The Event

What started out as a management strategy developed by Motorola, today finds widespread application in almost all sectors of the industry. But it is nowhere close to its maturity. Six Sigma as a concept continues to grow.

The ‘Lean and Six Sigma Excellence Awards’ is an effort from SCMHRD to recognize and honor those Corporate who strives to set new benchmarks in the sphere of quality and efficiency.

The selection parameters are first decided upon by a team of eminent panelists followed by the official invitations for participation to the Corporate. The projects received are then evaluated by the panelists on the previously decided parameters.

The best projects under each category are chosen and their team members are then invited to make their presentations at the regional rounds held at Bangalore, Delhi and Pune. The best projects under each category from the regional rounds will then be shortlisted and invited to make the presentations at the final round at SCMHRD, Pune, where they go through a final round of scrutiny. At the concluding day of the event, the winners are felicitated.

In our ninth year of hosting this event, we are proud to say, that the ‘Lean and Six Sigma Excellence Awards’ has accomplished new heights and has gained recognition among the Corporate to an extent where they have started considering these awards as a milestone in their six sigma journey. We promise to work at making the LSSEA, the most prestigious award in the field, in the years to come.
From the Desk of the Chancellor

Symbiosis International University

Dear All,

It gives me immense pleasure in welcoming you to the ‘Lean and Six Sigma Excellence Awards, 2013’.

Given today’s economic scenario, when organizations across all sectors are making an effort to minimize the effects of the slowdown on their day to day operations, it is Six Sigma concepts that hold special importance for one and all. Consistency in quality while minimizing waste is what will help us all in this trying period.

Six Sigma is not only about correcting errors but also about continuously innovating what seems perfect and this is what we strive to do at Symbiosis.

At Symbiosis, we aim to improve the efficiency and effectiveness of all those who are a part of the Symbiosis fraternity. Hence Six Sigma is somewhere at the root of all that we do.

Wishing you all the very best for all your future endeavours.

Best Wishes,
Dr. S.B. Mujumdar
Chancellor,
Symbiosis International University
From the Desk of the Vice Chancellor,

Symbiosis International University

Dear All,
I am pleased to welcome you all to the “Lean and Six Sigma Excellence Awards, 2013”.

SCMHRD has always worked on improving the quality of its curriculum year after year to benefit its students. This event is the manifestation of the same drive.

- I am happy to see the respect this institute as well as this current event has drawn from the Corporate.

My best wishes for all your future endeavours.

Dr. Vidya Yeravdekar
Vice Chancellor
Symbiosis International University
From the Desk of the Pro Vice Chancellor

Symbiosis International University

Dear All,

I am delighted to welcome you to ‘The Lean and Six Sigma Excellence Awards 2013’ that is hosted by SCMHRD every year.

I appreciate the efforts taken by SCMHRD, to not only felicitate Corporate who have taken Six Sigma initiatives and reaped benefits from them, but also to build a platform where everyone interested in Quality can learn a lot from the experiences of others.

We at Symbiosis believe in harnessing and disseminating knowledge to the youth today for a better quality tomorrow.

All the very best to all of you!

Best Wishes,

Dr. Rajani Gupte
Pro Vice Chancellor,
Symbiosis International University
From the Desk of the Director

Symbiosis Centre for Management & Human Resource Development

Welcome to SCMHRD ‘Lean and Six Sigma Excellence Awards, 2013’.

In today’s crisis struck world, very few think in terms of growth. One needs to consistently improve quality while aggressively reducing cost. Lean and six sigma methodologies empower organizations to achieve these goals even in adverse economic situations. The sooner we realize this, the better.

We strongly believe that Six Sigma is not just a methodology, but a way of life.

The organizations are yet to mature in this concept.

We, as an institute, wish to act as a catalyst in bringing about this awareness by felicitating those who have reaped the benefits of using six sigma methodologies.

We, at SCMHRD, constantly strive for perfection in every endeavour that we undertake. We thank the corporate for enabling us in grooming our students in this regard and also for making this event a well branded one in an international context.

Best Wishes,
Pratima Sheorey,
Director,
SCMHRD.
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DMAIC - MANUFACTURING

KENNAMETAL INDIA LTD

VSM of Assembly process to reduce lead time of Special Vertical Turn-Mill Centre, Model - VM850

Introduction:
Kennametal India is an Rs 5000 Mio turnover MNC based in Bangalore. We are part of $ 2.0 billion Kennametal Inc. Company, with headquarters in Latrobe, North America. Kennametal India is in the field of manufacturing tungsten carbide products for metal working and metal forming applications.

Kennametal India was formerly known as Widia India Ltd, which was established in the year 1967, in technical collaboration with Krupp Widia, Germany. In the year 2002 Kennametal Inc. took over Widia and since then we are part of Kennametal Inc.

Kennametal India has different production units within the same campus manufacturing various types of cutting & machine tools. The plant, Machining Solutions Group, where this project was undertaken manufactures Special Machines, Tool and Cutter Grinder machines, Fixtures and Special Vertical Turning and Turn Mill centers for the global requirement. This plant was setup with a view to manufacture & supply Special Machines primarily for Auto industries. Special Turning machines address a broader range of customers. To name a few Pump Industry, Motor industry, Tyre Industry, Heavy duty crane etc.

Project Summary:
The project was undertaken to meet the market requirement of supplying the machine in 5 months. During the start of the project, the Delivery period was about 7 months. Recently concluded Conjoint Analysis indicated a strong influence of lead time on buying decisions. Our team in MSG took up the project of Lead time reduction through the DMAIC approach. A team of seven persons was identified for this purpose.

Benefits:
- **Impact on customer**
  - Trials team, the next process step, is getting adequate time for proving out the customers components.
  - On time delivery.
- **Impact on quality of employees’ work life**
  - Standardized and simplified work process have reduced the special skill requirement
Minimized inspection, rework almost eliminated – reduced non value added activities > better motivated.
KENNAMETAL INDIA LTD

“Grinding cycle time reduction of Endmills (Anca Cell)”

Introduction:
Kennametal India is an Rs 5000 Mio turnover MNC based in Bangalore. We are part of $ 2.7 billion Kennametal Inc. Company with headquarters in Latrobe, North America. Kennametal India is in the field of manufacturing tungsten carbide products for metal working and metal forming applications.

Kennametal India was formerly known as Widia India Ltd, which was established in the year 1967, in technical collaboration with Krupp Widia, Germany. In the year 2002 Kennametal Inc. took over Widia and since then we are part of Kennametal Inc.

Kennametal India has different production units within the same campus manufacturing various types of cutting & machine tools. The plant, Product Unit 7, where this project was undertaken manufactures solid carbide end mills for the global requirement. This plant was setup with a view to manufacture & supply standard general purpose end mills. The plant has a facility to manufacture and supply solid carbide end mills of Ø1.0mm to Ø25.00mm. More than 90% of the products manufactured in this plant are exported to North / South Americas, EMEA and Asia Pac.

Project Summary:
The project was undertaken to mitigate the increase in raw material cost, an increase of 13% and also customer’s unwillingness for any pricerise. The recession of 2008 was a back drop wherein we had issues of excess capacity created on a temporary basis. Hence investment was not an option.

At the site level it was thought of to run projects across all production units in Kennametal India. When the project was identified following were seen as areas that could result in improved performance to propel the ability of the organization to meet the varied meet customer demand and reduce the impact of manufacturing variances.

1. Value Stream Mapping to understand the alignment of different plant to meet the customer demand.
2. SMED. To have standardized process for setup and approval
3. Standard Ops
4. Cycle time Optimization and
5. Visual Factory

Though different teams were formed to take projects on the above mentioned areas, the team in Product Unit 7 took up the project of grinding cycle optimization through the DMAIC approach. The critical factor was, any change in the process parameter would have an impact with the end customer and result of which will be known in a time frame of six to nine months. Hence it was very essential that when this project was undertaken one had to view the end in mind and have a focus that, any adverse impact on account of changed process is minimized / eliminated.

A team of six persons was identified for this purpose. Two persons from this team were given formal training on the DMAIC approach spread over a period of six months.
KENNAMETAL INDIA LTD

Establish Sintering method for big CHP products

Introduction:
Kennametal India is a Rs. 5400 mi. turn over MNC based in Bangalore and a part of $ 2.7 billion Kennametal Inc. spread over 60 + countries with head quarter in Latrobe(USA). Kennametal India is in the field of manufacturing Tungsten carbide products for Metal working applications and Metal forming applications. Kennametal also manufactures Machining solutions group products.

In Kennametal India one of the plants produces sintered wear parts with annual turnover of over Rs. 65 crore. This plant uses typical powder metallurgy process for the production of wear parts. Different products produced include Cold heading pellets, Wire drawing pellets, Bar and Tube drawing dies, flats, Brazed tips and other Mining products.

Typical Manufacturing Process:

![Typical Manufacturing Process Diagram]

Project Background:
In Fiscal Year 11 (Jan 2011 to July 2011), the percentage of scrap due to distortion in Big Cold Heading Pellets (CHP) was 4.5% as against 0.04% for normal size CHP. Higher Scrap rate leads to increase in internal PPM as well as increase in lead time for this product & it affects the delivery of this product to the customers. Also to compensate distortion rejection higher grinding allowances on outer diameter & height has been given to the big size product as compare to normal size CHP. Hence this project has been taken up to reduce distortion rejection & optimize grinding allowances for BIG CHP product.

Abstract
Cold heading pellet (CHP) of size 10mm to 80mm in diameter & 4mm to 140mm in height is produced in a manufacturing plant in India. Sintering condition (Sintering temp.=CHP=1350±10 Deg. C) for big size CHP (Sintering temp.=1350±10 Deg. C) is different from normal size CHP (Sintering temp.=1350±10 Deg. C) & follows different processing routes.

In Fiscal Year 12 (July 2011 to June 2012), the percentage of scrap due to distortion in BIG Cold Heading Pellets (CHP) was 4.5% as against 0.04% for normal size CHP. To reduce distortion rejection & optimize grinding allowances for BIG CHP product, a project using Six-sigma methodology is taken using DMAIC approach.

Define Phase: Identified the project using analysis of rejection data, identified the customers, CTQ’s, and defined the scope and project goal. Cross functional team members have been identified and the responsibilities have been made clear to them.
**Measure Phase:** In Measure phase, Process capability study has been performed on all the “must be” CTQ’s and MSA study has been done and found that measurement system is adequate and acceptable.

**Analyze Phase:** During analyze phase, activity flow chart has been drawn and brainstormed to list out various causes which could lead to the problem in every area and each of the causes have been validated and significant causes have been identified.

**Improve Phase:** For each of the significant cause, solutions were proposed and less risk, most feasible solution has been implemented at the appropriate manufacturing stage. Risk analysis for the identified solutions and mitigation was also done to sustain the result.

**Control Phase:** Actions were initiated to sustain the results. Preparation of Control plans, updating the work instructions, Process sheets etc. been done to sustain and results were monitored.

**Benefits:**
- Rejection due to distortion in big size CHP is eliminated & grinding allowances optimized for big CHP product.
- Sintering of big CHP product has become easy as Identification is not dependent on Technician skill.

**KENNAMETAL INDIA LTD**

**Reducing defects in WC-12wt%Co grade from 60% to less than 10%**

Kennametal India is a Rs. 5400 mi. turn over MNC based in Bangalore and a part of $ 2.7 billion Kennametal Inc. spread over 60 + countries with head quarter in Latrobe(USA). Kennametal India is in the field of manufacturing Tungsten carbide products for Metal working applications and Metal forming applications. Kennametal also manufactures Machining solutions group products. In Kennametal India one of the plants produces sintered wear parts with annual turnover of over Rs. 65 crore. This plant uses typical powder metallurgy process for the production of wear parts. Different products produced include Cold heading pellets, Wire drawing pellets, Bar and Tube drawing dies, flats, Brazed tips and other Mining products.

**Typical Manufacturing Process:**

- Press powder in Direct press/CIP
- Green Machining
- Sintering
- Grinding
- Inspection, Pack, Dispatch

**Project Background:**
In Fiscal Year 12 (July 2011 to June 2012), the percentage of Non-Conformances given for defects like Low Coercive Force, Low Hardness and Microstructure Anomalies in WC-12wt%Co was at 26%. WC-12wt%Co grade is one of the premium grade supplied to the metal forming industries.
Defects in this grade could lead to failure of the product under extreme conditions at the customer site. Also since batches were having defects, approval of these batches took a long time as it had to wait for the approval of Concession waivers and hence had an impact on the Lead time. Hence this project has been taken up to reduce such defects and ensure defect free components to the customer on time.

**Abstract:**

WC-12wt%Co is a hard metal grade with 12 weight% Cobalt binder content and fine-medium carbide grain size being used for manufacturing of metal forming and wear components by powder metallurgy route. In Fiscal year 2012, 60% of the WC-12wt%Co grade manufactured is with micro structural defects due to Abnormal Grain growth (AGG) of Tungsten Carbide (WC). To resolve this micro structural anomaly, a project using Six-sigma methodology is taken using DMAIC approach.

**Define Phase:** Identified the project using Pareto chart of defects, identified the customers, CTQ’s, and defined the scope and project goal. Cross functional team members have been identified and the responsibilities have been made clear to them.

**Measure Phase:** In Measure phase, Process capability study has been performed on all the “must be” CTQ's and MSA study has been done and found that measurement system is adequate and acceptable.

**Analyze Phase:** During analyze phase, activity flow chart has been drawn and brainstormed to list out various causes which could lead to the problem in every area and each of the causes have been validated and significant causes have been identified.

**Improve Phase:** For each of the significant cause, solutions were proposed and less risk, most feasible solution has been implemented at the appropriate manufacturing stage. Risk analysis for the identified solutions and mitigation was also done to sustain the result.

**Control Phase:** Actions were initiated to sustain the results. Preparation of Control plans, updating the work instructions, Process sheets etc. been done to sustain and results were monitored.

**Benefits:**

- Uniform microstructure has been observed due to the addition of Grain growth Inhibitor to WC-12wt%Co Grade.
- Flexibility increased and Lead time improved from 15 Days to 9 Days.
- Study on Grain growth Inhibitors has helped in Further Grade developments projects.
- Reduced power consumption due to lesser processing time of
- WC-12wt%Co batches with Grain growth Inhibitors.

**BHARAT ELECTRONICS LTD.**

**Yield Improvement in Solder Masking Operation in PCB Manufacture**

Solder Mask on Bare Copper (SMOBC) is a vital Printed Circuit Board finish required by most end users over which other finishes like HASL, ENIG, TIN, etc. are processes. This is done in
order to protect the circuitry which is not employed in component assembly and to avoid short circuiting during component assembly.

For SMOBC, a liquid photo-imageable ink is applied on the PCB surface using screen printing technology. This ink layer on the board is tack dried, selectively exposed and developed using photolithography. On the developed areas further finishing processes are carried out.

Various quality issues were faced related to Solder Mask Ink applied. Major among the rejections were due to non-uniformity and peel-off. Even customer approached the division due to failure of the solder resist during assembly operations. Since the standards allowed touch-ups, reworks were done wherever possible. Rest of the cards were rejected.

This issue was taken up and from CTQ diagram, it was understood that the main drivers to peel-off and non-uniformity were surface preparation, ink mixing and solder resist thickness. These drivers were studied and factors affecting these drivers were addressed in CNX diagram.

Modifications were brought about in
- Tin Stripping operation – process preceding solder masking operations
- Panel surface preparation – to remove stains and oxides
- Ink mixing parameters
- Screen used in screen printing technology – for Solder resist thickness
- Method of daily inspection of solder resist thickness.

