Six Sigma implementation, as part of TQM efforts in a large Engineering company in India

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Why the Initiative?

- The company has won prestigious Deming Prize from Union of Japanese Scientists and Engineers (JUSE) as a result of effective implementation of Total Quality Management (TQM) for about 6 years.
- Company is aiming to challenge next level JUSE award—Japan Quality Medal (JQM).
- As part of JQM initiative, company organized a diagnosis by a Japanese consultant. One area of improvement identified by Japanese consultant was “knowledge and application of scientific methods and tools” for problem solving.
- Company management team looked at best practice of other national and international organizations and found Six Sigma as best approach to meet the requirements.

Approach

- Senior team participation
  - Understanding Six Sigma
  - Visit of top leadership team to a Multi-Nation company which had successfully implemented six sigma
- Leadership Jumpstart Session
  - Identification of the key performance drivers for the company to excel in the business.
- Champions Training
  - Finalizing wave 1 projects
  - Preparing project charters.
- Selection of six sigma Black belts and Green belts.
- Formal organization, review mechanism,
- Structured training for BB and GBs at main plant
- Project facilitation was undertaken
- More project at main plant & deployment to main as well as satellite plants plants in wave 2 & 3

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Scope of Work done so far

- Pre-work--understanding the company products and processes
- Leadership Jumpstart Training
- Diagnosis for Project selection
- Champions Training (2 batches)
- Green Belt Training (5 batches)
- Black Belt Training (1 batch)
- Project Facilitation and toll gate reviews
- Green Belt / Black Belt Certification

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PROJECT TARGETS

- The project targets fixed by the client organization based on the Business plan in consultation with TQMI.
- Stretch targets were decided based on
  - Where the company is?
  - Where is the competition?
  - What is customer expectations?
  - Where is the Benchmark (best in class) company?
- Project achievement varies between 70% to 115% of the target and averages about 92%.
- Successful completion of each project is validated by Quality Head and/or Finance Head.

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Leadership Jumpstart Training

- Major event and was organized for two days. Participants included the President, VPs/ General Managers of all divisions. Major objective of this exercise was to:
  - Identify critical customer requirements and critical business issues,
  - Commit to improvements, allocate resources, and sponsor project teams.
  - Select high-impact Six Sigma projects for implementation,
  - Guideline for selection of GB and BB candidates

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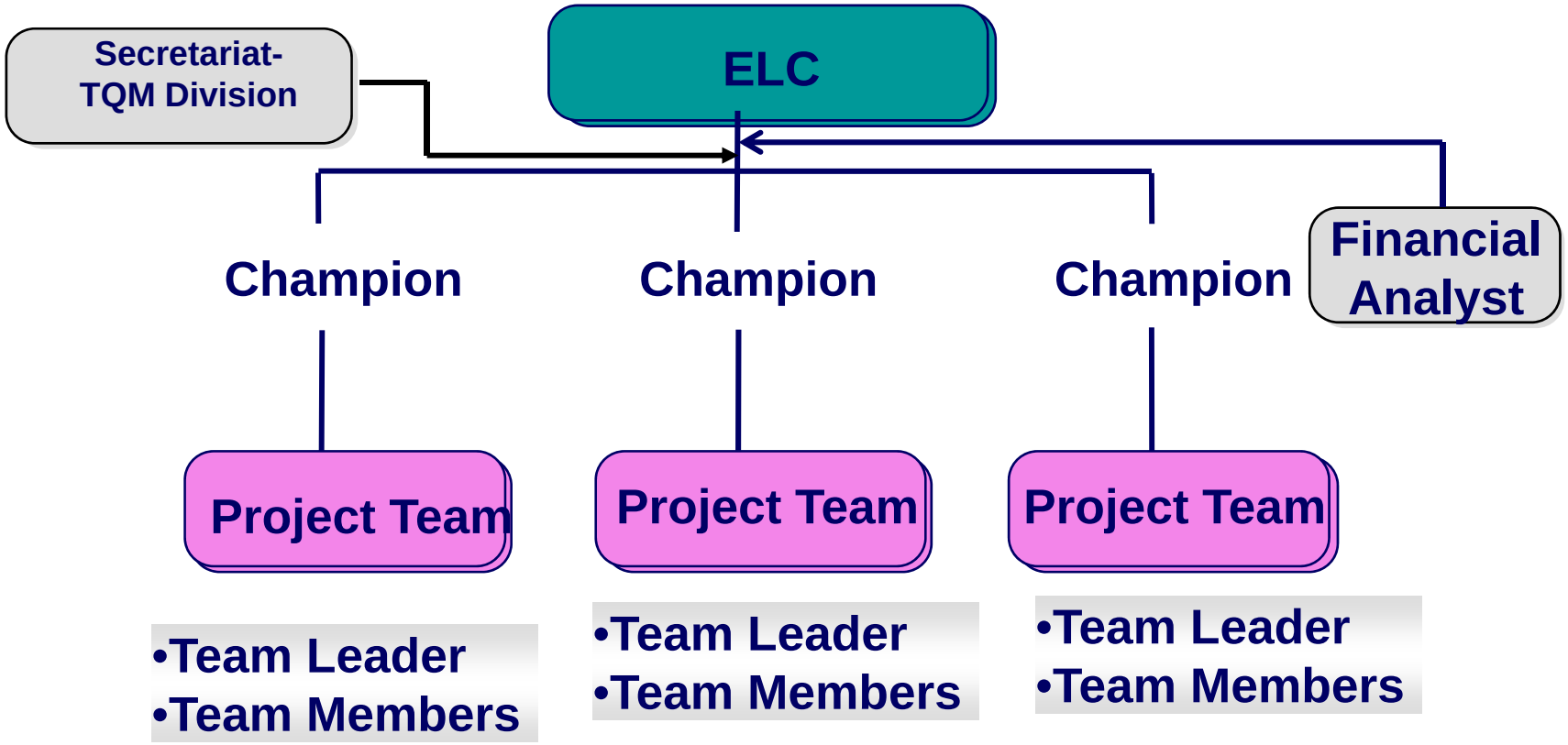
Organization Chart



