are,

- Pre- Implementation Stage
- Implementation Stage
- Post- Implementation Stage

The Pre- Implementation Stage is the one in which companies must question the need for a new ERP system by development of the Business Case Analysis. It is carried out to establish the need for ERP system. Benefits and the viability of going ahead with the implementation of ERP is also studied in this phase.

Stage II mainly deals with Change Management, Project Management, IT Infrastructure Management and the Implementation Approach. To cope up with this change, training programmes are conducted, visits to ERP sites are arranged and workshops are held to educate employees about the change process, ERP package and its effective utilization.

The ERP implementation does not end with the project goes live. After that the post impact analysis of the project is done, generally after 1-2 years of implementation. Analysis is carried out regarding the optimum utilization of resources in the project. The impact such as financial, operational, organizational, etc. which the ERP implementation had on the total business is calculated and the profitability is measured thereof. It is studied whether further improvement can be done on the project for future up gradation and benefits.

1.1.1 Enterprise Resource Planning

ERP systems attempt to integrate several data sources and processes of an organization into a unified system. A typical ERP system will use multiple components of computer software and hardware to achieve the integration. A key ingredient of most ERP systems is the use of a unified database to store data for the various system modules.

The two key components of an ERP system are a common database and a modular software design. A common database is the system that allows every department of a company to store and retrieve information in real-time. Using a common database allows information to be more reliable, accessible, and easily shared. Furthermore, a modular software design is a variety of programs that can be added on an individual basis to improve the efficiency of the business. This improves the business by adding

functionality, mixing and matching programs from different vendors, and allowing the company to choose which modules to implement. These modular software designs link into the common database, so that all of the information between the departments is accessible and real-time

1.1.2 Advantages

In the absence of an ERP system, a large manufacturer may find itself with many software applications that do not talk to each other and do not effectively interface. Tasks that need to interface with one another may involve:

- Design engineering
- Order tracking from acceptance through fulfillment
- The revenue cycle from invoice through cash receipt
- Managing interdependencies of complex Bill of Materials
- Tracking the 3-way match between Purchase orders, Inventory receipts and Costing
- The Accounting for all of these tasks, tracking the Revenue, Cost and Profit on a granular level.

1.1.3 SAP

SAP was founded in 1972 in Walldorf, Germany. It stands for Systems, Applications and Products in Data Processing. Over the years, it has grown and evolved to become the world premier provider of client/server business solutions for which it is so well known today. The SAP R/3 enterprise application suite for open client/server systems has established a new standard for providing business information management solutions.

SAP product is considered excellent but not perfect. The main problems with software product are that it can never be perfect. The main advantage of using SAP as company ERP system is that SAP has a very high level of integration among its

individual applications which guarantee consistency of data throughout the system and the company itself.

In a standard SAP project system, it is divided into three environments,

- Development,
- Quality Assurance and
- Production.

In development, most of the implementation work takes place. In quality assurance, all the final testing is conducted before moving the transports to the production environment. In production all the daily business activities occur. It is also the client that all the end users use to perform their daily job functions. To all company, the production system should only contain transport that has passed all the tests.

SAP is table driven customization software. It allows businesses to make rapid changes in the business requirements with a common set of programs. User-exits are provided for business to add in additional source code. Tools such as screen variants are provided to let you set fields attributes whether to hide, display and make them mandatory fields. This is what makes ERP system and SAP in particular so flexible. The table driven customization are driving the program functionality instead of those old fashioned hard-coded programs. Therefore, new and changed business requirements can be quickly implemented and tested in the system.

Many other business application software have seen this table driven customization advantage and are now changing their application software based on this table customizing concept. In order to minimize upgrading costs, the standard programs and tables should not be changed as far as possible. The main purpose of using standard business application software like SAP is to reduce the amount of time and money spends on developing and testing all the programs. Therefore, most companies will try to utilize the available tools provided by SAP.

1.2 Review of Literature

Adel M. Aladwani, ***"Change Management Strategies for Successful ERP Implementation",*** Kuwait University, Kuwait

When implementing an ERP system, top management commonly faces an unwanted attitude from potential users for one reason or another, they resist the implementation process. Top management should, therefore, proactively deal with this problem instead of reactively confronting it.

Andreas I. Nicolaou, ***"ERP Systems Implementation: Drivers of Post-Implementation Success"***, Bowling Green State University

This paper examines the determinants of success during the post-implementation stage of ERP systems and identifies drivers that contribute to successful implementations. Insights from the analysis of two case studies are used to validate the importance of such drivers of success during the post-implementation stage of a system. The study presents important implications useful in the development of conceptual research models for ERP system success.

Christopher P. Holland, Ben Light ***"Critical Success Factors Model for ERP Implementation"*** May/June 1999 (Vol. 16, No. 3) pp. 30-36.

An effective IT infrastructure can support a business vision and strategy; a poor, decentralized one can break a company. More and more companies are turning to off-the-shelf ERP solutions for IT planning and legacy systems management.

Chwen Sheu, Bongsug Chae and C.-L.Chen-Lung Yang, "*National Ddifferences and ERP Implementation: Issues and Challenges*" Volume 32, Issue 5, October 2004, Pages 361-371

Multinational ERP implementation introduces another dimension of complexity—national differences—into the already complex nature of ERP implementation in the context of global information management. The findings suggest that language, culture, politics, government regulations, management style, and labor skills impact various ERP implementation practices at different countries. Understanding such effects will enable companies to be more proactive in planning project budget and duration.

Dr Clare Archer-Lean, Jo-Anne Clark and Dr Donald Kerr, "*Evading Technological Determinism In ERP Implementation: Towards A Consultative Social Approach*"

ERP systems are implemented in business in the hope of obtaining benefits in the form of improved communications and increased efficiency through the standardization of information technology (IT) across functional business areas. The benefits, and in some cases problems, associated with implementation have been well documented, however there is little information available on their effectiveness in a different form of organization.

Jiang Yingjie, "*Critical Success Factors in ERP Implementation in Finland*" Swedish School of Economics and Business Administration, 2005

Organizations look to ERP as a significant strategic tool of competition. ERP plays an important role in today's enterprise management and is beginning to be the backbone of organizations. Although ERP has been recognized as a useful tool, in practice, there are many difficulties in compelling people to implement it effectively. In this case, how to help ERP's future effective implementation has already attracted some researchers' attention. The core research developed is focused on critical success factors of ERP implementation. Six general accepted critical success factors (CSF) are identified

based on the relevant literature: top management support, effective project management, business process reengineering, and the suitability of software and hardware, education and training, and user involvement.

Keng Siau, Jake Messersmith, "*Analyzing ERP Implementation at a Public University Using the Innovation Strategy Model*", International Journal of Human-Computer Interaction 2003, Vol. 16, No. 1, Pages 57-80

ERP systems have revolutionized the way companies are using information technology in their businesses. ERP was created in an effort to streamline business processes and has proven to be successful in many operations. Unfortunately, not all ERP implementations have met expectations. One way that businesses may be able to increase success rates is to embrace creativity and innovation in their ERP implementations. For businesses to do this, they must first understand how creativity originates and how that creativity can be integrated into business solutions.

Majed Al-Mashari "*Enterprise Resource Planning (ERP) Implementation: a useful road map*", King Saud University,

Many enterprises have improved their productivity, cost structure, and organizational culture by implementing ERP. However, there are also many enterprises under estimating or misunderstanding the risks in ERP project.

Mary C. Jones, Melinda Cline, Sherry Ryan, "*Exploring Knowledge Sharing in ERP Implementation: an Organizational Culture Framework*" Decision Support Systems archive Volume 41 , Issue 2 (January 2006) Pages: 411 – 434.

It examines eight dimensions of culture and their impact on how ERP implementation teams are able to effectively share knowledge across diverse functions and perspectives during ERP implementation. Through synthesizing the data, we develop a cultural configuration that shows the dimensions of culture that best facilitate knowledge sharing in ERP implementation. The results also indicate ways that firms may

overcome cultural barriers to knowledge sharing. A model is developed that demonstrates the link between the dimensions of culture and knowledge sharing during ERP implementation.

Tsu-Ming Yeh, Ching-Chow Yang and Wen-Tsann Lin, "*Service Quality and ERP implementation: A Conceptual and Empirical Study of Semiconductor-related Industries in Taiwan*", Computers in Industry, Volume 58, Issues 8-9, December 2007, Pages 844-854

The study first establishes a modified service quality gap model incorporating: (i) the downstream customers' expectations and perceptions, and (ii) the upstream manufacturers' perceptions of the customers' expectations and perceptions. The results show that service quality gaps do exist in the Taiwanese semiconductor industry between upstream manufacturers that are implementing ERP and their downstream customers.

The proposed model provides valuable guidance to manufacturers with respect to the prevention, detection, and elimination of the demonstrated service quality gaps. The model thus helps manufacturers to evaluate the contribution of various ERP modules to improved customer satisfaction with service quality and also provides guidance on improvement strategies to enhance service quality by eliminating quality gaps.

1.3 Statement of the Problem

ACC plays an important role in Indian cement industry. During the year 2006-07 the company implemented SAP ERP system to improve the efficiency of its operations. Now the company needs to analyze the benefits and effectiveness of the ERP system. The effectiveness of the system mainly depends on the employees' performance. To determine the level of utilization of the ERP system by the employees is a challenging and complicated issue for management.

The major problem faced during implementation of the system is change management. To overcome this problem, the management has to get proper feedback from the employees who are using the ERP system in the company. The Project was primarily to get the feedback from the ERP users in the Company.

1.4 Objective of the Study

1.4.1 Primary Objective:

- To evaluate the Operational Efficiency of the ERP system in ACC Cements, Coimbatore.

1.4.2 Secondary Objectives:

- To study the service quality of ERP Implementation
- To study the system quality of ERP System
- To study the information quality of ERP System
- To study the satisfaction level of the employees
- To Identify the improvements in individual productivity

1.5 Scope of the Study

The study of employee feedback on ERP implementation provides an insight into effectiveness of the ERP system in ACC Cement, Coimbatore. The effectiveness of the ERP system is analyzed on the data collected from the respondents through a structured questionnaire. In the study only the authorized ERP user are the respondents.

1.6 Methodology

1.6.1 Type of the Study

The project is descriptive in nature as concerned with employees who are using the ERP system in the Company.

1.6.2 Sampling Design

This study is based on population survey. In the Coimbatore unit of ACC Cement, only 85 employees are using the ERP system. So the responses from all the 85 are taken for the study.

1.6.3 Method of Data Collection

a) Primary data

The primary data are the responses on service quality, system quality, and information quality. They were collected using the structured questionnaire. Satisfaction level at each department was also collected.

b) Secondary data

Secondary data regarding the industry, company and products were obtained from

- Internet
- Company reports
- Books
- Journals & News Papers

1.6.4 Tools for Analysis

- SPSS 11.0 & MS- Excel 2003
- Percentage Analysis
- Compare Means Analysis

1.7 Limitations

- The sample unit was restricted to the users of the ERP system in ACC, Coimbatore
- The study was carried out with the assumption that the respondents responded frankly without any bias.
- The statistical tools used for the analysis have their own limitations.

1.8 Chapter Scheme

The report is divided into five chapters. First chapter includes the details regarding the study, such as introduction, objectives, methodology and review of literature.

In second chapter the facts regarding the Associated Cement Company (ACC) are provided. The history, management, organization structure, products and various other aspects about the company are furnished.

The macro and micro analysis of the cement industry are made in the third chapter of the report.

Analysis of the data collected from the respondents is made in the fourth chapter by applying various statistical tools.

Last chapter provided the findings, suggestions and conclusion about the study.

Organization profile

CHAPTER 2

ORGANIZATION PROFILE

2.1 History of the Organization

ACC (Associated Cement Company) is India's foremost manufacturer of cement and concrete. ACC's operations are spread throughout the country with 14 modern cement factories, 19 Ready mix concrete plants, 19 sales offices, and several zonal offices. It has a workforce of about 9000 persons and a countrywide distribution network of over 9,000 dealers. ACC's research and development facility has a unique track record of innovative research, product development and specialized consultancy services. Since its inception in 1936, the company has been a trendsetter and important benchmark for the cement industry in respect of its production, marketing and personnel management processes. Its commitment to environment-friendliness, its high ethical standards in business dealings and its on-going efforts in community welfare programs have won it acclaim as a responsible corporate citizen.

In the 70 years of its existence, ACC has been a pioneer in the manufacture of cement and concrete and a trendsetter in many areas of cement and concrete technology including improvements in raw material utilisation, process improvement, energy conservation and development of high performance concretes.

