Synopsis of the PhD. Thesis

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In Management On

A comparative case study of the role of automation and optimization by the use of Six Sigma and other cost reduction management techniques implemented in major companies from Pune.

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Under the faculty of modern sciences and professional skills.

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The topic of the thesis is broadly related to the areas of Production Management, with special focus on Cost Reduction Techniques in order to maintain the ‘competitive edge of superiority’ of a firm in the present ethos of global reforms. It is also closely connected with ‘modern science of intrapreneurship’, in which the companies promote ‘cost cutting’ along with ‘enhancement of quality’ and maintain their market share and leadership not only in conditions of cyclical slowdowns and recessions but also in stable and normal conditions of industrial climate.

It is a common observation that topic of the ‘Production Management’ and that too ‘Cost management’ is very rarely chosen by the students of Advanced Management Research. The areas of Marketing Management, Financial Management, Human Resources Management, Supply Chain Management, Materials Management, Strategic Management and in recent years Retailing Management, Insurance and Risk Management are relatively more favourite to young Management Researchers. Production Management specially requires in-depth knowledge and experience of Engineering therefore it can only be opted by those MBA students who have academic background of Engineering faculty. Since this topic has remained much unexplored, I am strongly motivated to choose the same and endeavor to produce some original research work; which not only, will enrich this area of management but will also become immensely useful to those corporate managers who face the crisis of losing the market to their competitors and close the production wing, which makes huge losses during recession.

Just recently, because of Crash of Lehman Brothers and other Financial corporations due to lending against ‘sub-prime mortgages’ and recession in Automobile Industry, all over the world; many units had to shut down their production operations and were compelled to give lay-off to huge number of their employees.

The deep study of Business Cycles reveals that ‘Recessions’ are not only recurrent but their frequency has increased in post 1980s. The modern manager therefore has a much more difficult challenge to cope up with the crisis of slowdowns and recessions by grasping the advanced techniques of ‘cost cutting’ and retaining the market share, by enhancement of quality and efficiency by the application of ‘Six Sigma’ and similar techniques. The research done in this field will thus be useful to enrich Management Theory and to improve the Management Practices, too.

**The Title of the PhD Thesis**

The approved title of this thesis is viz. “A Comparative Case study of the role of automation and optimization by the use of Six Sigma and other ‘Cost reduction’ management techniques.” [Case studies of some selected companies in and around Pune.]
The Scope and Coverage of the Research Study

The scope and coverage of this study broadly consists of following aspects.


b) The role of innovations in improving the technology, productivity, quality and reduction of the cost and price and still improving the market share and profitability of a firm.

c) The role of cost minimization and cost effectiveness- The effects of rationalization- The pricing policies under different conditions of market.

d) The importance of the concept of ‘Optimization’.

e) Survival and Sustainance of efficiency in the keen and ruthless competition caused in recent years after the entire world has adopted economic reforms of privatization, liberalization and globalization. The countries, continents and regions cannot afford to have ‘closed economies’ due to the new regime of WTO.

f) The vital role of ‘Cost reduction’ during Recession.

g) Factual cases studies of some selected companies in Pune and around Pune, which have successfully and efficiently managed their costs and improved their market shares; with detailed ‘Break-up’ of their Cost-cutting item by item, or operation by operation.

Objectives of the Study

1) To identify and understand, the ‘Creative’ and ‘innovative role’ by which ‘Cost-consciousness’ is developed and correct diagnosis of the wrongs and weaknesses of the prevalent system of production which causes huge and exorbitant amounts of wasteful expenditure, can properly be adjusted by the persons who try to do the ‘cost-cutting’.

2) It is further interesting to note; how appropriate solutions to sort out the problems of wasteful expenditure; bring drastically down the routine amounts of spendings’ which for a long time were not noticed and continued in the system, as if taken for granted.

3) To examine the importance of continuous quality enhancement, at the lowest possible cost by means of automation and eliminating fabulous amounts of Labor-Payrolls.

4) To find out ways and means for making the most optimum use of plant, machinery, resources, labour and materials and getting maximum utilization of their capacity.

5) To cut down huge expenses and time consuming practices caused by conventional manual operations involved in secretarial and administrative practices, by introducing use of ‘smart cards’ and ‘paperless office’.

6) To establish the automatic control on the actual working of the personnel and obtain maximum productivity from them.

7) To find out ways and means of saving energy, fuel, natural resources, as well as, finance, time, space, Capital and labour.

8) To prove the vital role of ‘Cost cutting’ for very survival during recessionary conditions and for sustaining the efficiency in retailing the largest share in the market.

