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A STUDY OPREATIONAL STRATEGY FOR INDUCTION FURNACE INDUSTRIES IN SOUTH INDIA (DURING RECESSIONARY PERIOD)

P-3037

By

P.SENTHIL KUMAR

Roll No. 0803MBA2427

Reg. No. 68108101609

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A PROJECT REPORT

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Signature of student

Name: P.SENTHIL KUMAR

Roll No.: 0803MBA2427

Reg. No.: 68108101609

Signature of Guide

Name: Mr.K.R.AYYA SAMY

Designation: Professor,

Address: KCT Business School,
Kumaraguru College of Technology,
Coimbatore

Signature of Project-in-charge

Name: Prof.Dr.S.V.DEVANATHAN

Designation: Director, KCT Business School

Certificate of Viva-voce-Examination

This is to certify that Thiru. P.SENTHIL KUMAR,
(Roll No. 0803MBA2427; Register No. 68108101609) has been subjected to Viva-voce Examination on ...07.03.10..... at ..11.15 Am.... At the Study centre: Kumaraguru College of Technology, Coimbatore, Tamilnadu - 641006.

KUMARAGURU COLLEGE OF TECHNOLOGY KCT STUDY CENTRE COIMBATORE

Internal Examiner
Name: Prof. K.R. Ayyaswamy
Designation: Professor
Address: Kumaraguru college of technology
Coimbatore -06

External Examiner
Name: Prof. Dr. K.R Ramamoorthy
Designation: Prof & Head, Dept of MSI
Address: Coimbatore Institute of Technology
Coimbatore

Coordinator Study centre
Name: Dr.S.SADASIVAM
Designation: Dean (Biotechnology)
Address: Kumaraguru College of Technology,
Coimbatore, Tamilnadu - 641006.

Date: 07-03-10

ABSTRACT

The study is a report on operational strategies to be adopted for induction furnace industries in South India during recessionary period. This study helps to know about the induction furnace industries and identify the strategic and choices that distinguish from the successful and unsuccessful furnace industries during study period (2004-2008). For this purpose a detailed research was conducted by surveying method with the help of a questionnaire and personal interview with customers of the company.

The information collected through the research relates to the foundry operations and related problems faced by them during the recessionary period. The analysis has been done using statistical tools viz. chi-square test; correlation and coefficient.

The result obtained from the study reveals that the furnace industries have new product development, constant customer contacts and outsourcing as their primary strategies. Also product quality, innovation, prompt response and continuous improvement are the prime factors to achieve a higher stature in export market as well as in Indian market. Induction furnace industries need to be effective decision making, e-business. Cost reduction and out sourcing for sustain their market in worldwide.

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P.SENTHILKUMAR,

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I INTRODUCTION

INTRODUCTION

The Indian furnace manufactures industry serves all sectors and increases the economy status of our country, besides the foundry sector. The Megatherm is a leading competitor furnace manufacturer located in Kolkata. Megatherm was founded in Year 1989, Promoted by Professionals who were industry leaders and pioneers in the development of induction melting and heating technologies in India. Starting from Eastern & Northern part of the country, the company gradually spread and consolidated its base in West & South India, which otherwise was dominated by foreign multinationals till recently. As a matter of fact Megatherm has emerged as an Indian Multinational company through its exports globally.

1.1 PROFILE OF THE COMPANY:

The company established in two major units and installed their products in all over India as well as other countries.

Unit – I (20,000 sq.ft. of covered area) at Salt Lake City near to Kolkata International Airport accommodates the following facilities.

- Central Sales & Marketing Office.
- Application Engineering & System Design Centre.
- R&D Centre.
- Assembly line of Power Sources / Frequency Converter for Induction Heating System, Drives & Automation Controllers for various applications.
- 1 MVA Powered Test bay to support
- New Power Source Development.
- Routine Heat Run Tests of Solid State Converters manufactured.
- Coil Design validations for new applications.
- Hot trials on demand for Induction Heaters.

Unit – II {more than 1,50,000 sq.ft. covered area operating as Engel India Machines & Tools Ltd., a Joint Venture between Megahterm (74%) and Govt. Of West Bengal (26%)} at Taratolla Road, near to Kolkata Shipping Port accommodates the following facilities.

- Machine & Material Handling Design Centre.
- Fabrication & Machining lines for various sub-assemblies.
- Assembly line for Induction Melting Furnaces, Heating Workstation.
- Coil assembly line.
- Test bay to support – Cold trials of Machines & Material Handling Equipments & associated automations, Drives & Hydraulics.

Synchronous Growth of the company:

The company has started the Commercial Operation since January, 1990. Past two decades their performance was carefully evaluated and each year the turnover reaches Rupees thirteen million approximately.

Table 1: Total high power committee members

S.No	Description based on the Designation	No of experts
1	Sales & Marketing	08
2	After Sales Service	45
3	Design & Engineering	18
4	Finance & Commercial	20
5	Direct Manufacturing	80
6	Indirect Manufacturing	120
Total		291

Core Competencies: Power Electronics & Electromagnetic as applied to Induction Heating.

History of Induction melting:

The furnaces are used in the induction melting through MG Sets in the year 1920. At the olden stages entry of normal frequency furnaces made dramatic changes. The core type induction furnaces are an advent of solid state equipment and coreless induction furnaces with medium frequency power sources. The step by step modernization and competitive are the essential sources for the development of furnaces.

Medium Frequency Induction Furnaces:

The principle of Induction is used in this method that when a high frequency current is flowing through a conductor it induces the current in any conducting thing which is lying nearer to the conductor thus producing eddy currents and Hystersis losses which heat up the metal. The non magnetic materials only eddy currents heat up the metal. Any metal which is conducting in nature can be heated with Induction and anything which is non conducting cannot be heated with Induction Process.

Coreless Medium Frequency Furnaces:

In the solid state converters thyristors are used as switching devices for conversion of the normal currents to high frequency currents. Multi-turn shielded/unshielded coils made of electrolytic copper with hollow tubes for creating magnetic field to melt the charge. The DM water cooling system to ensure the cooling of all the equipment and because of water cooling the size of the equipment is smaller as compared to the earlier furnaces.

Coreless Induction Furnaces:

The Automatic load matching ensures that no capacitor switching is required. The Power factor is maintained at high levels throughout the cycle. They can be switched on or off as and when desired. No Molten heel or solid charge is required for starting. The power conversion efficiency is up to 97% as there are no rotating parts. Non polluting in nature as the fuel is electricity only.

Induction Furnaces:

The Temperatures up to 1700° C can be realised in these furnaces depending upon the lining materials. These furnaces can be used for steel, Stainless Steel, Alloy steel, Ferrous and non Ferrous metals, because of this flexibility these furnaces offer a versatile equipment to a foundry. As it operates very smoothly no jerking loads are put on the electric bus. The action of the multi pulsing system the harmonics can be reduced to a great extent.

Current Scenario and Mile stones of Megatherm:

Major Domestic Clients

Foundry Sector:

Melt – shop producing castings for automobile and engineering. 1 kg – 3000 kgs)

- 3 x 1.5 MW, 3 Ton, 300 Hz Induction Melting Unit at Grey Iron Foundry, Jabalpur under Ordnance Factory Board.
- 1 x 0.75 MW, 1.5 Ton, 500 Hz Induction Melting Unit at Muradnagar Ordnance Factory, U.P.
- 1 x 3.5 MW, 8 Ton, 500 Hz Induction Melting Unit for Spun Pipe Casting at Electrosteel Castings Ltd., Khardah, West Bengal.
- 1 x 5 MW, 12 Ton, 500 Hz Induction Melting Unit for Roll Foundry at Gontermann Peipers (India) Ltd., West Bengal.
- 1 x 1 MW, 2 Ton, 500 Hz Induction Melting Unit at South Eastern Coal Field Ltd., Korba.
- 3 x 1 MW, 2 Ton, 300 Hz for Aluminium Melting at Hindalco, Sambalpur, Orissa.
- 1 x 2 MW, 3 Ton, 300 Hz for Casting at Goetze, Bangalore.
- 1 x 0.65 MW, 1 Ton, 500 Hz for Aluminium Melting at Goetze, Patiala.