ACC's brand name is synonymous with cement and enjoys a high level of equity in the Indian market. It is the only cement company that figures in the list of Consumer Super Brands of India. The company's various businesses are supported by a powerful, in-house research and technology backup facility - the only one of its kind in the Indian cement industry. This ensures not just consistency in product quality but also continuous improvements in products, processes, and application areas.

ACC has rich experience in mining, being the largest user of limestone, and it is also one of the principal users of coal. As the largest cement producer in India, it is one of the biggest customers of the Indian Railways, and the foremost user of the road transport

network services for inward and outward movement of materials and products. ACC has also extended its services overseas to the Middle East, Africa, and South America, where it has provided technical and managerial consultancy to a variety of consumers, and also helps in the operation and maintenance of cement plants abroad.

ACC is among the first companies in India to include commitment to environmental protection as one of its corporate objectives, long before pollution control laws came into existence. The company installed pollution control equipment and high efficiency sophisticated electrostatic precipitators for cement kilns, raw mills, coal mills, power plants and coolers as far back as 1966. Every factory has state-of-the art pollution control equipment and devices.

Cement Manufacturing Plants

location	Units	Capacity (MTPA)
Bargarh	Bargarh Cement Works	0.96
Chaibasa	Chaibasa Cement Works	0.87
Chanda	Chanda Cement Works	1.00
Damodhar	Damodar Cement Works	0.53
Gagal	Gagal Cement Works	4.40
Jamul	Jamul Cement Works	1.58
Kymore	Kymore Cement Works	2.20
Lakheri	Lakheri Cement Works	1.50
Madukkarai	Madukkarai Cement Works	0.96
Sindri	Sindri Cement Works	0.91
Wadi	Wadi Cement Works	2.59
New Wadi Plant	Wadi Cement Works	2.60
Tikaria	Tikaria Cement Grinding and Packing Plant, ACC Limited	2.31

2.1.1 Regional Marketing Offices

The regional marketing offices are available in India at Bangalore, Bhopal, Chandigrah, Coimbatore, Kanpur, Kolkatta, Mumbai, New Delhi, Patna and Pune.

2.1.2 Subsidiaries and Associates

Subsidiary companies of ACC include the country's first bulk cement distribution terminal in Mumbai. Their experience of several decades in manufacturing and engineering has helped acquire skills that have proved useful in other areas. Through subsidiaries, technical collaborations and associations, ACC offers products and services in fields such as cement machinery, tyre machinery, bulkers.

2.1.3 Bulk Cement Corporation (India) Limited (BCCI)

Situated at Kalamboli, in Navi Mumbai (formerly New Bombay), this company caters to bulk cement requirements of the city of Mumbai and its environs. It has two cement storage silos with a capacity of 5,000 tons each. The plant receives cement in bulk from ACC plants at Wadi. BCCI is situated strategically on the outskirts of Mumbai, just off the new Mumbai-Pune Expressway. It is a landmark structure spread over 30 acres of land.

2.1.4 ACC Machinery Company Limited (AMCL)

Located in the Butibori Industrial estate near Nagpur, AMCL manufactures machinery and equipment for use in chemicals and cement industries such as bulk transporters, vertical pre-grinding roller mills and blowers and tyre and rubber manufacturing machinery such as presses, mixers and extruders.

2.1.5 International Associations

With its large pool of skilled scientists, engineers and technocrats who keep abreast of the latest international trends and developments in cement, ACC has successfully handled a diverse range of assignments in different parts of the world,

mainly in Asia and Africa. Our project engineering consultancy and project management expertise has been tested against the best in the world.

2.1.6 Saudi Arabia - Yanbu Cement Company

Since 1979 ACC has been operating and managing a large cement plant owned by Yanbu Cement Company (YCC) and located near the port city of Yanbu in the Kingdom of Saudi Arabia. The Yanbu plant incorporates sophisticated process control systems. YCC today has a capacity of over 3.30 million tonnes per annum. Cement production at this plant has continued to exceed the guaranteed quantum stipulated in the contract year after year.

2.1.7 Nigeria - Dangote Industries

ACC has been retained by M/s Dangote Industries, a leading diversified industrial group of Nigeria, to provide comprehensive engineering consultancy for setting up their proposed new green field cement plants of capacity 3 x 7000 TPD (tonnes per day) and for optimisation and upgradation of their existing plants from 2x2000 TPD to 2x3500 TPD.

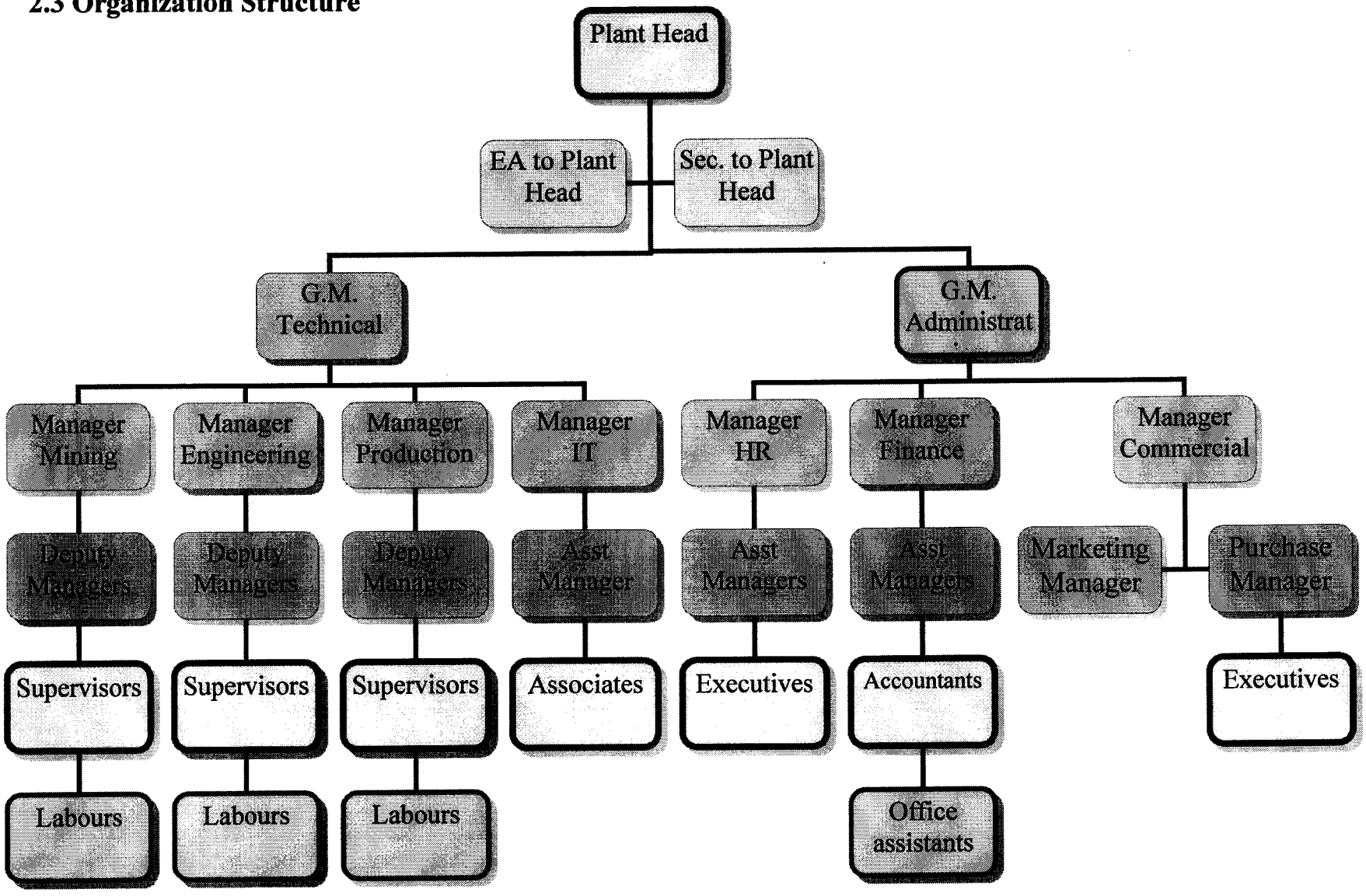
2.2 Management

Mr N. S. Sekhsaria	-	Chairman
Mr Paul Hugentobler	-	Deputy Chairman
Mr Sumit Banerjee	-	Managing Director

Directors

Mr A L Kapur	Mr S M Palia
Mr Naresh Chandra	Mr Markus Akermann
Mr M L Narula	Mr D K Mehrotra
Mr R A Shah	Dr Nirmalya Kumar
Mr Shailesh Haribhakti	Ms Shikha Sharma

2.3 Organization Structure



2.4 Product Profile

ACC manufactures the following types of cement, in addition to which, it provides Bulk Cement and Ready Mix Concrete.

2.4.1 Ordinary Portland Cements

OPC 43 Grade and OPC 53 Grade

2.4.2 Blended Cements

- Fly-ash based Portland Pozzolana Cement,
- Portland Slag Cement

2.4.3 Bulk Cement

Yet another first in ACC's six-decade history of cement in India has been the introduction of Bulk Cement, an alternative to bagged cement, which is of particular advantage to large consumers of cement. Internationally, the trend is to move cement more and more in loose form rather than bagged. In fact, over 90 percent cement in the USA, and other European countries is transported and sold in bulk, unlike in India, where only one percent is transported in bulk.

2.4.4 Ready Mixed Concrete

ACC set up India's first commercial Ready Mix Concrete (RMX) plant in Mumbai in 1994. Today the company is the largest manufacturer of RMX in India with 19 modern plants in Mumbai, Bangalore, Kolkata, Chennai and Delhi. Goa is the latest on the map for ACC RMX.

ACC's pioneering efforts in introducing RMX coupled with the promotion of bulk cement handling facilities have been responsible for redefining the pace and quality of construction activity in metropolitan cities and in mega infrastructure projects

2.5 Competitive Strength of the Company

Strengths

- Recycling of dusts to reduce pollution
- Health and Safety measures provided to the employees
- Leader in the domestic market and use of advanced technology
- ACC Cements is named as the Super Brand of all Cements
- Management and the employees readily accept the changing environment

Weaknesses

- Heavy equipment are subjected to operational hazardous
- Unable to purchase Bauxite at reasonable cost
- Material disruption and industrial disruption
- Accidents, delay, unfavorable climatic condition

Opportunities

- Growth in infrastructure sector
- Demand drivers are economic growth and industrial activity

Threats

- Competitors
- Substitutes
- Non-availability of coal

2.6. IT Infrastructure

The Company currently in the process of making a quantum jump from current in-house developed systems using Oracle 9i and Developer 6i to an ERP based solution. This decision was solely based on the strategic objectives and the business benefits that they expect to derive from implementing such a solution.

As part of the objective of providing uninterrupted service to the business, they are setting up a primary data centre and a disaster recovery centre to house all the servers related to the ERP solution. These data centers are inter-connected using high speed data links so that the data is always current at both these locations.

ACC is a large organization with centers of manufacturing, marketing and R&D spread across the length and breadth of the nation. Therefore, they invested in the creation of a comprehensive infrastructure that allows free flow of information across the organization. This enables almost instant communication between all levels in the organization. This, they achieved by installing a hybrid WAN network to connect each of our 275 plus locations. A judicious mix of VSAT and VPN links ensure adequate connectivity between these locations. Each manufacturing location has a well designed LAN to meet the needs of that location.

2.7 Functional Departments

The major functional departments of the Associated Cement Company Ltd, Madukkarai are as follows

- Purchase Department
- Stores Department
- Personnel Department
- Information Systems Department
- Accounts and Finance Department
- Production Department
- Cement Dispatch Section

Micro macro analysis

CHAPTER - 3

MACRO- MICRO ANALYSIS

The Indian cement industry is on a roll. Driven by a booming housing sector, global demand and increased activity in infrastructure development such as state and national highways, the cement industry has outpaced itself, ramping up production capacity, attracting the top cement companies in the world, and sparking off a spate of mergers and acquisitions to spur growth.

The increased demand has in turn led to a rise in the capacity utilization crossing the 100 per cent mark for the first time in January 2007. In fact, according to Cement Manufacturers Association (CMA), the average monthly capacity utilization during fiscal 2006-07 was 94 per cent. And due to the sustained demand levels, the growth in capacity utilization has continued in the current fiscal 2007-08, with 94 per cent capacity utilization for the period April-September as against 90 per cent during the corresponding period quarter last fiscal.