9) To investigate the evidence and concrete proof of the results obtained by ‘Cost cutting’ by not only global Businesses but by the companies in and around Pune; in which, I had the opportunity to be the member of a team assigned to do the actual cost cutting and expand Our clientele and business.

10) On the basis of this empirical evidence, to prove the validity of the hypothesis of this research study.

11) Lastly to judicially separate the ‘qualitative profit’ from the normal ‘quantitative profit’. Normally, any firm having assured market; can expand its sales (without doing minute and
intensive cost cutting) at the prevailing market price; which is a case of a quantitative profit. But when overall market demand reduces, and the firms conduct neck to neck competition by price cuts and cost cuts; and thereby earn profit, that is a case of 'qualitative profit'. It is no doubt easier to earn quantitative profit in any seller’s market but it is very difficult to retain market share and profits during the conditions of recession in which ‘Cost cutting’ occupies place of prestige.

12) To highlight the role of a modern manager, who can accept the challenge of sustaining the leading position of his firm during the common crisis of recession, thus partly it is a study of crisis management, too.

**The Sources of the Data**

There are a large number of text books and advanced theoretical literature published by well known management Gurus, all over the world. E.g.

1. Allan DeMacro-Principles and practices of integrated cost reduction.
2. Dunning- “Alliance capitalism”
3. Joel Dean (Managerial Economics)
4. Alfred Chandler- “Dynamics of Industrial Capitalism”
5. Salvator- “Microeconomics”
7. Lerter Thurow- Theory of Profits- The Future of capitalism
8. Peter Drucker- “Management by Results” etc. etc.

There are Seminar papers, Conference Research papers published by International Economic Association etc. There are hundreds of Research papers contributed by renowned management experts and published by leading business journals like Wall Street Journal, Finance and Development Journal, IMF surveys, Business Week, The New York Times, The Economist (London), Times magazine, Harvard Business Review, Fortune etc. In recent years, internet access also has become a time saving source of classified data. Especially the topic of ‘Cost reduction’ has evoked a lot of attention and interest among the worldwide leading management faculty and business experts because of the radical changes in the global market, from protected and closed ones to free and open markets, vulnerable to the recurrent crises of slowdowns and recessions because of the growing pressure of stiff competition!

[The complete list of sources of data used is given in the bibliography which is included in the Appendix A of the PhD. Thesis]

**Methodology of the Study**

This research study has collected the theoretical contributions; as well as, the authentic secondary data concerning the results of the actual cases of ‘Cost cutting’ of Global Giant Businesses like General Motors, General Electric, IBM, Microsoft, Ford, Chrysler, Toyota, Nissan, Honda, Krupp, Mercedes, Xerox, Coca-cola, McDowell, Dominos, McDonald, Canon, Dell, Axlerod, Kodak, Intel, AT&T, American Airline, De Beers Diamond and Walmart etc. This data consists of facts and figures which are authenticated by the prestigious Global Business Journals.

In addition, the author of this study had a good fortune and privilege to be associated with the task of ‘Cost cutting’ which was assigned to him, as a member of the expert team in initial stage and later on as chief leader of the team by well known International and National companies like Honeywell U.S., Tata Honeywell, Compulink etc. He has successfully been instrumental in maximum cost reduction and promoting the growth of the turnover and profits
of the companies which he served. He collected primary data with essential statistics and technical details from following case studies; which were made available to him by his clients.

He has furnished the authentic primary data of following case studies.
World’s cheapest car-Nano.
Cost cutting by introducing the use of smart cards in H.R. Department of TCS, Hyderabad.
Cost cutting by replacing manual security system by introducing electronic security system at Bombay House, Mumbai.
Cost cutting of H.R. Department of ONGC.
Huge Cost cutting in IT firms like Wipro, Infosys etc.
Cost Reduction Automatic Devices of PLC and DCS given to HPCL.
Diagnostic Software produced by Eco-axis for getting ‘Boiler Health Intelligence’; from minute to minute.
Energy Cost Saving by automation in the Building of Taj Hotel, Mumbai, Apollo Hospital, Mumbai, TCE Mumbai.
Minimizing Errors and Cost Savings done by application of Six Sigma method given to Tata Honeywell Building controls Division.
Capturing the market of HVAC (Heating, Ventilation and Air conditioning of huge buildings) by the lowest bid of the price made by Tata Honeywell and obtaining Number 1 Position in the global market.

The recorded data of these case studies will furnish the quantitative and qualitative evidence of its authenticity as such, any finding derived from both the secondary and primary data; can be, without a tinge of doubt, acceptable and true. The entire research is based on the analysis and processing of the secondary and primary data.

