FINDINGS, SUGGESTIONS & CONCLUSION

“The most immutable barrier the nature is between one man’s thoughts & another’s”

- William James
6.1 SUMMARY OF MAJOR FINDINGS
Electronic Companies of small and medium size are using Six Sigma. However, based on the level of difficulty in gathering information from these companies, it is concluded that many of these companies may not have the resources to document their Six Sigma deployment. Based on the findings of this study, several arguments surrounding Six Sigma implementation at Electronic companies can be addressed with respect to size, challenges, training, satisfaction and cost/savings.

Size
When evaluating the size of the Company, it was found that the size did not limit the amount of money being spent on Six Sigma. For example, there were companies who staffed 1-100 employees and spent more than $50K a year on Six Sigma. These companies were spending as much as other companies who staffed 500 employees and spent similar amounts on Six Sigma.

Challenges
Upper management support, cost of implementation and fear of cultural change are the major challenges facing Electronic SME’s in implementing Six Sigma. However, these challenges are not limitations, they served as a handicap to some of the companies studied.

Training
The companies are training their employees predominantly, through internal master black belts and black belts. Of the companies studied, a total of 83 of their employees were trained black belts. Therefore, many of the companies are knowledgeable on Six Sigma training and staffing implementation.
Satisfaction
Of the companies studied, 70% agreed that Six Sigma could improve job satisfaction and the same amount of customer expressed similar opinion that Six Sigma improved customer satisfaction. These results were generally positive, we could conclude that Six Sigma improves the level of satisfaction at the company.

Cost/Savings
Most of the respondents in this study had 500 or fewer employees. Comparing the total savings to the amount spent on Six Sigma, the average companies spending less than 1% (0.80%) of its potential savings on Six Sigma per year. The companies being studied could potentially save a great amount of money with a Six Sigma program. However, one must speculate that the salary amounts and other indirect costs may not have been included in their cost estimates resulting in a low estimate of Six Sigma cost estimated by respondents. This may have been due to the positions of the respondents completing this survey. Some respondents may not have had this information that would be easily available to a CFO or higher-level manager.

The work reported in this study was undertaken to explore the extent to which Six Sigma is implemented in Electronic SMEs and to identify the reasons that explain the state of affairs. This was pursued using questionnaire targeted at a sample from a population of Electronic companies in a widely used and relatively large company database. When respondents were asked their opinion on whether the benefits outweighed the cost of Six Sigma, 88% of the respondent population agreed. 81% of the respondents felt that Six Sigma had increased their company profitability. This supports the argument that there is benefit in implementing Six Sigma at these companies. There is a tendency to explain the Electronic industry’s performance relative to other industries on account of its uniqueness. While the uniqueness of the
Electronic industry can be understood, it should be noted that there are developments taking place in the Electronic industry, such as increasing competitiveness, framework agreements and enlightenment that are continually diminishing the uniqueness argument. The above reasons highlight three main issues: the external environment within which Electronic companies operate, the mode of delivery of Electronic industry products and the nature of Six Sigma as a quantitative approach to managing quality.

1. The external environment within which Electronic companies operate does not Promote Six Sigma
Despite the evidence from some large Electronic organisations of the benefits of Six Sigma, the Electronic industry appears rather slow in responding to Six Sigma (and other new initiatives). One may even say that it is no wonder that the Electronic industry continues to lag behind other industries such as manufacturing and automotive. However, the industry is only a sum of constituent organisations, including SMEs. These organisations should be seeking competitive advantage by looking at the environment beyond the immediate industry to identify ways and means with which they can differentiate their products and/or services. Although 6s will not be the panacea for each and every SME, the very least that can be done is to explore its potential in the context of each organization.

2. The mode of delivery of Electronic industry projects
The idea that output is in the form of individual unique projects – often underpins explanation for mismatch between the Electronic industry and other industries. Yet, many Electronic industry processes are repeated from one project to another. In addition, the increasing emphasis on framework agreements that involve working with the same partners over a relatively long time period diminishes the uniqueness.
3. The nature of Six sigma as a quantitative approach

It should not obscure the fact that the Electronic industry is better placed to generate the quantitative data necessary. This drive has defined a significant number of standard quantitative variables that can be used. Furthermore, the move towards framework agreements that ensure a supply of reasonable work loads over relatively long time periods provides increasing opportunities for repetitive activities that are suitable for generation of large data sets.

This study has highlighted the potential of Six Sigma for Electronic companies. It has also challenged Electronic SMEs to take the initiative to innovate and not wait for prescribed solutions from other project stakeholders. When comparing SME’s and large companies, the study found that although there were some differences in their Six Sigma programs, the majority of information pointed towards similar Six Sigma programs. Top management support, fear of cultural change and implementation cost were the biggest challenges in Six Sigma deployment for these companies. It was important to compare the challenges faced at small and medium companies to those of large companies to analyze whether they were facing similar issues.

Six Sigma Awareness

The post globalisation period in India had brought in several opportunities and improvements in Indian organizations. Technological development and economic competitiveness had greater impact on managerial dimension and directions in this era. There were many organizations both within and outside electronic sector that died of not being able to adapt to the above changes. The above discussion brings forth the necessity of the organization to respond to changes whenever it becomes necessary. The concept of Six Sigma has been enjoying its important role in both situations – “Before and after globalisation”.

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The concept of Six Sigma was introduced in India from 1980’s onwards only. This timing strategy has largely helped the companies today to enjoy the benefits. It has been an established fact that Six Sigma philosophy and practice bring in systematic, integrated, consistent, organizational perspective involving every one and everything. Numbers of companies including Electronic industry have been enjoying Six Sigma benefits. While examining the company’s records it was very clear that the Electronic industry has been on the upper side in terms of employee efficiency. The employees have supported this observation equally in their responses.

The study on the evaluation of Six Sigma in Electronic Companies comprises, respondent perceptions and comparing it with management’s policy and vision for quality excellence. The general perception is judgmental ability of an individual improves creating a positive and expected influence on the awareness and understanding of Six Sigma in the organization. Hence, considering this significant aspect, the study is concentrated upon to know the specific impact of Six Sigma and their believes and perceptions about Six Sigma awareness and its existence.