Simultaneously, cement dispatches for the recently concluded fiscal was at an all-time high of 155 million tonnes (mt), up from 142 mt in the previous fiscal, thereby recording a growth of 10 per cent. During the first half of the current financial year, dispatches (including exports) have also jumped by 8.19 per cent to reach 80.24 mt.

Production

Globally, India is the second largest producer of cement. Cement production grew at the rate of 9.1 per cent during 2006-07 over the previous fiscal's total production of 147.8 mt. Of this, 9.3 mt of cement was exported. Continuing the growth momentum, cement production increased by 8.4 per cent to 80.85 mt during the period April-September from 74.58 mt during the corresponding period last year.

Simultaneously, the industry has added 6.35 mt capacity in the first two quarters of the current financial year. With this, the country's total capacity has moved up from 166.73 mt to 173.08 mt, an addition of 3.80 per cent, according to the Cement

Manufacturers Association. The Indian cement industry comprises 130 large cement plants and 365 mini-cement plants, with installed capacities of 165 million tonnes per annum (mtpa). Large cement plants accounted for over 94 per cent of the total installed capacity.

Despite the growth of the Indian cement industry, India's per capita production of 115 kilograms per year lags the world average of over 250 kilograms and China's production of more than 450 kilograms per person. Also, the per capita consumption of cement in India is estimated to be 150 kilogram per annum, which is less than one-third of China's per capita consumption. Clearly there remains room for growth in the industry in India.

Capacity Additions

By the strong demand, increased capacity utilization and highly remunerative price levels many companies have been planning major capacity additions. According to the latest ICRA Industry Monitor report, installed capacity of the cement industry is expected to increase to 186 million tonnes per annum (mtpa) by end of 2007-08, 219 mtpa by end of 2008-09, and up to 241 mtpa by end of 2009-10.

- The Anil Dhirubhai Ambani Group (ADAG), by incorporating a new arm, Reliance Cement, plans to set up four cement plants of 5 mt capacity each with a total investment of US$ 2.54 billion.
- Dalmia Cement (Bharat) Ltd plans to invest 14 billion rupees to more-than-double its capacity to 8 mt by March 2009.
- Binani Cement plans to invest around US$ 457.95 million over the next three years to put up two greenfield plants each with a capacity of 2.5 to 3 mt.
- Burnpur Cement plans to invest US$ 2.54 billion over the next 7-8 years to increase cement grinding capacity from 0.3 million tonnes per annum
- Jaiprakash Associates will invest US$ 1.01 billion by 2009 to increase its cement capacity by more than three-fold to 25 mt.

- Grasim Industries is expanding capacity by 10.2 mt at subsidiary UltraTech by spending US$ 885.38 million.

Along with the investment in Greenfield projects, the Indian cement industry has also witnessed a flurry of mergers and acquisitions within the domestic players, bringing smaller players under the umbrella of larger companies, and larger companies coming under the umbrella of global players like Holcim and Heidelberg. For example, the top two groups in the industry, Aditya Birla Group and Holcim Group, now control more than 40 per cent of total capacity in the country.

Multinationals

The booming demand for cement, both in India and abroad, has attracted global majors to India. By 2005-06, four of the top-5 cement companies in the world had already entered India. These include France's Lafarge, Holcim from Switzerland, Italy's Italcementi and Germany's Heidelberg Cements. Currently, more than a quarter pie of total capacity is now being controlled by global majors.

Holcim

The Holcim Group, the world's second-biggest cement maker entered India in January 2005 through a strategic alliance with Gujarat Ambuja Cement Limited (GACL), which was later renamed as Ambuja Cements. Since then it has been progressively increasing its stake which now stands at 46 per cent at the end of 2007.

Simultaneously, Holcim has also increased its stake in Indian cement company ACC taking its total holdings in the company to 41.6 per cent. Holcim is now the largest shareholder in the company. With this Holcim now commands around 25 per cent of the total market share. India represents its single largest country exposure at about 18 per cent of its total country exposure.

Environment Analysis—Porter's Model

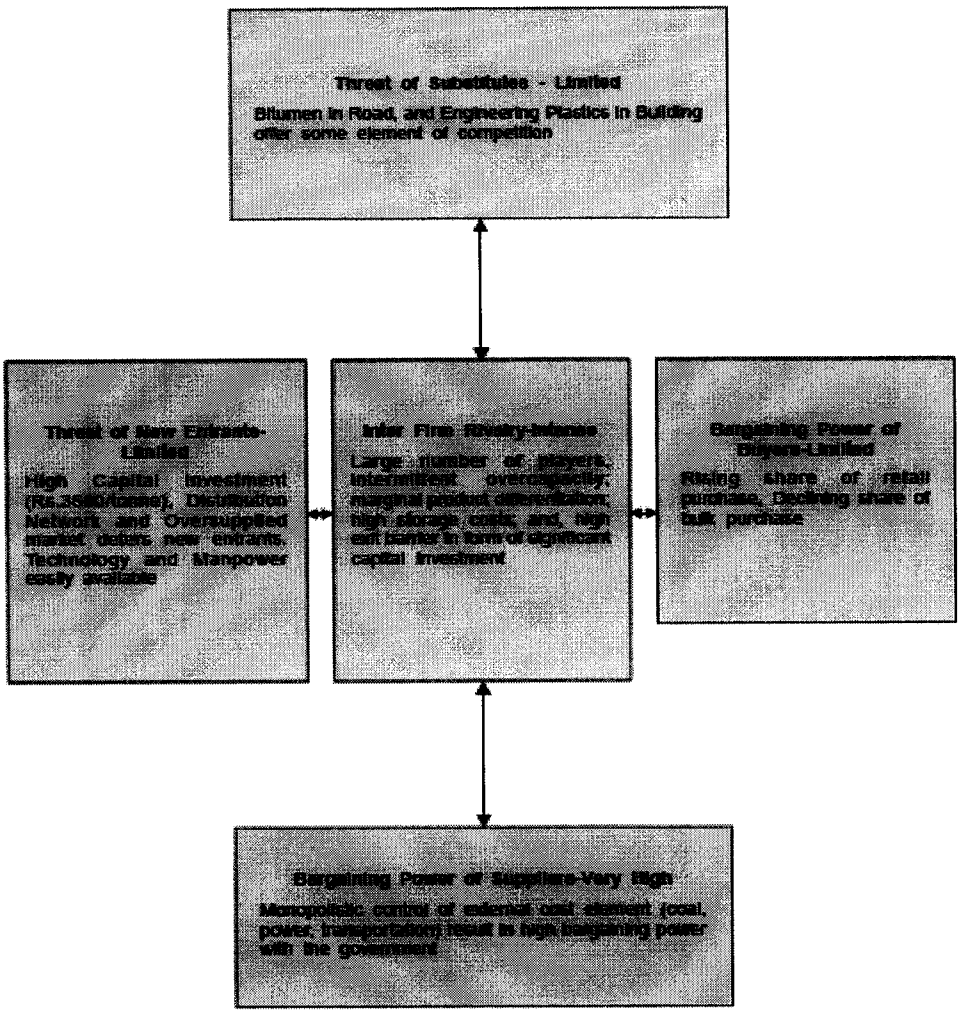


Fig no : 3.1

Major Players

With an installed capacity of around 157 million tonnes per annum (mtpa) at end-March 2006, large cement plants accounted for 93% of the total installed capacity in India. The installed capacity is distributed over across approximately 129 large cement plants owned by around 54 companies. The structure of the industry is fragmented, although, the concentration at the top is increasing. The fragmented structure is a result of the low entry barriers in the post decontrol period and the ready availability of technology.

However, cement plants are capital intensive and require a capital investment of over Rs. 3,500 per tonne of cement, which translates into an investment of Rs. 3,500 million for a 1 mtpa plant. The cement industry has witnessed substantial reorganisation of capacities during the last couple of years. Some examples of the consolidation witnessed during the recent past include: Gujarat Ambuja taking a stake of 14% in ACC; Gujarat Ambuja taking over DLF Cements and Modi Cement; India Cement taking over Raasi Cement and Sri Vishnu Cement; Grasim's acquisition of the cement business of L&T; Indian Rayon's cement division merging with Grasim; Grasim taking over Sri Digvijay Cements; L&T taking over Narmada Cements; ACC taking over IDCOL.

FY	2001	2002	2003	2004	2005	2006
The Associated Cement Companies Limited	11.2%	12.2%	12.8%	13.5%	13.0%	12.6%
UltraTech CemCo Ltd.	11.9%	11.1%	10.5%	10.1%	10.1%	9.7%
Gujarat Ambuja Cements Limited	10.6%	8.7%	9.5%	10.1%	11.3%	10.6%
Grasim Industries Limited.	9.2%	10.3%	10.9%	10.9%	10.3%	10.3%
Century Textiles and Industries Limited	5.4%	5.0%	4.6%	4.6%	4.6%	4.7%
Birla Corp Limited	4.2%	4.0%	4.1%	4.1%	3.9%	3.6%
The India Cements Limited	7.3%	5.6%	5.4%	5.4%	5.1%	5.9%
Jaiprakash Industries Limited	2.3%	3.9%	3.8%	3.6%	4.3%	4.5%
Lafarge	3.6%	3.6%	3.4%	3.2%	3.4%	3.2%
Others	34.1%	35.2%	34.8%	34.3%	33.7%	34.6%
Total	100%	100%	100%	100%	100%	100%

Table 3.1 : Market Share of the Cement Companies

Declining Role of Public Sector

Historically, cement has been one of the most important areas of operations for the Indian private sector. Unlike much of heavy industry and utilities, cement was not deemed to be the exclusive preserve of the State sectorin the post-independence development strategy. Cement was also the industry of choice of many corporates diversifying away from the troubled traditional areas of jute and textiles.

Over the years, the share of the public sector in cement production has declined. While the private sector (large companies) accounts for around 95% of the total installed capacity, the share of public sector companies has declined from a level of 11% in FY1996 to around 4.4% in FY2006. The share in production of the public sector companies is even lower at 1.2% in FY2006 as compared to 6.5% in FY1996.

Among cement public sector undertakings (PSUs), Cement Corporation of India (CCI), a central PSU, is the leading player. It has 10 cement plants with a total installed capacity of 3.85 mtpa at end-FY2006. Other PSU companies manufacturing cement include State entities such as UP State Cement Corporation (3 units with total capacity of 2.16 mtpa); and Tamil Nadu Cement (2 plants with a total capacity of 0.9 mtpa).

Given the extent of losses being incurred by most of these plants, restructuring and revival through privatization appears imminent. Accordingly, the Yerraguntla unit in Andhra Pradesh, which belonged to CCI, was taken over by India Cements in FY1998. The three units of UP State Cement Corporation have been closed since early 1998. These units were taken over by Jaypee Group in FY2006.

The Mini-Cement Industry

In order to reduce transportation as well as capital costs, to increase regional development and to make use of smaller limestone deposits, many mini-cement plants have been set up in dispersed locations across India. Construction of such plants began in the early-1980s and their capacity (including capacities of white cement plants) aggregates about 11.1 mtpa. The main attraction of the mini-cement plant concept is the lower capital costs per tonne of capacity as compared to large plants. Against the requirement of Rs. 3500+ per tonne of capacity of large plants, capital costs for mini-cement plants come to about Rs. 1,400-1,600 per tonne. This reduces to a large extent the fixed cost per tonne of cement produced. Also, as the main market is in the vicinity of a mini-cement plant, savings are large on transportation costs.

Importance to Economy

The cement industry accounts for approximately 1.3% of GDP and employs over 0.14 million people. It is a significant contributor to the revenue collected by both the central and state governments through excise and sales taxes. For example, central excise collections from cement industry aggregated Rs. 45.23 billion in FY2005 and accounted for 4.3% of total excise revenue collected by the government. Cement has consistently figured among the top 5-7 commodities. It is a heavily taxed commodity and the duties amount to around 30% of the selling price of cement.

India is the second largest producer of cement in the world. In 2005, India produced 142 mt of cement, accounting for 6.4% of global production of 2.22 billion tonnes. India is the second largest producer-behind China (1,000 mt), but ahead of the US (99 mt) and Japan (66 mt). India's cement industry-both installed capacity and actual production-has grown significantly over the past three decades, with production increasing at an average rate of 8.1% per year between 1981 and 2004-05.