**The Hypothesis reads as follows:**

The role of Cost Reduction and Quality Enhancement techniques, has proven their importance for maintaining the competitive edge in the present globalised Business Environment in general, and its vitally indispensable in the conditions of cyclical slowdowns and recessions, in particular.”

**In all, the PhD. Thesis comprises of 5 chapters which are as follows:**

Chapter 1- Introduction, Chapter 2- Theoretical framework of Cost-Analysis (Based on review of Secondary data), Chapter 3- Review of factual cases of cost-cutting done by successful global businesses (Based on Secondary data), Chapter 4- Case studies of 11 companies and the positive results of their ‘cost-cutting’ (Based on Primary data), Chapter 5- Main findings and Conclusion.
Main findings and the Conclusion

Notable findings from Chapter 2 (Theoretical framework)

Adam Smith argued that competition would tend to establish the ‘natural price’ which is equal to the sum total of all costs plus marginal profit involved in the production of any commodity or service. Thus ‘Cost of production’- according to Ricardo- happens to be a synonym for the ‘value’ or ‘Price’ of a commodity.

Marshall found this explanation as ‘one sided’ i.e. based on only supply side. According to Marshall, value of anything will be determined by the interaction of both sides of Supply and Demand.

‘Cost effectiveness analysis’ has been recently developed in the theory of managerial economics.

According to Schumpeter, innovations reduce the existing levels of costs, increase the ['productivity and enhances quality of the products’.

The role of new technology is to go on reducing existing cost and raising productivity and quality.

By reduced (cost) price and improved quality, a company can expand its market share and profits. Thus profit is inversely related to Cost. Greater the cost, other things remaining constant, profits will decrease; by reducing the cost, other things remaining equal, profits will increase.

The profit is the reward for entrepreneur’s innovative ability.

Innovations comprise ‘new’ product, ‘new method’ of production, exploring a ‘new’ market, introducing ‘new’ production process, new machine, new energy, new inputs and changes in production organization. Innovation is the mother of the technological advance. Research and Development department has become indispensable in the survival and success of firms for long run. Trying innovations after innovation is a continual managerial process.

Then tangency of Isoquant and Isocost gives guideline for a firm to produce optimum output within minimum cost and providing maximum, revenue/profit.

Modern Managers may not find it practically easier to follow the concepts of Marginal cost and opportunity cost in their business decisions but it is very essential that they have to become knowledgeable and well-versed in developing their theoretical ‘Cost consciousness’ and output giving maximum profit within minimum cost.

In most difficult times of recession; the decisions and actions taken promptly for integrated cost reduction; are indispensable for the very survival of the firms.

Along with other goals of modern firms, managers of present times should give extraordinary consideration to profit Goal, share of the market goal and sales expansion Goal in order to maintain the competitive edge of their units and for achieving these three edge goals, cost cutting, productivity raising and quality improving are essential.
In recent years ‘knowledge’ has emerged as the main contributor to market leadership, business success and profit; because knowledge multiplies the existing productivity and can reduce existing level of production costs by multiple times, too.

**Findings from Chapter 2 (Factual cases of cost-cutting done by Renowned global businesses)**

1) Recently, new generations of Business Managers trained in Management Economics, have realized the importance of optimality. Sheer surplus above cost, creates a deceptive complacency. Marginal Analysis of the discipline of Management Economics proves that a firm can maximize its profit by equating marginal cost to its marginal revenue. Thus on one side, a firm should expand its sales and its market share and on the other hand, it should subsequently develop the vision of ‘Minimizing the production and sales costs’.

An Advertising firm could maximize its profit by $30,000 by equating its MC of $4000 to its MR of $4000 by spending $4000 each for four TV spots. (Wall Street Journal 8 February, 1993) vide Case No. 1 of Chapter 2.

2) Since Economy of USSR was totalitarian, prices, costs and demand were ‘administered’ by the heavy hand of force, economy was not allowed to exercise free enterprise, private property, individual initiative and to face any competition from within and without, all the products and services became exorbitantly expensive, the quality of Automobiles, refrigerators, TV Sets, Consumer Durables and Consumer Essential goods were ‘primitive’ by world standards. In computers and machine tools, Soviet Union was a decade behind the U.S., Germany and Japan and its standard of living was less than third that of the U.S. Therefore Soviet regime collapsed as a result of serious economic failures. The moral of this case study is that for achievement of ‘World class efficiency’, Technological Superiority and Product Quality; free economy made open to market forces of competition. In the interest of every individual enterprise, people endeavor to maximize their profit, by minimizing cost and maintaining the quality, too. Large number of the most efficient firms of the world belongs to free market economies. (Vide Case 2-Chapter 2).