Using certain specific parameters mentioned earlier, the study has derived at the awareness levels of Six Sigma among companies. The opinions of respondents were sought to ascertain the basic awareness of Six Sigma in them as indicated. The results of parameters against which the opinions were obtained indicate that the responses are highly phenomenal and interpreted that the major segment are aware of and existence of Six Sigma and its implementation in Electronic companies. In fact most of the organizations today mandatorily follow the practice of Six Sigma in reaching to excellence level. In addition to the above it can be understood that the application & implementation of Six Sigma has greatly influenced the electronic industry in India and elsewhere.
Therefore, the concept of Six Sigma is all pervasive and it influences every function, department and grade. Top management plays a vital role in the successful implementation of techniques and models such as Six Sigma. Further top management as its responsibility prepares a number of models and techniques through its functions such as objectives, policy communication, leadership etc. To enjoy the benefits of Six Sigma as a consequence of this, people in the operative level will implement the models and guidelines for effective results of Six Sigma. Thus top management need to be ambidextrous. They must balance the need for structural dimensions on the one hand with the behaviour dimensions on the other. The structural dimensions include hierarchy, budget, plan, controls, and procedure of Six Sigma. The responses indicate that the policy implementation with regard to Six Sigma is very strong as it enjoys complete support of top management. It also indicates the existence of positive and perfect relations between employees and management in Electronic industry.

**Awareness of Six Sigma in Electronic companies**

Six Sigma implementation should be done with a particular strategy. Four components cited as critical for successful Six Sigma strategy implementations are customer satisfaction, employee involvement, managerial leadership and process improvement and control. These components are essential and successful implementation of components provides many significant benefits to an organization. These benefits include customer satisfaction, enhanced quality and services, lower maintenance cost, greater productivity, increased flexibilities in meetings, customer demands, better utilization of human resources and better management control. The successful implementation of Six Sigma related to organization can also be discussed through various other parameters. Certain specific and most relevant components, mentioned in the respective chapter, were taken for the purpose of the study.
The benefits and functions are also reported to find out letter and spirit of an effective administration of organization with proper quality. This has indeed resulted in total positive responses for determined benefits to the organization. In addition to the above, organizations should also make it mandatory to evaluate the level of benefits derived by various functions in department so that they cumulatively constitute the growth of organization with in the context of Six Sigma. Every employee expects his department or a function to progress and prosper. It is interpreted from the study that the maximum Six Sigma benefits were derived from more than 5 out of 8 parameters. Comparing with the performance and perceptions of respondents it may be understood that the impression for quality consciousness, awareness and knowledge for implementation can be observed high in any respondent within the study.

It sounds quite impressive to know from the study that these aspects of an employee keep influencing his level of understanding and perceptions. Of all the parameters given, the two parameters are relatively difficult hence requires additional concentration and carefulness on the part of management to attract employee's response. The management may enhance its total quality strategy concerning these two parameters. Simultaneously it is suggested that all the employees may be exposed constantly to realize the benefits from time to time.

There are a number of concepts and components that constitute Six Sigma. The essence of all the models mentioned earlier, certain concepts were evolved considering their importance, necessity and organisation’s ability for the purpose of the study. These concepts were pre-tested for their existence in electronic companies before soliciting responses from the respondents. Majority of respondents declared that all concepts mentioned definitely belong to and are very much involved in Six Sigma implementation as mentioned.
The study results indicate that the majority employees may be under the impression that Six Sigma has to do with internal and managerial aspects also. If this observation is correct, then the company may concentrate on training employees vigorously towards enhancing their knowledge and awareness levels regarding Six Sigma and the impact of internal environment. It is mentioned here that Six Sigma has all pervasiveness and is mainly directed towards customer focus and satisfaction. From the study results, we can interpret that one of the reasons for major success of Six Sigma implementation in Electronic Company is due to potential knowledge of Six Sigma in employees. Hence it can be understood that organization is poised for excellence in Six Sigma implementation in the future.

It is found that in certain areas of Six Sigma such as customer focus and statistical process control the awareness level among respondents regarding these concepts belonging to the Six Sigma implementation. Hence, it is also suggested that the company may propose for implementation of certain strategies such as job rotation, job enrichment and employee postings based on potential appraisal essentially enhance their awareness and knowledge about Six Sigma. Unless this is achieved the management of the company cannot gain excellence in implementation of Six Sigma. It is also reminded here that some organizations consider Six Sigma practice as their competitive advantage.

On the necessity for implementation concepts of Six Sigma, the study further concentrated to find out their exact usefulness in the organization. Some concepts as mentioned earlier were taken for this purpose for better, accurate and meaningful comparison among determination of Six Sigma concepts and their usefulness to the organization. The study results indicate the strong presence of top management
leadership. They in fact believe that their top management is a strong force behind them in their working. This interpretation is supported by the personal observation that the top management and the employees are sailing with same opinion with regard to identification of concepts and their usefulness for successful implementation of Six Sigma. This extends further to observe that respondents as highly significant to implement Six Sigma feel the implementation and usefulness of concepts successfully. However, they appear to be lacking theoretical knowledge on the usefulness of concepts in Six Sigma implementation. Hence, the management may develop certain ways and means of strategically linking the level of knowledge and skill in the management of Six Sigma.

Similar observations have been made with regard to gathering perception of respondents in the usefulness of some concepts for growth, development and excellence of Six Sigma in their respective departments. The corresponding results have been thought provoking. The only one concept parameter that received discouraging respondents was 'statistical process control'. This could be because certain departments may not be having proper supportive process control mechanisms or the central statistical control that may not be reaching to the requirements of the department concerned. Hence it is suggested that the management can put a step forward in reaching to the excellence in implementation of Six Sigma by integrating further the concept of statistical process control with the various departments that required additional support. On the overall the usefulness of predetermined concepts, mentioned above, are believed to be strongly useful for the development of organization in general and respective department in particular with in the context of Six Sigma implementation.
From the responses it is understood that the onus of Six Sigma implementation largely depends on the top management and its leadership. Top management must be fully responsible for helping each one concerned towards quality performance and must constantly endeavour to accomplish total transformation of organizational activities for Six Sigma. Prior to this, top management must get convinced of the necessity for quality and must clearly communicate the same to the employees in a written form. The most important concepts of group effort and group decision making contribute to a greater extent for the successful implementation of Six Sigma provided the top management commitment is ensured.

The ability to make decision qualitatively and effectively is considered critical at all levels of Six Sigma implementation and emerged as crucial competitive method for the organization. This observation is very much applicable to all the organizations. Being in the business of highly competitive products, Electronic companies needs to be following Six Sigma with complete commitment from top management. Understandably the respondent companies are found to be highly responsive in this context. It is further interesting to note that bench marking is a latest addition to concepts of Six Sigma and also preferred by the respondents. Benchmarking is the method of identifying and adopting new ideas, new ways of improving organizational process for meeting high-level customer expectations. Incidentally the Electronic Companies also has designed and implemented the concept of Benchmarking under total quality system approach by examining its role in the product and process supply.

In the light of the results an interpretation can be drawn to understand that the Six Sigma concept, implementation and the progress are being followed and monitored meticulously and successfully. Therefore it is logical and reasonable to conclude that
the organisation's success in the market is extensively attributed to successful implementation of Six Sigma. It can also be interpreted that the responses given are reasonable, reliable and responsible as the majority of respondents fall in the experience in the category of 4 years and above. This length of service is more than sufficient for an average employee to observe and assimilate the organization and its processes. This indicates the profile of respondents as highly reliable and acceptable.