Quality of Solder Mask improved and rejections were found to be reduced. Customers were also offered higher flexibility to process the PCBs in assembly and testing areas. Thickness of solder resist coating increased from 8-11 microns to 18-20 microns. The sigma level of the process improved from 3.8 to 4.5.

RELANCE INFRASTRUCTURE LTD.

Improvement of Coal Mill performance by AUTO operation.

COMPANY PROFILE

Reliance Infrastructure Limited is a fully integrated utility engaged in the generation, transmission and distribution of electricity. Dahanu TPS, a 500 MW (2 X 250 MW) coal based thermal power station is R-Infra’s single largest power generating facility. The plant was commissioned in 1995 and has been constantly upgraded to maintain its technological edge. DTPS is certified for numerous management systems like Integrated management system (IMS) for Quality ISO 9001:2008, Environment ISO 14001:2004, OHSAS BS 18001:2007, Information Security ISO 27001:2005 and Social Accountability SA 8000; being the first in the country to implement Energy Management System (ISO 50001:2011). Organization-wide SAP as a part of maintenance management system efficiently performs day-to-day asset management functions. DTPS has established a comprehensive fuel management system by blending Indian with imported coal. Plant has developed competency in measurement, monitoring, evaluation and control of various parameters related to plant performance. The plant undertook 6 Sigma initiatives, uses techniques
like 5-S, FMEA, COPQ, etc. which has resulted in considerable improvement in Key Performance indicators.

PROJECT SUMMARY
Introduction
DTPS has been operating with variety of coal since its inception. We have been pioneers in coal blending technology as far as Indian power sector is concerned. DTPS is provided with Ball and tube mills. Each Coal mill fires coal at two elevations of furnace with coal flows from both ends of the horizontal shell. Due to high volatile matter in coal and high GCV, low load operations are difficult. Coal mill changeover is very critical. The high air flow and low coal during the single end operation of coal mill and low load operations created sudden disturbances in the coal mill along with sudden increase in coal mill outlet temperature. Coal and Coal mills are two most dynamic variables of the power plant. Coal is a natural resource and as economy of power generation process is largely dependent on coal prices, stricter control must be exercised when selecting the coal. DTPS has been blending Indian coal with imported coal in the ratio of 70:30 giving GCVs ranging from 4000 to 4500 Kcal. We can’t move ahead with higher GCVs due to limitations of coal mills.

With varieties of coal it is very difficult to operated & maintain a level of coal in the mills in Auto with the traditional differential pressure measurement method. Since last 10 years coal mill differential pressure levels are not working in Auto. Lot of efforts, pains & vigilance with experience required to run mill in manual mode. Manual mode gives lot of variations in the coal mill output creating process variations.

A first of its kind, innovative strategy of using Air-Fuel ratio to control Coal flow through the Mills was developed to run Coal feeders in Auto. The concept was pilot tested and successfully implemented in all Mills at DTPS even with different coal flows and moisture.

Define Phase
In Thermal Power-plant, Coal is pulverized in a machine called as the Coal mill. At DTPS there are three 2300kW, BBD 4772-model Ball Tube mills. This design consists of a horizontal rotating cylinder containing a charge of tumbling steel balls. Better performance of the Mill can enhance the overall capacity of the plant. With varieties of coal it is very difficult to operate & maintain the coal-level in the mills in Auto with the traditional differential pressure (DP) measurement method. Since last 10 years the conventional DP level system is not working optimally thus warranting Mill operation in Manual mode; which further causes lots of variations in the output creating process variations.

If coal mill performance deteriorates then it creates problems like Poor combustion, High unburned carbon loss, Slagging and Fouling, High CO leaving furnace, Secondary Combustion, Increased spray flows. Analytical tools like, prioritization matrix, effective brainstorming were used for identification of alternative options for Coal Mill Auto operation to respond for different coal properties and Boiler load.

Measure Phase
The activities identified form VOC, prioritization matrix and affinity diagram is validated from the actual data for period of 2001-2011. Process sigma level is calculated by considering Coal Mill
operation in manual mode as a defective. Scope of the project is to improve performance of coal mill with variable coal quality by “AUTO operation “of raw coal feeders.

**Analyze Phase**

Coal mill provides the primary fuel in Coal Fired Thermal power plant. Operation of coal mill requires close monitoring of parameters by the operator and it takes lot of attention during operation of power plant. Brain storming with the process people was done & FMEA done to identify all possible causes for Y. Possible causes were grouped using affinity diagrams.

RPN greater than 25 are considered as prioritized causes. The possible root causes were validated by the past data form (IMS documents) the Digital logbooks, HMI generated reports, various MIS reports & SAP were used.

**Improve Phase**

Brain storming is done with process experts and numbers of solution were identified. Innovative and new technology solutions were discussed. Prioritization is done by using project prioritization matrix, priority rating is given on the basis of high, medium, low, criteria depends on cost, time required for implementation, ease of implementation & impact on Coal Mill operation. High score solution has first priority for implementation by considering feasibility and availability. Final Pilot testing was done in one Unit with FMEA and HIRA. The data was collected from the system and validated. The results of pilot test were compared with the old data. Dash boards were prepared and were discussed in Daily plant meeting with all HOD and apex members. New Sigma levels were calculated and compared. Detail Implementation plan with responsibility matrix prepared and approved by apex members.

**Control Phase**

Following control plan developed

1. Standard operating procedures and guidelines, Checklists were modified, approved & circulated. (Mill Auto operation, SOP of emergency handling and process upsets)
2. Monthly ORT report and Project dashboard are circulated to all HOD & apex members indicating the deviations if any and is reviewed by Head O&M daily. **First Information Report (FIR)** is raised for the deviation through SAP and to be closed by concerned dept. with corrective and preventive action with due approval of top management.

All Improvements & Control plan deployed through IMS system. Work orders & Improvement plans format available in SAP was used. DPR was prepared and got approved.

**Benefits**

1. Zero Investment
4. Operator intervention reduced, hence more time is available for maintaining other process parameters.
5. Coal mill operation optimized.
6. Good adaptability for different types of Coal Mills are subject to regular non–normal changes caused by factors such as Liner/ball wear, coal grind ability, GCV, moisture content which requires experienced operator intervention. Any changes in the above factors changes the AFR
& even a new operator can understand the changes through AFR & can vary the SP to keep the Mill stable.

**JOHN DEERE INDIA PVT. LTD.**

**Reduce Head-line Downtime**

For this project Six Sigma DMAIC Methodology has been used, where Process Improvement, statistical tools and Data Analysis tools have been used.

**Problem Definition – Overall Production Efficiency was 77% as against a target of 80% on Engine Head Machining Line.**

In the engine machine shop there is machining line for Engine Head, it was observed by the team that the overall production efficiency is 77% less than the target of 80%. When the further analysis was done, it was observed that down time of four Horizontal machining centers is more on head line. After drill down it was observed that the down time was more related to spindle & automatic tool changer.

**Goal Statement- Reduce ATC & Spindle related breakdown from 3.5% to 1.4% for horizontal Machining Centers on Head Line by August’12**

**Six Sigma DMAIC Process**

The Six Sigma DMAIC process has 5 stages – Define, Measure, Analyze, Improve and Control. In the **Define** stage, the team prepared a charter, set project goals, and approval from management. The charter was approved by a Certified Black Belt mentor.

In the **Measure** phase, data related to Horizontal Machining centers was taken from the Data Base Management system. Using Pareto chart prioritization of the frequent & major problems contributing to down-time was done. Fishbone diagram was used to find the root cause. Input output worksheet & Cause & Effect matrix was prepared to prioritize the input variables.

In the **Analyze** phase, Failure Mode Effect Analysis was done to find potential causes of failure. Measuring System Analysis was done to verify the results of newly developed Three Piece Jig for Automatic Tool Changer (ATC) alignment. Also hypothesis testing was done for a problem related to improper tool clamping.

In the **Improve** phase, to resolve the problems related to tool clamping in spindle, tool clamp-unclamp signal, tool knock-out, off-line fixture was developed. Which also was convenient to operators as the operator could do the setting outside the machine instead of confined space on machine. Also this helped to reduce Mean Time to Repair. Another Three Piece Jig for Automatic Tool Changer (ATC) alignment was developed to reduce operator dependency during ATC Alignment.
In the Control Phase, Work instruction sheets were updated and proper training was given to operators regarding new methods. Preventive & Predictive Maintenance Sheets were updated for sustenance of improvement actions.

**Project Benefits**
Reduced ATC & Spindle related downtime from 3.5% to 1.02 % for HMC on headline.

**Other Project Benefits**
- Effectiveness of machines improved.
- Reduced MTTR.
- Reduced fatigue of maintenance Technicians.
- Improved Morale due to safe working conditions
- Learning new Tools and Techniques - Technicians

**Horizontal deployment**
- Implemented Horizontally – EFF 04 HMC Machines
- Can be implemented in Transmission Factory on similar HMCs

**RELIANCE INDUSTRIES LTD.**

**PSF CP6Quality Improvement**

**Company Description:**
A 200 Acre Patalganga (PG) manufacturing unit was established in 1982 in the state of Maharashtra-India. RIL-PG is an integrated Petrochemicals unit manufacturing with following Products

- Polyester Staple Fiber [PSF] : 106 KTA
- Polyester Filament Yarn [PFY] : 232 KTA
- Linear Alkyl Benzene [LAB] : 125 KTA
- Purified Terephthalic Acid [PTA] : 270 KTA
- Paraxylene [PX] : 180 KTA

**About PSF Unit:**
Reliance is the largest producer of polyester fiber, with a capacity of 6.3 lac tones per annum. PSF PG is producing PSF with a capacity of 1.0lac tones per annum. Polyester Staple fiber is short length fiber manufactured as per customer requirement. It is blended with cotton, viscose & wool fiber to produce blended fabric. PSF PG is producing various differentiated products for various applications like
- SHT: Sewing thread
- Spunlace: Medical Application
- R3S : Construction & Paper industry
- Nonwoven: Carpet, Automobile industry
- Commodity: Suiting, Shirting, Hosiery, Dress materials, Upholstery.
Why this Project?
RELIANCE is a leader in PSF Manufacturing. To expand its leadership position in Specialty fiber manufacturing, Reliance introduced more & more specialty products in the market.

Since PSF plant in Patalganga is of smaller capacity, this feature made it most suitable for producing specialty fiber. But in the process of manufacturing new differentiated products along with spinning grade product, Overall First grade quality of PSF plant got affected.

Voice of Customer Was
Produce various differentiated products without compromising overall PSF quality Target. Increase in First Quality will increase PSF Bottom line to the tune of Rs16.0Lacs/Annum & it also increase customer delight.

Define:
Project was taken up in response to the Voice of the internal Customer. % First Quality was chosen as the Critical to Quality (CTQ) parameter. Impact of project is identified on revenue generation, delivery cycle time & reduction in customer complaint. A cross functional team was formed and the Project charter was prepared with benefits, scope, constraints CTQ & timelines. Problem and goal statement was “Increase First Quality to > 95.5 % with product mix not less than current. Project kicked off after financial validation by Finance Manager.

Measure:
Team collected baseline data and Baseline mean & standard deviation was calculated Sigma level calculated after conducting normality test & was arrived at -0.62.

Analyze:
Initially team did Pareto analysis to determine cause wise down gradation level. Series of Brainstorming session was conducted to identify potential X’s. Further Screening of X’s done using Control impact matrix. Total 21 X’s out of 42 X’s found having relationship with low quality & selected for improvement in First Quality

Improve:
Annova, system modification, SOP change and Design of Experiment tools used to optimize 8 X’s. After confirming positive result in trial, full scale implementation of all solutions carried out.

Control:
Significant improvement in First Quality observed & same confirmed using 2 sample t tests Improved Sigma level also calculated & observed Sigma level improved from -0.62 to 0.73. To sustain the improvement, a transparent control plan for all vital X’s prepared indicating control method, responsibility for each X’s. Various Control type (SOC, SOP & Visual display) recommended for different X’s.

Highlights:
This project is in control since Nov 12. Team managed to improve the First Quality without compromising product mix. CP6 Quality is continuously at >95.5% level despite of increase in Specialty product production. A savings of Rs16.8Lacs/Annum achieved & validated by Account Dept.
BEHR INDIA LTD

Sealing Frame Leak in Nissan CAC

Description: Sealing frame leak issue was the highest contributing defect for Nissan CAC in terms of Internal rejection & Scrap Cost.

Observations:
   a. Tank Warpage
   b. Sealing leg resting dimension in header at higher side
   c. Tank surface finish not ok at sealing resting area

Major Actions Initiated:
   a. Tank Warpage Correction done.
   b. Modification done in sealing resting area
   c. Tank surface correction done

Results:
   • Internal rejection due to sealing frame leak reduced from 4.46% to 0.56%.
   • Saving of Rs.7.41 Lacs/Annum.
DMAIC – SERVICES & SUPPORT

CAPGEMINI

Optimization of Cycle Time of Recruitment process in Infrastructure Services BU

Introduction:
Capgemini is one of the largest IT Consulting & Services Company with a presence in more than 40 countries and headcount of more than 40000 employees in India. Capgemini provides IT Services across the areas of Bespoke Development, Package Implementation, Consulting, Application and Infrastructure Management and other service lines across sectors like TME, Retail, Energy & Utilities, Public Sector etc. Infrastructure Services(IS) is one of the Business Units which provides remote IT infrastructure management services to worldwide customers.

The Infrastructure Management Service includes various Technology Platforms like server support in 24x7 service model using technologies like Windows, Exchange, Citrix, VMware, DBA, Linux, Messaging, HPOV & Tivoli, Unix, Linux, Backup technologies, Storage Administration, Database Administration, Sharepoint services and so on. IS Business Unit partners with the Human Resource – Recruitment function for staffing its engagements. In a strive towards constant endeavour of improving the efficiency of the Recruitment process, Capgemini integrates Six Sigma and Lean techniques to reduce the cycle time of recruitment process, especially, the time period between the Job Request is raised with recruitment till an Offer is made to the selected candidate.

Objective and Approach:

Voice of Customer (VOC) (Customer is IS Business Unit) –
- Reduce Turn Around Time for Recruitment
- Reduce Delay in billing leading to loss of revenue

Voice of Business (VOB) (Business is Recruitment Function) –
- Not able to meet the Pre-Offer target SLA of 40 days.

To establish its causes and determine the solutions/practices we have used the proven Lean and Six Sigma methodology DMAIC (Define-Measure-Analyze-Improve-Control).

Define phase:
Data on the Recruitment Cycle Time was collected for a period of Jan’12 to May’12 and the Compliance against the target SLA of 40 days was measured. Since the volume of recruitments is significant at Consultant, Sr. Consultant and Manager levels, the scope of the project was limited to these 3 levels. Goal was to achieve Pre-Offer Cycle Time SLA Compliance of 80%.
Measure Phase:
For each of three levels, IMR was plotted to understand any pattern in the data. Histogram for process capability check was completed to understand the capability of the process and check for special causes.

Analyze Phase:
Along with Recruitment and Business, we came up with VSM of current process and analyzed the NVA. Parallely, along with NVA from VSM, we also did brainstorming session to do RCA and used Fish Bone diagram to identify and record root causes. Out of all the cause list, Gemba was performed to study sample data and used Pareto to prioritize the causes.
**Improve Phase:**
Focus was to identify suitable actions based on the root causes, implement the actions and monitor the results at intermediate stages. Value stream mapping of the improved process was redrawn.

**Control Phase:**
After piloting the improvements for few months, results started showing improvement in terms of reduced cycle time and improving the compliance of target SLA of 40 days.