3) In liberal globalized market of present times: “Survival for the fittest” is proved because of the worldwide popularity of American airplanes, Japanese cars, German steel and chemicals, Italian handbooks, French perfumes and champagn, Hungarian clothes and hats, Taiwanese calculators, Korean ships, Scotch Whisky, Swiss chocolates, Canadian Fish, Indian Tea and Brazilian Coffee. Because of the principle of comparative cost advantage: ‘internationalization’ of both production and consumption have taken place. E.g., American IBM PC is not American, it is manufactured abroad and its more than 40 percent revenue is generated abroad. So is the case of Microsoft so is the case of Honda Cars manufactured in U.S. (Read IBM PC break up of total cost Case 3).

4) Among the Three Giant Automobile Companies of U.S., General Motors had the Top Position having maximum sales worth 123 billion dollars in 1991. But because it had employed more than 74000 workers, its sale per employee was only 162 dollars as against that of Ford being 265 dollars. It therefore became ‘cost conscious’ and decided to increase efficiency and cost cutting by closing 21 plants and about three thousand of laborers. (See case No. 4)

5) Firms have to make systematic research of knowing consumer’s preferences as advocated by Kelvin Lancaster. Ford used his advice in designing its 1986 Taurus Model and gained the status of ‘Best Selling Car’ in U.S. It lost its popularity due to competition of ‘Honda
Accord’ in 1989. It therefore worked hard to redesign a new model of 1996 Taurus and regained its top position. Thus Market Study is equally important as ‘cost cutting’. (See case no. 5)

6) Due to globalization, very rapid convergence of consumer tastes has taken place in one world today. Tastes in the U.S. affect the tastes in the rest of the world and converse is also true because Americans have developed tastes for Indian Vegetarian food recipes, Ayurvedic and herbal medicines and cosmetics, Yoga etc. Coca-cola, Jeans, Pizza, Burgers, Tea shirts and Reebok shoes etc. have become consumer essentials all over the world. Telecommunications, Movies, TV channels, Mobiles, Internet, Computer PCs, travel and tourism, transportation and global job openings have promoted convergence of tastes and common ‘Life style’ all over the world. (Case no. 6)

7) In dynamic and vibrant global economy; no country or MNC can retain its supremacy for long time, because of the constant threats of international competitive business efficiency. E.g. U.S. lost its leading position to Germany and Japan in steel and other metals, it had to totally surrender its electronic industry to Japan during 1970s. At present, it has sustained its supreme position in ‘Pharmaceutical Industry’; because of its enviable and un-matching strength for investing in Research and Development. (See case no. 7)

8) By 1990s, U.S. brought a grand revolution in production by introducing computer-aided-design and computer aided manufacturing by CAD & CAM techniques. It could reduce production costs and production time by amazing proportions. ‘New Digital factory’ which is responsible for a ‘Quantum leap’ in the spread, flexibility, cost reduction and productivity. E.g. Motorola company can now produce ‘Customized paper’ within minutes, as per the specifications given by the customer and delivers him the same on next day. ‘Customized Manufacturing’ has been adopted by all the leading corporations of the world. (Read case 8)

9) As long as ‘Xerox’, the pioneer enjoyed monopoly: never gave any thought to its productive efficiency. When it was challenged by the competition of Japanese firms which produced better and cheaper copiers; it went into collaboration with Fuji Xerox and made the latter, its subsidiary to obtain the ‘cost advantage’, within a short time, it regained its top position! Thus complacency is not desirable in Management; Modern Manager has to be constantly alert about intensive cost efficiency. (Case no. 9).

10) “Be American and buy American” slogan became very popular because of its sentimental appeal. In objective terms, a number of U.S. products and services, are being outsourced or being manufactured in U.S.; by its foreign subsidiary companies. (Case no. 10)

11) ‘Radio cabs’ have amazingly restrained the monopoly of Taxi License Owners of New York. As a natural reaction, people make an effort to find out a close or semi-close substitute to every monopoly, product and service. (Vide case no. 11)

12) No country remains the most advanced and prosperous forever and no country remains poor and backward for longer period of time. 19th century belongs to British Empire, 20th century first half belonged to America, 2nd half was shared by U.S., Japan & Germany, some Middle East and South East Asian countries. By 21st Century, China has emerged as threatening superpower in World Trade and manufacturing. It can be proved by American ‘Score card’. (Vide Case no. 12)

13) Firms have to study the competing moves of their rivals - South West Airlines of U.S. wanted to improve the turnaround of it’s aircrafts and studied ‘Indianapolis 500’ for watching how pit crews fuel and service race cars in a matter of few seconds. The result was that it could cut it’s turnaround time by multiple times. Domino’s Pizza takes an order, produces the pizza, delivers it and collects the money all in less than 30
minutes. By following that example, a gas service in U.S. greatly speeded it’s delivery to customers and increased it’s earnings and profits.