Steel Sector:

Melt – shops used sponge ion & steel scraps as feed stock (3000 Kgs – 40,000 kgs)

- 1 x 10 MW, 25 Ton, 500 Hz Induction Melting Unit at Jairaj Ispat Ltd., Hyderabad.
- 1 x 7.5 MW, 20 Ton, 500 Hz Induction Melting Unit at Vijay Iron & Steel Ltd., Hyderabad.
- 1 x 7 MW, 18 Ton, 500 Hz Induction Melting Unit at SPS Metal Cast Pvt. Ltd., Durgapur.
- 1 x 6 MW, 15 Ton, 500 Hz Induction Melting Unit at Bhushan Ltd., Angul, Orissa.
- 1 x 8 MW, 20 Ton, 500 Hz Induction Melting Unit at Bhawani Industries Ltd., Mandigovindgarh.

Forging / Extrusion Sector:

Producing rings for Bearings and automobile industries besides various forged auto and engineering parts. (100 kgs – 4000 kgs)

- 1 x 1.8 MW, 300 Hz Induction Bar Heater at Shell Forge shop, Ordnance Factory, Ambajhari.
- 1 x 0.75 MW, 250 Hz Non-Ferrous Billet Heater for Shell Cartridge, Ordnance Factory, Katni.
- 1 x 0.25 MW, 3 kHz Billet Heater at MGM Forging Ltd., Bangalore.
- 1 x 0.40 MW, 3 kHz Billet Heater at MGM Forging Ltd., Mysore.
- 1 x 0.30 MW, 3 kHz Billet Heater at Laxmi Forge, Bangalore.

1.2 STRATEGIC CHOICES FOR INDUCTION FURNACE INDUSTRIES:

Ten operational strategies were identified for induction furnace industry during recessionary periods. Top five strategies are considered most important and discussed in detail.

1. **Outsourcing**
2. **Innovation and New product Development**
3. **Lean Manufacturing**
4. **Downsizing**
5. **Cost Reduction**
6. **Constant Customer Contacts**
7. **Supplier Consolidation**
8. **Effective Distribution**
9. **Identification of new opportunities**
10. **Employees as Vendors**

The choices of these strategies may differ from one industry to another. Appropriate strategies should be selected by the industries during times of uncertainty.

1. Outsourcing

Outsourcing has become a strategy to enhance an organizations' flexibility to meet the rapidly changing market conditions. Strategic outsourcing enables an organization to focus on its core competencies. Outsourcing helps in cutting down costs, and reducing the employee size and it provides the opportunity to innovate new products and processes.

A competitive analysis helps an oro-, inistion to identify the core strength of its business function and categorize the core and non-core activities. Core activities can be

identified by asking questions such as "How we are different from our competitors? "What are the critical success factors of our product?" For induction furnace industries the strength may lie in design of the product, winding methods, production processes or equipments used.

Once the non-core activities have been identified by the company it should perform a cost benefit analysis by comparing the cost of making in-house and cost associated with outsourcing. These non-core activities are reviewed to find whether they can be performed more effectively and efficiently by external sources or suppliers. The next step is selecting suitable supplier and outsourcing the non-core activities to those suppliers. The relationship between the company and those suppliers should be carefully nurtured as long-term contractual relationship.

Today, outsourcing has gained popularity to the extent that even outsourcing of business processes has increased considerably. Most common business processes that are outsourced. Are:

- *Sales and Marketing*
- *Contract maintenance*
- *Logistics and Travel*
- *Advertising and Promotion*
- *Recruitment and Training*
- *Auditing and Financial analysis*
- *Information and Database management*

2. Innovation and New product Development

Innovation is a wealth creating activity. It is important for every organisation to be innovative for business success. Furnace industries should introduce new products seeking competitive advantage in international markets.

In the 21s' century, one of the most important factor for efficiency in work place is the capacity to innovate. Innovation could be improving the existing products or entirely new products.

Technological and product innovation in the changing competitive environ ment is necessary for every organisation to enhance their capability to become creative and generate new ideas to function more effectively and efficiently. Every company has the potential to be creative. It is important that a suitable environment must be established to encourage creativity which is vital to the future of the industry.

R&D for changing environment:

The process of globalisation, rapid scientific and technological advancements, as well as direct and indirect trade barriers by advanced countries are eroding the traditional competitive advantage of industries that contribute significantly to the overall industrial development. Due to these reasons, it is evident that the industry is disturbed and passing through a critical phase. It cannot be neglected the fact that the multinational companies are bringing more productive and innovative technologies.

R&D in industries need to shift to top gear with an objective to bring out excellence in the products and manufacturing practices through development and application of knowledge for innovative technologies. For a substantial development of industry, R&D support is very essential.

Generally, to become as an innovative organisation, the organisation has to create a climate that suitable and supports creative thinking. This could be possible by:

- Encourage the employees to be creative
- Freedom to experiment with innovative approachesland techniques
- Provide required inputs for creativity viz.. brainstorming, group discussions, training programmes, libraries and other learning opportunities.
- Implementing the employees ideas effectively.

3. Lean Manufacturing

While some companies continue to grow, other companies struggle because of their lack of understanding of the change of cost practices and customer mind-set. To become more profitable, companies must practice lean manufacturing principles and tools to elevate the performances of the company. In today's fiercely competitive pump market, manufacturers have to adopt lean manufacturing strategy to continue to remain globally competitive.

"Waste elimination" is the buzz word for organisations to become lean. A systematic approach to identify and eliminate waste through continuous improvement will help organisations to put themselves in lean manufacturing system. Today, they are abundant information about lean manufacturing principles and techniques. Still, there is a very little information about the application of lean techniques and tools and successful implementation of lean manufacturing in practice. No single methodology or way will suit at the organisation to implement lean transformation. This is because every organisation has different kinds of problems with different kinds of processes

and resources. However, for successful lean implementation there is a road map that guides the way to help organisations to ensure success.

Lean focuses on abolishing or reducing wastes or muda (the Japanese word for waste) and on maximising or fully utilising activities that add value from the customer's perspective.

The leading Japanese automobile manufacturer Toyota identifies seven types of waste which are more predominatnt in manufacturing.

i)**Waste from overproduction:** To keep the equipment running and engage the employees companies sometimes produce more than the requirement. Ultimately, producing products for which there is no demand is a waste. Is is difficult to identify the causes of the problem and appears that everything is right. In addition, overproduction causes the machinery and employees to seen busy, additional equipment may be purchased and labours are hired considering thath they are necessary.

ii)Waste of waiting time: Reasons for waiting time are many more such as waiting for preceding processes, materials, orders, etc. But unlike overproduction it is easily identifiable.

iii)Transportation waste: Repeat handling of raw materials and finished goods from one place to another are one form of waste found in industries. Proper facilities layout and sequence of operations with appropriate material handling equipment will reduce transportation waste.

iv)Processing waste: Ineffective manufacturing method is considered as waste. Suitable jigs and fixtures will improve processes. Preventive maintenance at regular intervals will reduce ineffective processing and helps the operator to produce quality products.

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V)Inventory waste: Excess inventory in raw material, work in process and finished good is another source of waste. Storage, material handling and inventory costs accounts a large sum of amount. Reduction in inventory levels will not only reduce the wastage but also helps to identify the causes of defects.

vi)Waste of motion: Motion is considered unnecessary if it does not add any value to the
product / process. The movements or motion considerd waste are motions of jobs, searching, picking of tools; loading and unloading etc. For any activity the focus should be to attain a 100 per cent work oriented movement.

vii)Product defects: Products not meeting the required specification and not up to the quality level is considered as waste. It also indirectly causes other types of waste throughout the manufacturing process such as increased production lead times, increased labourand additional material cost. His can be eliminated fully if products were produced right time first time.

5. Cost Reduction: (make it cheap)

Cost reduction strategy must be a long-term thinking process with the following questions answered.

- How can we reduce the product cost without additional capital expenditure?
- How can the rejection rate and wastage levels be reduced?
- What is needed to reduce product cost significantly?
- Which production bottlenecks need to be overcome?

Business Process re-engineering and value analysis should be used to attack the cost of significant items of expenditure, not just in production departments but in all functional areas. Value analysis, should be used to challenge the specification of products

In some cases, cost considerations indicate that a part should be made in-house; in others, they dictate that it should be purchased externally. A make-or-buy cost analysis involves determining the cost to make an item and a comparison of this cost with the cost to buy it.