It is expected generally when the organization is enjoying benefits, implementing Six Sigma concepts in a respective department and function will also be enjoying the similar status. However in certain cases this hypothesis may prove to be wrong. This requires thorough investigation of the actual benefit received by different organisations through implementation of Six Sigma. With the responses corresponding to the above discussion, it is appreciated that the effort put in by all concerned including top management, employees, systems and planning are being directed in one trend and are integrated perfectly to achieve favourable business results through implementation of Six Sigma concepts in Electronic companies.

**Perceptions of the significance of Six Sigma**
Six Sigma has been acclaimed as the most important philosophical approach towards excellence in quality in various organizations across the globe since 1980's till today. Many of the Indian organizations have risen to the level of quality achievement since couple of decades now. It is often interesting to find out the actual practice of Six Sigma in Indian organizations that have studied models of quality excellence. In Electronic industry too, there are number of organizations that have introduced and achieved the benefits of Six Sigma over a period of time. Based on the responses, the results of the study were arrived at with the help of certain statistical techniques the logical and rationale interpretations; conclusions and suggestions are discussed.
1. Leadership Style
In any organization the style of leadership among senior management leads the organization. In the Six Sigma environment, the leadership gets different perspective. The leader is a coach and mentor with a shared purpose, vision, values and beliefs. The communication is open and vide of followers are heard. Leadership is highly dynamic and effective and promotes quality enhancement in the Six Sigma context. When the leadership effectiveness is highly significant on the performance of organization in Six Sigma environment, it indicates that the philosophy, policies and commitment of management for quality enhancement are very effective. The analysis of managers has been synergetic and significant. This synergy should be brought in the respondents so that the organization can enjoy a high level of effectiveness at the top and bottom lines of organizational hierarchy.

2. Training and Development
Training and Development activity is an investment on human resources. During the industrial age, experienced managers trained the unskilled. Supervisors and managers have to develop their knowledge by observation in most of the occasions. The Six Sigma environment places high priority on training employees at all levels in the organization. Therefore the aim of any training programme is to provide the person with the required skills, which enhances creative skills of every employee for the better performance by the organization.

The study results corresponding to this particular parameter indicates that the respondent’s perceptions have yielded high responses. In a sense it is true to believe that the ultimate result of any training effort falls on the end beneficiaries such as employees. The management respondent’s perceptions are based on their perceptual observations only and effective on the implementation training and development.
Hence, it is interpreted that the data derived are very effective and encouraging. Therefore, the organization may maintain the quality, of course, with rigorous practice of existing practice and policies for Six Sigma in Electronic industry.

3. Quality of Work life
The environment in which people work in an organization plays a vital role in affecting their efficiency and quality of work life. Quality of work life indicates the conditions in which workers or other employees work and the contribution they are able to make in terms of their physical as well as mental abilities and creative capacity towards improving the performance of the company. The concept encompasses -

(1) The working conditions
(2) The employee attitude towards job
(3) Opportunities for improvement in career, status, esteem
(4) Regular feed back to employees
(5) Convoking family days, recreation and community facilities
(6) Provide job security etc.

The organizations should necessarily believe that the worker or employee is to be looked upon as a person and an asset. Hence, he should be expected to improve human effectiveness and work performance. He is required to develop and grow with the organization. The performance of business enterprise depends finally in its ability to get people to perform.

The analysis of responses from respondents needs to be made to reach certain logical conclusions. The synergic view of respondents can be found in the statement—`Ascertain the overall experience of employees`. They are of the opinion that the practice of this statement has no significance with the implementation of Six Sigma in the company. Their opinion indicates that the practice of this statements yielded
highly positive improvement after undertaking Six Sigma activity in the organization. But for the other statements there are mixed and varying responses. Comparing the overall weighed scores of all the statements put together there has been a positive improvement in respondent categories. In conclusion we can attribute that respondents are common in their views on the positive implementation of quality of work life in the Six Sigma environment. It is therefore suggested that the sample organization, may continue its present practice of quality of work life. It is also suggested that the company may take certain necessary steps to overcome insignificant areas as mentioned by the respondents.

4. Employee Involvements and Development

Employee involvement is one of the most important management sub-systems of Six Sigma. Employee involvement in the implementation of Six Sigma in organizations is considered primarily as suggestion plan approach. But after the advent of Six Sigma, the employee involvement is being considered to be within and between all levels and functions and further considered to be a way of life, with ongoing education and multiple skill training. The employee involvement and development concept is also called Total Employee Involvement and it encompasses several aspects such as -

(1) Empowerment
(2) Quality Circles
(3) Suggestion Schemes
(4) Rewards
(5) Education.

The overall perceptions of the respondents indicate that the parameter “Employee Involvement and development scheme” is significantly being practiced in the Six Sigma environment. Thus, the electronic companies should be reaping in the benefits

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of Six Sigma richly as the employees at all levels are being involved totally with commitment in the organization’s processes.

5. Social Responsibility
The social responsibility includes several ethical and value responsibilities towards suppliers, customers and other stakeholders. The concept of social responsibility refers to two types of business obligations for organizations. They are -

(1) The Socio-economic obligations;
(2) The socio-human obligations.

The concept encompasses employees towards whom the organization has a special responsibility. The organization’s responsibility towards employees includes several issues such as fair wages, proper selection, training and promotion without discrimination of any nature, healthy working conditions and security measures, freedom, self-respect and self-realisation among employees. The above analysis indicates the true culture and organizational practices in highly professional corporate companies in Electronic industry. Hence, it can be concluded that all the corporate and professional business organizations have imbibed in their culture the responsibility towards the society they live in, including employees. The respondent company’s profile has been on the same lines as a part of Electronic companies.

Slightly contradicting results were observed in the responses given by the respondents for the same statements. Considering the mutually conflicting views it is suggested that the management may need to educate the employees more than earlier to make them further more aware of and appreciate the relevance and role of corporate social responsibility as a parameter to find the effectiveness of Six Sigma implementation in Electronic industry.
6. Information and Communication
Communication is inextricably linked in the quality process. When top management’s vision of quality gets filtered down, the vision and the plans can be lost with both clarity and momentum. Thus, top management and other managers at all levels serve as translators and executors of organisation’s directive. Therefore, the ability to communicate is a valuable skill at all levels, from front-line supervisor to Chief Executive Officer.

The study results on the practice of parameter ‘Information and Communication’ indicate that the practice of activity statements mentioned in the corresponding tables have been significant between 95 to 99 percent effectiveness with implementation of Six Sigma. Hence, it is understood that though there are variations in the views responses, the overall result of the study indicates that there is significance of Information and Communication. Hence, the Electronic Company may be considered effectively practicing communication activity as a part of Six Sigma practice. The company has been regarding an excellently maintaining effective communication network among all cadres. This reduces majority of the problems related to sharing of information and communication.