14) Walmart’s pre-emptive expansion marketing strategy - By 2009-10, fortune magazine chose Walmart as the most successful firm of the world on the basis of it’s sales, profit, cost-cutting and worldwide network of more than 2500 discount stores. The sole secret of Walmart’s number 1 position is it’s continuous effort of cost cutting and sharing it’s profit by reducing the prices to it’s customer’s and thereby multiplying it’s sales turnover, by providing ‘lowest price’ in the market. Walmart makes exhaustive market survey so as to preempt the opening of shops of competitor retailers’s. Once Walmart opens in a town, no rival firm dares to open it’s store because ‘People trust that Walmart Price would be the lowest and quality of the products and services will be the best’. It shares it’s costs of inventory, transport, finance, marketing or sales cost and also the labour, with it’s customers.

15) Coca-Cola Vs. Pepsi War - Because of very strong competition of Pepsi, In April 1985, Coca-Cola decided to change it’s 99 years old recipe for coke and wanted to make new cola, sweeter and lighter; so as to reverse Pepsi’s gain. It spent a fabulous amount of $ 4 million for developing a ‘New Coke’ and conducted taste tests on nearly 2 lakh consumers. When it was introduced in May, 1985, it unexpectedly faced a violent consumer’s revolt against the new coke and the new coke flopped in the market and company was compelled to bring back the ‘old coke’ to pacify it’s consumers. Company named the same old coke as ‘Coca-Cola classic’ and it made a grand business. But the new coke also became as popular among children, ladies and older people, as Pepsi and brought a second source of earnings and retained it’s first position in the market of soft drinks.

16) De Beers Diamond Monopoly - When there is a recession and the demand for diamonds is low, De Beers withholds diamonds from the market in order to make the supply artificially limited and avoid further fall in price. When in 1980s, Russia along with Zaire attempted to sell large quantities of industrial diamonds at lower prices; De Beers immediately flooded the market from its own stockpiles at cheaper prices and eliminated Russian competition. De Beers has also taken initiative to constitute a cartel of its fellow diamond producers namely, ‘Central selling organization’ and virtually commands a monopoly share of 80 to 90%; just like ‘OPEC’ in case of petrol.

17) Dell’ success in mail order business of PCs - Dell, a smaller company than IBM, Microsoft, Apple eliminated the middlemen, distribution channels etc. and charged lowest price to its buyers by mail-order delivery! Ordering a computer from Dell by mail is like asking for pizza of Domino-you know exactly what you will get! Due to this innovative idea, Dell could reduce its selling and administrative expenses upto only 14 cents for each dollar of sales (i.e. 14%); whereas Apple spent 24 cent and IBM 30 cent!! So Dell could become World’s 6th largest computer company in the U.S. Dell is also very efficient ‘after sales service’! Dell technician reaches the customer’s place within 5 minutes of calling!

18) A Case of ‘Nash Equilibrium’ - Giren Dell’s dominant strategy, IBM, Apple, Zenith etc. companies also quickly followed the same method by just imitating it in 1994. Computer industry is in a condition of a ‘Nash Equilibrium’; every company’s share in the market has become almost constant but Dell- being the original pioneer- still retains almost 50% of the mail order business.

19) American Air Lines Fare War - During 1990 and 1991 domestic airlines in U.S. suffered from heavy losses due to ‘hike in air fares’. In April 1992 American Airlines
introduced simplified and concessional fare structure and could induce more passengers to use them and restricted the losses. But there was a unmindful war of ‘price-cuts’ which ultimately brought them huge losses. The moral of the case study is that lowering the price should have the ‘floor limit’ of the actual cost. Otherwise companies face bankruptcy.

20) Voluntary Export Restraints by Japan as a Saviour of U.S. Automobile Companies - From 1977 to 1988, U.S. Automobiles production fell by 33 percent. The share of imported cars rose from 18% to 30% and nearly 3 lakh Automobile workers in the U.S. lost their jobs. In 1980s, the Big Three (GM, Ford & Chrysler) suffered a combined losses of $4 billion. As a result, U.S. negotiated an agreement with Japan, that Japan should voluntarily restrict its auto exports up to 1.6 million units per year during 1981 to 1985. Japan agreed to restrict as per negotiation, so as to avoid more stringent measures by the U.S. In recent years, Japan has been producing an increasing number of automobiles in the U.S. in ‘so called transplant factories’ and saves money of American buyers (due to lower prices) and retains jobs to American Auto Workers!! The competitive threat is a disguised boon to improve the ‘cost efficiency’ in post 1990s. American Car makers reduced the costs and prices too.