Scale of Operations

The cement industry has witnessed a significant change in the scale of operations. In 1961, the largest kiln in operation had a capacity of 750 tpd. In 1970, of the total 119 kilns, 1 had over 1,000 tpd capacity, with 55 having less than 400 tpd capacity. In 1980, 11 of the total 141 kilns were over the 1000 tpd mark, with 1 kiln having acapacity larger than 3,000 tpd (roughly 1 mtpa). The 1990s saw still higher capacity 4500-5000 tpd (or 1.5 mtpa) kilns. The recent practice for a large size plant is to have 6,500-7,000 tpd (or 2.5 mtpa) capacity. As of end-FY2006, there were 7 plants with a capacity exceeding 3 mtpa at a single location, and 71 plants with a capacity exceeding 1 mtpa at a single location. Plants with a capacity exceeding 1 mtpa at a single location had a cumulative installed capacity of 126.2 mtpa at end-FY2006, accounting for 80.3% of total installed capacity.

Distribution of Single-location Plants by Installed Capacity and Production

Plant Size by Installed Capacity	Volume (thousand tonnes) No. of plants	Installed Capacity	Production	No. of plants	Share of total (%) Installed Capacity	Production
>5 mtpa	1	5,300	3,592	0.7	3.4	2.5
2-5 mtpa	24	60,443	59,906	17.4	38.5	42.2
1-2 mtpa	46	60,474	53,711	33.3	38.5	37.9
<1 mtpa	67	30,928	24,596	48.6	19.7	17.3
Total	**138**	**157,146**	**141,805**	**100.0**	**100.0**	**100.0**

Table 3.2: Distribution of Single-location Plants by Installed Capacity and Production

Recommendations on Cement Industry

For the development of the cement industry 'Working Group on Cement Industry' was constituted by the Planning Commission for the formulation of X Five Year Plan. The Working Group has projected a growth rate of 10% for the cement industry during the plan period and has projected creation of additional capacity of 40-62 million tonnes mainly through expansion of existing plants. The Working Group has identified following thrust areas for improving demand for cement;

- Further push to housing development programmes;
- Promotion of concrete Highways and roads; and
- Use of ready-mix concrete in large infrastructure projects.

Further, in order to improve global competitiveness of the Indian Cement Industry, the Department of Industrial Policy & Promotion commissioned a study on the global competitiveness of the Indian Industry through an organization of international repute, viz. KPMG Consultancy Pvt. Ltd. The report submitted by the organization has made several recommendations for making the Indian Cement Industry more competitive in the international market. The recommendations are under consideration.

Technological change

Cement industry has made tremendous strides in technological up gradation and assimilation of latest technology. At present ninety three per cent of the total capacity in the industry is based on modern and environment-friendly dry process technology and only seven per cent of the capacity is based on old wet and semi-dry process technology. There is tremendous scope for waste heat recovery in cement plants and thereby reduction in emission level. One project for co-generation of power utilizing waste heat in an Indian cement plant is being implemented with Japanese assistance under Green Aid Plan.

The induction of advanced technology has helped the industry immensely to conserve energy and fuel and to save materials substantially. India is also producing different varieties of cement like Ordinary Portland Cement (OPC), Portland Pozzolana Cement (PPC), Portland Blast Furnace Slag Cement (PBFS), Oil Well Cement, Rapid Hardening Portland Cement, Sulphate Resisting Portland Cement, White Cement etc. Production of these varieties of cement conform to the BIS Specifications. It is worth mentioning that some cement plants have set up dedicated jetties for promoting bulk transportation and export.

Data analysis And Interpretation

CHAPTER 4

DATA ANALYSIS & INTERPRETATION

Interpretation in its widest sense includes many processes like arrangements, analysis, establishing relationship between available facts and finally making conclusions. The specific and common objective of interpretation is to rank and identify the factors that affect the operational efficiency of ERP system in ACC limited.

Percentage Analysis:

Percentage refers to a special kind of ratio percentages are used to describe relationship. Data analysis plays a major role in any research because ultimately it is an apt analysis.

$$\text{Percentage} = \frac{\text{No. of customers}}{\text{Total No. Of Customers}} \times 100$$

Compare Mean Analysis (One Sample T-Test)

The One-Sample T Test compares the mean score of a sample to a known value. Usually, the known value is a population mean. Under the Analyze menu, choose Compare Means, then One-Sample T Test. Move the dependent variable into the "Test Variables" box. Type in the value you wish to compare your sample to in the box called "Test Value." The dependent variable is normally distributed. You can check for normal distribution with a Q-Q plot. A one sample t test compares the mean with a hypothetical value. In most cases, the hypothetical value comes from theory.

4.1. USERS OF VARIOUS FUNCTIONAL MODULES:

Departments	No of users	Percentage
Finance	17	20
Engineering	19	22
Commercial	19	22
Production	30	36
Total	85	100

Table 4.1. Users of various functional modules

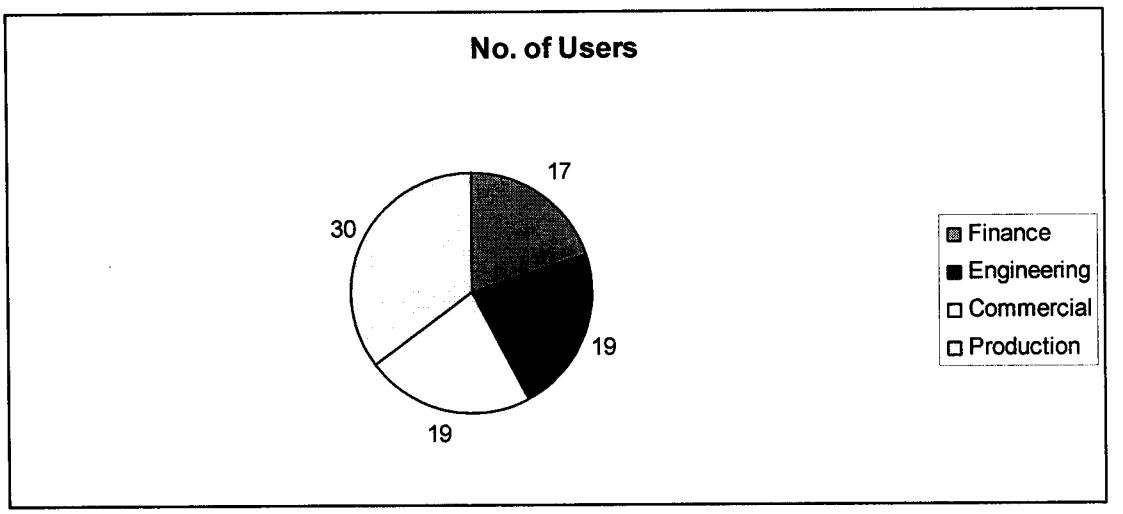


Fig 4.1. Users of various functional modules

INTERPRETATION:

The table shows that there is maximum number of users in production department with 30 users constituting for 36% of total users and the finance department constitutes for minimum number of users with 17 users which is 17%. The Engineering and production departments have 19 users both which constitutes for other 40%.

4.2. SATISFACTION ON TRAINING:

Satisfied	Frequency	Percent
Yes	66	78
No	19	22
Total	85	100

Table 4.2. Satisfaction on Training

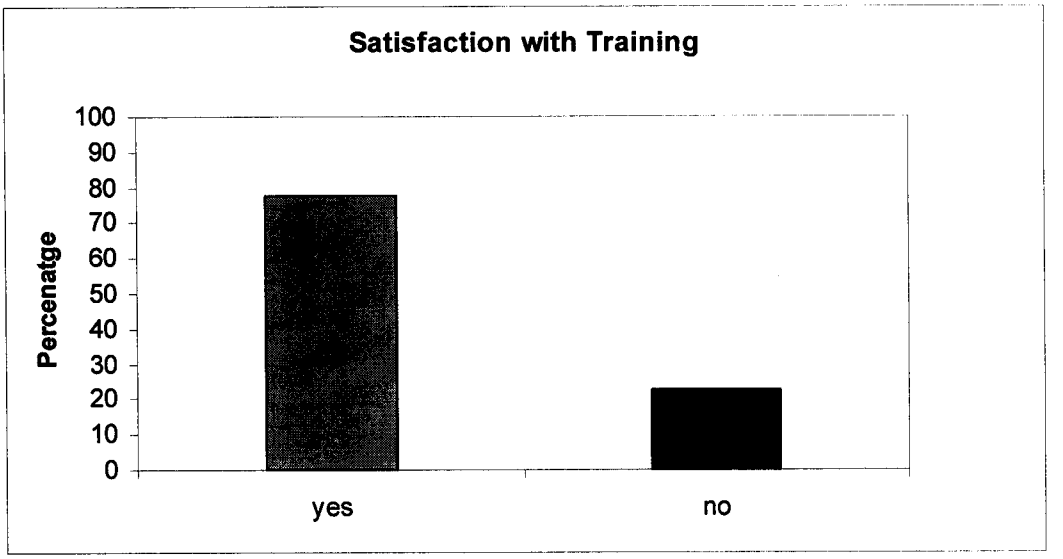


Fig 4.2. Satisfaction on Training

INTERPRETATION:

The above analysis shows that most of the employees are satisfied with training provided by the implementation partner, 66 users of the 85 users are satisfied with the training which is about 78% of the total users.

4.3. ACCOMPLISHMENT OF ADDITIONAL WORK

Response	Frequency	Percent
Strongly agree	29	34
Agree	44	52
Neutral	8	9
Disagree	4	5
Total	85	100

Table 4.3. Accomplishment of Additional Work

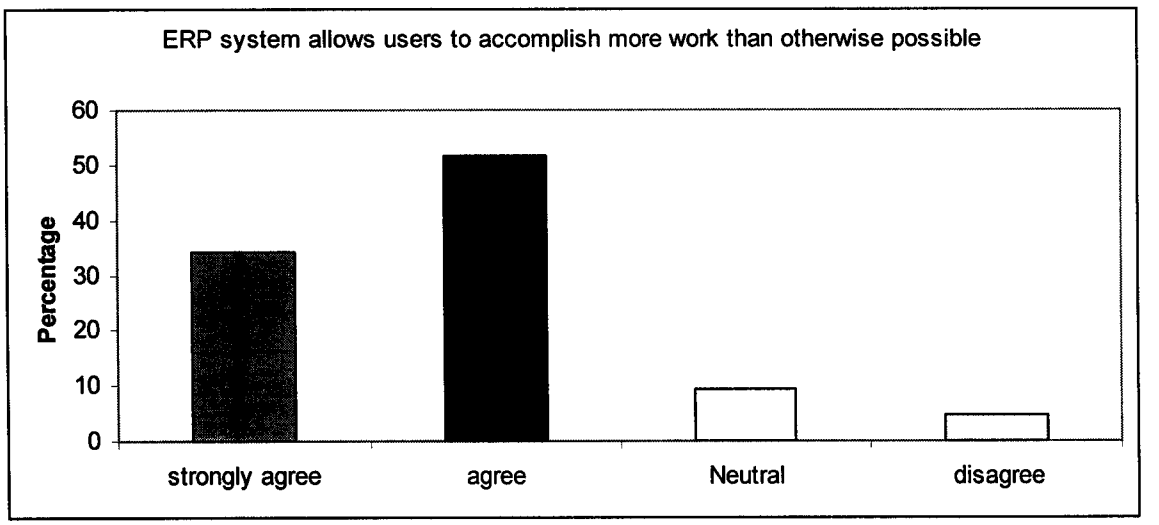


Fig 4.3. Accomplishment of Additional Work

INTERPRETATION:

The table shows that most users agree that ERP system helps to accomplish more work than otherwise possible. Only 9% of the users are neutral towards this and 5% of the users disagree with the statement.

4.4. TIME SAVING:

Response	Frequency	Percent
Yes	75	88
No	10	12
Total	85	100

Table 4.4 Time Saving

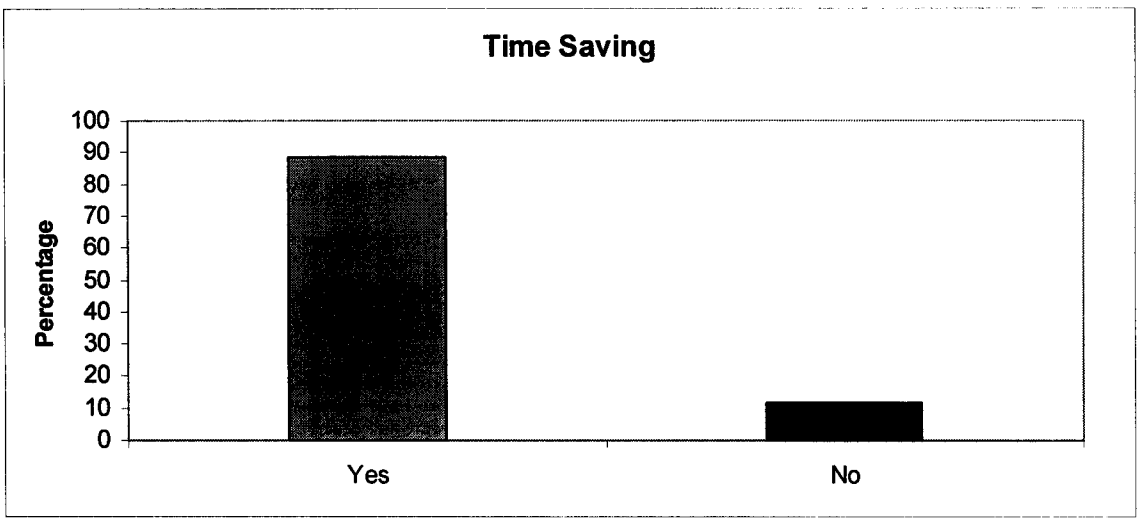


Fig 4.4 Time Saving

INTERPRETATION:

From the table it can be observed that 88% of the users agree that ERP system helps to save time, i.e., 75 users agree that ERP system saves and only 12% of the users don't agree with the statement.