7. Resource Management
The organizations generally have to allocate various resources available with them for implementation of any programme or activity. The resources thus required may range from financial to non-financial and material to non-material. These resources may further be classified into internal and external environmental resources. Whatever the classification may be, certain amount of resources of all types should be deployed depending on their requirement to manage the activities and programmes of organisation. In the Six Sigma environment the availability and allocation of
resources plays a vital role in improving quality in the process. The resources should basically of high quality and may be procured at an affordable price. The need of Six Sigma with regard to resource utilization has been a matter of concern for management. There is a clear indication to place on record that in the opinion of management respondents all the activity statements under resource management enjoyed 100% effectiveness as a component of Six Sigma. This healthy practice will have positive impact on the other activities such as optimal usage of resources, reduced cost of resources etc that would lead to higher profits and growth to achieve competitive advantage for the organization in reference.

It is true to believe that the ultimate result of any resource management effort falls on the result areas such as cost reduction, error proofing (*Pokayoke*), perfect allocation of resources available with the organization. The financial results as indicators of this phenomenon also suggest that the organization in reference is able to muster its resources properly in the Six Sigma environment.

8. Strategic Planning for Quality
Most of the successful companies will attribute their progress to a quality-based strategy that was developed through a formal structured approach to planning. The pervasive role that quality plays in strategic planning can best be understood by examining the components of strategy such as mission, product or market scope, competitive edge, supporting policies, objectives and organization culture. Therefore, the Strategic Quality Planning constitutes a number of activities that may be concentrated upon by the organizations. For example vision, policies, goals, etc., are the basic components that strategy succeeds.
The responses signify that all the activity statements mentioned under the respective table indicate that the companies, recognises the wide scope and role of Strategic Quality Planning is being practiced more significantly with the introduction of Six Sigma. This signifies a good trend towards effective practice of Six Sigma in the respondent organization. Hence, it is suggested that the company may continue to maintain status quo in the practice of Strategic Quality Planning as a parameter of Six Sigma. It is further suggested that the company may go on adding few more activity statements so as to increase the effectiveness of parameter in future.

9. Quality Assurance
Quality assurance concentrates on preventing defects to achieve zero defects or defect free work most of the times in organizations. The quality assurance encompasses several issues such as -

(1) New product development methods;
(2) Process design and improvement;
(3) Process capability;
(4) Measurement and inspection;
(5) Quality assessment and audit; etc.

It is a management system designed to give the maximum confidence that a given acceptable level of quality is being achieved consistently with minimum total expenditure. Quality assurance usually requires a continuing assessment of factors that affect the adequacy of a design or specifications for the intended applications. Quality assurance is, therefore, a management tool in an organization and it enhances effectiveness of Six Sigma practice. By the nature of statement it may be interpreted that managers have more knowledge than the employees in the subject of quality assurance and therefore, could respond better than employees. It is suggested that the Electronic Company may put more efforts in educating its employees through training.
and development programmes. This will enable employees to understand and respond better on the activity of succeeding in supporting and completing quality activities and seem to be getting better at it.


Process management is the coordination and implementation of measured, streamlined, and controlled processes to continually improve organizations. This managerial function is often cross functional as many functions at this stage cross their own departmental boundaries. Hence, requires departmental collaboration with process and indicator functions appropriately allocated. The rationale behind process management is to ensure that the organization has business process performs various activities such as eliminate errors, minimize delays, maximize use of assets, promote understanding etc. There are five phases of improving total quality process management, mentioned earlier. Therefore, the activities included under the parameter called 'Process Management' may be referred as Business Process Management for organizational performance improvement. Hence, it is highly significant to ascertain the practice of process management as a parameter to decide the relative performance effectiveness of Six Sigma in any organization.

The trend in the responses is in the high range and this indicates that the parameter process management is being well received and implemented at the grass root level. The observation also throws light on the practical impact of the concept over its formulation and designing. There is no condition that the management respondents should be more effective in understanding concepts and their implementation now a day. In fact the organization should feel proud of its operating personnel for having highly positive view on the concept and its practice in the context of Six Sigma.
11. 5-S Concept and Workplace Management

To have a systematic approach to Six Sigma, it is necessary to develop a conceptual model. Model is a sequence of steps arranged logically to guide the implementation of a process in order to achieve the ultimate quality goal. Among the step-by-step models, Japanese 5-S practice is the first one. This is a part of Six Sigma model for managing quality in organizations. The observation of responses calls for immediate attention by the management on the people’s attitude towards rules and instructions. There could be several reasons for successful implementation and practice of Six Sigma in Electronic Company. Though the people are not following rules, it may be noticed here that the people in the company are given free hand to do their job with self-imposed rules that contribute to the company’s success.

However, the organization may concentrate to achieve further more positive results in Six Sigma implementation by motivating people to follow rules and instructions desired by the organization. The analysis suggest that the categories of respondents gave their positive voice for management in implementing 5-S concept for overall quality improvement in Electronic companies. As the organization enjoys recognition from its managers and employees for its efforts towards quality performance, the management may think of innovating new methods and concepts in quality management and thus become pioneer in the Six Sigma practice to stand as role model to other organizations in Electronic industry and else where to emulate it.

12. Customer Orientation

This examines the Company’s relationships with customers, its knowledge of customer requirements and the key quality factors that drive market place competitiveness. It also examines the company’s methods to determine customer satisfaction, the current trends, and level of customer satisfaction, retention and their
results relative to those of competitors. In other words customer satisfaction is the successful fulfilment of customers expectations over time, which provides strategic direction, organizational identity, and prioritised objects for the total quality firm. Sustaining customer satisfaction and producing associate delight increases market share and ultimately profitability provides directional stability for organizations during turbulent times. Considering the general profile of sample respondents in the organization, the results of survey are proved to be correct. The respondents are expected to have sufficient and wide knowledge on the customers and their expectations from the organization. Hence, they may know the specific practice of activities to orient and retain their customers. The results also indicate that the managers in the respondent company have highly positive view on the practice of customer orientation as a parameter to understand the effectiveness of Six Sigma implementation. The overall weighted averages also indicate significance in the practice of customer orientation activity under Six Sigma environments. It is interesting to observe similar trend in the responses by the sample respondents. Presumably the organization concentrates heavily on the satisfaction of customers and the rest is only secondary. It is also given to understand that unless the systems and processes are tuned towards customer orientation, it is difficult for any organization to reach to its customers successfully.