21) The need for ‘Attach Strategy’ in modern Competitive Business (Corporate Combat) - In both business as in warfare, strategy, tactics, spying are essential. Stealing a rival’s technological innovation, or seducing the Key person in a successful rival unit by ‘head hunting’, employing a top manager in charge of R & D of a rival firm etc. and conducting a futuristic planning for 6 to 10 years ahead are not only essential but beneficial also.

22) Price War of Market of International Calls in Europe (or mobile companies) - AT & T of U.S. and British Telecom have crept into European Markets with lower rates than those charged by National Government Telephone Monopolies. In 1994, European Commission decided to open the inter telephone market to global competition. As a result, government started privatizing their national telephone companies. Thus because of privatization and competition, telephone rates went on becoming cheaper. So is the case of rates per second charged by BSNL, Idea, Reliance, Airtel in India in recent years; have been reduced due to competition.


The major causes can be identified as follows:

a) Failure to understand the core competency
b) Lack of prudence to understand and anticipate competitors ‘surprise moves’
c) Lack of innovative technology
d) Lack of flexibility for conducting diversification of industries
e) Personal conceit and complacency
f) Overconfidence
g) Casual Attitude
h) New product lines in which company does not have adequate experience and expertise
i) Heavy indebtedness of a firm

The most classic example is Kodak which diversified into pharmaceuticals and consumer health products and failed!
American car makers went on producing big and luxury cars because of very attractive high margin of profit. But ultimately they failed because they lost the market of small and affordable cars in the short run and lost the market of luxury cars too! IBM the Giant was unable to recognize the importance of the vast scope of PC market in the mid 1980s.

Moral: It is more difficult to keep a business in running condition than to build it!

24) Duopoly Situation - It is in the interest of duopolistic firms to have a formal or a tacit compromise and cooperation. If the rival wants to cooperate, continue to cooperate with him, as long as the status quo continues. Mr. Axelrod found it advisable, if the rival betrays you, next time you must be prepared to betray him; that will bring him once again on a wiser track!

25) Economies of ‘Scope’ - Economies of scope may arise when a company produces wide variety of products (multi products) with common production facilities, overheads, infrastructure and inputs. E.g. Cars and Trucks, sugar and hard liquors, passenger and cargo services of Travel companies etc.

26) Cost Minimization during one Lone Run - In the long run, the firm can produce more than proportionately by the small additions on capital and labour inputs.

27) How do firms get new technology?
The most important method of acquiring product and process innovations is by independent R & D by the firm. (Observation of a survey of 650 executives in 130 industries of the U.S.)
The next dependable method is ‘licensing’ or ‘Reverse Engineering’ i.e. devising different method of producing a similar product.
Third advisable method is of hiring employees of innovative firms.
The last method is to have dialogues, informal discussions with experts of innovating firms.

Findings from Chapter 4 (Primary Data)

1) Tata’s accepted a challenge of producing World’s cheapest and Best car by a targeted cost of $2500! It made use of Robotics for designing and production in order to reduce cost and maintain the quality. It avoided heavy and costlier materials, used alternate materials such as aluminum for Engine instead of cast iron; 624 cc engine instead of 800/1000 cc engine in order to obtain fuel efficiency, instead of water cooling, air cooling; made smaller size but more comfortable leg space by making it taller, minimum selling costs and assured ‘excellent’ after sales service! At the same time, it took judicious care of making suspension and the chasis as sturdy as any other Tata car. It got a special reward of ‘International’ Car of the year 2008-9! (See Case no. 1-Chapter 4)

2) By introducing ‘electronic security system’ equipped with smart cards, sensors, electronic readers, magnetic locks, ‘Turn style rotating iron doors’, automatic openings and shutting of doors, lifts etc. and ‘guard less ushering and exit, in ‘Venus Jewelers’, Surat, the company could save crores of rupees on its manual security; yet could prevent pilferages and stealing to the extent of more than 94 percent; which alone saved more than billion rupees of the company at the cost of meager fees of Rs. 10 lakhs paid to Tata Honeywell Group! Thus Cost Benefit ratio became exceptionally very high (1:10,000)!! The Security became tighter and automatic. (Read Case no. 2-Chapter 4)
3) H.R. Department of TCS used to spend very heavily on maintaining attendance record, Leave Account, subsidized medical facilities, lunch and refreshment coupons to be delivered by employees to the factory’s canteen; yet it used to make delays by its reliance on the manual operations of its secretarial staff. The number of employees of TCS Hyderabad being more than 70,000, it became a great headache and a problem to H. R. Wing of Management.
Tata Honeywell reorganized the entire system by introducing smart cards in which e-cash of Rs. 1200/- per employee per month was inserted. The electronic reader used to verify the authenticity of the user. As a result, accounts of canteen, vending machines, library etc. could be settled on day to day basis. The company could save huge amounts incurred far secretarial/manual work and further could raise the perks and satisfaction quotient of its employees. (Read Case no. 3 - Chapter 4).