**Sustenance and Way-Forward:** Standard JD format and Interview panel availability roster templates were introduced for IS and were to be standardized for other Business Units. The improved Recruitment process is to be institutionalized by integrating with Quality Management System. KPIs were identified and Visual KPI Dashboard has been put in place to measure the process.

**Benefits and Value Proposition**
Benefits is in terms of arresting the loss of revenue incurred due to delay in Onboarding resources. It is expressed through Improvement in Revenue Realization – i.e. – the days by which revenue generation has been advanced. We calculated the reduction in cycle time of joiners for recruitment start date spanning from Dec’12 to March’13. Financial Benefits is calculated by multiplying the Daily Rate with Reduced Joining Cycle Time.

| Improvement in Revenue Realization from Dec’12 to Mar’13: 92.4 KEuro |
| Annualized Benefits till Dec’13: 300.2 KEuro |

**TATA CONSULTANCY SERVICES**

**Improvement of accuracy and reduction of TAT for RMS process**

**Abstract:**
TCS has partnered with a leading US based Market Research client to deliver one of its business product, Retail Measurement Service (RMS). RMS helps the business to critically measure the market share and sales growth of different brands and products across countries and markets. Different FMCG and Liquor companies make their business strategies based on this data which provides insights about the market dynamic and product performance based on Point of Sales data. It is very important to deliver defect free database/reports on time as there is a contractual obligation/penalty clause between TCS Client and its end customer who buys these data reports.

A specialized team in TCS designs the retail research method and assigns appropriate precision and maintains the data quality by doing audit of the data and looking at statistical significance of the variation in the dataset also judging the market dynamics being represented in the data appropriately. It delivers databases to client who is a global market leader Market research industry. Databases contain information about 4 dimensions that is product, fact, market and period. Global Clients like Pepsi, Coke, BAT, Unilever, P&G etc. buy this data. On Monthly basis data acquisition team collects data from shops and stores and put it in the databases. There is one separate team which validates the data and provides respective product information to reference...
data team. Reference data team will code respective product based on specification and retailer description. Measurement Science team audits and check the quality of database based on product, facts, markets and products and based on regular change request from client maintaining database and delivering databases to client based on periodicity. Thus there is a need to produce the databases error free and to be delivered to the end client meeting the end client deadline; this in turn will create an opportunity of increase in revenue by reducing penalty to Nielsen. Saudi Arabia is one of the very important country of client as it drives 37% of the total revenue generated in the Geography. However the situation was not so good as on and average 11% Quality Escape reported (Target was 3%) in Saudi Arabia, So by just delivering the projects on time will not make client delightful instead we need to increase the Quality as well. To do that we need to understand the process end to end and then identify the loopholes or gaps wherein we can reduce the manual intervention. By improving error free delivery% through this Six Sigma project.

A Six Sigma project was under-taken to identify the causes of such huge no of errors and take corrective action and help client not paying penalty to End Client. Then we decided the goal statement saying reduce the Quality Escape from 11% to 3% by 31st Jan 2013. During this project execution, another business problem was introduced as a part of the project scope. Hand Held Terminal (HHT) was introduced. First period of Hand Held Terminals (Scanner) implementation (in Aug’12 to be reported in Sep’12) showed a significant increase in market size of almost all categories for all clients subscribing data in Saudi Arabia, which end client is not ready to accept. This it was decided to re process 8weeks production work in 3weeks and deliver all Database by 31st December 2012 to avoid potential revenue loss of $850K.

A series of quality tools and methods were used to carry out this project using the DMAIC methodology. As-IS Process Map was reviewed with brainstorming in detail to identify the gaps where periodic Quality Escapes are occurring, for Time reduction initially NVA’s are identified and then again using process analysis and brainstorming other areas of improvements identified.

Corrective actions were designed and implemented. Effective implementation of the solutions helped reducing Quality Escapes from 11% to 0.07%. Project also achieved over all lead time reduction of 34%. By doing this project and implementing the solution had a financial impact saving of worth $973K USD per annum over this Year. This TCS team thus created trust for quality data delivery and achieved new business of 8 associate recently.

Project Identification:
Average Quality Escape (QE) from Nov11 to Apr12 is 11% (Client SLA is 3%). This has led to escalation by “Platinum” end client as wrong business decisions were made based on these databases. TCS client suffered heavy revenue loss (X M USD)per quality escape.

Incident report sent by Client Governance team to Client COO –

First period of Hand Held Terminals (Scanner) implementation (in Aug’12 to be reported in Sep’12) showed a significant increase in market size of almost all categories for all clients subscribing data in Saudi Arabia. The projected revenue loss is in the tune of 850K USD.

Hence there was a need to improve the quality of the delivery also save penalty of client to its end client.
Goal Statement:
- Reduction in quality escape in processed database from 11% to 3% by 31st Jan’ 13
- Reduction in Lead Time for database delivery from 21 days to 15 days by 31st Dec ‘12

Adopted Methodology:
Cross functional team comprising of Operations, SME, and process excellence was formed for brainstorming to identify the possible causes along with detailed process map. Fishbone Diagram was used to identify all possible causes for not meeting delivery deadline and by designing the SIPOC and detailed process mapping we got to know the detailed end to end process. Then we have built the VSM (Value Stream Mapping) in order to identify the value added, Non value added & operationally value added activities.

Action plan was put in place for process steps with high risks identified through statistical validations and also VSM. Quick wins through VSM are immediately implemented then for other important causes solutions are designed and implemented both new solutions and the old process was on parallel run for 4 months and finally the process switched over to new process based on the solutions. The changes were made to the existing internal processes/methodologies; standard procedures were set post sign off from SME/Client.

Solutions Deployment:
Detailed implementation plan prepared & monthly reviews with project team were conducted to ensure smooth implementation and observe the progress of the project. Implementation of the solutions was monitored closely and clear responsibilities were defined for project team members to observe the impact post implementation.

Sustenance of gains:
Control Plan was put in place clearly defining Measure, Frequency and Responsibility. Control charts were prepared to monitor the performance closely and ensure that the process stays in control.

Benefits Realized:
Tangible: Savings of USD 973000/- per annum for the client.

Intangible: Opportunity for future prospect of business expansion as client’s confidence with the TCS got stronger.

TATA CONSULTANCY SERVICES

Increasing Activity Report Accuracy% in Client Data services

Client Data Services process build and maintain databases related to Product dimensions of Consumer Goods. End client (Manufactures & Retailers) uses these databases along with the sales information (added from downstream processes) to make various decisions on sales, market share, promotions, new product release and other business related information.

At Offshore, team works with Universal Product Code (UPCs) which falls into different product categories. Each of this product categories are maintained in separate Database for each client.
Associates do analysis on the placement of new UPCs & do verification to delete or change the existing UPCs in the database and also provide observations if there is any changes. This activity will then be validated by the Onshore Subject Matters Expects (SMEs) at client end.

Any errors on the product dimension in terms of wrong placement will lead to wrong reporting there by it will affect the decision making by the End client who uses this Databases

Activity Report (AR) accuracy is a metric which measures the Effectiveness of the Placements & Suggestion made by the associates for the UPCs in the Databases, this metric is a direct indicator of the Process Effectiveness in terms of providing the right reporting in the Databases to the End client.

Improving this Metric would provide accurate Databases to End clients and also would eliminate the validation step done by Onshore.

A Six Sigma project was under-taken to identify the root causes of the errors made in ARs & accordingly take corrective actions to improve and sustain performance. Customer expectation on AR accuracy % was >98.50% while the process performance in the baseline was 94.92%. The project target was to achieve >98.50% by Jul 2012. A series of quality tools and methods were used to carry out this project using the DMAIC methodology. AS-IS Process Map was created to identify the gaps, NVA’s and other areas of improvement. All possible/potential causes were identified through cause and effect analysis, metrics prioritization matrix, FMEA which was then prioritized using the C&E Matrix. Statistical analysis was done on the shortlisted X’s where Moods Median Test, Correlation study were conducted to establish relationship between various factors contributing to errors and thereby derive the validated Xs.

Corrective actions were designed and implemented based on the identified priority level. Effective implementation of the solutions helped improve the AR accuracy from 94.92 % to 98.86%, resulting in customer satisfaction by reducing errors in the Data bases delivered and brought down the No. of Complaints reported by the End clients and also had a financial impact of USD$365,040 per annum over last year through Productivity savings.

TCS team thus created an opportunity to increase Revenue by eliminating the Validation step by the Onshore by taking End to End ownership on the Databases delivered. This enabled us to pave the way for more clients to move into End-to-End ownership

**Project Identification:**
Client Expectation is to reduce the hand offs and ensure End-to-End Owner ship on the Databases maintained by the Client Data Services team, this effectively means that the quality of the delivery should be good enough to deliver directly to the client

**Problem Statement:**
From Jan’11 to June11, the average Activity Report quality for the selected Key Account Databases is 94.92%.

**Base Measurement:**
As - Is process, inputs received from Upstream processes for adding New UPCs / modifying the Existing UPCs in the database, each new/change in UPCs are analyzed and reported in the form
of Activity Report for each Database to Onshore. Onshore team will validate the placement of the UPCs suggested and provides observations to offshore to implement the final changes in the application.

**Metric:** Incorrect or Missed suggestions are considered as Defects which will be reworked by Onsite team.

AR Accuracy % = Incorrect or Missed Observations in a report/Total no. of Observations in report.

Defect Free databases: No of Defect Free Databases / Total no. of Databases delivered.

Base lining was done for AR accuracy post collecting 6 months data on count of errors. Baseline process sigma is calculated as 3.13.

**Root Cause Diagnosis:**
Cross functional team comprising of Operations, SME, Quality and process excellence was formed for brainstorming to identify the possible causes. Fishbone Diagram & Metric Prioritization list was used to identify all possible causes for low Accuracy rate and through FMEA all potential high risks associated to the process was captured. Then Cause and effect Matrix was then used to prioritize and shortlist these X’s. Pareto analysis, Mood Median Test, Correlation studies are used to study the significance of the Xs prioritized.

**Remedial Actions:**
Action plan was put in place for process steps with high risks identified through FMEA. Brain storming was done to come up with solutions for the Xs identified. The solutions were prioritized based on the control impact matrix, where solutions were rated on high or low impact levels and ease of implementation. The changes were made to the existing internal processes/methodologies standard procedures were set post sign off from SME/Client

**Solutions Deployment:**
Implemented robust solutions in the form of Automated Tools
1. Input / Output Comparison tool, New Attribute Highlight macro
2. Analysis Frame work for Quality Assurance (AFQA tool) to standardize the analysis process
3. Load Balancing based on VSM
4. CDS wiki – (K-Y-Database / K-Y-Category) to improve business/process knowledge
5. Overall 20 solutions implemented.

Detailed implementation plan prepared & weekly reviews with project team were conducted to ensure smooth implementation and observe the progress of the project. Implementation of the solutions was monitored closely and clear responsibilities were defined for project team members to observe the impact post implementation. Process sigma level increased from 3.13 to 3.68.

**Sustenance of gains:**
Control Plan was put in place clearly defining Measure, Frequency and Responsibility. Control charts were prepared to monitor the performance closely and ensure that the process stays in control. Also periodical control verification audits defined to monitor the performance of Macros and other tools developed.
Team has already replicated 7 solutions in other similar processes as a Horizontal Deployment

**Benefits Realised:**

**Tangible**
- AR Accuracy Improvement from 94.92 to 98.86 (Reduction in Defects – 57%)
- Defect Free Databases % improvement from 28% to 56%
- Financial Benefit thru’ effort saving as a result of process Automation
  - FTE savings – 15% from Total FTE Base
  - Annual $ Savings - $365,040

**Intangible**
- Through End to End Ownership gain, TCS has potential scope for increasing the Revenue

Penalties levied by the End clients to Our Customer can be avoided by bringing down the Incidents count reported by the End clients

**TATA CONSULTANCY SERVICES E-SERVE**

**Customer Service Enhancement: Increase in FCR**

A specialized leverage team in TCS provides Call Center services for a client who is a 2nd Largest Bank in Middle East. These services are rendered to meet the requirements of the customers & employees of the client. Two Contact Center teams operate from Chennai & Middles east, Manage end to end customer / client Employees, call and email queries pertaining to Personal Banking, Loans & Credit cards and also provide resolution to customer queries. The client has initiated a special drive this year to Re-band the bank’s image with enhanced customer service experience.

TCS embarked on this project to enhance the overall customer experience which in turn would lead to a big leap to strengthen the business partnership with future Middle East Clients. Contact Center is the 2nd direct interaction channel that customers experience with the Bank after branches. First Call Resolution became the touch point to drive customer experience. FCR has been 24% which was low as per client’s expectations. By increasing the FCR % through Six Sigma Project, over all TAT for various calls has been reduced & also resulted in elimination of outbound calls, printing & scanning.

A Six Sigma project was under-taken to identify the root causes for low FCR & accordingly take corrective actions to improve and sustain performance. Project aimed at FCR of 40%, while the process performance in the baseline was 24%. The project target was to achieve 40 % by June 2010. A series of quality tools and methods were used to carry out this project using the DMAIC methodology. Value Stream Map was created to identify the gaps, NVA’s and other areas of improvement. All possible/potential causes were identified through cause and effect analysis, which was then, prioritized using the C&E Matrix. Statistical analysis was done on the shortlisted X’s where Chi-square studies were conducted to establish relationship between various factors contributing to errors and thereby derive to the validated Xs.
Corrective actions were designed and implemented based on the identified priority level. Effective implementation of the solutions helped improve the FCR from 24% to 55%, resulting in customer satisfaction by eliminating Multiple Hands off, Outbound calls, Printing & scanning resulting in the client save of $5400 & Productivity save of $50000 per annum. TCS team thus strengthened relationship with Clients by partnering with the clients in achieving their target of re-banding Banks image by enhancing customer experience.

**Project Identification:** Contact Center is the 2nd direct interaction channel that customers experience with the Bank after branches. First Call Resolution became the touch point to drive customer experience.

**Problem Statement:**
Based on the data for the period Mar’13 – Apr’13 at Contact Center, the FCR % has been at 24%. This has resulted in client dissatisfaction & also in increased costs towards outbound calls. However, the target has been set for FCR at 40 %.

All incoming calls have been across both the sites forms a part of the process scope. However, calls transferred are not part of the project scope.

**Base Measurement:**
As Is process consists of agent taking call, verifies the customer & takes the customer request. Checks for the customer requested information in the system. If available informs customer, if not checks with Team leaders or mails to TL for checking with other units. For Non FCR cases agent would request customer to call back or promises to out call the customer with the requested information. Non FCR cases have also been identified with resolution of high TAT.

FCR % is number of calls resolved during the call by total number of calls received. Base lining was done for FCR by collecting sample data over 2 months. As the data was non-normal, process sigma was calculated for Attribute/Non normal data which came to 0.8. Data was collected and analysis of the Non FCR was done on various stratification aspects:

- Call Types
- TAT
- Absence of information
- Dependency on other units
- Multiple Hands off
- Active Screen non availability

**Root Cause Diagnosis:**
Cross functional team comprising of Operations, SME, Quality Trainers and process excellence was formed for brainstorming to identify the possible causes. Fishbone Diagram was used to identify all possible causes for low FCR and all potential high risks associated to the process were captured. Cause and effect Matrix was then used to prioritize and shortlist these X’s. Chi-Square test & Value Stream Mapping was used to study the impact of potential X’s on Y (Details in the presentation)

**Remedial Actions:** Action plan was put in place for call types with Non FCR. Brainstorming was done to come up with solutions for the Xs identified. The solutions were prioritized based on the
control impact matrix, where solutions were rated on high or low impact levels and ease of implementation. The changes were made to the existing internal processes/methodologies, standard procedures were set post sign off from SME/Client, and a thorough quality check mechanism was introduced as part of the solutions along with proposed training plan for new joiners.