4.5. INCREASE OF PRODUCTIVITY:

Response	Frequency	Percent
Strongly agree	38	45
Agree	29	34
Neutral	18	21
Total	85	100

Table 4.5. Increase of productivity

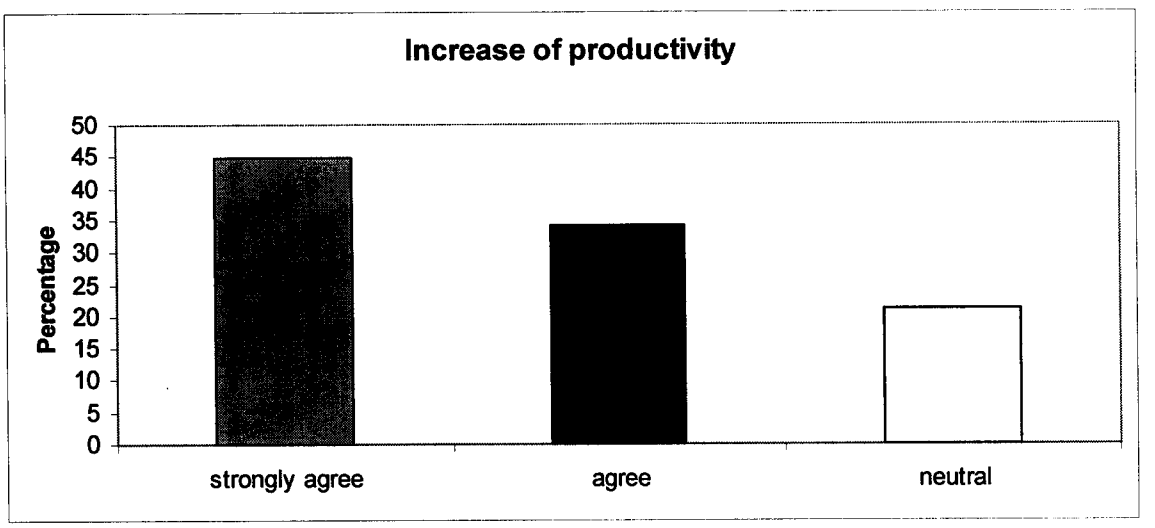


Fig 4.5. Increase of productivity

INTERPRETATION:

The table shows that 45% of the users strongly agree that ERP system increases productivity, while 34% agree to have increased productivity because of using the ERP system, and 21% of the users are of a neutral opinion when it comes to increase in productivity because of using the ERP system.

4.6. FACTORS INFLUENCING SERVICE QUALITY:

FACTORS	N	MEAN	RANK
ERP implementation partner has up to date h/w & s/w to support ERP	**85**	**1.65**	**1**
Users feel safe in their correspondence with implementation partner's employees	**85**	**1.67**	**2**
Implementation partner provide services whenever needed	**85**	**1.76**	**3**
Implementation partner tells users exactly service due date	85	1.99	4
Implementation partner's infrastructural facilities are visually appealing	85	2.00	5
Implementation partner is dependable	85	2.00	6
Implementation partner employees gives users personal attention	85	2.09	7
Implementation partner shows sincere interest in solving a problem faced by users	85	2.12	8
Implementation partner employees behaviour instills confidence in users	85	2.14	9
Implementation partner has working hours convenient to all its users	85	2.33	10

Table 4.6. Factors influencing service quality

INTERPRETATION:

The table of one sample T – test shows the important factors that influence the service quality of implementation partner. The factors are ranked based on their means. The factor, ERP implementation partner has upto date software and hardware to support the ERP has least mean value of 1.65 which becomes the most expected factor by the users of the ERP.

It is followed by the factor, users feel safe in their correspondence with implementation partner's employees which has a mean value of 1.67 and hence it is gets a second rank.

The factor with next least value of 1.76 is implementation partner provide services whenever needed and is ranked third.

4.7. FACTORS INFLUENCING SYSTEM QUALITY:

FACTORS	N	Mean	Rank
Easy to remember how to perform tasks using company's ERP package	**85**	**1.54**	**1**
Unexpected system down time makes my work hard	**85**	**1.99**	**2**
Company's ERP system is frequently subjected to problems and crashes	**85**	**2.11**	**3**
Company's ERP does not require a lot of mental effort	85	2.21	4
Satisfaction greater than expectation	85	2.21	5
Simplifies report generation	85	2.24	6
Capable of communicating data among system in different functional departments	85	2.33	7

Table 4.7. Factors influencing system quality

INTERPRETATION:

The table of one sample T – test shows the important factors that influence the system quality of ERP system. The factors are ranked based on their means. The factor, easy to remember how to perform tasks using company's ERP package has the least mean value of 1.54 and hence it becomes most important factor that influences the system quality. Unexpected system down time makes my work hard has the next least mean value of 1.99, factor with next least mean value of 2.11 is company's ERP system is frequently subjected to problems and crashes and hence it shows that these crashes should be avoided.

4.8. FACTORS INFLUENCING INFORMATION QUALITY:

FACTORS	N	Mean	Rank
System provides clear and precise information	**85**	**1.56**	**1**
Company's ERP provides all available information	**85**	**1.65**	**2**
System provides accurate and reliable information	**85**	**1.78**	**3**
Provides up-to-date information	85	1.89	4
Information provided by ERP is used for company's decision making	85	1.89	5
Provides needed information in time	85	2.20	6
ERP helps in easy storage and retrieval of required data	85	2.21	7

Table 4.8. Factors influencing information quality

INTERPRETATION:

The table of one sample T – test shows the important factors that influence the information quality of ERP system. The factors are ranked based on their means. System provides clear and precise information has the least mean value of 1.56 and hence it becomes the most important factor that influences information quality of the ERP system. Company's ERP provides all available information has a mean value of 1.65 and becomes the next most important factor that influences the information quality. The third most important factor is system provides accurate and reliable information.

4.9. FACTORS INFLUENCING FINANCE DEPARTMENT:

FACTORS	N	Mean	Rank
System improves financial management	**17**	**1.12**	**1**
System improves control system	**17**	**1.47**	**2**
ERP system generates documents for GAAP requirement	**17**	**1.53**	**3**
System improves efficiency in preparing salary sheet	17	1.59	4
Investment in ERP system is beneficial	17	1.65	5
System reduces working capital cycle	17	1.94	6
System improves financial reconciliation	17	1.94	7
ERP increases firm's profit	17	1.94	8
System helps in prompt payment to suppliers	17	2.00	9
Improves coordination between Madukkari finance dept and head office finance dept	17	2.00	10
System reduces errors in creating bills	17	2.00	11
System makes cash receipt/payment simpler	17	2.06	12

System improves investment management	17	2.06	13
System helps to reduce expenditure	17	2.12	14
System helps in prompt receipt from customers	17	2.12	15
System reduces time to process AR/AP	17	2.12	16
System improves budgeting process	17	2.12	17
System improves preparation of cost sheet for various departments	17	2.47	18
System improves fund allocation for various departments within the plant	17	2.53	19

Table 4.9. Factors influencing finance department

INTERPRETATION:

There are totally 19 factors that influence the finance and accounts department. In these 'System improves financial management' is ranked first with the least mean value of 1.12. 'System improves control system' is ranked second with a mean value of 1.47, 'ERP system generates documents for GAAP requirement' is ranked third with a mean value of 1.53.

4.10. FACTORS INFLUENCING ENGINEERING DEPARTMENT:

FACTORS	N	Mean	Rank
System reduces shutdown time and cost	**19**	**1.53**	**1**
Reduces machine break down to greater extent	**19**	**1.68**	**2**
Helps to achieve TPM	**19**	**1.79**	**3**
System improves manpower planning	19	1.84	4
System improves preventive maintenance	19	1.89	5
Reduces the frequency of breakdown to greater extent	19	2.00	6
Helps in reducing maintenance cost	19	2.00	7
Reduces mean time to recover	19	2.11	8
System improves production capacity due to improved maintenance schedule	19	2.21	9
System helps to register complaints about breakdown	19	2.32	10
System improves lifecycle mgmt of equipments	19	2.37	11
Reduces long cycle work processes	19	2.63	12

Table 4.10. Factors influencing engineering department

INTERPRETATION:

There are totally 12 factors that influence the Engineering department. In these 'System reduces shutdown time and cost' is ranked first with the least mean value of 1.53. 'Reduces machine break down to greater extent' is ranked second with a mean value of 1.68, 'Helps to achieve TPM' is ranked third with a mean value of 1.79.

4.11. FACTORS INFLUENCING COMMERCIAL DEPARTMENT:

FACTORS	N	Mean	Rank
Improves contract and vendor mgmt	**19**	**1.63**	**1**
Helps to achieve JIT concept	**19**	**1.79**	**2**
Simplifies inspection and approval of raw material	**19**	**1.79**	**2**
Reduces emergency purchases	19	1.84	4
Reduces procurement cycle time	19	2.00	5
Reduces procurement lead time	19	2.00	6
Improves relationship between company and vendors	19	2.00	7
System helps in mentoring stock in hand	19	2.00	8
Helps in prompt payment to vendors	19	2.26	9
System improves cross functional integration between various departments	19	2.37	10
System reduces item cost due to improved negotiation	19	2.42	11
Helps in timely delivery of the product to customers	19	2.42	12

Table 4.11. Factors influencing commercial department

INTERPRETATION:

There are totally 12 factors that influence the commercial department. In these 'Improves contract and vendor management' is ranked first with the least mean value of 1.63. 'Helps to achieve JIT concept' and 'Simplifies inspection and approval of raw material' are ranked second because they have an equal mean value of 1.79.

4.12. FACTORS INFLUENCING PRODUCTION DEPARTMENT:

FACTORS	N	Mean	Rank
Optimizes the plant capacity utilization	**30**	**1.50**	**1**
System reduces resource requirement	**30**	**1.67**	**2**
ERP system reduces WIP inventory	**30**	**1.83**	**3**
System improves labor productivity	30	2.00	4
System improves flexibility in production management	30	2.00	5
System integrates various production process	30	2.00	6
System reduces wastage in production	30	2.17	7
System improves machine productivity	30	2.17	8
Improves production planning and scheduling	30	2.17	9
System reduces production lead time	30	2.33	10
Improves quality control	30	2.33	11
Helps to monitor various process parameters	30	2.33	12

Table 4.12. Factors influencing production department

INTERPRETATION:

There are totally 12 factors that influence the production department. In these 'Optimizes the plant capacity utilization' is ranked first with the least mean value of 1.50. 'System reduces resource requirement' is ranked second with a mean value of 1.67, 'ERP system reduces WIP inventory' is ranked third with a mean value of 1.83.

Conclusion

CHAPTER 5
CONCLUSION

The evolution of Enterprise Resource Planning (ERP) systems has been a highlight in the information systems arena. In the implementation of ERP system the Post implementation Stage is very important. Acc plays an important role in production of cement in India. So now the company needs to analyses the benefits and effectiveness of the ERP system. To determine the level of utilization of the ER system by the employees is a challenging and complicated issue for management.

The major problem faced during implementation of the system is change management. To overcome this problem, the management has to get proper feedback from the employees who using the ERP system in the company. The research was primarily to get the feedback from the ERP users in the Manufacturing unit.

The study of employee feedback on ERP implementation provides an insight into effectiveness of the ERP system in ACC Madukkarai. The effectiveness of the ERP system is analyzed on the data collected from the respondents through a structured questionnaire. In the study only the ERP authorized user are selected. It was found that ERP system which is implemented in the company is effective. The overall productivity of the employees is increased and the users of the system are satisfied.