6. Constant Customer Contact

Customer care and regular contacts with the customers prove to be helpful during recessionary periods. Companies should list their most important customers in the order of invoiced sales, and understandably so, it may be more important to list major customers and non customers in the order of potential sales value, and alongside each one to record of actual sales. Large differences between potential and actual sales to a customer should be analyzed in order to understand the reasons, and a sales attack mounted. Quite often a customer buys only some of the product range. An analysis of sales by product type to major customers will highlight these situations, so that efforts can be made to sell the other varieties equally effectively.

Measurable standards are needed for customer service, and performance should be measured regularly. Standards should be set for the key features which are important to the customer. Constant touch with the customers will gain confidence and knowledge about the environment during downturns.

7. Supplier Consolidation:

In procurement strategy, supplier consolidation can bring significant benefits of scale through combining business entities' needs. Many companies have either the same deal with different suppliers or different deals with the same supplier.

With the same concept, few industries are adopting a strategy of component consolidation while outsourcing. It is that of getting a sub-assembly from a single vendor instead of outsourcing many components from more suppliers. This greatly reduces or eliminates the activity of inspection and testing time of components. This sub assembly directly goes to the final assembly, which reduces the time taken for final assembly.

8. Effective Distribution:

Effective distribution of products will increase sales. The furnace industries must focus on the strategy to improve their distribution channels during times of less movement of products in the market.

Answering the following questions will help to increase the sales.

- Which distribution channels are growing or declining in importance?
- What percentage share does the company have of each distribution channel?
- How fast are orders delivered?
- Which new distribution channels are emerging?
- What is the cost of distribution as a percentage of sales?

9. New Opportunities:

Identification of newer market opportunities, in terms of customer type, product usage or distribution channel will support the company during uncertain times. In furnace industry, the customer type can be categorized as urban and rural, the product usage under agricultural, industrial and domestic purposes. Climatic changes largely change the demand requirements for agricultural products. A through external environment analysis is required to grab newer market opportunities.

10. **Employees as Vendors:**

Converting the employees into vendors is a niche strategy. The productivity has doubled and the rejection rate has been dramatically reduced. This strategy adds greater responsibility to the employees to achieve the quality and quantity standards. This strategy also reduces production cost, wastage, employer- employee conflicts and overhead costs.

1.3 PROBLEM IDENTIFICATION:

Global crisis and other economic issues are very much affected in all countries economy; US Sub prime crisis and other industrialized countries financial crisis are the evidence of this issue. In India, generally Furnace industries has shown gradual amount of growth due to the demand of steel products.

During recession there were high amount challenges faced the furnace industries due to the global crisis (i.e.) order lost, poor order rate, etc. This research attempts try to explain how to tackle the challenge due financial crisis and what were the strategy adopted for their surveillance.

1.4 NEED FOR STUDY:

The Induction furnace is one among the major equipment in the foundry and steel sector. The roll of the furnace mainly concentrated on induction melting, mass heating, hardening and annealing. Research into this area of consumer behavior has brought understanding to some of the major issues with standard customer satisfaction research. The survey is based on inter-organisational study aimed at comparison between furnace manufacturers doing well and industries struggling to survive regarding their operations strategies for organisational survival under conditions of environmental uncertainty.

1.5 OBJECTIVES AND SCOPE:

- To identify the strategic choices that distinguishes the successful from the furnace industries during study period (2004-2008).

- To make a comparative study on how the strategic choices will have a significant on the organizational performance like efficiency of sales turnover, order booking, productivity and power consumption.

- To identify the common strategies that happens to be adopted by successful companies as well as sector (production/sale turnover).

- Comparative feedback of industries using other furnaces.

II LITERATURE REVIEW

LITERATURE REVIEW

Literature on strategy management is voluminous. It covers what are the strategies to be followed for the development of company, during the recession period etc. Recession is a phenomenon of decreasing demand of raw materials, products and services. Technically, its beginning, progress, and ending depend on the operational measures used by different researchers and federal agencies. A recession is a Terrible Thing to Waste.

Recession has been defined in the marketing literature as a "process of decreasing demand for raw materials, products and services, including labor"(Shama 1978) or as a " state in which the demand for a product is less than its former level"(Kolter 1973). Recession calls for marketing managers to use strategies to stimulate consumer demand. Such strategies often require a redefinition of the target customers and the marketing mix. They may include narrowing the product line, offering cheaper products and quantity discounts, lowering prices, increasing promotion, and offering products directly to consumers.

To weather the recession, Bonoma (1991) advises practicing marketing managers to : (1) " Avoid empty middle marketing" (2) " don't mistake expansiveness for empire," (3)" Do more for less", and (4) "remember what winter is like when summer again comes"(Bonoma 1991,10). In a related study, Goerne (1991) reports that marketing managers have been using significantly more coupons in the promotion mix in order to fight the negative impact of the recession and sales. In view of this, it is critically important that marketing managers make sure that the economic environment facing their that company is indeed one of recession.

According to Miller (1991, 6)," Spending for trade promotions reached a record level last year(1990) as marketers adjusted their budgets because of recession." Another example is Electronic Data Systems, the computing service of which has been growing rapidly because of the recession (Hayes 1991).

Different sized companies may be facing different economic environments depending on their target markets and market power. Larger companies usually have more market power, which often can help them whether the impact of a weak economy. Feder (1991) reports that small business are especially affected by their recessionary economic environment, and Bowers (1991) reports how small business are reducing expenses. However, Graven (1990) reports that mid-size companies especially those in manufacturing are the hardest times.

Small and medium enterprises (SMEs) play an important role in modern economies because of their flexibility and ability to innovate. In nearly every country, SMEs play a significant role in providing employment opportunities and supporting large scale manufacturing firms. However, there are not many studies reported in the literature that deal with productivity problems in SMEs.

Numerous studies show the difficulty of rebounding from non-strategic spending cuts resulting in a loss of visibility, a perceived lack of straying power, reduced quality, product irrelevance or diminished service. At the same, cash is indeed the lifeblood of business. While non-strategic spending cuts should be avoided, it is essential to manage cash flow and expenses to cover operational demands through the projected end of the recession, since the cycle of cash flows determine the business solvency.

Spending wisely during a recession also means taking advantage of lower priced materials, capital goods, services, enterprises and talent. A recession means spending smarter not just less. Cost reduction is an important part of preserving the core of business, as longs as the cuts promote organizational efficiency and do not interfere with the benefits the company is trying to create for customers, such as customer service or quick delivery. A recession provides a good opportunity to address organizational shortcomings that had been covered up by strong profits in more expansive economies.

III RESERCH METHODOLOGY

RESEARCH METHODOLOGY

Research methodology is a way to systematically solve the research problems. It may be understood as a science of studying how research is done scientifically. It includes the overall design, the sampling procedure, data collection method and analysis procedure. A survey on 'Operational strategies of furnace industries during recessionary periods were carried out to collect the required data and information from the induction furnace industries that are performing well and those who are not performing well.

3.1 RESEARCH PLAN:

The data for this research project has been collected through direct personal interview from the people belonging to various business and profession. A structured questionnaire was framed as it is less time consuming, generates specific and to the point information, easier to tabulate and interpret. Moreover respondents prefer to give direct answers. In questionnaires open ended and close ended, both the types of questions has been used.

3.2 DESCRIPTIVE RESEARCH:

This research is based descriptive research design. Sample selection and size should be representative of the target population. Descriptive research study includes surveys and fact-finding enquiries of different kinds, which help to describe the present situations that makes the analysis about the customer valuation and helps to reach the objectives.

3.3 COLLECTION OF DATA:

Primary Data:

A preliminary questionnaires were collected from the companies having the in depth details of technical solutions, economical background, service and product reliability. Face to face personal feed back interview with the existing customers are to get more accurate and reliable additional information. In total 50 companies and sector were choosed from various parts of south India.

Secondary Data:

A secondary data is collected from the database from sales representatives, and from customer feedback forms and from industrial meet; IIF (The Indian Institute of Foundry) Journal and Website, product profile catalogs and users impact of induction furnaces products.

Sampling units : Different types of induction furnace industries have been taken as target group for this research work. The population was divided into two strata, (i) Industries equipped with Megatherm furnaces doing good performance and (ii) industry equipped with other than Megatherm doing marginal good group.

Sample Technique : Simple Random Sampling.

Research Instrument : Structured Questionnaire.

Contact Method : Personal Interview.

Sample Size : The sample size for this project is 25 respondents.