**Solutions Deployment:**
Detailed implementation plan prepared & weekly reviews with project team were conducted to ensure smooth implementation and observe the progress of the project. Implementation of the solutions was monitored closely and clear responsibilities were defined for project team members to observe the impact post implementation. Process sigma level increased from 0.8 to 2.16

**Sustenance of Gains:**
Control Plan was put in place clearly defining Measure, Frequency and Responsibility. Control charts were prepared to monitor the performance closely and ensure that the process stays in control.

Team has already replicated some of the solutions in for other call types.

**Benefits Realised:**
Tangible: Savings of USD 5400/- per annum for the client.

Intangible: Productivity saves of $50000 per annum

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**CAPGEMINI**

**Reduction in Turn Around Time leading to improve productivity in extended value chain**

**Smiths Group UK Ltd** are leaders in Services Engineering, Major Contracts, Preventative and Reactive Maintenance, Mechanical and Electrical Engineering.

Capgemini provides application maintenance & enhancement support to its wide range of ERP suits, majorly into SAP and Oracle.

Capgemini and Smiths agreed to handle Approx. 1800 tickets per month having approx. 370 tickets per month for SAP Application. The team was resolving approx. 380 tickets more than agreed load for SAP with the headcount of 19 team members instead of 12 as budgeted which was directly taking toll on project cost.

The head count was increased to manage the extra load and ticket flow per month, as tickets were taking high resolution Average time up to 14 days which was becoming a perennial issue. The end users of Smiths escalated the delay in Ticket resolution to Smiths top management, as it was becoming a perennial issue and in turn it was escalated by Smiths Board of director’s as a pain area to be worked upon.

**Capgemini adopted detailed approach of Lean-Six Sigma Operational Excellence methodology to reduce MTTR (Mean Time to Resolve) Smiths SAP Ticket:**
• Capgemini Team observed the performance for different priorities of tickets with the help of histogram and checked the Normality of the data. It was observed the data was non-normal and rightly skewed having Mean as 14 days and Standard deviation as 16 days
• Capgemini team decided to take significant targets of 50% reduction in mean, Median and 66% in standard deviation
• Team identified approx. 63 outliers with the help of Box Plot ranging between 20 to 105 days
• Pareto analysis was done to identify vital few reason like process issue, skill issue, user dependency as major reasons for high TAT by studying outliers
• Process mapping was performed to identify waste in current processes at different stages like receiving information, approval from user, deadly in CM process, etc.
• A detailed root cause analysis was performed which was followed by actual Gemba investigation towards validation of root causes
• Root causes were verified with regression analysis before moving ahead with actual improvement plan
• Capgemini came-up with list of improvement actions inclusive of stringent SLA’s, process automation/ optimization extended at client and third party, reduction in the no. of approvals, Training/ refresher to Capgamini team and GSD team, created backup for all modules and activity, 3 strike rule and started rewards and recognition to motivate team to perform better
• This has resulted in an improvement of Improvement in process Mean from 14 days to 6 days, Median 6 to 3 Days resulting in shift in center and Standard deviation reduced from 16 Days to 7 Days, resulted in reduction of spread
• The improvements were further Statistically validated by performing Levene's Test & Mann Whitney Test to see the difference between Pre-Post stage Variance and center
• This was followed by implementing a strong monitoring and sustenance mechanism at different stages of ticket flow, as follows:

This Lean-Six Sigma project resulted in:
• Higher Customer Satisfaction, as 50% reduction of MTTR SAP Tickets
- Reduction of 2.5 buffer FTE from the CG team leading to direct reduction in cost
- Resource Utilization in additional project work resulted in additional billing
- Improved Team Utilization, efficiency and moral
- Reducing the risk of actual issues being lost in the noise
- Optimizing extended value chain

This has triggered a wave of improvement in Smiths, as Smiths not only appreciated Capgemini’s efforts in its Board meet, but also requested Capgemini to replicate the success in its other applications and enhancement projects.

Now, Smith considers Capgemini as one of the strategic business partner to extend its quantum of business excellence to create a strong footprint in the competitive European market.

**TATA CONSULTANCY SERVICES**

**Improve Business Process Exception Management (BPEM) productivity**

A specialized leverage team in TCS carries out business process exception management transactions for a specific client who is one of the leading suppliers of Gas & Electricity in Western Australia. These services are rendered to meet the business requirements for the end customers through this exception management where in the relationship with TCS is of more than 3 years. The overall productivity of the team across Complete, Query, WIP & OOS cases is 79.78% against the internal target of 85%. This is due to variation in productivity among associates. Client is expecting a minimum of 80% productivity at this BAU stage. Earlier there were process improvement projects have been initiated with the strong levers like Lean & SPS methodology however % of improvement was very marginal. Client was aware of the fact that after AHT benchmarking further increase in productivity will be very difficult however in the MBR they have highlighted this as a biggest concern.

A Six Sigma Green belt project is thus under-taken to understand root cause of this lower Productivity %. A series of quality tools and methods were used to carry out this project using the DMAIC methodology. As-Is Process Map was created to identify the gaps. Normality/Stability testing, capability analysis done, Cause & Effect diagram, Statistical validation of shortlisted Xs through scatter plot diagram, One way Anova, 2 sample T test square studies were conducted to establish relationship between various factors contributing to errors and thereby derive to the validated Xs.

Corrective actions were designed and implemented based on the identified priority level. Effective implementation of the solutions helped improve the productivity in BPEM from 94.17% to 99.07%, resulting in customer satisfaction by additional work responsibility was offshored and consequently had a financial impact saving of 164,841 USD per annum over last year. This TCS team thus created opportunity for taking additional work and created a prospect for more business.
Project Identification
Overall productivity of the process was 79.78% wherein the client expectation was a minimum of 85% and there was urgency to relook at the process and streamline the same through process improvement.

Problem Statement:
The average productivity is 79.78% which is less than SLA threshold productivity of 85% thus negatively impacting client satisfaction.

Goal Statement:
To improve the average Productivity of Business Process Exception Management (BPEM) team to at least 85% by 31 of August 2012.

Root Cause Diagnosis:
- Cross functional team comprising of Operations, SME, Quality auditors and process excellence was formed for brainstorming to identify the possible causes.
- Checking & re-checking unnecessary points
- Associate wise AHT Variation
- Usage of chat tools & lotus mail
- Variation of process knowledge among associates
- WP gets down on every Tuesday & Wednesday and other days
- Additional usage of shortcut keys by top quartile processors
- Typing Activity notes in system
- Doing recheck due to accuracy competition on the production

Remedial Actions
- Minimize unnecessary check points in the process steps calibration done through random buddy up with associates. A template has been created & getting shared with all associates to sensitize them so that they only follow the relevant process steps instructed in the BPEM SOPs.
- Revised internal new target AHT & shared with all the associates. New Target AHT of complete, WIP, Query & OOS cases across all 92 categories have been shared with the associates. Periodically AHT is monitored through e-PMO & feedback given to all associates.
- Associates were asked not use same time during processing cases.
- Easily Accessible Update Sheet prepared which fulfil all process related requirements ensuring that the update sheet is getting updated regularly.
- Process knowledge test were introduced.
- Trained the associates with all the shortcut keys and ways of SAP and Excel through Keyboard and Transaction Codes.
- Introduced a template of CRM and ISU notes which helped the Team to reduce AHT all across the categories.
Solutions Deployment:
Detailed implementation plan prepared & weekly reviews with project team were conducted to ensure smooth implementation and observe the progress of the project. Implementation of the solutions was monitored closely. Thus the productivity increased from 79.78% to 94.89%.

Sustenance of Gains:
Control Plan was put in place clearly defining Measure, Frequency and Responsibility. Control charts were prepared to monitor the performance closely and ensure that the process stays in control. One of the important audit called “Kamishibai” used get conducted on a weekly basis by the Team Leads & floor supports also deviations have been intimated to Customer Leader through raising alarms.

Benefits Realised:
- Tangible: Savings of USD 164,841/- per annum for the client.
- Intangible: Solutions Identified were replicated to other processes. Introduction of online update sheet and short cut keys led to accuracy improvement as well from 99.02 to 99.23.

INDUS TOWERS

Network Uptime Enhancement

Company Profile:
Indus Towers, headquartered at Gurgaon, offers passive infrastructure services to all telecom operators and other wireless services providers such as broadband service providers. With a portfolio of 111,819 towers in 15 telecom circles across the country, Indus is the largest telecom tower company in the world. Indus has the widest coverage in India and has already achieved 221,511 tenancies, another first in the telecom tower industry globally.

With a vision statement of Transforming Lives by Enabling Communication, and a tagline of Putting India First, Indus has contributed significantly to enable wider access, offer affordable services, and propel wireless communication sector towards achieving Government of India’s tele-density goals.

Project Background:
One of the major customers of Indus Towers was facing network uptime issues in some of its telecom tower sites. This led to poor connectivity, thus resulting in dissatisfaction of the customer’s customers and subsequent subscriber churn in the affected areas. The project was selected by analyzing the SLA Penalty Cost paid by Indus Towers to its customers. Due to the aforesaid issue, the penalty cost was high in the sites that had poor network uptime.

Problem Statement:
Around 250 sites of a major customer had a network uptime of around 99.75%, which was less than the SLA of 99.95%. This resulted in customer dissatisfaction and SLA penalties for Indus Towers.
**Solution Methodology:**
The project used the DMAIC approach of problem solving. Baselining of current performance was done through the network uptime data (continuously monitored by a dedicated system called Tower Operation Centre) of the last three months. The process capability was analyzed and the sigma level was found to be -0.33. Using Why–Why Analysis, the root cause was identified as the 24V supply on the problematic Base Transmission System (BTS). While the other BTS was on 48V supply, the status of the problematic BTS would be known only when it stopped radiating, as the low battery alarm was also on 48V supply. This root cause was validated using Circuit (Process) Walkthrough.

Solutions were identified and evaluated using Brainstorming and Cause & Effect analysis. Finally, an integrated alarm box was chosen as the best alternative. This box was designed to generate alarms and facilitate auto-start of diesel generator in case of low battery for any of the BTS on a site. The solution was then validated through product design evaluation and pilot testing at 5 sites on a trial basis. Process capability analysis and hypothesis testing were done on the pilot test results to demonstrate evidence that the solution is sustainable.

The vendor partner was involved throughout the solution development and piloting phases, thus gaining the necessary buy-in for the change. Post successful piloting, the solution was deployed in all applicable telecom tower sites (263 in total) of the customer. The technicians were trained in operating and maintaining the new solution. Control plans (I-MR charts) were made for sustainability and validation at regular intervals.

**Project Benefits:**
The project increased the sigma level from -0.33 to 2.25. As a result, the network uptime exceeded the target (SLA) of 99.95% from 99.75%. This resulted in lower subscriber churn for the customer, thus leading to higher customer satisfaction and an edge over the competition. Additionally, it also led to reduction in SLA penalty cost for Indus Towers.

**INDUS TOWERS**

**SR to RFAI Process Improvement**

**Company Profile:**
**Indus Towers**, headquartered at Gurgaon, offers passive infrastructure services to all telecom operators and other wireless services providers such as broadband service providers. With a portfolio of 111,819 towers in 15 telecom circles across the country, Indus is the largest telecom tower company in the world. Indus has the widest coverage in India and has already achieved 221,511 tenancies, another first in the telecom tower industry globally.

With a vision statement of Transforming Lives by Enabling Communication, and a tagline of Putting India First, Indus has contributed significantly to enable wider access, offer affordable services, and propel wireless communication sector towards achieving Government of India’s tele-density goals.
**Project Background:**
Indus received approximately 10,000 workable Service Requests (SR) from Apr-2011 to Dec-2011. Out of these, around two-third of the SRs got “Ready for Active Installation” (RFAI) and the balance one-third got rejected. This translates into an average potential revenue loss of INR 22 lakhs per SR over a ten-year tenure. These rejections happened mainly due to site solution related issues, land acquisition related issues and slow speed of conversion of SR to Service Proposal (SP). Based on customer feedback through customer satisfaction survey, Indus’ speed of delivery emerged as an improvement area. Improving the SR to RFAI process would ensure higher revenues for Indus from both increased conversion and faster delivery.

**Problem Statement:**
Around a third of the share SRs received gets rejected primarily due to long turnaround time from SR to RFAI. This translates to a potential revenue loss of Rs. 58 Crores per annum for Indus Towers.

**Solution Methodology:**
The project used the DMAIC approach of problem solving. Baselining of current performance was done using 9 month rolling Share SR inflow data. A week-long workshop was conducted with a cross-functional team to map the current state value stream and to identify and prioritize the possible root causes. Pareto analysis and cause & effect analysis were used along with value analysis on VSM. Multi-voting was performed to validate the significant root causes with the help of a large base of experienced participants.

Solutions were identified through Brainstorming in Kaizen workshops, and were prioritized using control-impact matrix. Feasibility study, simulation and piloting of the to-be process were used to validate the solutions.

A detailed communication plan involving the entire hierarchy of stakeholders was prepared. The improved process was uploaded in the company’s process repository for everyone’s easy access and understanding. A process control system (consisting of control plans and run charts) was deployed. Process audits were conducted in addition to monthly review of process compliance by project champion with all functional team members.

**Project Benefits:**
The project led to increased revenues of INR 23 crores per annum through higher percentage of SR to RFAI conversion. Indus’ market share improved by 13% points. The customer satisfaction also increased (by 11% points in “speed of delivery” section of customer satisfaction survey). In addition, fewer SR rejections meant effective utilization of available towers, thus saving significantly on energy costs, in addition to savings in space, material, etc.
**RELIANCE SECURITIES**

**Enhancement of Call Answer Ratio**

**Project Description:**
Reliance Securities facilitates Equity Trading across multiple platforms. Once such platform is CnT (Call n Trade), where clients have an option of calling, and upon authentication can place a trade (buy / sell).

Call answer ratio is the ratio of calls answered to calls offered. We need to ensure that we answer maximum number of calls since each call is a revenue opportunity for the customer, so failing to answer a call leads to a very high level of dissatisfaction.

If calls are answered at the first attempt we will have more satisfied customers and satisfied customers are more likely to continue doing business with us hence increasing the revenue potential.

This project was aimed at identifying such challenges, finding solutions for the same and sustaining the improvement, i.e. by Improving answer ratio (using the same manpower).

**The Big Y:** On an average we receive 39,000 calls at Call n Trade Desk of which approximately only 37,500 calls are answered. The YTD Call Answer % at Call n Trade desk for year 2011-12
was 95.74%. On an average 1,500 calls per month are dropped. The Big Y for us is Customer Satisfaction.

\[ Y \text{ (CSat)} = f \{ X_1 \text{ (Calls Answer Ratio)} \} + f \{ X_2 \text{ (Speed of trade execution)} \} + f \{ X_3 \text{ (Understanding)} \} + f \{ X_4 \text{ (Accuracy)} \} \]

The Small Y considered for the project is Calls Answer Ratio.

\[ Y \text{ (Calls Answer Ratio)} = f \{ X_1 \text{ (Call spikes)} \} + f \{ X_2 \text{ (ASA)} \} + f \{ X_3 \text{ (AHT)} \} + f \{ X_4 \text{ (Call Wait)} \} \]

**The Critical X’s**

We identified critical X’s based on all the attributes which constitute to a Trade placed via CnT. These X’s are as follows:

- X1 – Call spikes
- X2 – Average Speed of Answer (ASA)
- X3 – Average handle time (AHT)
- X4 – Call wait time

Using tolerance testing, we were able to identify critical X’s which influences Y the most, i.e. a minor change in any X which leads to a major change in Y (In Multi Linear Regression model)

**Approach:**

By using a variety of tools like Time & Motion, 5Why, Erlang C, Surface & Contour plotting, monitoring of Process Capability etc. we were able to identify some special events. Using a team of subject matter experts we identified actionable for each of these events.