4) The automatic Security System and guard less ushering and exit of visitors in Bombay House- Tata’s Headquarters could reduce enormous costs on manual security, waste of time involved in the same and stress caused because of intolerable boredom experienced by the visitors. The company not only saved all these costs but earned Satisfaction Quotient, Goodwill and Pleasure of its visitors. (Read Case no. 4/Chapter 4).

5) H.R. Department of ‘ONGC’ similarly got rid of the huge costs, delays, unmanageable secretarial work etc. by introducing the ‘Use of smart cards’. It could improve its communications, detailing of duties, transporting, providing prompt medical facilities to employees and their families, settling their salary and leave accounts by computerized operations. (Read Case no. 5/Chapter 4)

6) The main component of costs of IT companies is the huge salary bill of their software personnel. The minimum average salary with perks of one employee, happens to be around Rs. 50,000/-. Companies like Wipro, TCS, Infosys employ more than 70,000 employees. Thus their annual average expenses exceed than Rs. 4200 crores per annum. It is very difficult to keep a vigilant watch over the actual time of work per employee during a day, the surplus and idle labor without assignment of specific work on every bench; the rate of errors per every hundred units of a job and thereby the ‘quality of the working hour’, around fifteen to twenty days per year of ‘Complete Worklessness’ because of holidays in the countries of the clients, such as X’mas in U.S. and Europe, Two Golden Weeks of Thanks giving in Japan and New year celebrations in China. As a result, Indian companies like Wipro which is supposed to make billing of $7.25 billion; receives only $3 billion and face huge losses of about $4 billions because clients make payment on the basis of actual working hours an material quality per hour. There used to be complete chaos or lack of coordination and planning to make the fullest utilization of the employees by maintaining proper ‘Time Sheets’ and records of the quality of work.
A package named ‘Whizible’ designed ad issued by compulink company of Pune sorted out all the problems of Wipro and could save billions of dollars of company’s billing which otherwise used to be lost because of inefficient H.R. Management. (Read Case no. 6/Chapter 4)

7) Installation of PLC and DCS for improving and maintain the production quality of HPCL. Before 1991, Public Sector Refineries used to depend on manual operations for maintain the quality, purity and consistency of every petroleum product. There used to be hand
operated knobs which used to be operated by several men at the worksite. The cost of their labor used to be very huge but because of lack in precision in adjustment of knobs petrol used to be mixed up with diesel; or diesel with oil or tar. Mixed petrol used to choke up the carburetors of the cars and break down of cars was a very common and funny phenomenon in pre-reform years.

After economic reforms began, all the new cars like Maruti, Suzuki, Honda City, Hyundai, BMW, Toyota etc. badly require pure petrol or pure diesel.

Tata Honeywell introduced ‘Distributed Control System’ equipped with a number of programmable logic controllers and analog controllers, plus the sensors to measure and judge various parameters of the purity; by which HPCL could produce pure petro products and attracted the clientele of car/truck owners. The new system required only Rs. 35 crores so as to assure the purity of Rs. 10,000 crore worth petro products. Thus HPCL got the cost benefit ratio of an amazing figure of 3:1000! Honeywell U.S. has given this package to Aramco, Exxon, Cherron, Shell and other companies all over the world and helped them to save their labor costs as well as improve the quality of the products. (Read in details Case no. 7, Chapter 4)

8) Huge Cost Reduction done by Diagnostic Software to read and report about the Boiler Health produced by Ecoaxis.

On an average, after a breakdown of the boiler, a sugar factory faces a loss of Rs. 1 ½ crore per day, a power plant of 500MW suffers a loss of Rs. 20/-crores and oil refineries lose Rs. 105 crores per day. Thermax company Pune, is India’s principal Boiler Manufacturer and it assures ‘after sales service’ to its clients. Ecoaxis produced a ‘diagnostic software’ to judge and report the ‘Boiler Health’; by subsequently prescribing the preventive solutions and has helped a large number of clients of Thermax; so as to avoid break downs and consequent losses. It has helped them to save huge amounts of losses, delays required for repairing etc. (See Case No. 8, Chapter 4)

9) Energy Cost saving by automation in huge buildings like Taj Hotel, Gateway of India.