Sample Area : The sample area covered in South India

3.4 TOOLS USED FOR ANALYSIS:

The collected data is analyzed is using the statistical tools like simple percentage analysis, chi-square method. The analyzed data is presented using charts and tables.

IV DATA ANALYSIS &INTERPRETATION

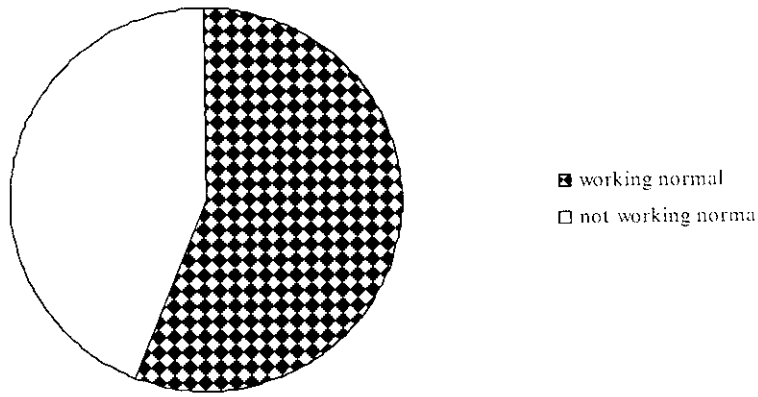
DATA ANALYSIS AND INTERPRETATION

The first question in the Survey was designed closely In relation to the objective of the study to find out the percentage of the induction furnace industries working normal and not working normal since inception. Table 2 indicates percentage of the companies working normal without facing any recession since its inception. The pie chart illustrates that 56 per cent of the respondent had not experienced any recession and the remaining 44 per cent had faced ups and downs due to various internal and external factors.

Table 2: Percentage of Induction Furnace Industries Working and Not Working Normal since Inception

No. of Induction Furnace Industries working normal	No. of Induction Furnace Industries not working normal	Percentage of Induction Furnace Industries working normal	Percentage of Induction Furnace Industries not working normal
14	11	56	44

Fig-1 Induction furnace industries working normal without any recession?



From the analysis it is inferred that 44 per cent of the companies have felt the impact of the recession. This is a huge percentage which indicates that the induction furnace industries in south India are facing a tough time. In spite of the recession, the companies are somehow managing to survive in the market and did not go for closure. The organizations that were smaller in size had felt impact of recession much more than larger firms during the course of their functioning.

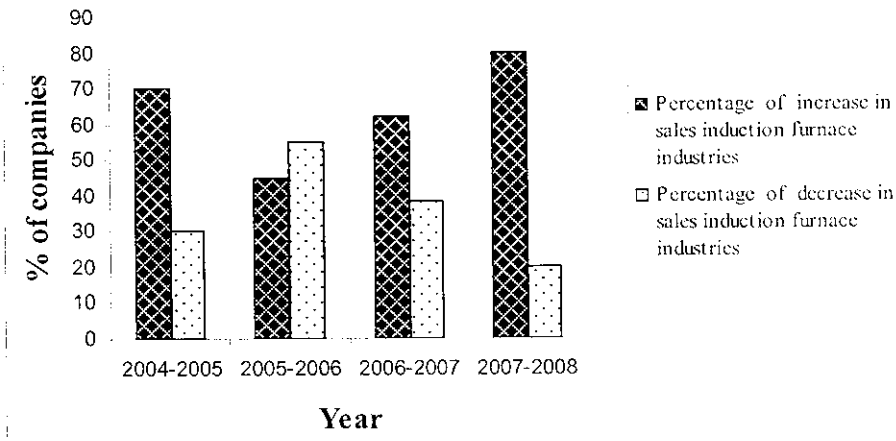
Table 3: Sales trend of induction furnace industries from the year 2004-2008

Year	Percentage of increase in sales induction furnace industries	Percentage of decrease in sales induction furnace industries
2004-2005	70	30
2005-2006	45	55
2006-2007	62	38
2007-2008	80	20

Table 3 represents the sales trend of induction furnace industries from the year 2004 to 2008.

When asked about the increase / decrease in sales turnover during the past 4 years (2004-2008), it was observed that about 48 per cent of the companies had an increase in sales only during 2005-2006. The respondents indicated that unhealthy competition; fluctuations in demand due to drought and threat of imported products were the major causes for the downfall in sales at that time.

Fig-2 Sales trend of induction furnace industries



From the comparative study, it can be inferred that for the same period, almost 90 percent of the manufacturers being successful, had decrease in sales when compared with the previous years sales in 2004-2005 and only a marginal 10 per cent decrease was observed during 2006 and 2007. On the other hand, there was 45 per cent decrease in sales observed by the unsuccessful companies. (While large manufacturers were doing fine at that time).

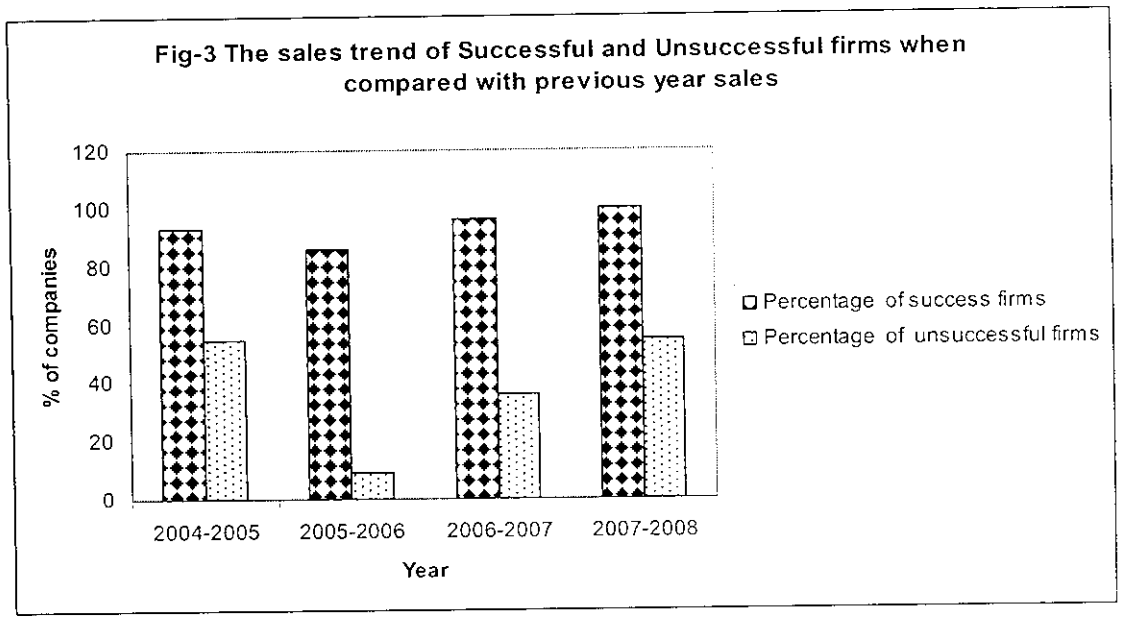
It is evident that the unsuccessful companies were finding it increasingly difficult to maintain consistent profits and survive as the technological and competitive pace intensifies both in domestic and global market place.

Thus in view of globalization businesses had changed markedly in recent years. Identifying the suitable strategies for survival will add profitability to the small companies. This project is an effort to contribute to understanding the changes and to face the recession strategically.The Sales trend indicates that the companies had a decrease in sales turnover during the years 2005 to 2006. It has started to improve again in 2007.

Table 4: Comparison of Sales trend of successful and unsuccessful induction furnace industries from the year 2004-2008 with the previous year sales

Year	Percentage of successful firms	Percentage of unsuccessful firms
2004-2005	93	55
2005-2006	86	9
2006-2007	96	36
2007-2008	100	55

Table 4 represents the increase in sales trend of successful and unsuccessful induction furnace industries for the year 2004-2008 periods when compared to the previous year's sales.