**Results:**

Post the project execution we saw a good growth in the Answer Rate of CnT. The Answer rate has gone up from 95% (pre-project) to 99% (post-project) and sustained till date, i.e. 1,200 more calls are answered every month compared to the same period 2011-12. Also resulted in significant improvement in CSAT scores as per the annual survey conducted by Nielsen.

**RELIANCE INFRASTRUCTURE LTD.**

**Reduction of fuel consumption- Light Diesel Oil (LDO)**

**COMPANY PROFILE**

Dahanu Thermal Power Station (DTPS) is one of the best power generation plants in the country, which commenced its commercial operations in January 1996. Recognized with innumerable awards, this power plant is known for its distinctive features that set it apart from others in terms of technological innovation, superior performance and continuous sustainability for a longer period. Dahanu Thermal Power Station (DTPS) consists of two units of 250 MW. DTPS has adopted modern O&M practices to make the power station highly reliable, efficient through system approach in all its activities. DTPS is certified for QMS (ISO 9001), EMS (ISO 14001), OHSAS (BS 18001), SA 8000 and ISMS 27001. Also, DTPS is the first power plant in the world to implement Energy Management System (ISO 50001:2011). DTPS has established a comprehensive fuel management system by blending Indian with imported coal. Plant has developed competency in measurement, monitoring, evaluation and control of various parameters
related to plant performance. The plant undertook 6 Sigma initiatives, uses techniques like 5-S, FMEA, COPQ etc which has resulted in considerable improvement in Key Performance indicators.

**PROJECT SUMMARY**

**Introduction**

DTPS has 2 x 250 MW coal based thermal power plant. Light Diesel Oil (LDO) is used as a secondary fuel during start-up, shutdown & process upsets. LDO is used for gradual heating of the boiler and ignition support to the coal mills. After 30% of the generating capacity the coal combustion become self-sustain and further oil support is not required. DTPS average specific oil consumption is from 2004 – 2011 is 0.150 ml/kwh against 1 ml/kwh normative by MERC & national average 1.47 ml/kwh (CEA 2007-08 report). DTPS specific oil consumption is among the top 10 power plants at national level. In spite of low specific oil consumption the project is selected as an opportunity for natural resource conservation, operation excellence to create new benchmarks. The project falls under the 6 categories (energy conservation, reliability, resource optimization, environment management, energy management, safety improvement) of DTPS system approach for improvement. LDO price is increasing by 10% each year. Reduction in 1kl of oil saves revenue of around 60,000/-. 

**Define Phase**

Light Diesel Oil (LDO) is used as a secondary fuel during start-up, shutdown & process upsets. LDO consumption is influenced by number of factors like number of start-up, shutdowns, type of process upsets. Analytical tools like, prioritization matrix, affinity diagram, supported by effective brainstorming were used for identification of process requires LDO consumption. LDO major consumption is during Cold start-up and warm start-up of the units. Objective of this project is to reduce the yearly LDO consumption by 20% from average 600kl to 480kl by adopting new technology, process optimization, standardization operation & maintenance practices. Reduction in 1kl of oil saves revenue of around 60,000/-. 

**Measure Phase**

The activities identified form VOC, prioritization matrix and affinity diagram is validated from the actual data for period of 2003-2011. Data collection done for the period 2003 to 2011 of the oil consumption for different activities from records of ORT report maintained by DTPS Efficiency Department. Pareto chart shows that the LDO major consumption is during Cold start-up and warm start-up of the units Project Y is to reduce the oil consumption of cold and warm start-up by 20%. Process sigma level is calculated with the oil consumed for start-up which is more than targeted value is considered as a defective.

The scope of improvement is to reduce the oil required for each warm start-up by 15kl and for cold start-up by 40 kl. Considering 8 warm start-up per & 1 cold start-up per annum total saving potential is 160 kl per annum.

**Analyze Phase**

Start-up of units is a complex process and requires sequential operations of more than 100 drives with continuous monitoring of more than 200 critical parameters. Brain storming with the process people was done & FMEA done to identify all possible causes for Y. Possible causes were grouped using affinity diagrams.
RPN greater than 45 are considered as prioritized causes. The possible root causes were validated by the past data form (IMS documents) the Digital logbooks, HMI generated reports, various MIS reports & SAP were used.

**Improve Phase**
For each Y System wise brain storming is done with process experts and numbers of solution were identified. Innovative and new technology solutions were discussed. Prioritization is done by using project prioritization matrix, priority rating is given on the basis of high, medium, low, criteria depends on cost, time required for implementation, ease of implementation & impact on LDO consumption. High score solution has first priority for implementation by considering feasibility and availability. PDCA cycle with DOE used & final Pilot testing was done in one Unit with FMEA and HIRA. The data was collected from the system and validated. The results of pilot test were compared with the old data. Dash boards were prepared and were discussed in Daily plant meeting with all HOD and apex members. New Sigma levels were calculated and compared. Detail Implementation plan with responsibility matrix prepared and approved by apex members.

**Control Phase**
Following control plan developed

1. Standard operating procedures and guidelines, Checklists were modified, approved & circulated. (Unit start-up and shutdown checklist, Mill start-up checklist, SOP of emergency handling and process upsets)
2. Daily / Monthly oil consumption Oil consumption report, Start-up & shutdown oil consumption report is circulated to all HOD & apex members indicating the deviations if any and is reviewed by Head O&M daily. **First Information Report (FIR)** is raised for the deviation through SAP and to be closed by concerned dept. with corrective and preventive action with due approval of top management.

All Improvements & Control plan deployed through IMS system. Work orders & Improvement plans format available in SAP was used. DPR was prepared and got approved. Change document formats filled for standardization of O&M practices.

**Benefits**
1. Oil consumption for warm start-up is reduced from average 50.46 kl to 32.45 after implementation. For 8 start-up after implementation, total savings of oil is 144.08 kl
2. Oil consumption for cold start-up is reduced from average 210 kl to 168 after implementation. For 1 start-up after implementation, total savings of oil is 42 kl
3. Oil consumption for oil guns trial reduced from 19.62 kl/annum to 6.23 kl/annum, total savings is 13.39 kl/annum
4. Total revenue savings after implementation is 199.47kl x Rs.60,000 = 119.68 lacs
5. Total oil consumption of the year 2012-2013 is 432.08 kl against the average 600 kl

**Saving of Oil required for warm & cold start-up, oil guns trial is recurring each year**
CAPGEMINI

Backlog Ticket Reduction in Prime Application in a Nordics AD/AM engagement

Background: As a part of IT support collaboration, Capgemini has undertaken the end to end responsibility for Application Development and Maintenance (ADM) of many of the business applications of a Nordics Credit Card Issuing company in a multi-million Euro contract which spans for 5 years. This includes delivery to all of client’s business in Norway, Sweden, Denmark and Finland. The Application Maintenance (AM) part of work consists of work packages (WP) and it is a Fixed Price contract. Whereas Application Development (AD) is a mixed bag which consists of responsibility engagements driven by Fixed Price as well Staff Augmentation projects based on Time and Material.

Opportunity Description:
In Mar-Apr 2012 it was noticed that there was considerable backlog build up in Work Pack 4 (WP4) – a set of Prime Application portfolio which needed to be addressed immediately and cleared. There was considerable pressure from both Client and Capgemini Management to reduce this backlog and ensure that it is managed at a permissible limit. Internal management was concerned that this could affect the client confidence and it was of utmost importance that we got off to a good start considering that all applications went live after transition between Jan-Feb 2012.

Objective and Approach:
Voice of Customer (VOC) – Help understand the current situation and reasons behind the high and increasing backlog and suggest quick resolution

Voice of Business (VOB) – Bring the backlog volumes in the WP4 especially in the Prime Applications to a permissible limit and control the same

Standard and proven Six Sigma Methodology – DMAIC (Define – Measure – Analyze - Improve -Control) was made use of to convert the mentioned business problem into discerning set of measurable parameters which helped us drive this project

Define Phase: Data regarding the tickets were collected from January 2012 to April 2012. Following CTQ was identified - Reduce the current backlog in WP4 Prime Application to permissible levels – below 30% and Help maintain customer confidence in overall Service Delivery.

AS – IS – Backlog Index (Prime) = 36.50% (Jan 12 – Apr -12*)

TO – BE – Backlog Index (Prime) = 20%

Tools/Techniques used: CTQ Tree, Project Charter, 1 Sample T-test and IMR Chart
Measure Phase:
Data was collected from the Ticket Management System (TMS) for the months Jan’12 – Apr’12. Backlog for months Feb, Mar and Apr stood at 31.56%, 38.20% and 38.72% respectively. Also the median of the Backlog age increased from 8.14 days in Feb to 22.39 days in Apr. The IMR chart was used to confirm whether the trend in the overall volume of tickets received have been consistent or not. The IMR chart showed that the trend is consistent and that the data range chosen can be used to make definite conclusions regarding AS-IS scenario and proceed with the analysis phase.

Analysis Phase:
Fishbone analysis carried out on each of the top alert category and 5 why’s conducted to drill down to the root cause.

Improve Phase:
The focus was to study each of the root causes identified in the fish bone, suggest corrective or improvement actions. The post implementation phase was July 2012 to November 2012, where it was observed that the backlog went down significantly. The backlog in the months of Jul – Nov were 18.10%, 6.90%, 7.33%, 9.31% and 12.57%

Control Phase:
A proper sustenance plan was suggested in order to maintain the backlog in WP4 within permissible limits

Benefits:
One of the main benefits observed was the facilitation of offshoring 4 onshore roles which would have been delayed had the backlog of WP4 not tackled. The overall benefit of reducing the backlog was INR 31,82,400. Other intangible benefits such as better uptime of WP4 applications, optimum utilization of resources and end customer satisfaction for Client itself was observed.

CAPGEMINI

Reduction of inflow of Auto Alerts

Background:
Capgemini is a world-class AM service partner and its collaborative approach, and Rightshore® strategy using its centres around the world gives customers the right balance of service, quality and cost. Capgemini’s AM Services aims to continuously improve the cost-effectiveness, efficiency and scalability of its client’s AM Operations. Capgemini is a
recognized global leader in applications management, with a proven track record of consistent and innovative delivery. Though united by common long term client's business goal the natural urge to chase short term objectives eludes the much needed synergistic collaboration with the customers. Capgemini integrates Six Sigma and Lean techniques which are extremely useful in analysis and improving effectiveness and consistency of processes.

**Introduction:**
Capgemini is the AM Infrastructure service provider to one of the largest and most Busiest Airport Infrastructure company in the world. The AM Service includes application support in 24x7 service model for critical services like AOS, PES & Airport back office. The Application Support team is responsible for supporting the application 24x7 which consists of approx 450+ applications across all the airport in UK excluding Edinburgh. All application and servers are continually monitored by an alert monitoring tool HPOV & Tivoli.

**Objective and Approach:**
Voice of Customer (VOC) - Supported application should be more stable and generated lesser alerts.
Voice of Employee (VOE) – Non Genuine alert during the non-office hours cause disruption in personal life.

To establish its causes, determine the solutions/practices and pilot it to study the favorable results so that this can be subsequently used and applied across other Business Units across the organization we have used the proven Lean and Six Sigma methodology DMAIC (Define-Measure-Analyze-Improve-Control).

**Define phase:**
Data on the number of Incidents raised was collected for the period of Jan’12 – Oct’12.

- **Our Problem Statements are**
  - High number of Non Genuine Auto alerts generated out of office hours.
  - Substantial efforts are expended to monitor this auto alerts.

Thus calculating our target based on 72% of alerts are Out of Office hours & 55.6% of alerts are Non Genuine alerts.

- **Target = 40% reduction of the overall alerts.(72% Out of Office Alerts * 55.6% Non-Genuine Alerts)**

The scope of study would be for all Auto Alerts raised between August’12 and October’12.

**Tools/Techniques:** IMR-Chart, GEMBA, SIPOC and Brainstorming.
Measure Phase:
IMR was plotted to understand any pattern in the data. Histogram for process capability check was completed to understand the capability of the process and check for special causes and hence consider the data for further analysis.

Analyze Phase:
Fish-bone analysis carried out on each of the top contributing groups to drill down on the root cause.

Improve Phase:
The focus was to study each of the root causes identified in the fish bone, compare results of piloting the recommended actions and monitoring the improvements.

Control Phase:
In this phase the recommended solution that was piloted was developed and elaborated for full scale implementation.

Sustenance and Way-Forward:
We have increased co-ordination with the other teams for releases and follow process for planned releases/downtime by putting servers on maintenance mode, so no alerts are generated.

Benefits and Value Proposition:
This initiative provided cost effective benefit to the customer by reducing a non-
genuine alerts which resulted in saving on callout, on-call and additional project work was absorbed in current team. Continuous improvement on projects performance in terms of reduced tickets and user complaints has been acknowledged by stakeholders and shown by statistical measurements.

<table>
<thead>
<tr>
<th>Tangible Benefits</th>
<th>Intangible Benefits</th>
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<tbody>
<tr>
<td>Reduction of call volume by 64.9%</td>
<td>More time available for project work and Service Improvement activities.</td>
</tr>
<tr>
<td>Additional work absorbed with current scope : 7.51 FTEs</td>
<td>Boost in enthusiasm during working hours</td>
</tr>
<tr>
<td>Additional work absorbed with current scope :</td>
<td>Reduced call outs and focuses only on genuine issues which resulted in better customer satisfaction.</td>
</tr>
<tr>
<td>INR 11,399,064</td>
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**RELIANCE MUTUAL FUNDS**

**Improve Redemption Process**

**Abstract**
Reliance Mutual Fund (‘RMF’/ ‘Mutual Fund’) is one of India’s leading Mutual Funds which offers investors a well-rounded portfolio of products to meet varying investor requirements and has presence in 179 cities across the country.

Key transaction carried out at RMF is Purchases, Redemption, and Switch. Redemption transactions facilitate Investors to get Funds in their Bank accounts against payout request given for Investments as per their need. It is the key component of business, where efficiency of the organization needs to be built to improve customer satisfaction. These transactions are extremely sensitive from customer point of view & complaints of Non-receipt/Delay in redemption proceeds could adversely impact customer perception about Reliance Mutual fund.

In the past it was observed that there were many investors who were finding inconvenience in redeeming their amount leading to major dissatisfaction and also loss of customer. Based on Pre-project data we were receiving on an average 0.33% complaint against total redemption request. It was imperative to not only reduce the no. of complaints but also address the constant need for continuous improvement in this critical process.

With the aim of enhancing operational efficiency, Management formed a cross functional team to relook at the process & improve performance under Six Sigma Project on “Improve Redemption Processing” by undertaking DMAIC approach.

This project was successfully completed in FY 2012 has yielded in multi faceted benefit, it has resulted to reduce Redemption related complaint % 0.33% to 0.10% with sigma improvement from 4.22 to 4.67.
It has also lead to process standardization across all Branches, Backend Operations with effective monitoring of output measures & Service enhancement. We continue to sustain the benefit of this project and look forward for significant improvement in this financial year as well.

RELIANCE INDUSTRIES LTD.

To improve Domestic Travel Process

Company Description:
Businesses began to use shared service centre and outsourcing to improve back office efficiency. The intention was to move routine, transactional work to specialists who were dedicated to processing it more efficiently at lower cost. This left the business free to be more volatile and focus on its customers. Shared service centres were the in-house solution, while outsourcing firms provided an external option.