ELC: Executive leadership committee headed by the President

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Leadership Jumpstart Training

- Various outputs of this workshop are enumerated below and the critical one are being shared.
  - VOC – Key Stakeholder Expectations
  - (Market) Situation Analysis
  - SWOT Analysis
- Based on above outputs, Strategic Objectives were formulated

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Key Performance Drivers and Typical Projects

- **Quality:**
  - Reduce defect rate (p.p.m.) of all parts in Engine and transmission assembly
  - Improve Hit Ratio in marketing area.
  - Reduce no. of drawing errors.
  - Improve supplier satisfaction levels.
  - Increase sales and service preparedness for launch of new product.
- **Cost:**
  - Reduce retail cycle (order to cash cycle.
  - Reduce time of value engineering projects to enable early realization of gains.
  - Improve productivity of a manufacturing cell
  - Reduce cost of canteen expenses
- **Delivery:**
  - Improve on time delivery of specific products at dealers end.
  - Reduce cycle time for spares at International market.
  - Reduce cycle time of bottleneck machining operations.
  - Reduce cycle time of new product launch
- **Safety:**
  - Reduce no. of eye injuries.
  - Reduce no. of hand injuries
- **Morale:**
  - Reduce attrition rate in R&D area.
  - Improve ESI (employee satisfaction Index) in R&D area.
  - Reduce payroll discrepancies

Data on Six Sigma Efforts

- Champions trained: 45
- Black Belts trained: 17
- Green Belt trained: 80
- BB Projects completed: 16
- GB projects completed: 45
- GB projects under process: 28

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Examples of Selected Six Sigma Improvement Projects

Quality	• Reduced total non-conformance in Engine shop (from components & assembly processes) from >10% to <1% in six months • Reduced number of drawing errors to 50% in 4 months • Supplier satisfaction process established—a first in India and satisfaction level increased by 3% points in 8 month period. • Policy Management effectiveness increased by 5% points.
Cost	• Productivity of key manufacturing cell increased by 30% and hence need to buy an alternative machine eliminated.
Delivery	• Average Cycle time for spares for international market reduced from >45 days to 25 days.
Safety	• Reduced eye and hand injuries by 50%
Morale	• Attrition rate could be reduced by 5%.

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Contd.

KEY BENEFITS

Successful implementation of Six Sigma led to :

- Tangible annualized Savings of **USD 3 millions, with an ROI of 1:15.**
- Intangible gains like:
  - Ability to solve problems
  - Defect reduction by 10X and cycle time reduction by 35% in critical processes.
  - Trained pool of 80 Green belts and 17 Black belts
  - Improvement in productivity & quality
  - Culture of systematic problem solving for chronic issues

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KEY LEARNINGS

Successful implementation of Six Sigma depends upon:

- Project selection: Direct linkage of projects and the company strategy.
- Project definition: Also sometime failure to define ‘pain statement’ clearly leads to unclear direction and hence, Failure of the project
- Selection of right candidates for Black Belts. If black belts are not analytical or are not result oriented the projects cannot be successful.

KEY LEARNINGS

- A critical to success factor is the project review by project champions. The success was better (both in terms of results and speed of project completion) where the champion took personal interest…
- It is possible for effective application of methodology and tools in any environment
- AND MOST IMPORTANT, how to integrate Six Sigma in a company working with traditional Japanese way of TQM

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FUTURE PLAN

- Identification of BIG TICKET Projects for 2007 with potential savings of USD 5 millions.
- Training of another batch of BBs.
- Integrating company initiative of Lean with Six Sigma
- Pilot application of DFSS methodology in R&D and design areas.
- Extend concept to key suppliers