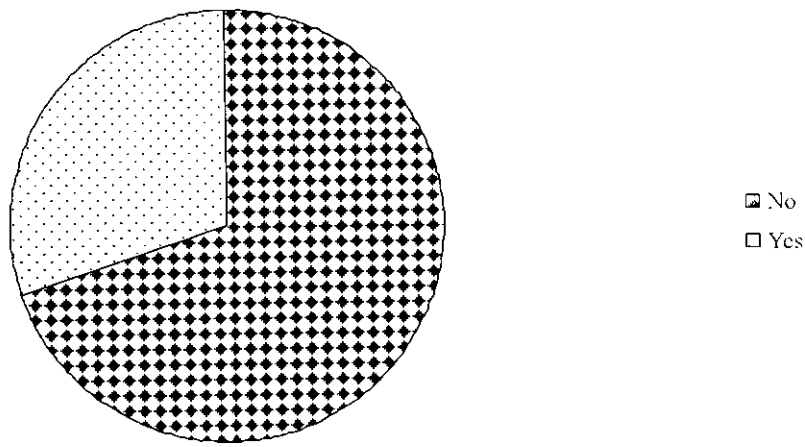
From the Figure-3, it is inferred that only a marginal percentage of successful companies had a decrease in sales during 2004-2006. During 2007-2008, all the companies that responded had an increase in sales. At the same time, while analyzing the unsuccessful firms, only 58 per cent of the companies are doing well in the year 2007-2008, while successful ones are doing very well. The bar chart shows an increasing trend in sales during 2006-2008.

Figure-4 gives a percentage analysis of induction furnace industries involved in exports.Induction furnace industries export from south Indian region was to the tune of Rs. 350 Crore in 2007-2008; this contribution came only from, 30 percent of the successful furnace industries. Though the induction furnace industries in south India are competitive both technical and quality wise, there are not many companies involved in export business.

While analysing the companies that are not performing well and their export business, these companies contribute only 9 per cent in exports. This shows that these

companies do not have a long term strategy to explore new global markets. Doing export businesses needs vigilant attention towards price and quality. Hence, to be globally competitive, these firms must identify the issues and develop appropriate strategies to overcome the risks involved in export business and take full advantage of export market potential

Fig-4 Product sold globally?



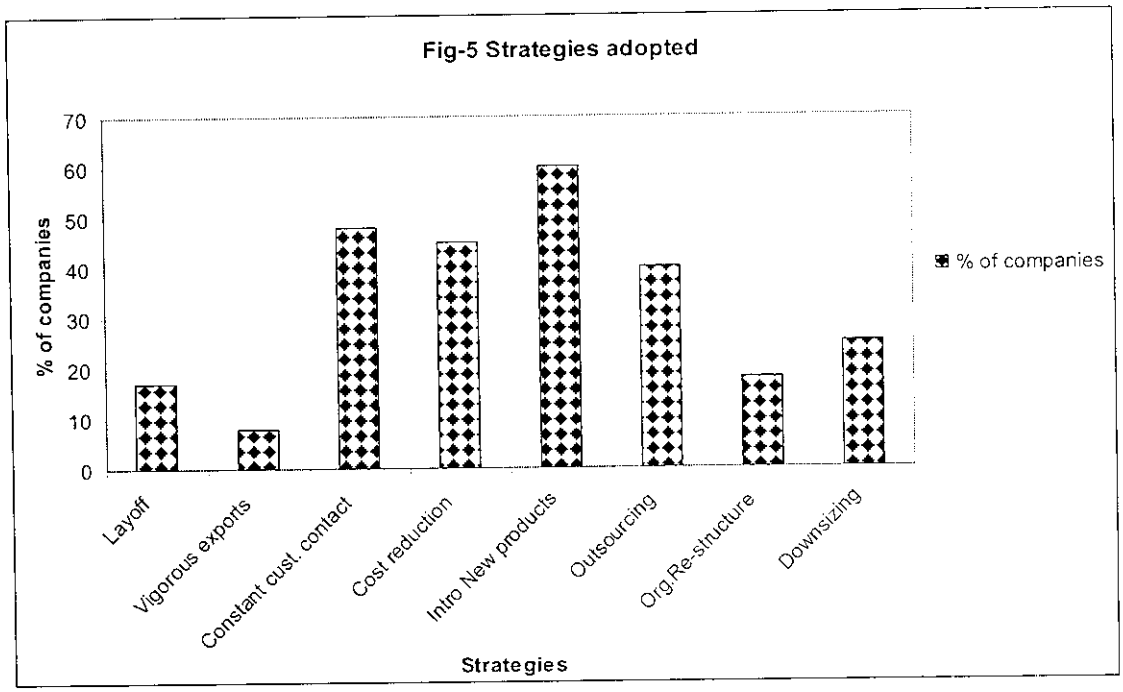
From the Figure-4 it is evident that the contribution of direct exports is more from the firms that are managed well than in the case of other firms. But, these firms are indirectly helping the successful companies by supplying the products. (as participants in the outsourcing strategy adopted by successful firms).

Table 5: Working normal Vs all Departments

Working normal?	Corporate planning	Separate R&D	HRD/Training	Industrial Engg./Time study
Yes	28%	54%	31%	28%
No	25%	42%	17%	25%

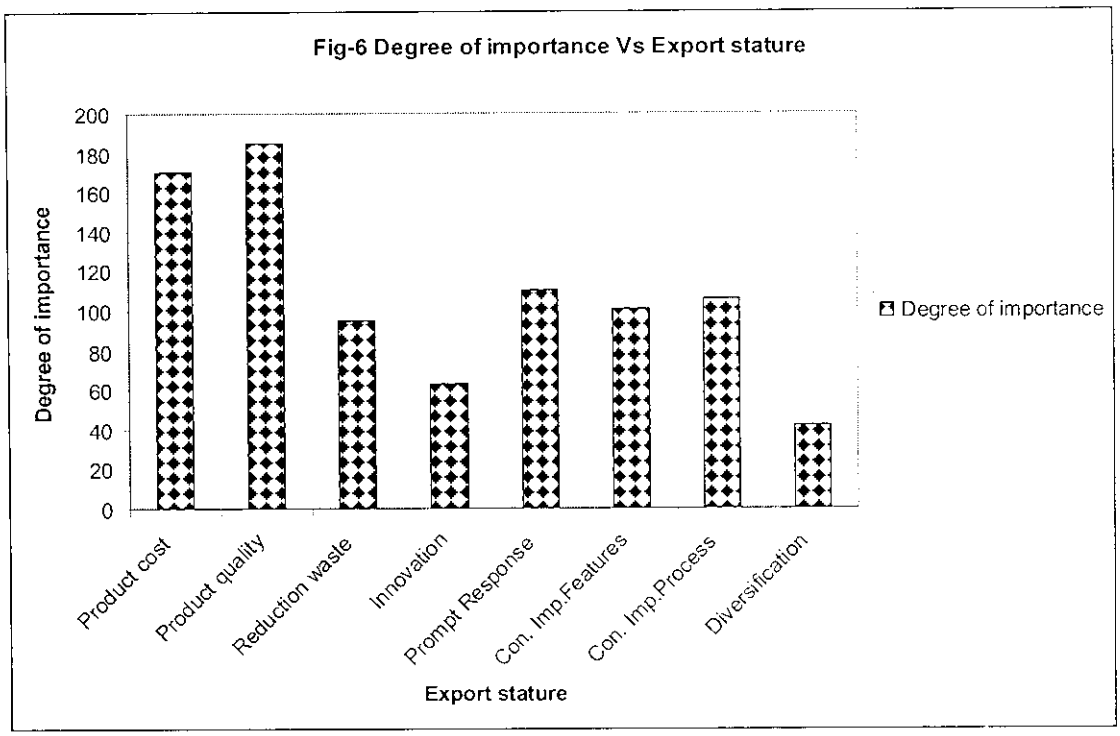
Table 5 shows the relationship of companies and their supporting departments equipped, for decision-making for the companies doing well and not doing well.
The cross tabulation gives the comparison of the percentage of companies equipped with the support departments for decision-making and the companies doing well and not doing well. This reveals that the companies working normal have greater percentage of functional support departments for the company's success and growth.
But, 60 percent of the firms that are not doing well have not set-up even any one of these departments. This gives an indication of one reason for the success of the firms when compared with unsuccessful firms. Though the firms that are not doing well are not necessarily to be equipped with supporting departments like Industrial Engineering and HR, it is important to have a planning department, because these firms woefully lack in planning activities.

Figure-5 indicates the respondents' beliefs in maximizing value and thinking that these strategies would help during recessionary periods. The chart provides a summary of strategies adopted by induction furnace industries during recessionary periods. The bar chart shows that the strategies such as Introduction of New Products, Constant Customer Contacts, Outsourcing and Cost reduction are considered as the primary strategies by most of the industries. Introduction of New Products, Outsourcing and Cost reduction are considered to be the best strategies to be adopted during uncertain times, followed by Constant customer contacts and downsizing.