Reliance chose the first one and set up shared services centre (SSO) in 2009 which is a multifunctional, fully integrated, end-to-end process oriented model and has the power to support the transformation of our business. Now our SSO is in a matured state and is moving from tentative steps to improving operational efficiency. The next big thing coming soon is the implementation of ‘Business Transformation’ across the entire Reliance.

About This Project:
As Reliance is having highly growth oriented and diversified business, we wanted to make our employee air travel process hassle free while paying attention to visibility of travel cost. Hence this project was initiated keeping in mind the travel triangles consisting of 1) Time spend on travel, 2) Policy compliance and 3) customer satisfaction for corporate travelers.

Why this Project?
Domestic air travel spend in our organization is more than 40 crore/annum and is likely to increase substantially with roll out of new ventures like 4G business, Jamnagar Refinery-3 and many more polymer and petrochemical projects. The improvement in travel process will definitely improve bottom line of our business.

Define:
Challenge before the team was to arrive at the most appropriate CTQ for the project which would rightly represent overall travel cost of the travel process.

Number of variables like 13 number of airlines involved, 21 sites across India and hence various sectors of travelling ranging from short distance to long distance travels, type of air travel, category of employee etc. made it difficult to arrive at generalized CTQ.

To counter this difficulty we did a prescreening exercise, identified various value levers and shortlisted 3 of them for improvement in areas of 1) % advance booking, 2) % Cancellation and reschedules 3) On time payment to service provider.

Measure:
In Measure phase, team collected baseline data from SAP and verified. Hence MSA not required, calculated % defects, sigma level using DPMO method.
Analyze:
Cross functional “As-Is Swim Lane Map” prepared to map the entire process based upon the SIPOC diagram to get the feel of end to end process. ‘CTQ’ wise data analysis done to identify hidden areas for improvement using simple tools like Bar Chart, Pareto, Trend Analysis and stratification in various areas of business. ‘Value Stream Mapping’ tool used for improving on time payment process. Based on the improvement areas potential X’s identified using series of Brain storming sessions & stratified using Fish bone Diagram. Further screening of X’s carried out using Control Impact Matrix.

Improve:
Action plan prepared for shortlisted 9 actions which were based on ‘System Based Improvement’ and ‘Change Management’. “To-Be Process” planned and action plan implemented with clearly defined responsibilities and timelines.

Control:
Apart from system based actions and other actions CTQ tracker plan prepared to monitor the progress of the project with responsibility assigned to process owner and service provider. Process change is evident from improvement trends which are clearly showing change in process.

Highlights:
In spite of continuously changing in volume of air travel the annualized savings realized from the project based on baseline estimate is 1.34 Cr.

INDUS TOWERS LTD.

Improving Landlord Delight

Company Profile:
Indus Towers, headquartered at Gurgaon, offers passive infrastructure services to all telecom operators and other wireless services providers such as broadband service providers. With a portfolio of 111,819 towers in 15 telecom circles across the country, Indus is the largest telecom tower company in the world. Indus has the widest coverage in India and has already achieved 221,511 tenancies, another first in the telecom tower industry globally.

With a vision statement of Transforming Lives by Enabling Communication, and a tagline of Putting India First, Indus has contributed significantly to enable wider access, offer affordable services, and propel wireless communication sector towards achieving Government of India’s tele-density goals.

Project Background:
In the business of Indus Towers (mobile tower passive infrastructure), the space rented for tower construction & maintenance plays a critical role. Timely and correct payment of rent to landlords (LL), from whom such space is rented, is vital for continuing uninterrupted services of mobile towers. Incorrect or delayed rent payment results in LL dissatisfaction, who in turn might switch off the site, leading to outages and Service Level Agreement (SLA) penalty, besides bringing disrepute to Indus Towers.
**Problem Statement:**
Maharashtra & Goa circle is one of the largest telecom circles in India. Here, 607 telecom tower sites had issues in monthly rent payment. Approximately 100 process deviations were made for regularizing the rent issues between 01-Apr-2011 and 31-Dec-2011. Rent payment teams of Operations and Finance fire-fight and consume valuable time trying to resolve the problem in a piecemeal manner, which otherwise could have been used for productive work.

**Solution Methodology:**
The project used the DMAIC approach of problem solving. Historic data of past 9 months was used to baseline the current performance. The sigma level was found to be 2.95. The possible root causes were identified using SIPOC, Process Flow Charting and Cause & Effect Matrix. Pareto Analysis revealed that four of the root causes (delay in payment due to reissue of cheque, company portal data mismatch, issues with name & escalation amount in agreement, and tax issues) contributed to 80% of the problem. These root causes were validated using hypothesis testing (One-Sample t-Test).

Solutions in the form action items were identified for each of the above root causes, and prioritized using Brainstorming and Cause & Effect analysis. They were then validated by plotting normal curve and measuring the shift in mean and standard deviation before and after implementation. The new process for rent payment was rolled out and the stakeholders were trained. Control plans were made for sustainability and validation at regular intervals. The project utilized cross-functional regional field teams to map the Present and Future State value streams and in Kaizen workshops.

**Project Benefits:**
The project resulted in an improved sigma level of 4.1 from 2.95 (against a target of 3.75). The rent payment process was standardized and mistake proofing was done in the company portal. The number of rent stoppage sites post-project went down by 75% for category 1 sites became almost negligible for category 2 sites. Financial impact of INR 2 crores has been realized in less than one year since project closure. Timely rent payment has ensured business continuity by maintaining good relationship with landlords. The improved uptime has resulted in higher customer satisfaction, thus providing an edge over competition.
MEDALL HEALTHCARE PVT. LTD

Customer Service Improvement

Company overview

MEDALL Healthcare Pvt. Ltd (MEDALL) is a chain of medical diagnostic service providers based in India. Medall's Vision is to build a trusted and dominant brand providing comprehensive health care services in the under-penetrated Indian Market. Medall's centers are highly distributed and it is important that the patient / customer experience in its various centers are consistent to achieve its vision.

Medall top management through the customer satisfaction surveys and focus group interactions understood that there are inconsistencies in its services. Management established a Voice of Customer Program as a corporate initiative which deploys and nurtures improvement projects across Medall’s various centers.

Need for the Project:
Inputs from Doctors, observations in the center indicated over 40 service gaps. Based on the Customer satisfaction form data 55% of the customers have rated us in the top 2 boxes (excellent & very good) while 19% have rated (in the bottom 2 boxes (needs improvement & Dissatisfied)

Project Goal:
- Eliminate the service gaps improve the top 2 boxes to 85%
- Develop a replicable program model for other centers

Approach:
A cross functional core team was formed and the initiative was rolled out as VOC program in the organization. VOC program used many of the tools practiced in Six sigma / LEAN. However methodology of training and the analysis of issues were done in an unconventional way of doing situational analysis using role plays. This method suited well as the organization is in healthcare and customer service is paramount.

Significant actions:
Most of improvement solutions were focused in preventing the issues from occurring again and this involved enhancement of software programs, behaviour changes, Report format changes, Staff planning etc.
Some examples of solutions taken are as follows:

<table>
<thead>
<tr>
<th>Issues Classification</th>
<th>Causes</th>
<th>Solutions</th>
<th>Solution Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cleanliness</td>
<td>Timely replacement of linen in the study tables / cots</td>
<td>Day wise colour codes for visual identification</td>
<td>Poke Yoke</td>
</tr>
<tr>
<td>Inconsistent staff interaction</td>
<td>People appearing to be busy and no face to face interaction</td>
<td>Greeting gesture to acknowledge when a customer arrives</td>
<td>Behaviour Routines</td>
</tr>
<tr>
<td></td>
<td>Unaware of specific study preparatory details to the Front office staff</td>
<td>Study wise pre instruction displayed when a test is selected</td>
<td>Poke Yoke</td>
</tr>
<tr>
<td>Long waiting time</td>
<td>Study completion information not on a timely manner to call the next patient</td>
<td>Study completion status updation in the online application reflecting in front office</td>
<td>Andon</td>
</tr>
<tr>
<td></td>
<td>Non availability of consumables like needles, glucose etc. in alignment to the foot fall</td>
<td>Stock status indication in respective study bays and monitoring by the stock keeper</td>
<td>Kanban</td>
</tr>
<tr>
<td>Delays</td>
<td>Inconsistency in downtime management of equipment</td>
<td>Refined call launch and response protocols with priority setting and alerts</td>
<td>SOP</td>
</tr>
<tr>
<td></td>
<td>Duplicate tests (between package and individual) during billing leading to delay in report entry</td>
<td>Duplicate test alert in registration and billing</td>
<td>Poke Yoke</td>
</tr>
</tbody>
</table>

**Improvement Achieved:**
- Customer Satisfaction score improved to 89% as against the target of 85%
- Over 12% increase in revenue
- Behavioral changes like:
  - Medall way of Greeting customers, Easy Staff identification through uniforms
  - IT enhancements with regard to Ultra Sound image push, Report printing

**WIPRO**

**Project Readiness Program (PRP) Optimization**

**About Project Readiness Program (PRP)**

Project Readiness Program (PRP) is a structured induction training program offered to all campus recruits (freshers) by Talent Transformation division of Wipro for three months. It is designed for entry-level freshers coming from varied background (Engineering + Science Graduates) to be trained on essential behavioral & technical skills that enable them to start working on real-life customer projects before they get into Business Unit.

Our goal has been towards continuous improvement in this flagship program and thus oriented towards applying lean techniques to optimize this program to align with the business needs. This helped in designing and implementing New PRP Model Framework aligning to the business.

There were certain challenges in the old PRP model that was in existence for several years.

**Challenges in Old PRP Model:**
- **Limited Technology Streams** – It resulted in re-training of freshers after getting into Business Unit that impacted in absorbing them into projects immediately after regular training
- **Mismatch in Business Unit (BU) requirements & PRP curriculum**
• **Business Unit (BU) Disconnect** - Resulted in mismatch of training output versus business expectations without BU interventions.
• **Unmonitored Effectiveness** - Training effectiveness metrics was rarely tied to business metrics.

**Lean Implementation – Brief**
The following lean techniques were applied to mitigate the challenges in the old model and improve productivity and optimization of resources.

- **Competency Management**
  - Interaction/extensive exercise with stakeholders (BU/WMG/CG teams)
  - Identification of 60 technology streams in line with Business
- **Value Stream Mapping**
  - Revamped/Redefined/Redesigned process/framework of new PRP Model
  - Introduced Fluency communication skills module
  - Effective utilization of resources by reducing outsourcing, Enabled BU Induction
- **Visual Control**
  - Identified metrics for publishing monthly dashboard to management and team

**Key Benefits after applying lean techniques**

**a. Competency Management**

Benefits
- Resulted in 60 technology streams against 18 generic streams
- Focused on strengthening learning during PRP Induction training itself rather than learning after getting allocated into BU/Practice

**b. Value Stream Mapping**

Benefits
- Building of better communication skills along with technical skills during PRP
  - 72% of freshers shown improvement
- Eliminated non-quality freshers in system
- Utilization of Infrastructure at Vizag
  - Facility was made operational and thus avoided closure of center
  - Eliminated outsourcing of PRP training in external venues
- Account Induction was made an inherent process when freshers are tagged into Accounts
- Elimination of heavy expenses incurred in current system on training a large number of Wipro selects through classroom led training of ‘**Project Campus**’ at colleges
  - **Reduced cost** by **78.5%** in shifting from classroom to e-learning
  - Elimination of outsourcing of external trainers for a portion of induction training delivery
  - **High Return on Investment (RoI)** per learner by **88.07%** in moving 5 days of induction training through e-learning

**c. Visual Control**

Benefits
- Transparent communication & visibility on progress fortnightly and monthly
- Tracking performance of Freshers in regular training and extended training
- Identifying freshers status on Account Allocation and Project Allocation
• Helps in taking further strategic decisions

Outcomes
• Reduced Re-training Efforts
  o Before: 18 generic Technology streams resulted in 60% of PRPians to undergo retraining for add-on/new technology skills after getting released to Business Units.
  o After: New PRP Framework resulted in only 7% of PRPians to undergo retraining for add-on/new technology skills after getting released to Business Units.
• Cost-effective e-learning solution
  Benefits:
  • Fostering e-learning culture to recruits before joining organization
  • Faster deployment into projects by reducing training duration after joining Organization
  • Engaging recruits before joining Organization

Result: This highly cost-effective learning solution has resulted in meeting Business Outcomes with significant saving and increased performance.
• Reduced cost by 78.5% in shifting from classroom to e-learning
• Increased Performance by 13.35% in e-learning
  o Increase in high scores by 13.35%
  o Decrease in low scores by 23%
• High Return on Investment (ROI) per learner by 88.07% in moving 5 days of induction training through e-learning
• User Satisfaction of 98.73% on e-learning experience
• Further sustenance by raising the pass % criteria
  o Visual Control helped in further enhancing the quality of generating quality talent deployed into Business Units from this year onwards.

KANRAY HEALTHCARE PVT. LTD.

Design and development of Semi-Automated Hot insertion Jig

Company Info:
Skanray combines the latest-in Technology with simplicity of design, innovation & high performance for efficient patient care.
Skanray caters to the entire range of critical care segment with Patient Monitors, Electro Surgical Units, Anesthesia machines, ECG machines, Ventilators, DR, C-Arm & Mobile X-ray.

Skanray has two manufacturing plants in Mysore, Karnataka,
• Skanray Technologies
• Skanray Healthcare

Skanray Healthcare is earlier known as Larsen and Toubro, Medical.
**Brief Description of Project:**
The lean project focuses on the thrust areas as ‘Productivity Improvement’, ‘Enhancement of Skill Set’ and ‘Improve Product Reliability and Brand Image’ in its effort to eliminate wastes of defect and waiting. The process of hot insertion of brass inserts into bosses (molded well-shaped structures in the component, which will hold the insert) of various molded plastic parts was fully manually and also led to defects like cracking, misplacement & inconsistent in insertion height. The use of fixtures and ultrasonic method of heat generation were also not without their own limitations.

A “boss-cracking” analysis was done revealing variations in temperature and pressure applied for similar locations, eventually leading to component damage. Not to mention the waiting time involved. A “Mold flow analysis” was performed to check the shear stress levels at different points of a component to further pinpoint that there are no molding stresses on the bosses and all defects seen are due to variation in manual insertion process.

As a result of brainstorming, a detailed user requirement specification for perfect insertion process was devised and elimination of manual variances was taken as primary target. Consequently, a HMI-display-control driven & programmable “Semi-Automated Insertion Jig” was developed. Various user safety features along with ANDON lighting for machine status declaration is implemented.

Standardization of process was achieved and validated via:
- Installation and Operational Qualification
- Process Capability was reviewed and Cpk = 2.1 was achieved
- Gauge R&R was performed to confirm repeatability and reproducibility

Benefits and Savings:
- Cycle Time Reduction by 60%
- Approximately 480 man-hours per year saved
- Saved man-hour expense amounting to approximately Rs. 76800/-

Additional learning from the project was the exposure to PLC control. The process is streamlined and consistent after implementation.

**TAFE**

**Reduction of Inventory ageing in Active BOM (Bill of Materials)**

**Project Details:**
Inventory ageing is in increasing trend which block the cash flow of the company and also occupy more space in raw material store. So stores team find difficult to accommodate new product parts in the existing store building.
Project Definition:
This project we have selected to support our company’s Critical Success Factor projects like “Inventory Ageing reduction and inventory turn ratio”. In TAFE, Ageing means part not consumed for 180 days from the date of receipt. We have lot of families under this ageing issue like Active BOMs, MOS, and BOND inventory and go down stock. A six sigma project with DMAIC approach applied to identify and eliminate the root causes and reduce the aged inventory on active BOMs alone.