5.1 Findings

- More than 75% of users are satisfied with the training provided by the implementation partner.
- 86% of the users agree that the ERP system allows user to accomplish more work.
- 88% of the users agree that the ERP system saves time.
- 79% of the users agree that the ERP system helps to improve productivity in their operations.
- The service quality depends on the hardware and software provided by the implementation partner.
- The user interface is the key factor that determines the quality of the ERP system
- The accuracy of the information is most important in the ERP system.
- Management of finance in the organization is improved due to implementation of ERP.
- The ERP system has reduced the system shutdown time and cost.
- The ERP system has improved the relationship with the vendors and customers.
- Plant capacity utilization has improved after the implementation of ERP system.
- All the above findings show that the overall operational efficiency of the company has improved after implementing SAP ERP system.

5.2 Suggestion

- The 17% of the users need more training in the ERP system, since the company need to provide training to those users to achieve 100% over the ERP system.

- The implementation partner should regularly update the software and hardware to achieve 100% service quality

- The company should remove these constrains while implementing the ERP system in others departments.

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2. Journal of Enterprise Information Management
3. Online Information Review

Appendices

APPENDICES

QUESTIONNAIRE

Personal

Name (Optional) :

Age :

Department :

Designation :

Educational Qualification :

No. of Years Associated

With ACC Coimbatore :

Total experience in the

Cement industry :

General

1. Do you know about ERP before implementation in your company?

☐ Yes ☐ No

2. What are all the ERP Packages you have heard?

☐ SAP ☐ People Soft ☐ Oracle

☐ SSA Global ☐ J. D. Edwards ☐ others

3. How long does your company operate on ERP?

☐ Below 6 months ☐ 6 months to 1 year ☐ 1 year to 2 years

☐ 2 years and above

4. How often you use your company's ERP system?

☐ once a month ☐ once a week ☐ 2-5 times a week

☐ all the time

5. Did your Company arrange any training on ERP?

☐ Yes ☐ No

6. a. If yes how long

☐ 1- 3 weeks ☐ 3 – 5 weeks ☐ more than 5 weeks

6. b. On Which Package?

☐ SAP ☐ People soft ☐ Oracle

☐ SSA Global ☐ J. D. Edwards

7. Did the Implementation Partner give the Hands on training on ERP?

☐ Yes ☐ No

8. Did the training cover various topics related to the ERP Functions?

☐ Yes ☐ No

9. Did they (implementation Partner) give any training materials?

☐ Yes ☐ No

10. Are you satisfied with the training?

☐ Yes ☐ No

11. Is your ERP, under any maintenance contract?

☐ Yes ☐ No

(1= Strongly agree, 2= Agree, 3= Neutral, 4= Disagree 5= Strongly Disagree)

12. My Company's ERP System allows me to accomplish more work than would otherwise be possible.

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

13. My Company's ERP system saves my time.

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

14. My Company's ERP system increases my productivity.

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

15. What role did you play in ERP implementation?

Enterprise Resource Planning (ERP) Service Quality

Directions: The following set of statements relate to your feelings about ERP implementation partner. There is no right or wrong answers. We are interested to know your perceptions about your ERP implementation partner.
(1= Strongly agree, 2= Agree, 3= Neutral, 4= Disagree 5= Strongly Disagree)

1. ERP Implementation Partner has up-to-date hardware and software to support ERP?

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

2. ERP Implementation Partner's infrastructural facilities are visually appealing

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

3. ERP Implementation Partner shows sincere interest in solving a problem faced by us

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

4. ERP Implementation Partner is dependable

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

5. ERP Implementation Partner provides services whenever it is needed

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

6. ERP Implementation Partner tells users exactly, services due date

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

7. The Behavior of ERP Implementation Partner employees instills confidence in users

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

8. Users feel safe in their correspondence with ERP Implementation Partner's employees

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

9. ERP Implementation Partner has working hours convenient to all its users

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

10. ERP Implementation Partner has employees, who give users personal attention

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Enterprise Resource Planning (ERP) System Quality

Directions: The following set of statements relate to your feelings and expectations in terms of ERP system which is implemented in your company. There is no right or wrong answers. We are interested to know your perceptions about ERP package.

(1= Strongly agree, 2= Agree, 3= Neutral, 4= Disagree 5= Strongly Disagree)

1. Unexpected system down-time makes my work harder

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

2. The My Company's ERP System is frequently subject to problems and crashes.

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

3. It is easy for me to remember how to perform tasks using my company's ERP package

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

4. My company's ERP package does not required a lot of mental effort.

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

5. My company's My Company's ERP System is capable of communicating / transmitting data & information amongst system in different functional depts.

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

6. My Company's ERP System simplifies report generation

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

7. My satisfaction level with regard to ERP system interface is better than what I expected

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Enterprise Resource Planning (ERP) Information Quality

(1= Strongly agree, 2= Agree, 3= Neutral, 4= Disagree 5= Strongly Disagree)

1. My Company's ERP System provides all the available information

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

2. My Company's ERP System provides clear and precise information

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

3. My Company's ERP System provides accurate & reliable information

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

4. My Company's ERP provides needed information in time

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

5. My Company's ERP System provides up-to-date information?

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

6. The information provided by my company's ERP system is used for company's decision making

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

7. My Company's ERP helps in easy storage/ retrieval of required data

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Finance & Accounts

(1= Strongly agree, 2= Agree, 3= Neutral, 4= Disagree 5= Strongly Disagree)

1. My Company's ERP System generates documents to meet GAAP[1] requirements

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

2. My Company's ERP System improves efficiency in preparing salary sheet

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

3. My Company's ERP System makes the cash receipt/ payment vouchers simpler

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

4. My Company's ERP System helps in reducing expenditures

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

5. My Company's ERP System helps in prompt payment to suppliers

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

6. My Company's ERP System helps in prompt receipt from customers

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

7. My Company's ERP System improves the co-ordination between Madukkari finance dept and Head office finance dept

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

8. My Company's ERP System improves fund allocation for various departments within the plant

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

9. My Company's ERP System improves preparation of cost sheet for various departments

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

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[1] GAAP- Generally Accepted Accounting Principles

10. My Company's ERP System reduces the errors in creating bills

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

11. My Company's ERP System reduces the time to process AR/AP

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

12. My Company's ERP System reduces the working capital cycle

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

13. My Company's ERP System improves budgeting process

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

14. My Company's ERP System improves financial reconciliation

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

15. My Company's ERP System improves financial management

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

16. My Company's ERP System improves control system

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

17. My Company's ERP System improves investment management

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

18. Investment made on my company's ERP system is beneficial

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

19. My company's ERP increases the firm's profit?

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Production

(1= Strongly agree, 2= Agree, 3= Neutral, 4= Disagree 5= Strongly Disagree)

1. My Company's ERP System reduces work in progress inventory

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

2. My Company's ERP System reduces Wastage in production

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

3. My Company's ERP System improves labor productivity

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

4. My Company's ERP System improves Machine productivity

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

5. My Company's ERP System reduces production lead time

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

6. My Company's ERP System improves flexibility in production management

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

7. My Company's ERP System improves production planning and scheduling

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

8. My Company's ERP System improves quality control

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

9. My Company's ERP System helps integrate various production processes

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

10. My Company's ERP System optimizes the plant capacity utilization

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

11. My Company's ERP System reduces resource requirement

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

12. ERP helps to monitor various process parameters

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Engineering

(1= Strongly agree, 2= Agree, 3= Neutral, 4= Disagree 5= Strongly Disagree)

1. My Company's ERP System reduces no. of machine breakdown to grater extent

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

2. My Company's ERP System reduces frequency of breakdown to greater extent

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

3. My Company's ERP System improves preventive maintenance

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

4. My Company's ERP System reduces shutdown time & cost

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

5. My Company's ERP System reduces Mean Time to Recover (MTTR)

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

6. My Company's ERP System helps achieve TPM (Total Productive Maintenance)

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

7. My Company's ERP System improves manpower planning

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

8. My Company's ERP System improves production capacity due to improved maintenance schedule

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

9. My Company's ERP System helps register complaints about breakdowns

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

10. My Company's ERP System improves the lifecycle management of equipments

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

11. My Company's ERP System helps in reducing maintenance cost

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

12. My company's ERP system reduces long-cycle work processes such as system reinforcement & equipment refurbishment

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Commercial

(1= Strongly agree, 2= Agree, 3= Neutral, 4= Disagree 5= Strongly Disagree)

1. My Company's ERP System reduces procurement cycle time

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

2. My Company's ERP System reduces procurement lead time

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

3. My Company's ERP System helps achieve Just in Time (JIT) concept

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

4. My Company's ERP System reduces item cost due to improved negotiation

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

5. My Company's ERP System improves the relationship between company and the vendors

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

6. My Company's ERP System reduces Emergency purchases

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

7. My Company's ERP System improves contract & vendor management

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

8. My Company's ERP System helps in mentoring stock in hand

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

9. My Company's ERP System improves cross functional integration between various departments

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

10. My Company's ERP System helps in timely delivery of the product to customers

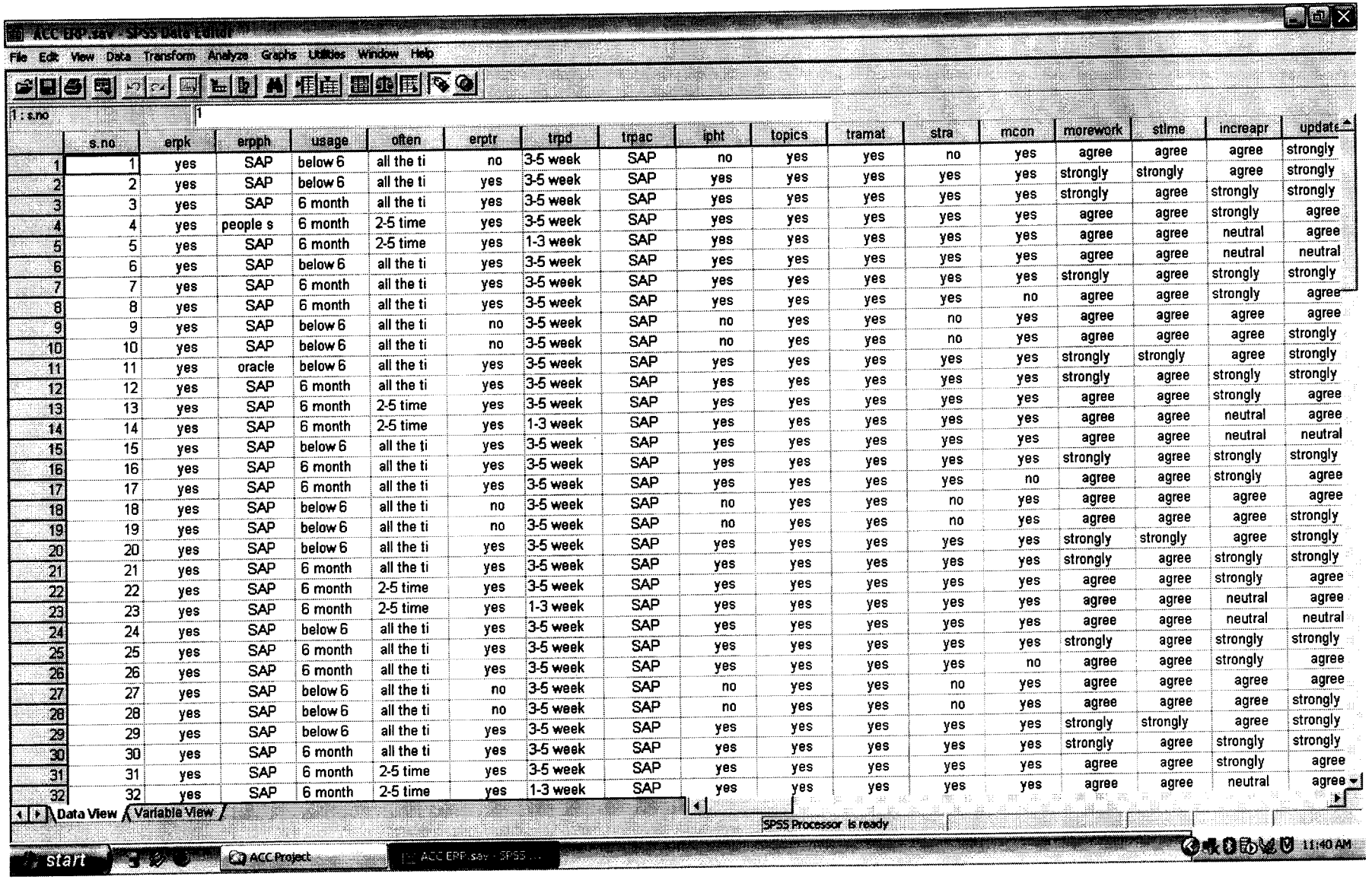
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