The industries that are not doing well are opting for Cost Reduction and Outsourcing as t focus much on Cost Reduction and Outsourcing rather than introduction of new products and customer contacts. Further, companies that are managed well do not have the strategy option as Layoff. In one-way it proves that they are really successful.

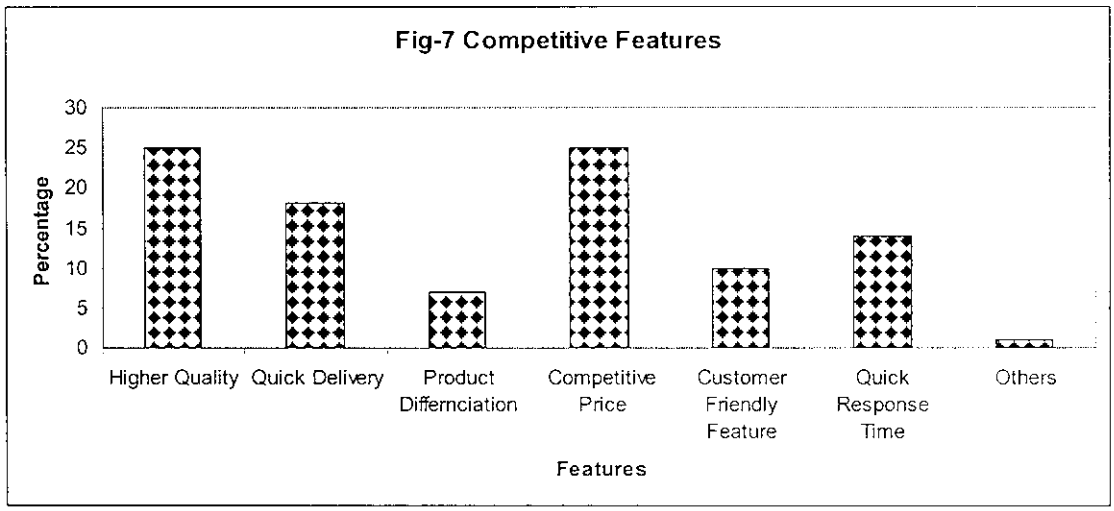
Figure-6 indicates the degree of importance attached to achieve higher export stature in global market.



Product cost and Product quality go hand in hand and rank at top for the importance rating given by the industries to achieve higher export stature in global market. Prompt response, Continuous improvement in Process and Continuous improvement in features are given second level of importance whereas; innovation and diversification are considered as least important.

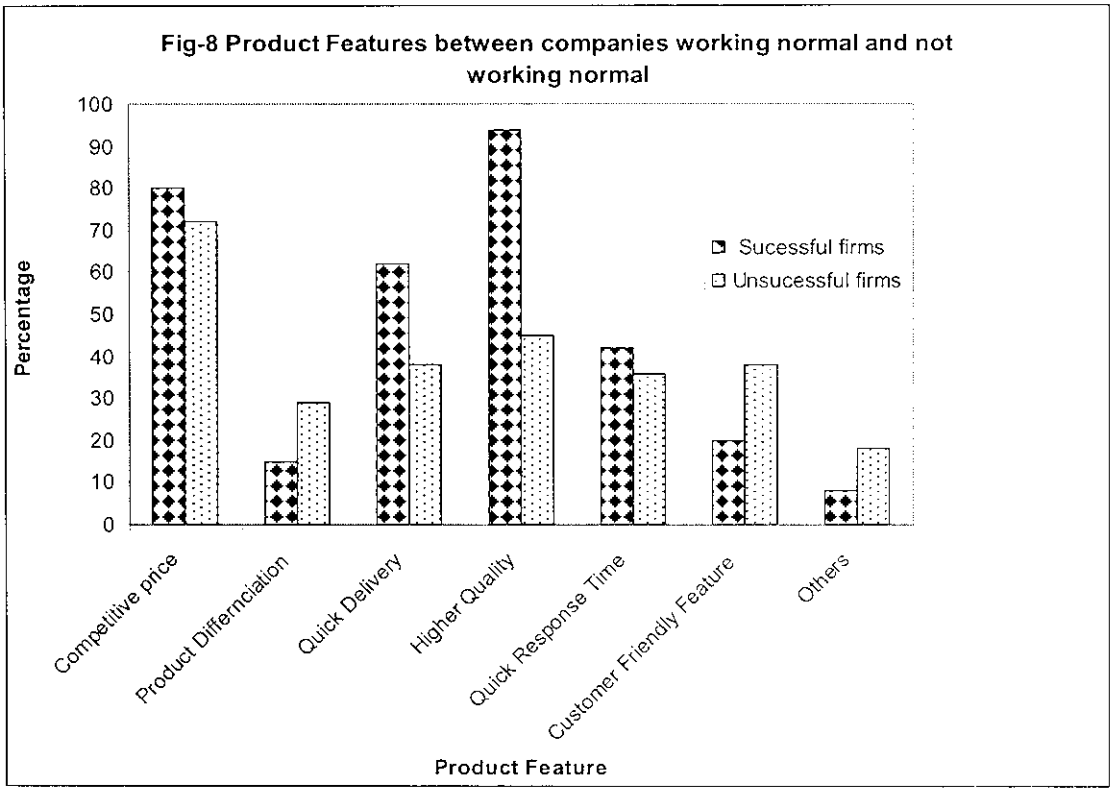
The graph reflects maximizing quality and minimizing product cost as the most highly ranked items. This holds true for units working normal and not working normal. This is because the dealers and distributors are not ready to accept even a slight increase in price or decrease in quality of the furnace industries. This also shows that the market is so competitive and the manufacturers are striving and finding it difficult to reduce the cost of production in spite of the continuous increase in prices of major raw materials like grey cast iron, stampings, and winding copper.

Fig-7 represents the data indicating the features that the industries have in their products when compared with the competitors. It is no doubt that competitive price and higher quality are the competing features with the competitors.



Competitive price, higher quality and Quick delivery are considered as the important competitive features when compared to the competitor's products. This shows that most of the companies' products are price-competitive reinforced by quality consciousness and quick delivery time.

Figure-8 gives the relative picture of the product features between industries working normal and not working normal. It is interesting to note that more than 90 percent of successful firms have quality and competitive price as their competing features. While analyzing the unsuccessful firms, only 45% of them have competing feature on quality.



Distribution channels selected by the companies to make better availability of induction furnace industries is shown in figure-9 &10.