13. Business Performance Practice

Business performance management is the implementation and control of business activities in line with total quality strategies, processes, and projects. The business performance is indicated in the daily implementation of continuous business improvement in the tasks and relational activities within an organization’s own scope of responsibility. The rewards of higher quality business performance are positive,
substantial, and pervasive. The business performance can also be viewed in two different perspectives such as service quality and product quality. It is absolutely true to ascertain from the study results the relevance of statements in the context of high technology electronic industry. Therefore, it is concluded that the respondent organization has been the front-runner in terms of its performance both within and outside the organization. As a part of most popular and respected business house in India, the organization has been running on high professional principles, practices, ethics etc. This in turn enhances the pride, belongingness, and sense of satisfaction and identification among employees, customers and suppliers.

Through this study, it was found that Electronic companies are not afraid to place their resources (money, time and employees) into Six Sigma. Regardless of size, many companies are embracing quality improvements that ultimately result in increased profitability. However, Electronic companies at times may be limited in their resources as compared to large companies. For example, GE devotes full-time positions to lead teams on quality management. Smaller companies typically, do not have the financial or staffing resources to support Six Sigma initiatives full-time. Therefore they often rely on mid-level management leading projects.

6.2 FINATE SUGGESTIONS
Six Sigma projects have specific objectives and are set to achieve the results within the allotted time limits. While doing so they also focus on overall improvement in a specific domain. The objective could be as specific as reducing the defects in a manufacturing process or as broad improving customer satisfaction through surrogate objectives. When an organization takes up Six Sigma projects regularly, people within the organization tend to become much focused and quality conscious. In the organization which was deeply studied as part of this research, the challenge was to
sustain the spirit of Six Sigma and finally to spread the Six Sigma culture across the whole organization. Sensing the possibility of people becoming monetary and non-monetary incentives to encourage the employees to participate in Six Sigma projects.

As a first initiative the companies arranged Six Sigma training (Green Belt, Black Belt, Master Black Belt and Champions) for all their employees in batches. Traditionally, organizations compare current performance with past and not with what might have been or what is yet to be. Six Sigma tears down the structures that protect existing systems. The breakthrough strategy gives organizations a road map to business situations. In the decide phase, the organization will need to create new information. This information can come from a number of reviews or assessment it can make. The more new information an organization has, the better it’s planning for change. There are a number of areas that should be reviewed, like -

- Customers – Conduct a customer loyalty assessment to determine what they like or dislike about the products and service.
- Culture – Identify the areas of strength and uncover possible problems in the organizations performance.
- Key business processes – Understand the key business processes and how they will be impacted by the changes.
- Business case for change – Conduct a cost analysis or poor performance process to determine the financial impact of these costs on the bottom line. Conduct a world-class business system review of all of the business units to understand the level of improvements needed in each unit.

Project selection and infrastructure focused on customer, business strategies and priority acts as a driving potential in obtaining explosive results in all business streams. High performance factor obtained by four prominent constituents of Six Sigma initiatives leads to improved products and services, better reward system and improved markets and customers. Success factors counts in selecting projects,
identifying sponsors, ensure commitment, team management and technical infrastructure. Six Sigma emphasized on high impact solution, setting a strong rationale for improving performance, restricting the organization, redesign process and integrating information systems. The models proposed by pioneers in the field of quality were studied and on similar lines a new model has been proposed.

**Model-1: Juran’s Model of Quality**

According to Joseph Juran, people can’t change unless they are made aware of their current reality. Awareness of this reality comes through accumulation of unquestionable evidence known as data. New measurements create new data, and new data (when properly analyzed and interpreted) lead to new knowledge. In turn new knowledge leads to new beliefs and new values. New values when cultivated through success and properly reinforced create passion and passion is the root of profound change. Six Sigma has become an imperative tool in satisfying the genuine customer needs and business objectives.

The road map of change includes five phases. Each phase is independent of each other. Each organization reacts differently to changes taking place. This can lead one business unit in an organization remaining in one phase longer than other business unit. These phases once again are managerial guides to change. The five phases of road map are shown in **fig. 6.1**. It begins with decide phase with someone on the executive team deciding something must be done or the organization will not meet the share holder expectations and plan. It ends with a clear plan for change. Project selection requires some know-how on the part of management to identify the projects and the team clearly understands both the problem and the mission. In the ideal, all members of an organization engaged in six Sigma efforts will receive at least minimal training or orientation and subsequently be awarded with appropriate belt.
Fig: 6.1

JURAN’S MODEL OF QUALITY

Sustain

Expand

Launch

Prepare

Decide

Integrate, Audit, Measure, Assess, Review, Inspect, Focus

Expand Training Across the organisation
Transition training from Juran to Client

Initial training
Pilot Projects

Un front planning
Establish
Infrastructure
Executive council

Yes to Development

Organization / Partner

Source: Strategies for World Class Quality, Juran J. M, Quality progress, 1991
The organization will need to create new information and a number of reviews or assessment it can make. The more new information an organization has the better it’s planning for change will be. There are a number of areas that should be reviewed. For the customers, conduct a loyalty assessment to determine what they like or dislike about the products and service.

- For the culture, identify the areas of strength and uncover possible problems in the organizations performance.
- For the key business process, understand how they will be impacted by the changes.

For the business change, conduct a cost analysis of poor performance process to determine the financial impact of these costs on the bottom line. Conduct a world-class business quality system review of all the business units to understand the level of improvements needed in each unit. The road map to success demands the following success factors:

1. Breakthrough in current performance solves quality problems namely excessive number of defects, delays, long time cycles and costs.
2. Internal experts (Six Sigma Black belts) become drivers who propel their company to best in class.
3. Focusing improvements on the customer first will enable cost reduction & delighted customers, which will enable breakthrough bottom line results.
4. Extensive training in tools and techniques for all employees assures learning has taken place and they can use the tools learned.
5. Significant increase in customer satisfaction only happens when the process and services that influence them are improved.
6. Systematic applications and deployment through proven methodologies like DMAIC and DFSS are necessary to create a common language.
7. Leadership and commitment of the executive team, which controls resources and the culture.
8. Consequently the organization becomes unified behind the Six Sigma effort and resistance is minimized.
Model-2: Peter Pande and Neuman Model of Quality

According to Pande, the road map is the path of Six Sigma improvement based on organizations specific needs and goals. Five important steps towards achieving road map to excellence are shown in fig. 6.2.