11. My Company's ERP System helps in making prompt payment to vendors

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

12. My Company's ERP System simplifies inspection and approval of raw materials

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5



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7	7	yes	SAP	6 month	all the ti	yes	3-5 week	SAP	yes	yes	yes	yes	yes	strongly	agree	strongly	strongly
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19	19	yes	SAP	below 6	all the ti	no	3-5 week	SAP	no	yes	yes	no	yes	agree	agree	agree	strongly
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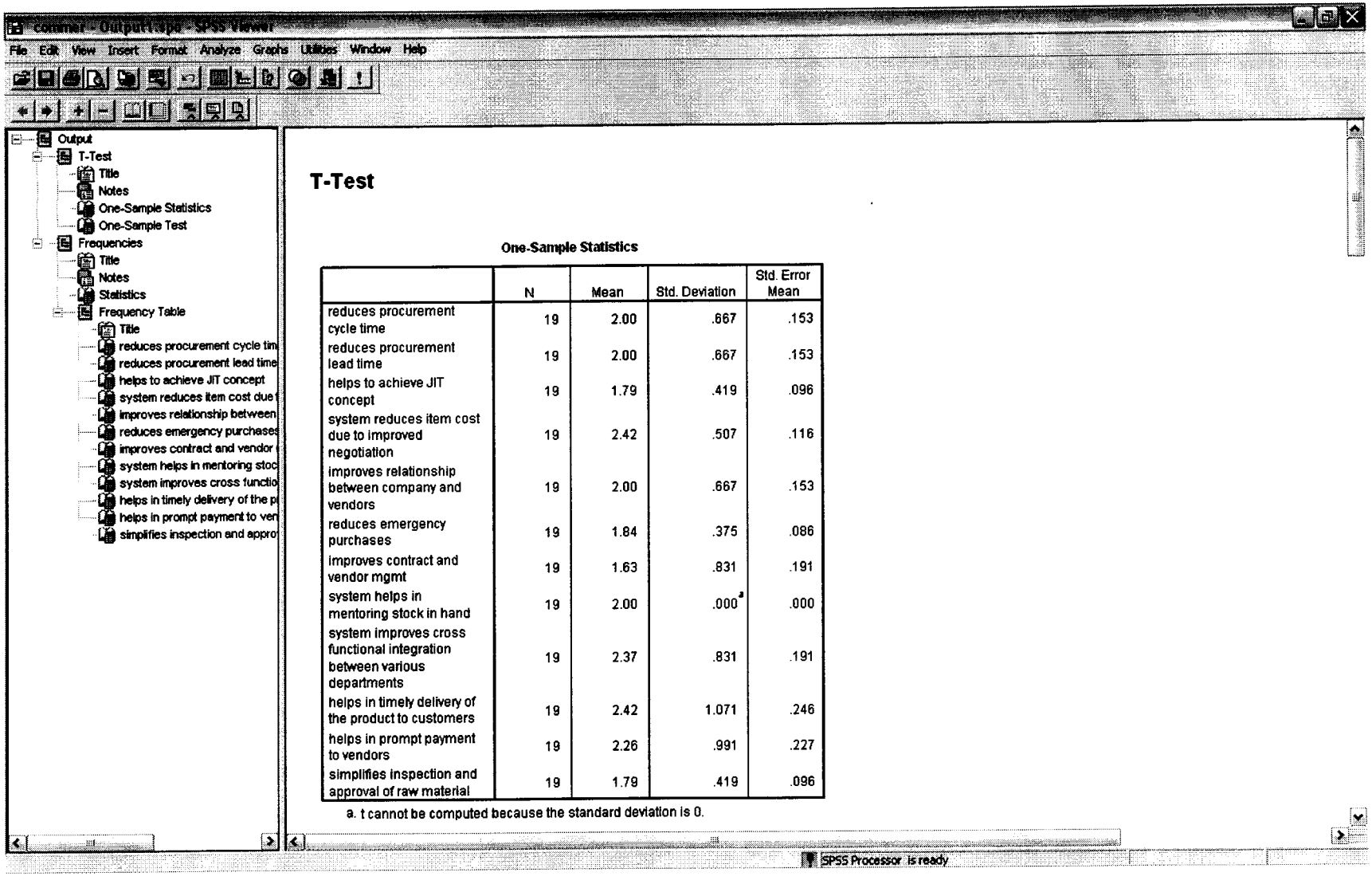
25	25	yes	SAP	6 month	all the ti	yes	3-5 week	SAP	yes	yes	yes	yes	yes	strongly	agree	strongly	strongly
26	26	yes	SAP	6 month	all the ti	yes	3-5 week	SAP	yes	yes	yes	yes	no	agree	agree	strongly	agree
27	27	yes	SAP	below 6	all the ti	no	3-5 week	SAP	no	yes	yes	no	yes	agree	agree	agree	agree
28	28	yes	SAP	below 6	all the ti	no	3-5 week	SAP	no	yes	yes	no	yes	agree	agree	agree	strongly
29	29	yes	SAP	below 6	all the ti	yes	3-5 week	SAP	yes	yes	yes	yes	yes	strongly	strongly	agree	strongly
30	30	yes	SAP	6 month	all the ti	yes	3-5 week	SAP	yes	yes	yes	yes	yes	strongly	agree	strongly	strongly
31	31	yes	SAP	6 month	2-5 time	yes	3-5 week	SAP	yes	yes	yes	yes	yes	agree	agree	strongly	agree
32	32	yes	SAP	6 month	2-5 time	yes	1-3 week	SAP	yes	yes	yes	yes	yes	agree	agree	neutral	agree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helps to achieve JIT concept 19 1.79 .419 .096
system reduces item cost due to improved negotiation 19 2.42 .507 .116
improves relationship between company and vendors 19 2.00 .667 .153
reduces emergency purchases 19 1.84 .375 .086
improves contract and vendor mgmt 19 1.63 .831 .191
system helps in mentoring stock in hand 19 2.00 .000a .000
system improves cross functional integration between various departments 19 2.37 .831 .191
helps in timely delivery of the product to customers 19 2.42 1.071 .246
helps in prompt payment to vendors 19 2.26 .991 .227
simplifies inspection and approval of raw material 19 1.79 .419 .096
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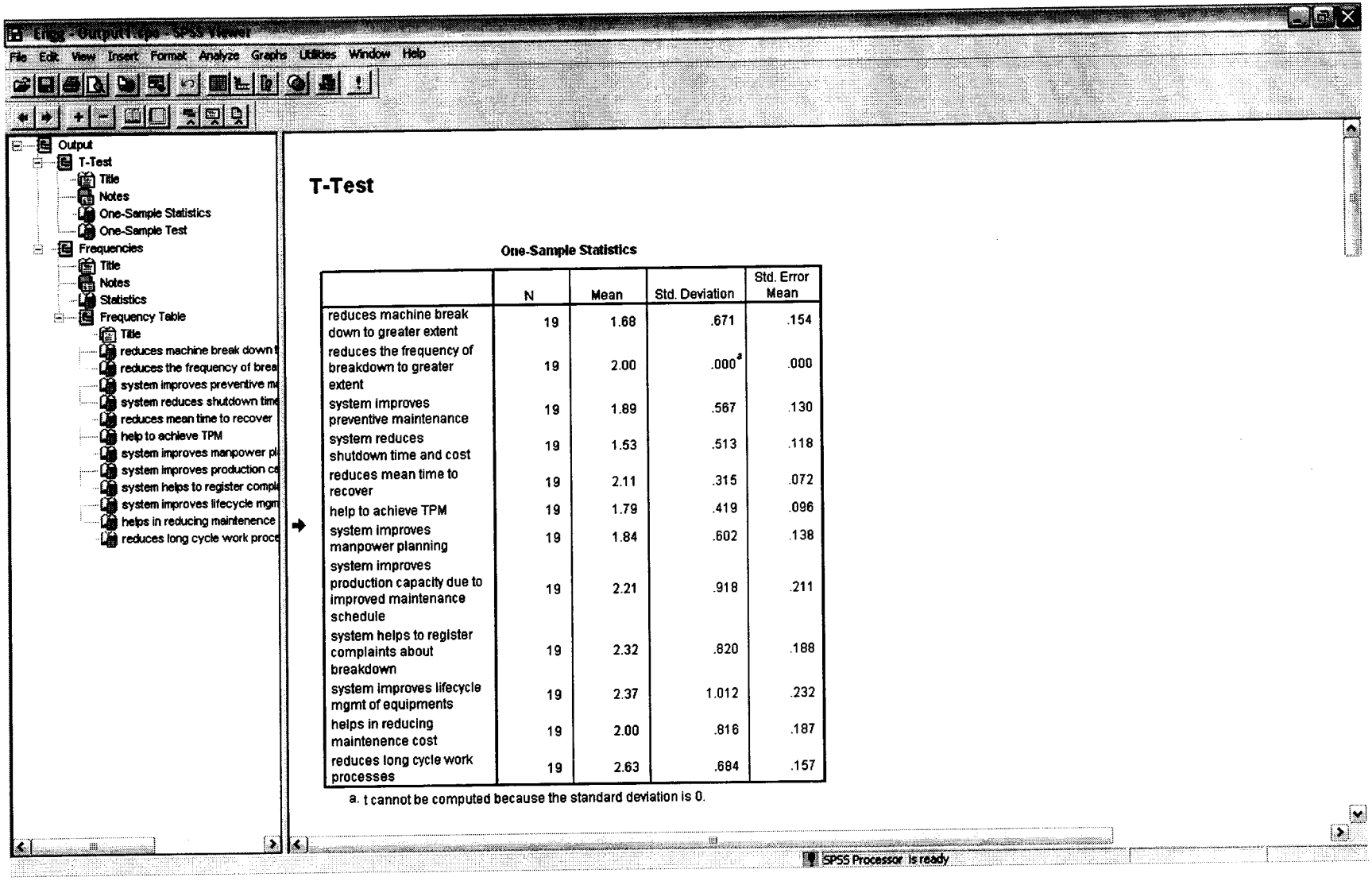
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reduces machine break down t
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reduces machine break down to greater extent 19 1.68 .671 .154
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system improves preventive maintenance 19 1.89 .567 .130
system reduces shutdown time and cost 19 1.53 .513 .118
reduces mean time to recover 19 2.11 .315 .072
help to achieve TPM 19 1.79 .419 .096
system improves manpower planning 19 1.84 .602 .138
system improves production capacity due to improved maintenance schedule 19 2.21 .918 .211
system helps to register complaints about breakdown 19 2.32 .820 .188
system improves lifecycle mgmt of equipments 19 2.37 1.012 .232
helps in reducing maintenence cost 19 2.00 .816 .187
reduces long cycle work processes 19 2.63 .684 .157
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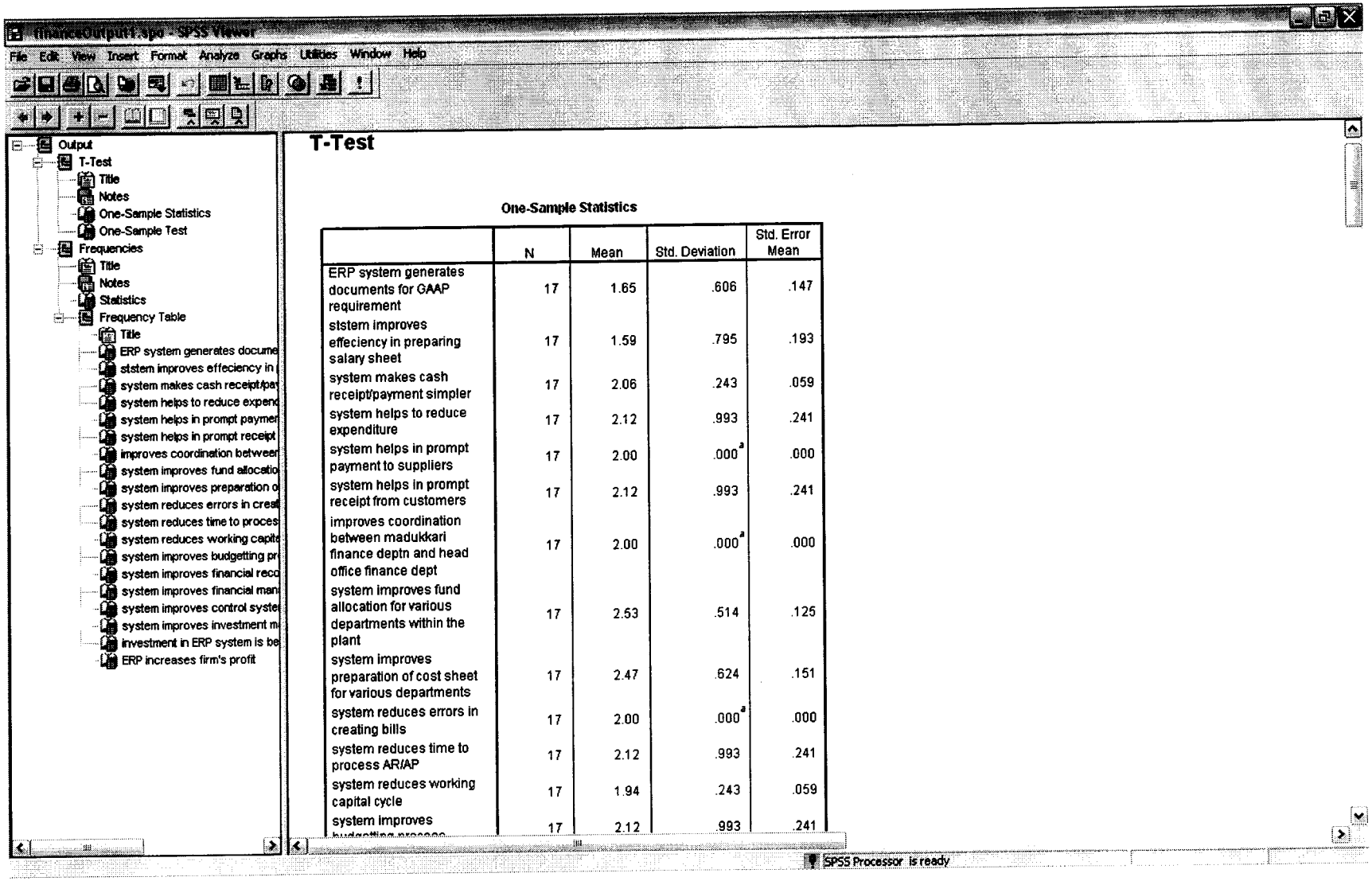
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ststem improves effeciency in preparing salary sheet 17 1.59 .795 .193