Measuring Baseline:
- 8 weeks data was considered for project base line aged inventory value of active BOMs at the start time of the project is Rs.460 Lakhs.
- There is an opportunity to reduce the inventory by 30 % of this category.

Measure:
- Cause and Effect analysis conducted through brainstorming activity.
- Process experts and managers helped in identifying major causes of aged inventory of active BOMs from the cause and effect diagram.
- Identified major cause of aged inventory are ranked based on Circle of concern (External factors), inventory impact and dilution feasibility.
- Based on the overall score out of 7 major causes, 5 causes taken for further analysis.
- Operation definition given and Data measurement sheet with the support of SAP is made available for analysis.
- As the data was extracted from SAP, MSA not encountered.

Analyze:
The five major causes are plan change, models not produced for longer period, receipt through development purchase order, higher lot size and variable consumption in MDUE and MDU plant. The below table shows the validation of major causes.

<table>
<thead>
<tr>
<th>Sl.No</th>
<th>Cause</th>
<th>Validation Status</th>
<th>Tool used</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Plan change</td>
<td>Done</td>
<td>1 Sample t Test</td>
<td>Significant contribution validated</td>
</tr>
<tr>
<td>02</td>
<td>Models not produced for longer period (Safety Stock)</td>
<td>Done</td>
<td>2 Sample test</td>
<td>Significant contribution verified</td>
</tr>
<tr>
<td>03</td>
<td>Receipt through dev po's</td>
<td>Done</td>
<td>1 Sample t Test</td>
<td>Significant contribution validated</td>
</tr>
<tr>
<td>04</td>
<td>Variable consumption is MDU and MDUE plants</td>
<td>Done</td>
<td>2 Sample test</td>
<td>Significant contribution validated</td>
</tr>
<tr>
<td>05</td>
<td>Higher lot size</td>
<td>Done</td>
<td>2 Sample test</td>
<td>Significant contribution validated</td>
</tr>
</tbody>
</table>

Implementing Solutions:
- Implementation of distributed KANBAN for engine procurement and a policy decision made between plant and Integrated planning cell to restrict the plan change within 10 %.
- Bin quantity of the safety stock parts is revisited to ensure optimum inventory.
- ADD PO (Purchase through development order) process is redefined to control inventory.
- Lot size of the high value items contributing for aged inventory is reduced through working with supplier based on their economic lot size finalization.
- A proposal of single plant buying is made to avoid variable consumption in MDUE and MDU plant.

**Holding & Sustaining Improvements:**
- All above identified improvements are made. Improvements like bin quantity finalization and lot size reduction are standardized in purchase department ISO documents like QSP MAT 006, QSP MAT 009.

**Benefits:**
- Inventory value reduced from Rs.460 lakhs to 334 Lakhs.
- Overall inventory ageing reduced from Rs.1792 lakhs to Rs.725 Lakhs through the horizontal deployment of improvements identified for active BOMs for 90 Days aged inventory.
- Space creation in store is 162.2 Sq.Meters which is equal to Rs. 24 lakhs if we create.

**APPOLLO MUNICH HEALTH INSURANCE CO. LTD.**

**Mission Suvidha**

**Introduction:**
Apollo Hospitals Group has joined hands with Munich Health with the aim of making quality healthcare affordable to citizens of India.

The company’s uncomplicated insurance plans consist of a broad spectrum of products covering healthcare, travel insurance and personal accident plans, tailoring to the needs of individuals and families, as well as catering to large corporate with customized Group Health Insurance Plans. Apollo Munich’s health insurance plans are effective towards hedging larger financial risk and offer freedom for efficient treatment at the best healthcare provider (access to over 4000+ network hospitals).

**How we identify project in AMHI**
We constantly track voices through feedbacks/reports (Internal/Third party), C-Sat, E-Sat and benchmarking exercise to capture the VOC of different stakeholders to derive the CTQ for the project then the internal benchmarks are decided (targets) to improve the ‘Critical to Quality’ of the process by adopting suitable methodology.

**Business Case**
Cashless facility is the commitment to the customer by the insurer at the time of medical emergencies to meet the financial requirements during hospitalization on urgency basis.

Since this is the point of realization for the customer, regarding the servicing aspects of the insurer, for what he had paid in the past; it will have direct impact on customer satisfaction, organization
image and renewals etc. which ultimately impact on the organization image on the market as well as our renewal business.

**Problem**
There is always a risk of delayed response from the insurer on the claim’s decision which may create delay and confusion during the admission process in the hospital for the customer.

- **Defect:** Response time more than 65 minutes
- **Metric:** Turn Around Time (TAT)
- **Unit:** Minutes
- **Period for measurement:** 1\textsuperscript{st} Jan 2013 – 31\textsuperscript{st} Jan 2013
- **Target:** There is an opportunity to improve our response time from 65 percentile (percentage of cases responded in 65 min.) to 80 percentile.

**Methodology Adopted**
DMAIC (Project period: 5 Dec 2012 – 30 March 2013)

**Process capability**
We collect the data through Gemba for a period of 1 Jan – 31 Jan 2013. From this data we have identifying that the process sigma stands at 1.97. Since this is a system generated data we assume data accuracy; hence we avoid the MSA.

**Identification of Root causes and solution selection**
Total 34 X’s has been identified through brainstorming, expert opinion and cause and effect diagram, out of which 8 has been eliminated due to non-availability of data, difficult to collect etc. Further using cause and effect matrix we drill down to 19 X’s.

Post the above step we further move to data collection; data has been collected for the period of 1 Jan – 31 Jan 2013, using MIS, Gemba, Literature Review, Board & Committee Memos and Minutes of the Meetings.

Using the different statistical tool (GLM, Regression, Kruskal-Wallis) we have identified four critical X’s which are

- Claim Amount raised by the customer
- 64 VB – premium amount paid or not
- Non-Disclosure of Facts by the customer
- Authorizing Doctor at TPA

We use Brainstorming, TRIZ and Expert opinion to arrive total 9 solutions out of which following solutions got selected on the basis of selection criteria like Easy to implement, reversibility, cost benefit etc.

1. Limit of the cases referred to AMHI is increases from Rs. 50,000 to Rs. 75,000.
2. Surgical cases will be approved as per package agreed with Hospital in one go.
3. Dedicated people to handle the referred cases – AMHI.
4. Dedicated people to provide 24 X 7 support to TPA.
5. TPA training – Need basis – on Med Vs Insurance (procedures and process)
6. Tracking & review of TPA periodically and identify the TPA locations where the Training intervention required.
7. Education series on Cash less Claim procedure to Hospitals on monthly basis.

**Improve and Control**
We had implemented the above said solutions for the period of Feb 10 to 27 March 2013, with a control limits to restrict the outliers which we had observed during Improve stage.

The control limits are as below:
- Total 80 percentile of cases should be within TAT
- Maximum referred cases to AMHI should not be more than 4 cases per day.
- Average of 92 cases can be handled per day
- Refresher training for TPA doctors and Hospital are mandatory
- 20% process cycle efficiency is required.

The outcome of improve and control phase has been statistical proven (Kruskal-Wallis Test); there is a significant improvement in the CTQ Trend after the project.

**Impact of the project**

**Process Impact:**

<table>
<thead>
<tr>
<th></th>
<th>Pre Project</th>
<th>Post Project</th>
</tr>
</thead>
<tbody>
<tr>
<td>VA</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>NVA</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>TAKT Time</td>
<td>6.48 min.</td>
<td>5.54 min.</td>
</tr>
<tr>
<td>Exit Rate</td>
<td>9 per hour</td>
<td>11 per hour</td>
</tr>
<tr>
<td>WIP</td>
<td>11 per hour</td>
<td>12 per hour</td>
</tr>
<tr>
<td>PCE</td>
<td>18%</td>
<td>21%</td>
</tr>
<tr>
<td>Project CTQ</td>
<td>65% (Historical)</td>
<td>86%</td>
</tr>
<tr>
<td>Sigma Score</td>
<td>1.97</td>
<td>2.55</td>
</tr>
</tbody>
</table>

**Impact on Stakeholders:**
**Non-Financial:**
- Post project process efficiency has been improved from 18% to 21%.
- Referred to AMHI cases have been reduced from 5% to 4.3%.
- C-Sat score has been improved from 76 to 80.2
- Process has been improved from 1.97 sigma to 2.55 sigma

**Financial impact on organization**
- Since processing volume improved from 9 to 11 per hour, will yield a discount to AMHI from the TPA has been estimated as *0.4 million.
- Fewer cases will be referred to AMHI, thus less man hour required (better alternate utilization of resources).

**Impact on Customer**
- Operating cost will be reduced since most of the cases settled within 65 minutes.
Financial Impact (Vendor/TPA)
- Capacity utilization improved from 8 cases to 9.2 cases per hour.

Future Prospects: Cashless facility will be linked with smart card for paperless and fast operations.

BARCLAYS

Lean deployment at Barclays shared service

Objective
To carry out Lean Deployment within identified processes in BSS operations, to identify and deliver productivity benefits

Scope
- 1300 FTEs in scope across Barclaycard and Retail banking operations.
- Spread across multiple locations
- Deployment divided into 15 workstreams, across 2 waves Jan’13 – Jul’13

Approach
11 week structured program comprising of 4 phases: prediagnostic, diagnostic, future state design and implementation

Benefits
Realised 17% benefits (combined) from Barclaycard and Retail Banking

RELIANCE GENERAL INSURANCE

Improving Policy Issuance TAT through Innovative Technology

Need for the project
General Insurance industry is a practice based industry. It works on declaration from customer and based on the principle of “utmost good faith”. KYC norms are not strictly followed at Reliance General Insurance Company. Moreover, the industry is highly intermediary driven. Hence seeking correct and complete information from customer first time becomes crucial to service the customer better, beginning with the delivery of his policy document. This is the first experience a customer will go through and form an impression about the company.

At present, RGIC issues close to 2.5 lac retail policies per month. Current policy issuance TAT is more than 10 days. A Customer generally expects his policy to be delivered within 5-6 days. As a result, Policy delivery related complaints were more than 50%. In view of above challenges, it became crucial to transform the process for customer delight.

Direct Sales Team gets an opportunity of directly interact with customer at the time of sale. Hence, it was decided to run this project on pilot basis for DST team and after successful completion, would extend to agents.
As Is Process Study
We have studied the existing process through value stream mapping to identify MUDA. Earlier, sales managers would meet customers and get details filled in a manual Proposal Form cum Covernote. Along with this, the payment would also be collected either in cash or cheque. Additional supporting documents also would be taken from the customer and there after submitted to the branch for policy issuance. Post receipt of the documents, branch service manager would physically verify completeness and accuracy of the Covernote. In case of any discrepancy, same would be returned to the sales team for resolution and resubmission. Also a perpetual problem was covernotes without customer contact details being submitted which were rejected in QC check. In such cases, it would be very difficult to contact customer for discrepancy resolution. This entire process had multiple manual interactions and required lot of rework.

Innovative Process
Through this project, we have implemented a breakthrough innovative solution for policy issuance process which currently only Reliance General Insurance has in Indian general insurance market. We eliminated and combined several process steps with help of technology to deliver policy to 95% of the customers within 5 days. Process cycle efficiency is also increased from 0.35% to 1.66%.

Results:
1. Percentage policies delivered to customers within 5 days has improved from 0% to 95%
2. DST sales manager’s productivity increased from Rs. 8.54 lacs/quarter to Rs. 17.69 lacs/quarter
3. Total Cost savings are Rs. 22.7 Lacs
4. Average premium per quarter increased from 7.27 Cr to 10.82 Cr
5. Rolled throughput yield increased from 84% to 97%
6. Policy delivery related complaints reduced from 56% to 29%
7. Manual covernote utilization reduced from 51% to 9%
8. Customer contactibility increased from 45% to 84%
10. Reduced mis-selling and potential frauds
TATA CONSULTANCY SERVICES

Improve Turnaround time for Airline schedules

TCS BPS is a market leader in back office service operations having presence across globe with 1.4B USD revenue, @52K employee strength and 12% revenue contribution to TCS larger Business. Its business model comprises of diversified Service offerings. Travel, Transport and Hospitality (TTH) is one of the vertical from its 14 different verticals.

In one of the client engagement, TTH BPS offshore team works on Catering Database Management for their airline customers (>100Nos) with 30% market share worldwide. A specialized BPS team works on Airline schedule requests to update food, beverages, food serving items in the client database. This database is in-turn used by Client Kitchens who procure the beverages, food items, prepare menus and load them in the flights which are eventually served to Passengers.

TCS BPS team performance is measured primarily on Turnaround Time (TAT) and Quality. TAT for Schedule request change is 72hrs. Any delay in TAT affects the procurement and production planning at Kitchens and may result in excess Inventory, wastage and loss of perishable items. High pressure on TAT also leads to defects which may result in inapt food service to passengers or sometimes even leading to delay in flights takeoffs. Most of the time offshore team misses its deadline resulting into escalations and customer dissatisfaction. This is building tremendous pressure on team for meeting Targets and further resulted in operations instability in terms of Quality of service, team motivation and attrition.

In January’2013, Lean productivity improvement project initiated to Improve on TAT. Cross functional team was formed involving Subject Matter Expert, Automation Expert and Lean Experts. Objective set for the team is to achieve TAT below 65 Hrs by Mar 2013. Series of Lean tools used to list down improvement ideas. VSM was created to identify VA & NVA’s in the process. Cycle time analysis done and waste, critical steps are categorized into 8 type of wastes. For each type of waste 16 different improvement solutions generated along with SMEs and Automation team. Solutions are prioritized through control impact matrix, out of 16 solutions; it is found that 7 solutions can be implemented after considering all constraints. Detailed action plan prepared to implement these solutions in the process. After case VSM created to check the effect of process improvement. TAT reduced from 92 Hrs to 65.63 Hrs means net improvement observed is of 26.37hrs per cycle, 1055 man hour efforts saving per month.

Cost benefits analysis done at the end. With cost expense of @15000 USD, we are able to book the saving around 109,137 USD per annum. Softer aspect of this improvement follow-on in higher customer satisfaction (appreciation received), Attrition reduced, Higher team moral. Tools developed internally and also borrowed from larger IT team in TCS and implemented across the process.
**PROJECT IDENTIFICATION:** Need for productivity and TAT improvement arises from SLA noncompliance and escalations from customer. There was urgency to relook at the process and streamline the same through process improvement.

**PROBLEM STATEMENT:** The average TAT is 92 Hrs which is higher than customer expectation of 72 Hrs. Delay in scheduling impact procurement and production planning & leads to severe client, customer (airlines) & end customer (passengers) dissonance.

**GOAL STATEMENT:** Reduce the TAT for schedule change request for 92 Hrs to 65 Hrs by Mar 2013

**ROOT CAUSE DIAGNOSTICS:** In January’2013, Lean productivity improvement project initiated to improve on TAT. Cross functional team was formed involving Subject Matter Expert, Automation Expert and Lean Experts. Objective set for the team is to achieve TAT below 65 Hrs by Mar 2013. Series of Lean tools used to list down improvement ideas. VSM was created to identify VA & NVA’s in the process. Cycle time analysis done and waste, critical steps are categorized into 8 type of wastes.

**REMEDIAL ACTIONS:** For each type of waste 16 different improvement solutions generated along with SMEs and Automation team. Solutions are prioritized through control impact matrix, out of 16 solutions; it is found that 7 solutions can be implemented after considering all constraints. Detailed action plan prepared to implement these solutions in the process.