By making essential alterations in the glass window panes of the heritage building, using colored glasses from the inside to prevent heat of outside and help air conditioning with limited input of energy and separate automatic control of ‘Switch on and Switch off’ operated by ‘movement detectors and embedded sensors’; the use of lights and Air conditioners was rationalized and controlled; only when the user or occupier of the room or corridor needed lights or Ac. Instead of hundreds of electric geysers, common boiler started supplying hot water in all the rooms of the hotel. Taj Hotel, after installation of this system, started saving around Rs. 1.5 crores per annum on its energy bill. (Read in details Case no. 9, Chapter 4)

10) Reduction in costs of unwanted material supplied by the dealers of Tata Honeywell Building controls division, ordered by the field staff because of the communication barrier and consequent errors. Case of application of ‘Six Sigma Method’ for minimizing errors and reduce the wasteful costs.

Due to the communication gap between field staff, suppliers of building materials and Head office, many a time huge quantities of materials used to be ordered directly to the approved dealers of Tata Honeywell Builds Division.

When the instruction of ‘Center of Excellence Team;’ were not followed by the field staff and COE Team used to make amends in the design of the building and give specific quantities of materials required for new amends; the old ordered material which used to be
around 20 to 30% of the total project cost; could not be returned to the Dealers. Company used to suffer heavy losses due to sheer ‘communication gap’. By application of Six Sigma method by the COE Team, the company could reduce its huge costs and losses. PCs of field staff, dealers, COE Team and e-mailing enabled every one concerned, to get the correction information and changes were also promptly communicated to them. (See the details in Case. No. 10, Chapter 4)

11) The success story of Tata Honeywell Product XL 28 which became the cheapest and topmost popular system for maintaining the temperature and moisture at the shop floors of Tea Industries, Textiles, Food industry, IT parks, 5 start hotels, Hospitals etc. American Honeywell Company used to supply HVAC system by brand name of XL 100 at a rice of Rs. 5.5 lakhs. It used to sell XL 50 to retailing shops, small public buildings, libraries, offices etc. at a price of Rs. 4.8 lakhs. Johnson Controls, its competitor got manufactured in China at a lower cost and started selling it at Rs. 4 lakhs; being a perfect substitute to U.S. Honeywell product XL 100. Tata Honeywell with the initiative of the author of this Ph.D. thesis, eliminated the Heating part because it is redundant in India, and only focused on AC arrangement. Therefore it could produce it only within about Rs. 1 lakh only. Due to the least cost advantage, it offered a competitive price of Rs. 4 lakhs; when its competitors further lowered a price to Rs. 3.5 lakhs; it offered a retaliatory price of Rs. 3 lakh and made fabulous business all over in India. (Read in details Tata Honeywell’s detailed programming of its cost-every component wise!)

Main Conclusion

The theoretical findings of the Part I, empirical findings of the actual case studies of World’s Leading Corporations and case studies of companies in and around Pune; all together prove the vital role of ‘Cost reduction’ in not only for the survival of Modern Businesses but also for securing Top position in the market; in the present intense competitive conditions of businesses which are radically changed during the Economic Reforms Era Commenced from 1991 onwards. They have highlighted the role of innovation in cost minimization. They have also justified its Life-saving role during hard periods of economic slowdowns and recessions.

Thus findings have proved that Cost-Cutting also helps firms to raise their productivity, to enhance the quality of the products and promote its sales in the market. Cost Cutting therefore indirectly is an exercise to improve the Managerial Efficiency. Cost-Consciousness helps to stimulate creative intelligence for thinking of n number of solutions to the problems; and it is a must for Managerial Vision and Performance. Cost Cutting helps to raise ‘Qualitative Profits’ rather than Quantitative profits which make Business Managers too complacent and unaware of the serious crises, if there are sudden cyclical downturns.
The hypothesis which reads as follows:

“The role of Cost Reduction and Quality enhancement techniques, has proven their importance for maintaining the competitive edge in the present globalized Business Environment in general and is vitally indispensable in the conditions of cyclical slowdowns and recessions, in particular”.

The hypothesis has been proved in ‘toto’, word by word in its letter and spirit by all the findings of the Secondary and Primary Data.

Thus proved perfectly by the findings, it has earned the ‘Status of an undisputedly acceptable, true and Valid Thesis!!

To sum up, the Success of a Modern Business Unit largely depends on its capability of finding ways and means of Cost Cutting, raising the productivity per unit of input and improving the ‘one-upmanship’ of quality!!!