system makes cash receipt/payment simpler 17 2.06 .243 .059
system helps to reduce expenditure 17 2.12 .993 .241
system helps in prompt payment to suppliers 17 2.00 .000a .000
system helps in prompt receipt from customers 17 2.12 .993 .241
improves coordination between madukkari finance deptn and head office finance dept 17 2.00 .000a .000
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system reduces errors in creating bills 17 2.00 .000a .000
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system reduces working capital cycle 17 1.94 .243 .059
system improves 17 2.12 .993 .241
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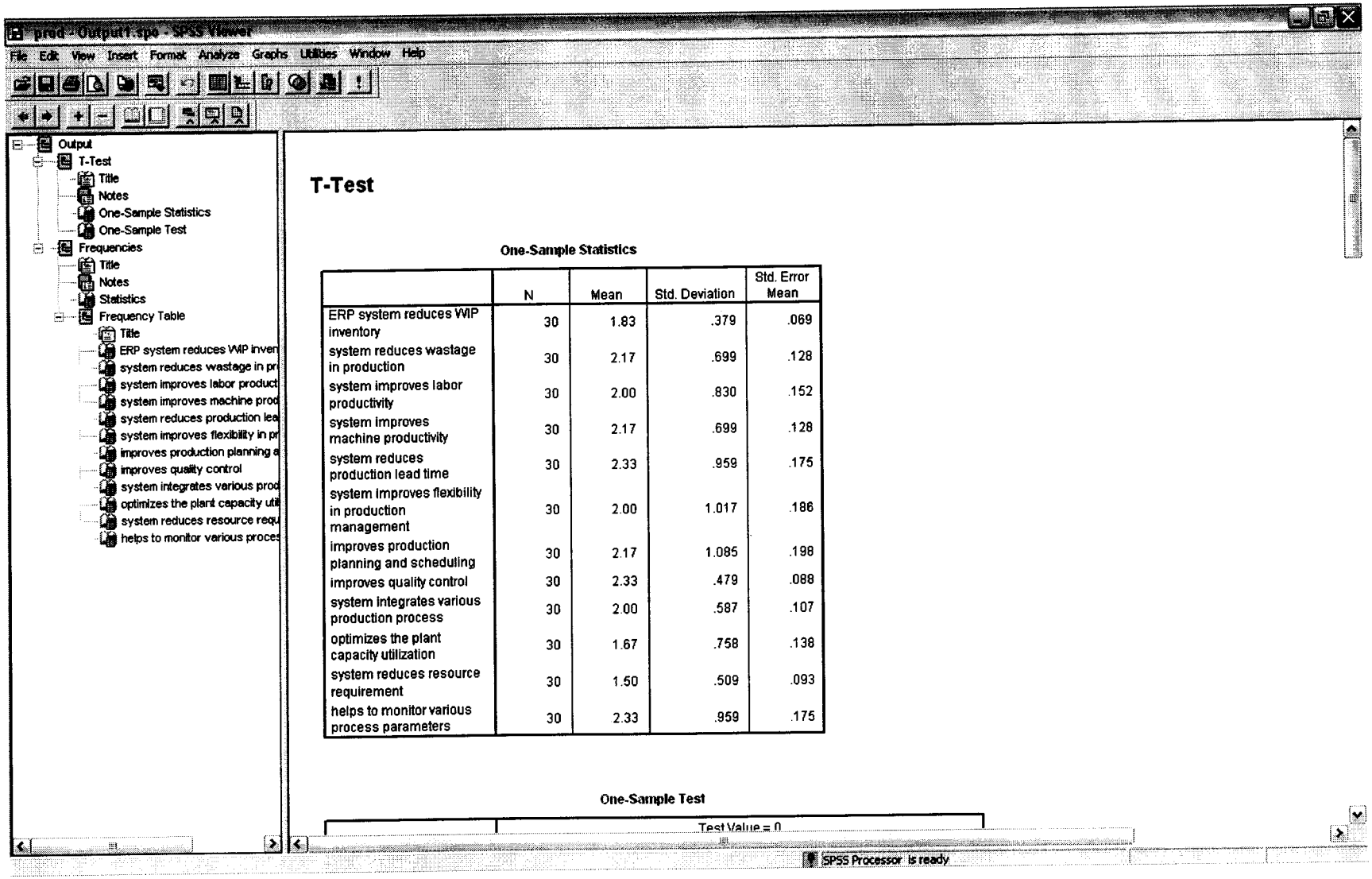
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ERP system reduces WIP inven
system reduces wastage in pr
system improves labor product
system improves machine prod
system reduces production lea
system improves flexibility in pr
improves production planning a
improves quality control
system integrates various proc
optimizes the plant capacity uti
system reduces resource requ
helps to monitor various proces
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ERP system reduces WIP inventory 30 1.83 .379 .069
system reduces wastage in production 30 2.17 .699 .128
system improves labor productivity 30 2.00 .830 .152
system improves machine productivity 30 2.17 .699 .128
system reduces production lead time 30 2.33 .959 .175
system improves flexibility in production management 30 2.00 1.017 .186
improves production planning and scheduling 30 2.17 1.085 .198
improves quality control 30 2.33 .479 .088
system integrates various production process 30 2.00 .587 .107
optimizes the plant capacity utilization 30 1.67 .758 .138
system reduces resource requirement 30 1.50 .509 .093
helps to monitor various process parameters 30 2.33 .959 .175
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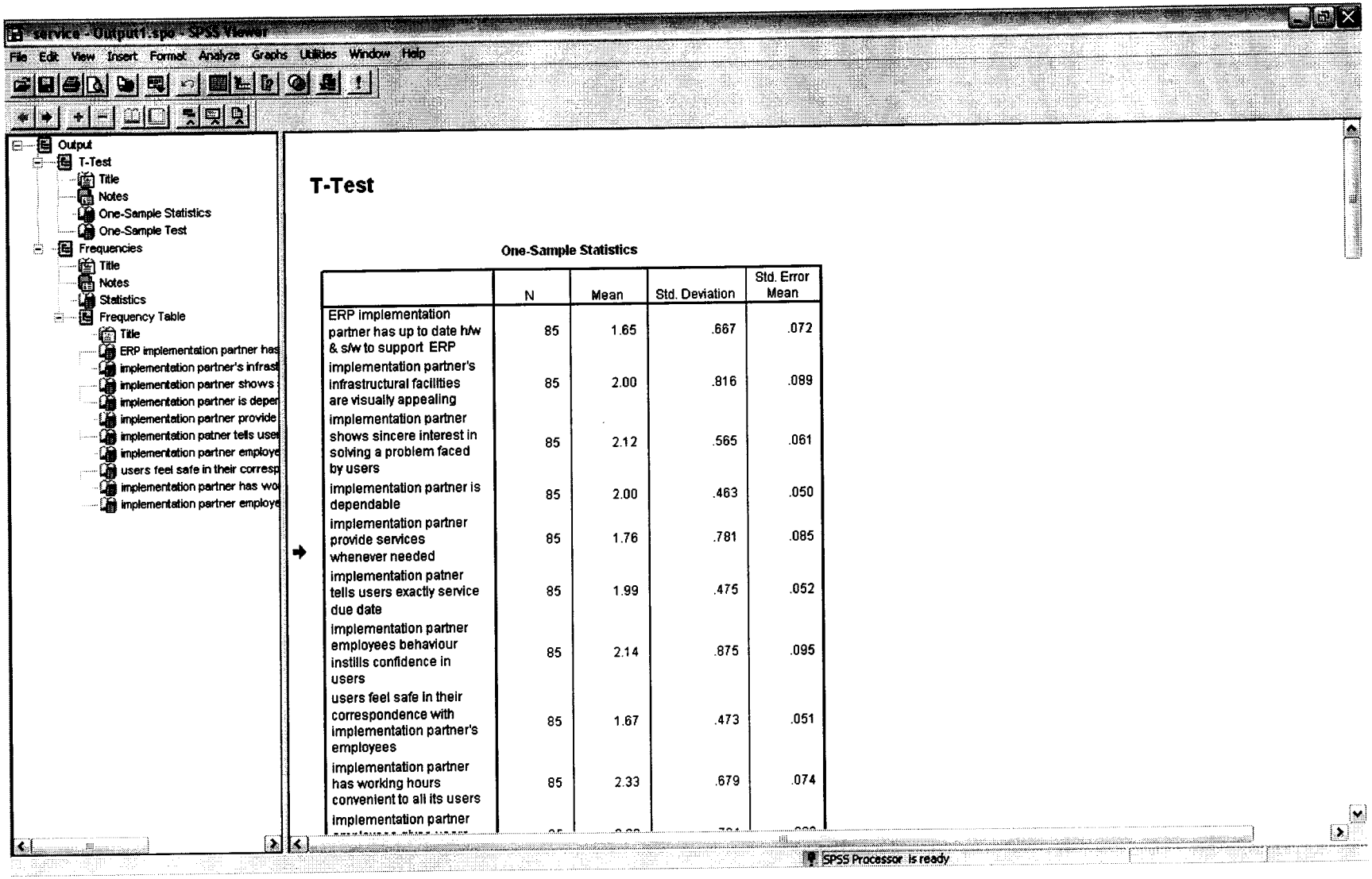
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One-Sample Statistics
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implementation partner is deper
implementation partner provide
implementation patner tells use
implementation partner employe
users feel safe in their corresp
implementation partner has wo
implementation partner employe
T-Test
One-Sample Statistics
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Std. Deviation
Std. Error Mean
ERP implementation partner has up to date h/w & s/w to support ERP
85
1.65
.667
.072
implementation partner's infrastructural facilities are visually appealing
85
2.00
.816
.089
implementation partner shows sincere interest in solving a problem faced by users
85
2.12
.565
.061
implementation partner is dependable
85
2.00
.463
.050
implementation partner provide services whenever needed
85
1.76
.781
.085
implementation patner tells users exactly service due date
85
1.99
.475
.052
implementation partner employees behaviour instills confidence in users
85
2.14
.875
.095
users feel safe in their correspondence with implementation partner's employees
85
1.67
.473
.051
implementation partner has working hours convenient to all its users
85
2.33
.679
.074
implementation partner
SPSS Processor is ready