Step 1. Identify Core Processes and Key Customers - As business becomes even more dispersed and global customer segments more narrow and products and services more diverged, it gets tougher. The main activities are –
- Identify the major core processes
- Identify process output and key customers
- Create high level core process maps

Step 2. Define Customer Requirements - Getting good customer input on Company’s needs and requirements is the most challenging. The main activities are –
- Gather customer data and develop voice of the customer strategy
- Develop performance standards and requirement statements
- Analyze and prioritize requirements and evaluate per business strategy

Step 3. Measure Current Performance - Defines what customer wants and how likely to do so in future. Performance measures focused on the customer serve as the starting point for establishing more effective measurement system. Its main activities are –
- Plan and execute measures of performance against customer requirements
- Develop base line defect measures and identify improvements

Step 4. Prioritize, Analyze and Implement improvements - A key to success, the Six Sigma is to choose the improvement priorities carefully and not to overload the organizations with more activities than it can handle. The main activities are –
- Analyze, develop and implement root cause focused solutions
- Design / redesign and implement effective new work process

Step 5. Expand and integrate Six Sigma systems - To initiate ongoing business practices that drive improved performance and ensure constant measurement reexamination and renewal of product, services, processes and procedures.
Fig: 6.2
PETER PANDE AND NEUMAN MODEL OF ROAD MAP TO QUALITY

Identify Core Business
Define Process
Create high Level Core

Identity Core Processes & key Customers

Gather Customer Data
Develop performance Standards
Analysis & prioritize Requirements

Define Customer Requirements

Plan & Execute Measures
Develop Base line Defect Measures

Measure current Performance

Prioritize Analyze & Implement Improvements

Select improvement Projects
Develop & Implement Root Cause
Implement Effective work process

Expand & Integrate The Six Sigma System

Define Responsibility for Process
Execute Close loop management

Drive to Six Sigma Excellence

Source: Quality Control - Peter Pande and Neuman, Quality progress, 2001
The main activities are –

- Implement ongoing measure and actions to sustain improvements
- Define responsibility for process ownership and management
- Execute close-up management and drive to Six Sigma

The advantages of this road map are:

1. A clear understanding of the business as an interconnected system of processes and customers.
2. Better decisions and uses of resources to get the greatest possible amount of benefit out of Six Sigma improvements.
3. Shorter improvement cycle time.
5. A stronger infrastructure to support change and sustain results.

Model-3: Mikel Harry’s Model of Quality

According the Mikel Harry, Six Sigma breakthrough strategy is a disciplined method of using extremely rigorous data gathering and statistical analysis to pinpoint sources of errors and the way of eliminating them. Six Sigma rely on performance metric coupled with statistical analysis. Quality improvement project using Six Sigma are chosen as a result of customer feedback and potential cost saving. Improvement that has the largest customer impact and revenues are given the highest priority. Six Sigma adds value for the customer and the company. The breakthrough strategy methodology uses specific tools to reduce operating costs, improve capacity, improve margins, shorten the length of time it takes it takes to bring a new product to market and reduce inventory. The breakthrough strategy applies to defect removal, to redefine the system, removing critical defect and refining the entire system for greater profitability. Six Sigma is a problem-solving venture. Every project has a process or design problem in search of a solution. The breakthrough strategy directs people’s energies to find solution and improving bottom lines.
<table>
<thead>
<tr>
<th>Stage</th>
<th>Breakthrough strategy phase</th>
<th>Objective</th>
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<tr>
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<td>Recognize</td>
<td>Identify key business issue</td>
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<td>Characterization</td>
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<tr>
<td>Institutionalization</td>
<td>Standardize</td>
<td>Transform day-to-day business</td>
</tr>
<tr>
<td></td>
<td>Integrate</td>
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</table>

Source: Statistical Quality Control - Mikel Harry, Quality progress, 2003
The breakthrough strategy takes executives through the network of business, technology, manufacturing, quality, production and delivery system issue. There are eight fundamental steps or stages involved in applying the breakthrough strategy to achieve Six Sigma qualities. They are shown in table 6.1. Project selection requires some know-how on the part of management to identify the projects and the team clearly understands both the problem and the mission. In the ideal, all members of the organization engaged in Six Sigma effort will receive at least minimal training or orientation and subsequently be awarded with appropriate belt. In this way, everyone understands the Six Sigma effort; no one feels left out or in the dark. Consequently the organization becomes unified behind Six Sigma effort and resistance is minimized.

The measure phase includes a review of the types of measurement system and their key features. Companies must understand the nature and properties of the data collection and reporting. Companies must study the frequency with which defects occur and the process capability that governs the creation of defect. In the analyze phase, the breakthrough strategy offers specific statistical method and tools to isolate key pieces of information that are critical to explaining the number of defective products. Practical business problems are turned into statistical problem. In the improve phase, the breakthrough strategy focuses on discovering the key variables that cause the problem. The improve phase compasses the process known as Design For Six Sigma (DFSS), the process that creates the product or service are designed from the beginning or reconfigured in such a way that they produce Six Sigma quality goods and services. Finally in the control phase, the breakthrough strategy ensures that the problems don’t reoccur by continually monitoring the processes that creates the product or service.
Ultimate Six Sigma

The ultimate Six Sigma process has several reach-out objectives:

1. To develop a comprehensive infrastructure that goes well beyond the narrow confines of Quality to encompass all areas of business excellence.
2. To maximize all stakeholder loyalty, customer loyalty, employee loyalty, supplier loyalty, distributor/dealer loyalty and investor loyalty.
3. To maximize business results, return on investment, asset turns, inventory turns, and sales/value added per employee.
4. To minimize people turnover and bring joy to the workplace, especially to the line worker.
5. To go beyond modest and mediocre quality standards/systems to device an ideal yet practical quality system.
6. To go beyond the tired problem solving tools of the twentieth century to forge powerful new tools for the twenty-first century.
7. To go beyond the propaganda and results with mirrors of the hyped Six Sigma consulting companies.
8. To use in an ultimate Six Sigma to reduce implementation costs and high business results.
9. To provide keys to critical success factors in each of the factors.

Success Factors on deploying the road map for Six Sigma Excellence

The road map to success demands the following factors:

1. Internal experts become drivers who propel their company to best in class.
2. Extensive training in tools and techniques for all employees assures learning that has taken place and they can use the tools learned.
3. Systematic applications and deployment through proven methodologies like the DMAIC and DFSS are necessary to create a common language.
4. Focusing improvements on the customer first will enable cost reduction and delighted customers, which will enable breakthrough bottom-line results.
5. Significant increase in customer satisfaction only happens when the process and services that influence them are improved.
6. Leadership and commitment of the executive team, which controls resources.
7. Breakthrough in current performance solves quality problems namely, excessive number of defects, delays, long time cycles and excessive costs.
BUSINESS EXCELLENCE THROUGH ULTIMATE SIX SIGMA

Source: Universal approach to Quality, Juran J M, Executive excellence, 1989
Model of Six Sigma Excellence
The above observations made the researcher to think beyond the routine Six Sigma project and to conceptualize achieving excellence through Six Sigma methodology. It is proposed to develop a model of Six Sigma Excellence, so as to sustain the spirit of Six Sigma and move beyond the projects. The present study has resulted in the development of a more suitable model as mentioned in fig. 6.4. Six Sigma projects are regularly taken up to develop solutions either for specific problems or recurring problems as was observed during the present research. The spirit of Six Sigma doesn’t stop at finding a solution to a particular problem, but goes beyond. This is where the organizations would be looking at both to sustain the spirit of Six Sigma and also to further improve from there. In this context, a model is developed and it is observed that success factor depends on selecting the right kind of projects, ensuring commitment, team management & providing technical infrastructure.