Fig-9 Channel of Distribution by normally working companies

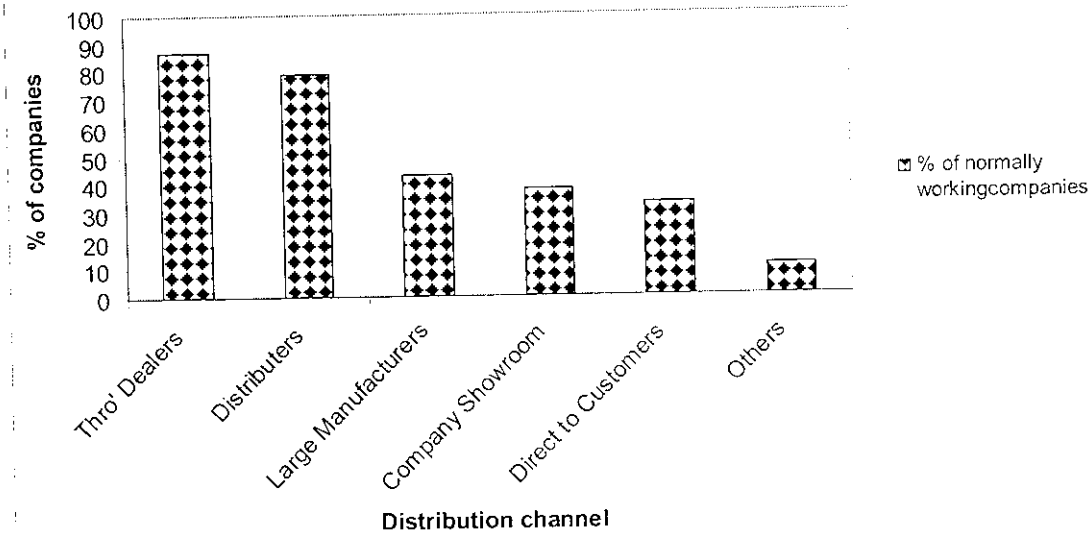
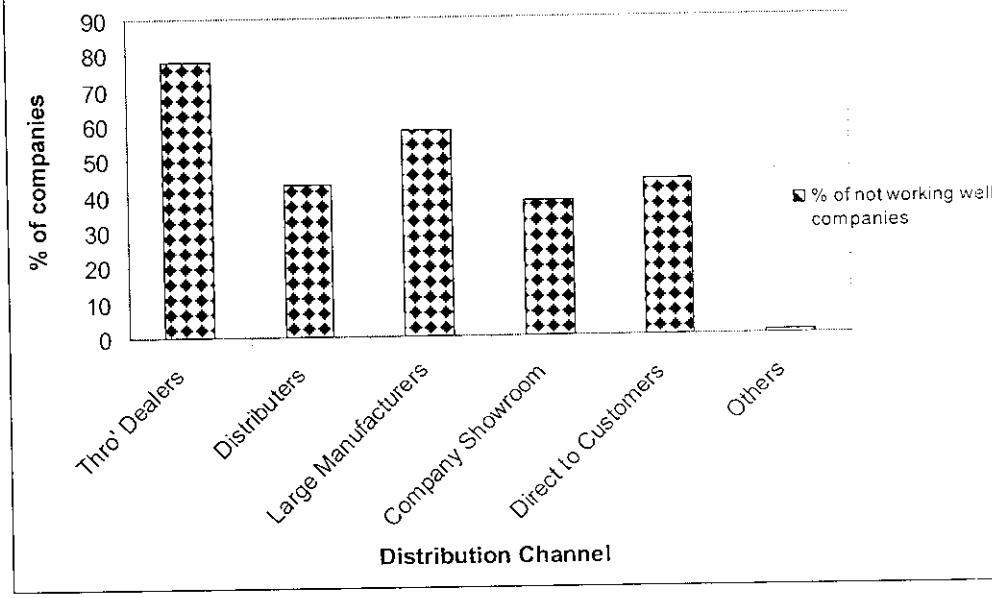
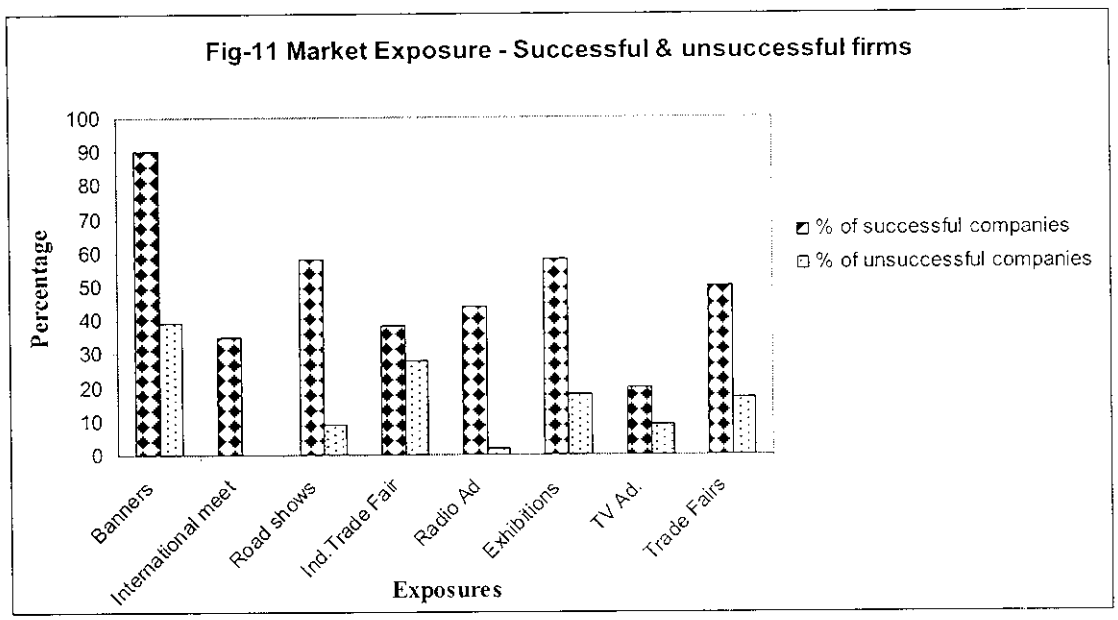


Fig-10 channel of Distribution by companies not working well



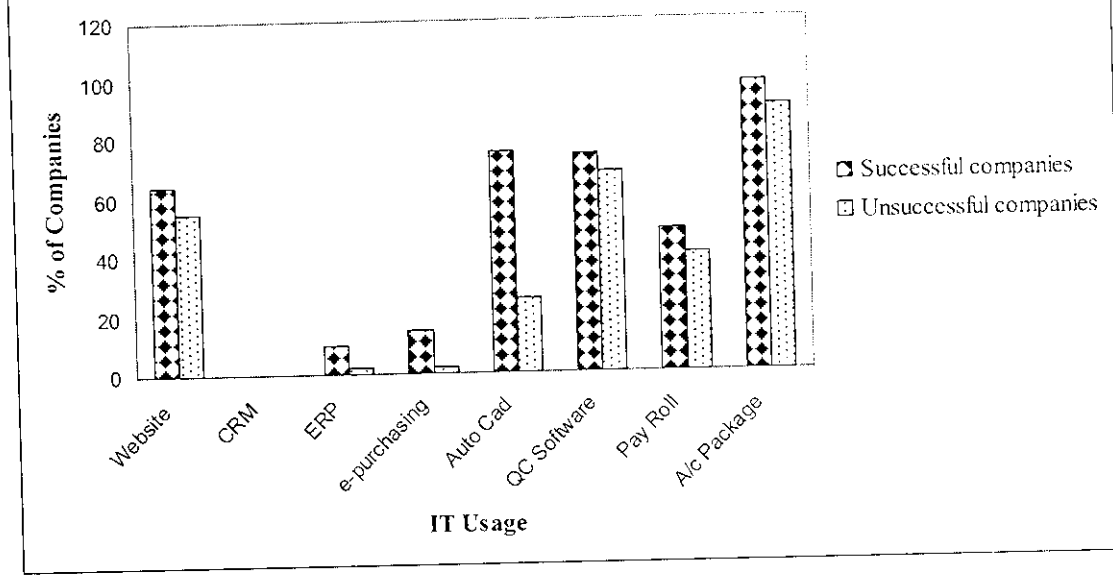
Most of the induction furnace industries market their products mainly through Dealers and Distributors. The industries that are not doing well comprising small manufacturers, mainly supply their products through dealers. They have their distribution strategies to supply to large scale product manufacturers and sell directly to customers. This reveals that the small firms do not have a good network of distribution for their products. This is one of the major drawbacks for the small firms.



The Figure 11 clearly indicates the strategy adopted by the successful firms in creating awareness of their products by participating in all of promotional activities listed. Out of the samples collected, none of the units which are not doing well participated in international meets (which gives an opportunity for export business) and Radio advertisements. Only less than 10 per cent have participated in Road shows and TV.

Usage of Information Technology in Induction Furnace industries are shown in figure 12.

Fig-12 Information Technology in Induction furnace industries



Most of the companies, whether doing well or not have their Accounting and Quality control/Testing procedures computerized. It is an indication that the companies are very particular about the quality aspects, which means that these areas of automation, would have considerably reduced large amount of manual work in personnel and quality departments. It is also found that none of the companies had gone for on-line Customer Relationship Management (CRM) software, though customer services are considered important.

Test of Hypothesis

Chi-Square test

Objective: To test whether there is significant differences in continuous increase in sales between firms doing well and firms not doing well for the past 4 years.

Increase in Sales			
Count	Yes	No	Row Total
Firms doing well	10	3	13
Firms not doing well	2	10	12
Column Total	12	13	

Null Hypothesis H_0: There is no significant difference on continuous increase in sales between firms doing well and firms not doing well.

Alternative Hypothesis H_A: There is significant difference on continuous increase in sales between success and unsuccessful firms.