Proper project selection, infrastructure focused on customer, business strategies and critical priorities act as a potential in ensuring desirable results in almost all business systems. The different modules discovered in setting an excellence benefit in creating a channel for communication, accurate performance measures and skills for pragmatic innovation. On the whole, the block diagram clearly gives a unique idea for understanding the techniques of Six Sigma initiatives to obtain high performance. Six Sigma employs an innovative and structured approach for problem solving which have the potential of having significant impact on the business with improvements in productivity, challenge employees to pool, develop and implement the ideas to be harvested. The ultimate goal is to achieve excellence through Six Sigma.
Fig: 6.4
MODEL OF SIX SIGMA EXCELLENCE

<table>
<thead>
<tr>
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<th>Organisational Culture &amp; Values</th>
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<td>Management involvement &amp; commitment</td>
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<td>Strategy coupled with right people</td>
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<td>Project orientation with clear &amp; well defined goals</td>
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<tr>
<td>Striving for better quality, not just meeting minimum standards</td>
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<tr>
<td>Pragmatic Innovations</td>
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</tbody>
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High performance
- Improved products & services
- Improved technologies & facilities
- Better Performance system

Leads to
Better rewards
- Improved communication
- Improved skills

Excellence through Six Sigma
1. Six Sigma Initiatives
The prominent Six Sigma initiatives which are a part of Six Sigma Excellence are -
   a. Management Involvement and Commitment
   b. Strategy coupled with right people
   c. Project orientation with clear and well defined goals
   d. Striving for better quality
   e. Pragmatic innovations

Management involvement and Commitment is the integral part of organization’s strategy. Change is accelerated by the most creative ideas of top people in the organization, which empowers and motives employees and is driven by customer needs. Transformational impact is to envision and implement large-scale change that generates dramatically better performance levels. Principles for better change lead to change driven by global competition and technology innovations to set goals and establish milestones. High impact solution improves the work processes in accessing to the right information and tools make decisions measure performance in new ways and reward for higher performance.

2. Direct Benefits
The five integrated Six Sigma initiatives leads to direct benefits which acts as a strong force in shaping organizational cultural values of an organization. Some of the benefits include –
   a. High performance
   b. Improved product and services
   c. Improved technology and facility
   d. Better performance system

High performance provides an early warning indicator of problems and the effectiveness of corrective action. It provides input to resource allocation and planning such as decreasing personnel or financial resources or changes in workload.
Better performance leads to periodic feedback to employees, customers, stakeholders and the general public about the quality, quantity and cost. Improved technologies and facilities leads to changing role in the globalize economy and have undertaken interesting initiatives, boosts to both quality and quantity.

3. Organizational and cultural values –
   a. Improved communication
   b. Better rewards and
   c. Improved skills

Improved communication provides the leadership team to communicate early and often clearly conveying the vision, strategies and benefits for all concerned. Better reward system leads to high performance because human behavior is influenced by reward system. Six Sigma employs an innovative and structured approach for problem solving which have the potential of having significant impact on the business with improvements in productivity, challenge employees to pool, develop and implement the ideas to be harvested. The ultimate goal is to achieve excellence through Six Sigma.

It needs to be observed that each parameter is not completely independent but has either direct or indirect relationship with other parameters. For example, defect reduction leads to cost reduction, which in turn will enhance performance improvement and customer satisfaction. Ultimately, the objective is customer satisfaction; the difference is in micro-level. Further the companies though decide to achieve customer satisfaction, they translate it into other understandable and quantifiable objectives in the form of defect reduction, cost reduction or time compression, etc. This makes the setting of objectives easy and establishes clear goals. Hence the models can be said to differ in terms of the micro level goals.
The proposed model has put customer satisfaction ahead of all the objectives considering the fact that it is vital for survival and growth. It needs to be observed that cycle time reduction, cost reduction & defect reduction are metrics established within the organizations, which are regularly used to track improvements & are internally investigated used to track improvements. Customer satisfaction on the other hand is more of a composite measure & not akin to easy measurement. Further, both internal & external customers have to be considered which while examining the customer satisfaction. The external customers may be looking beyond the usual regular features of products & services to assess quality that includes post-sales service, maintenance, reparability, ease of upgradation & life cycle.

Thus when one tries to improve customer satisfaction, the attempts will have to be more broad based and rigorous requiring special resources as well expertise. The proposed model by putting customer satisfaction as the number one objective has clearly indicated that customer satisfaction indeed demands stronger efforts to maintain and improve quality. Secondly, the objective automatically generates a number of next level objectives that need to be addressed.

Business success is achieved by,

- Converting micromanagement into inspirational leadership.
- Providing creative spirit of the worker.
- Increasing customer satisfaction into customer loyalty and retention.
- Enhancing shareholder value with stakeholder
6.3 FUTURE SCOPE FOR RESEARCH

Through this study it was able to gain information from companies on Six Sigma as a business strategy. Information was analyzed on five Fortune 500 companies and their success in Six Sigma deployment. From this information, the study developed a data collection instrument to pool smaller companies on their usage of Six Sigma as a business strategy and to get positive feedback from respondents. Some respondents were so interested in the study, that they asked for the survey results and reports be sent to them upon completion of the research. Many of these comments and lessons learned were used as the background for recommendations of future work.

1. The results obtained from this study conclude that the benefits of implementing Six Sigma at Electronic companies do outweigh the costs. These results were limited by the sample size. Therefore, a future study with the same scope of work and a higher sample size would potentially result in a more decisive conclusion. Future research should consider targeting specific regions in the country highly populated with large manufacturing companies in order to gain more respondents. These regions would likely to have many smaller companies close by who are suppliers to the larger companies.

2. One of the things that the research lacked was investigating those companies that had not implemented Six Sigma and why they hadn’t implemented this quality business strategy at their companies. This would be an interesting area to research in order to gain understanding on why some companies decide not to take on the implementation of Six Sigma.
3. Another recommendation for future work is to better quantify the benefits of Six Sigma at Electronic companies. This could include the request of data on annual Six Sigma savings as well as the annual revenue of each company. Annual reports from large companies could serve as comparison to financial data received from small-scale companies. Many of the smaller and larger companies needed more time in Six Sigma in order to sustain valuable results. This was seen in companies such as Motorola that deployed Six Sigma for over 26 years. The issue of evolution would be a key area to research for future work.