Test Statistics: $?^2 = \sum_i \sum_j \frac{(Oij-Eij)^2}{Eij}$

$\sum_i$ = Sum of rows

$\sum_j$ = Sum of columns

Oij = Observed values

Eij = Expected values

Level of Significance: 5%

Degrees of freedom: (m-1) (n-1)

= (2-1) (2-1)

=1x1 =1

Calculated Values:

Increase in Sales			
Count	Yes	No	Row Total
Successful firms	6.24	36.76	13
Unsuccessful firms	5.76	6.24	12
Column Total	12	13	

$$?^2 = \frac{(10-6.24)^2}{6.24} + \frac{(3-6.76)^2}{6.76} + \frac{(2-5.76)^2}{5.76} + \frac{(10-6.24)^2}{6.24}$$

$$= 2.26 + 2.09 + 2.45 + 2.26$$

$$= 9.06$$

Total value of Chi-square for d.f. =1 and 0.5 level of significance is 3.841 the calculated value is 9.06. Since the calculated value is greater than the table value, the null hypothesis is rejected.

Thus it is concluded that there is a significant difference in the continuous increase in sales between firms doing well and firms not doing well.

V CONCLUTIONS

CONCLUTIONS

5.1 SUMMARY OF FINDINGS

- This study was to test whether there is significant difference in continuous increase in the sales turnover between companies doing well and companies not doing well for the past 4 years. It was found that there is significant difference in continuous increase in sales.
- In this research, while performing the percentage analysis, it was found that 44 percent of induction furnace industries have felt the impact of the recession.
- From the percentage analysis it is inferred that only 30 percent of the induction furnace industries are involved in export business.
- The suppor departments such as Corporate Planning, HR, R&D, and time-study are proved necessary for the success of the company. The cross tabulation reveals that the industries working normal have a greater percentage of these supportive functional departments for their success and growth.
- To find Out what strategies did the successful and unsuccessful furnace industries adopt during the times of uncertainty:
    - The successful induction furnace industries have mentioned New Product Development, Constant Customer Contacts and Outsourcing as their primary strategies. This clearly indicates the reason for their success.
    - Whereas, most of the unsuccessful induction furnace industries have said that Cost Reduction followed by Outsourcing were their primary strategies.
- From the factor analysis.
    - It was found that Product Quality. Innovation. Prompt Response and Continuous improvement in features are the prime factors to achieve a higher stature in Export Market as well as in Indian Market.

➢ It can be said that to succeed in the market, these factors must be considered important and must be taken care of with more concentration and effort.

➢ It is interesting to note that product cost is not a major factor for success of a product when quality, innovation and quick delivery come into the forefront.

- It was found that most of the firms doing well, distribute their products through distributors and dealers. In the case of other firms, apart from dealers the products are supplied to large scale manufacturers and directly to customers. This may be due to the investment cost required to establish a distribution network
- A comparison was made on how the successful and unsuccessful induction furnace industries differ on their marketing strategy. It was found that ,
    - ♦ The Successful firms give large exposure to them by actively participating in all means of advertising and create awareness for their products.
    - ♦ There was only 10 per cent of the unsuccessful firms which participated in Industrial trade fairs, Radio and TV advertisements. None of the firms have participated in any international meet, which others the opportunity for export markets.
- Both the induction furnace industries that are doing well and nor doing well have computerised their accounting, pay-roll and quality control / testing procedures. None of the industries surveyed had gone for any sort of on line customer relationship packages.

5.2 RECOMMENDATIONS

Downsizing! Think Twice: Reallocation of manpower in scare areas enables retaining them in the organisation. This helps to keep the experienced workforce inside the company and also indirectly saves money in training and recruitment.

Cost Reduction: Strategy in cutting cost must prove to be valuable and should not leave the companies under-resourced. Cost reduction must not affect the strength and core competence of the company.

Potential Markets: Virtually all the induction furnace industries were focused heavily upon the domestic market, although it was clear that over the past five years there had been a movement towards exporting.

Outsourcing: Outsourcing should be considered as a strategy during uncertain times, but may not always be the right answer, particularly when the control over intellectual property is lost.

Leadership is key: Top management of induction furnace industries (particularly small firms) must have a long-term vision and should also immediately react to interim downturns.

Effective decision-making: Taking the right decision quickly and making use of the opportunities will cope with uncertainty effectively. Delayed decisions will cost the business.

Clear Communication: Both the internal and external communication should be clear and concise in times of uncertainty.

e- business: Electronic business with proper planning and integrated activities delivers direct cost savings. Example: e-procurement reduces procurement costs.

Intangible assets: Last but not the least; Intangibles are assets that industries should protect. Brands, Trademarks, Patents, Know-how are sources of strategic advantage. Intangibles need to be managed effectively to ensure that their value is maintained and enhanced overtime.

5.3 CONCLUTIONS

The survey provides a number of thoughts in the areas of operational strategy as it relates to the current situation of induction furnace industries in south Indian region. Although the evidence is based upon the samples collected, it supports the view that the industries do not generally regard the economic climate as favorable. Factors like Unhealthy competition, Monsoon conditions and Entry of foreign products in Indian markets are some of the possible causes for recession. The industries felt that Government has a positive role to play in the development of furnace industries. They feel that the Government does not understand the problems faced by the industries.

From the study, it is evident that most of the industries in south India had felt the impact of the recession during the past five-year period and that the situation is slowly improving. Furnace industries should immediately enter into the international market to be globally competitive. The small industries need to be more proactive than reactive in this matter. This will find solutions to the issues of uncertainty surrounding future domestic market conditions.

The management of quality will be a major factor in the development and growth of small enterprises while competing with the domestic and as well as the global players.

In this age of competitive intensity, it is necessary for the industries to develop winning strategies based on the company's competitive advantages and customer needs. Many companies have come up with alternate strategies that are wrong or for which the timing is unsuitable. The key is to build on the core competence the organisation with appropriate strategies as needed. To be most effective, a company's values and strategies should be reflected across all management practices of the company.

The customer valuable feedback is add up most appreciated point viz clarifications. Based on their approach the hypothesis has been framed as follows

- The most reliable current fed parallel inverter design to ensure smooth and efficient running of the equipment.
- Most Rugged, reliable and energy efficient equipment.
- VDLC design with no dummy turns ensures high energy efficiency.
- 5% less Kwh / ton than our Major Competitors.
- Easy maintenance and user friendly equipment.
- Higher availability of equipment & less down time.
- Consistent high Power factor.
- Highest melt rate.
- Most efficient after sales services.

Annexture I

QUESTIONNAIRE

A Study Operational Strategy for Induction Furnace Industries in South India- (During Recessionary Period)

Respected Sir/Madam,

Please help us to serve you better by taking a couple of minutes to tell us about your company performance. This research will help us to understand the overall Induction furnace industries. Thank you in advance

Name:

Designation:

Company Name:

Address:

E-mail id:

---

1. Whether your company is working normal without any recession?

   1. Yes 2. No

2. Whether product sold globally?

   1. Yes 2. No

3. Whether company is working normal in all departments?

   a. Corporate planning 1. Yes 2. No

   b. Separate R&D 1. Yes 2. No

   c. HRD/Training 1. Yes 2. No

   d. Industrial Engineering & Time Study 1. Yes 2. No

4. What are the strategies adopted in your company during recession period?
    a. Layoff
    b. Vigorous exports
    c. Constant customer contact
    d. Cost reduction
    e. Introduction of new product
    f. Outsourcing
    g. Organization restructure
    h. Downsizing

4. Degree of importance while exporting your product

    a. Product cost
    b. Product quality
    c. Reduction waste
    d. Innovation
    e. Prompt response
    f. Continuous improvement in features
    g. Continuous improvement in process
    h. Diversification

5. Competitive features of your company
    a. High quality
    b. Quick delivery
    c. Product differentiation
    d. Competitive price
    e. Customer friendly feature
    f. Quick response time
    g. Any Other

6. Channels of distribution of your company?
    a. Through dealer
    b. Distributors
    c. Large manufacturers
    d. Company showroom
    e. Direct to customers
    f. Any other
7. Promotional strategies of your company?
    a. Banners
    b. International meet
    c. Road shows
    d. Industrial Trade fair
    e. Radio advt.
    f. Exhibitions
    g. TV advt.
    h. Trade fairs

8. Information Technonology usage in your company
    a. Website
    b. CRM
    c. ERP
    d. e-purchasing
    e. AutoCAD
    f. QC soft wares
    g. Payroll
    h. Account packages.

I sincerely appreciate your time and co-operation. Thc following information will helpful to our study.

Thank you!

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BIBILIOGRAPHY

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