4. A greater emphasis on the various staffing levels in Six Sigma would be another area to research in the future. As suggested by Becky Dieter, the study could be extended to include yellow belts and champions. Yellow belts have become an important part of the Six Sigma training world. Limited information was discussed in the study concerning the importance of champions and yellow belts in Six Sigma deployment.

5. One can hypothesize that the respondents who were spending the most money on Six Sigma were the ones who agreed that Six Sigma could improve customer profitability at their company. In order to prove this hypothesis, it would be necessary to extend this research to this area. More information should also be gathered on the amount of money spent on Six Sigma at Electronic companies. It would be necessary to examine why the amount spent on Six Sigma at these companies is low. Could this be because many of the respondents' only included training costs and not salary costs in their estimates? Or was it possibly because the companies studied pursued Six Sigma part-time as opposed to the full-time pursuit by larger manufacturing companies.
6. Other types of industries should be included in the scope of the study for future work. The analysis could focus on the benefits of Six Sigma based on different industries such as service, manufacturing and even technology. There should also be an emphasis on the amount of information collected from each company. This should include gathering annual data on companies for an estimate of the learning curve associated with savings. It would be important to define the types of projects tackled by the smaller companies and the exact amount of projects each company pursuing per year. This also brought about the realization that future research could examine those companies that have not implemented Six Sigma and why they haven't moved towards this business strategy.

7. Another step of the research would be to carry out a number of semi-structured interviews with people at different levels of Six Sigma knowledge and expertise. A greater emphasis on the various staffing levels in Six Sigma would be another area to research in the future. Many of these comments and lessons learned were used as the background for recommendations of future work.

6.4 CONCLUSION OF THE STUDY
As a global hub for Electronic innovations, Indian Electronic sector has a bright prospect. Companies in this sector are progressing in the right direction to become globally competitive. Nevertheless, except for a few, many have not yet adopted advanced breakthrough quality improvement strategies like Six Sigma and other continuous process improvement techniques. Presumably, this can be one of the important reasons for not being able to gain access to the international market and contribute significantly to the Indian economy.
There is little research carried out specifically in Electronic industries to explore its journey in achieving competitiveness. The present survey makes a contribution to this area in terms of research data and analysis. The findings should not only help further research agenda but also inform Electronic industries located in developing countries like India to plan strategies on quality continuum.

For the past 20 years or so, organizations in India have begun to recognize that Six Sigma is a powerful business strategy that can be applied as the driven force for achieving operational excellence in Electronic industries. As could be seen a number of organizations have implemented the programme with some degree of success. Concluding remarks that may be drawn from the results of this research are related to various investigated issues. Most of them, such as human resources training, project selection, tools and techniques adopted, and its inherent benefits showed agreement at some extent.

Six Sigma has evolved into a disciplined, data-driven approach to process and quality improvement in many organizations today. In view of successful deployment in the manufacturing and service industries, it is logical to expect similar or even better results in Electronic industry using the Six Sigma breakthrough improvement strategy. Six Sigma for development process is rapidly emerging as the new wave of change in Six Sigma.

Quality is critical in the world economy and it is a key element of customer satisfaction and therefore the growth, if not the very existence of an organization. Quality management and improvement therefore take on a critical role in any forward thinking and successful organization. The World Wide Web search data tends to correlate to the views of business and industry people around the world. Six
Sigma is clearly the more popular and recognized of the two operating systems, but not necessarily the best. When comparing what are very successful programs, it was found there to be six major items with regard to Six Sigma, that really standout and differentiate that program from others and make it the success.

Implementing Six Sigma at a company, large or small, must be a wide initiative. All companies can save money by reducing the causes of defects in products and improving sales through greater customer satisfaction. Larger companies like GE, Motorola, Honeywell, Caterpillar and Ford have the resources to implement Six Sigma at full force. However, smaller companies must split their resources between projects and management of tools. Since Six Sigma has become a quality standard, many smaller companies are trying to decide whether or not to implement Six Sigma.

This study objectively analyzed the performance (challenges, benefits and cost) of Six Sigma programs at SME’s of Electronic companies to get a clear answer on whether the benefits of Six Sigma really outweigh the costs of Six Sigma. The motivation for this research was based in part on the improved popularity of the Six Sigma quality tool at larger companies, and the increasing pressure from many large companies to their supply base SME’s companies mandating Six Sigma deployment. Overall, the data shows that there are benefits and challenges in implementing Six Sigma at Electronic companies. The three most important requirements for successful Six Sigma deployment were found to be management support, cost of implementation and fear of cultural change. These three requirements served as challenges for all companies regardless of size.
A main difference between SME’s and large Companies is simply the size of the company. From the study it was found that SME’s have the capacity to implement successful Six Sigma programs. However, the size of the company may limit its number of projects. The short term costs for training and the length of time to complete projects may cause more of an impact to SME’s than to large companies. However, they faced similar problems in Six Sigma deployment. In the end larger companies may have had more resource to allocate to resolutions.

When analyzing the amount of money and resource spent on Six Sigma, it was found that there was little difference in the expected savings. The savings a company saw appeared to grow at least initially has gained a few years experience with Six Sigma. Also, larger companies were supporting Six Sigma initiatives on a full-time level. Many of these companies had full-time employees devoted specifically to Six Sigma. However, in order to yield this high-end savings, companies need well-trained black belts to lead projects. This is where training becomes important. Large companies like Ford reported spending millions of dollars on Six Sigma training. However, their expected savings was not as high as calculated based on Pyzdek’s model. The smaller companies reported spending thousands of dollars on Six Sigma. Although, no information was given on the amount saved by these companies, it was found that they spent less than 1% of its potential savings on Six Sigma per year.

High performance and accurate inferences are the two major aspects enumerated to focus on key business issues and critical customer opportunities. The prominent Six Sigma initiatives that help in attaining performance level are management of change, transformational impact, principles for better change and high impact solution. Success factor counts in selecting projects, identifying sponsors, ensure commitment,
team management and technical infrastructure. Change of management is the integral feature focused in organizational strategies, beneficial to prop up performance status, responsible results and measurable disparities. Customer needs are satisfied by empowering and motivating employee through better change.

The next constituent is the transformational impact, entrepreneurial challenge, tremendous change, generating better performance levels, etc. The principles for better change has the potential to focus on three invigorating features namely confronting reality, strategic contents and summon a strong mandate. Finally, Six Sigma derivatives emphasized on high impact solution, setting a strong rationale for improving performance, restricting the organization, redesign process and integrating information systems.

The benefits of Six Sigma are great. Companies reported increased profitability and employee and customer satisfaction associated with Six Sigma implementation. Based on the findings of this study, we can conclude that benefits such as trained quality professionals in statistical control, increased profitability, improved employee job satisfaction, and success in quality components are important reasons to deploy Six Sigma in electronic companies.