**SOLUTIONS DEPLOYMENT:** Detailed implementation plan prepared & weekly reviews with project team were conducted to ensure smooth implementation and observe the progress of the project. Implementation of the solutions was monitored closely and clear responsibilities were defined for project team members to observe the impact post implementation. After case VSM created to check the effect of process improvement. TAT reduced from 92 Hrs to 65.63 Hrs means net improvement observed is of 26.37hrs per cycle, 1055 man hour efforts saving per month. Process standard deviation decreased from 5.6 to 1.8.

**SUSTENANCE OF GAINS:** Control Plan was put in place clearly defining Measure, Frequency and Responsibility. Control charts were prepared to monitor the performance closely and ensure that the process stays in control.

Team has already replicated some of the solutions in 10 other processes where excel / PDF comparisons are required.

**BENEFITS REALIZED**

**Direct Benefit**
- TAT reduced from 92 hrs to 65.6 hours
- 1055 man hours efforts saving per month aggregated to 6 FTE / $124,137 USD saving to client
- Net saving 109,137 USD per annum after cost benefit analysis from this project
- Standard deviation reduced from 5.6 to 1.8
**Additional Benefit**

- Improvement in TAT SLA
- Reduction in inventory at Kitchens
- Reduction in wastage of perishable good
- Attrition reduced (Before – 32%, After – 17%)
- Solutions replicated to 10 other processes within the domain
- Employee Morale Boost up!

**JOHN DEERE INDIA PVT. LTD**

**Machining Time Reduction for PR component**

For this project LEAN Methodology has been used, where Pareto Chart, VA / NVA study, ECRS, Effort – Impact Matrix, have been used.

**Problem Definition** –
Existing cycle times will not support forecasted demand. In the transmission machine shop, machining centers are utilized for machining of PR & KR models. According to current cycle times, the demand was fulfilled as PR 30 nos per & KR 10 no’s per day. But, with this cycle times it won’t possible to support the future requirement of PR 42 nos & KR 10 Nos.

**Goal Statement**-
So, to meet 42 no's of Daily requirement of PR model, we have to reduce the current cycle time of each component of PR & KR model.

**LEAN Approach**
The LEAN process has 5 stages – Select, Clarify, Organize, Run & Evaluate.
In the **Select** stage, the team prepared a charter, set project goals, and approval from management. The charter was approved by a Certified Black Belt mentor.
In the **Clarify** phase, data related to machining time for all parts was taken on each machining centers. Using Pareto chart, prioritization of the machining time & tools was done. ECRS, VA / NVA tool used to identify the potential solutions. Effort & Impact matrix was prepared to prioritize the potential solutions.
In the **Organize** phase, Failure Mode Effect Analysis was done to find potential causes of failure. Also, we filled PCN ( Process Change Note) for all proposed improvements. This PCN was taken approval by CFT to start the trials.
In the **Run** phase, We have taken trials with improved tools & process to get satisfactory results. Also, we conducted the Cp-Cpk study to ensure process capability with changed tools & process.
In the **Evaluate** Phase, Work instruction sheets were updated and proper training was given to operators regarding new methods & tools. Tool list & Control plan were updated for sustenance of improvement actions.

**Project Benefits**
PR model capacity improved from 30 no’s to 45 no’s and KR model from 10 no’s to 15 no’s.
Other Project Benefits

- Reduced in house manufacturing cost.
- Improved machining center’s utilization

Horizontal deployment

- Can be implemented in Transmission Factory on similar machining centers.

RELIANCE INDUSTRIES LTD.

Reduction of Management of change (MOC) execution “Planned cycle time” reduction

Requirement of Project: It was felt “Planned cycle time” for the Management of Change (MOC) at Jamnagar site is very high and not uniform. Reduction in planned cycle time will result in value realization earlier benefit levels and will reduce the cycle time consumption in MOC execution and help business flexibility.

Baseline: As per the initial samples collected, planned cycle time wide variance noticed and cycle time was having scope of improvement. Due to every MOC unique in its nature there was a need to improve by data study.

Target: To reduce and control the Planned cycle time by 20%.

Approach: Lean Six Sigma methodology of data collection (100 samples taken) was used for Systematic analysis and suggesting a scientific solution of root causes.

Observations: It was observed that major chunk of planned cycle time was consumed in Engineering, Procurement and Execution.

Recommendations: After several brain storming sessions and use of various Six Sigma tools (Box Plot; RPN, FMEA etc.) our team reached on the recommendations mentioned below category wise:

Engineering:

- Change in scheme - Revalidation of scheme
- Elimination of Hard copy of file (SAP System)
- Process and Instrumentation Diagram (Pand ID) with Document change note (DCN) Hard copy sign-off -Digitization of sign-off.
- Delay in Engineering – Single line priority list
- Under Approvals MOCs are being monitoring by top management.
- Material Request for Quotation to PR Raising – Step action plan to be developed to minimize it.

Procurement:

- Delay in Procurement – Mumbai Procurement to Jamnagar Procurement
- Fortnightly review with Procurement
- For Long lead items – PR placement in parallel to engineering.
• Available material in different Project Construction yards: Soft copy approval for declaring availability and non-availability to inform Material Management Centre to release the PR at A7 (Hard copy movement is avoided).

Construction:
• Execution time – In addition to all above recommendations following are:
  • Maintenance managers/Plant Managers have been made as co project managers.
  • Profit improvement opportunity (PIO) – Schedule is made in advanced and being tracked fortnightly.
  • Delay in work permit issue – Formal Confirmation from Operation to be taken prior taking up job.
  • Delay in material issue – Yard wise Material issue note (MIN) is being given- Separate Contractor Lined up.
  • All IBR materials have been checked for original TCs well in advance of material rest of the items are converted to Non-IBR for JGE2 items. Similar Activity for CMC material and MMC JGE1 material – this is to be carried out.
  • Material Inventory of running items – separate approval is taken from Management – PR made and Material under delivery.
  • ARC with cap value to be made available for construction and procurement of selected items to avoid every time PR of small items or known items. SOR Finalization (Schedule of rates)
  • SAP milestones log in for effective tracking - w.r.t. Project Hard benefits –to be included as a part of SAP BT.
  • Contract manpower approval in advance based on rolling plan of Management of Change.

SCOPE INTERNATIONAL PVT. LTD.

Re-engineering of Lending Process

Business Case
Loans Processing Unit (LPU), Chennai supports the end to end processing and book keeping of loans disbursed to Wholesale Banking clients of Standard Chartered Group cutting across different business portfolios spread over numerous business booking locations. The complexity of loans handled by LPU ranges from simple bilateral loans to complex turnkey project funding loans.

Project Objective
Re-engineer LPU process to reduce complexity and there by improve efficiency and customer experience
1. Standardization across markets
2. Breaking Country Silos
3. Elimination of paper based processing by introducing electronic work flow systems.

Project overview
A review of the existing process highlighted scope for re-engineering on the following aspects.
• Standardization of process across booking locations
• Moving away from country silos into process based organization
• Elimination of paper based processing by introducing electronic work flow systems which would result in reduction of operational cost, allow flexibility in operation and improve stakeholder satisfaction

**Result**

Standardization Index improved from 58% to 80% resulting into reduction of Errors/ Risk

- Reduction in Idle time due to cross training which enabled staff to work for all markets.
- Queries are responded to customers and country within the agreed TAT
- Productivity improvement by 5% resulting into a cost save of USD 62,500

**Improvements made in the process**

Complexity in the existing process was effectively reduced by

- Process Standardization across markets for identified key 60 parameters
- Cross training across markets and creation of 3 different Process verticals breaking country silos
- Elimination of few manual processes
DFSS
HCL

NI Roster Rollout

Abstract:
HCL’s Northern Island Belfast center is one of the BPO’s locations where approx. 250 employees (both full time and part time) are presently taking care of all the associated businesses. WFM team manages all the rostering, staffing for HCL NI and HCL NI was paying approx. GBP 2K monthly (AMC) to Open Wave Firm for using their applications which included shift track for staffing, scheduling & marking leaves to the employees. HCL NI had hired an employee specifically to maintain this application. However, the application had lot of constraints in respect to altering the shift timings, shift intervals.

Requirements
The management was looking for avoiding this cost by rolling out Online Roster which has to be customized as per following NI requirements:

a. Provision to mark more than two week offs in a week while uploading roster in upload roster functionality, for NI employees.
b. Interface required to update more than two week offs for NI employees, also for manual entry purpose.
c. Allow less than 4 hrs. Shift for NI employees.
d. Provide 15 minutes shift interval for NI employees.
e. Removal of general cab instructions option for NI employees.

Solutioning
### Cost Benefit Analysis after Implementation:

<table>
<thead>
<tr>
<th>Particulars</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maintenance Charge for Shift Track Application</td>
<td>GBP 2K monthly (AMC)</td>
</tr>
<tr>
<td></td>
<td>24K GBP per Annum</td>
</tr>
<tr>
<td>After rollout, cost will be saved related to the employee who is maintaining</td>
<td>18K GBP per Annum</td>
</tr>
<tr>
<td>the Shift Track application at NI Location</td>
<td>$ 65,171 (GBP 42K)</td>
</tr>
</tbody>
</table>

**BHARAT ELECTRONICS LTD.**

**Design Improvement of Array Interface card of BSU for LR/TLR/WLR**

**Voice Of Customer:** Design (H/W & S/W) of Card addressing obsolesce for FPGA to achieve long term product support & extra resources for 3msec dwell time BSU.

**Target of case study:** Cost optimization by 50%
**Business Case:** The Troop Level Radar is Multi-functional Phased Array Radar which is a primary sensor element at the combat flight level for the surface to air missile **Akash Weapon System.** TLR antenna is a phased array & beam is electronically steered using Beam Steering Unit (BSU). BSU has 5 nos. of Array Interface Cards (AIC) in which main controller FPGA had become obsolete. The new card development was undertaken with new FPGA for long term support, cost optimization & extra resources for 3msec dwell time BSU. New Beam steering less than 3msec(2.5 msec) is achieved, BSU with 2.5 msec dwell time gives 400 beam positions/sec to perform the desired radar functions of target capability as (also derive advantages of waveform agility) required in TLR.

**PROJECT WORK:** Project was taken under DFSS (Design for Six Sigma) as the existing product is not meeting our requirements because of obscelence and less resources.

1. **Define:** Concept development was done under the head based on Customer requirements, critical customer requirements Technological capabilities understanding. Following methods Voice of Customer, SIPOC, Process MAP. CTQ, QFD, KANO diagram were used to brainstorm, validate the needs & requirements of the customer of the process targeted for improvement.

2. **Measure:** Data was collected in this phase cost and Tools used were Pareto Chart to identify which are the items falling under 80/20 ratio (FPGA, PCB, EPROMS etc.). Normality test done, Cpk was calculated for BSU (USL=3msec, mean = 4.8msec approx) indicated that mean shift from 4.8 to 3.0 msec is to be done.

3. **Analyze:** This phase of the project helped to understand the root cause analysis where it was brainstormed to find all the possible causes, narrowing down the final causes for high cost of card & increased timings of BSU. Process analysis was carried out to find exactly how well or poorly the processes are working, compared to what’s possible and to find out where the greatest inefficiencies/causes exist. Use of measured data for Cost & timings to discern patterns and other factors approving the problems were found out with the help of Fish-Bone(Cause & Effect diagram), C-N-X diagram.

4. **Design:** Taking in consideration the analysis the new design of the card was done considering cost, improved reliability and timings improvements. Detailed design alternatives, selecting the best, evaluation in terms of failure resistance, predicted capability and impact on customers’ requirements. Tools used Compilers, Schematic developers and cross compilers, Thermal & Signal Integrity.

5. **Verify:** verification is a phase in which we have checked all cost parameters, timings improvements are working as per requirement, producing desired output results. It involved the testing, documentation and monitoring to achieve desired results.

**Conclusion:** New card design was produced having 30% cost saving (Rs 0.55 Lacs/Card) producing overall cost benefit of 300 lacs. Timing was achieved better than the requirement( 2.5 msec as compared to 3msec)BSU with 2.5 msec dwell time gives 400 beam positions/sec to perform the desired radar functions surveillance of 10 targets, tracking of 10 targets & guidance of 8 missiles towards 4 targets simultaneously of target, capability as required in TLR.
SUPPLY CHAIN AND LOGISTICS

HCL TECHNOLOGIES

Cleansing of Monthly Accrual Report for REMY Account – IND Station (Logistics)

Client is one of the global logistics company. It provides solutions in freight management, contract logistics, and distribution & transportation management. The company runs a global network with facilities in over 170 countries and employs 46,000 people worldwide. HCL provides back office support for Client and caters to Rating & Billing and Customer Service Activity. Under Rating & Billing - HCL rates the shipment document against the applicable Tariff/Service Level and bills the customer for the contracted charges and includes variable charges for movement of shipment from Origin Station till Destination point.

1. Monthly Accrual Report performed for REMY Account in IND Station needs to be cleansed in terms of accuracy of data presented as amount accrued is more than the estimated actual figures.
2. This report includes Total Amount invoiced by Client + Estimated shipped but not billed amount LESS Total Payment received by Client.
3. Currently this report needs to be reconciled against the Invoiced billed V Invoices Paid and Estimated Charges V Invoices Billed. This report includes of more than 3000 line items on an average.

Goal Statement:
To reduce the current accrued amount of $ 1.39 M (June’12) to less than a $1 Million by the end of October-2012

<table>
<thead>
<tr>
<th>ACCRUAL MONTH</th>
<th>PERIOD</th>
<th>ACCRUAL AMOUNT (IN MILLIONS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan’12</td>
<td>1st-31st Dec’11</td>
<td>$0.89</td>
</tr>
<tr>
<td>Feb’12</td>
<td>1st-28th Jan’12</td>
<td>$0.86</td>
</tr>
<tr>
<td>Mar’12</td>
<td>1st-29th Feb’12</td>
<td>$0.81</td>
</tr>
<tr>
<td>Apr’12</td>
<td>1st-30th Mar’12</td>
<td>$1.24</td>
</tr>
<tr>
<td>May’12</td>
<td>1st-30th Apr’12</td>
<td>$1.36</td>
</tr>
<tr>
<td>Jun’12</td>
<td>1st-30th May’12</td>
<td>$1.30</td>
</tr>
</tbody>
</table>

HCL delivers May’12 Accrual Statements
### Verification of Potential X’s

<table>
<thead>
<tr>
<th>X’s</th>
<th>Potential Causes</th>
<th>Action Plan</th>
<th>Benefits</th>
<th>Contributors</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Follow-up not done with Customer for invoices closure</td>
<td>Communication with origin station on Billing</td>
<td>Past Due invoices and current payments will be done on time</td>
<td>Thangaraj Justin A</td>
</tr>
<tr>
<td>2</td>
<td>Discrepancy in billed invoices to paid invoices</td>
<td>Follow up on documents with origin/station and Billing Team</td>
<td>Accuracy in billing and audit thus reducing the past due and balance due invoices</td>
<td>Srikant Palanati</td>
</tr>
<tr>
<td>3</td>
<td>Lack of Remittance details</td>
<td>Constant Reminders for Remittance Report which is delivered on every Wednesday</td>
<td>Able to have then information on what invoice going in to due bucket and have it cleared</td>
<td>Satish R Pillai</td>
</tr>
<tr>
<td>4</td>
<td>Invoice corrections not done by station on time</td>
<td>Escalation Matrix followed for Billing correction not done</td>
<td>Realize the amount faster with right amount be invoiced to customer</td>
<td>Thangaraj Justin A</td>
</tr>
<tr>
<td>5</td>
<td>Lack of Communication between Collection /FPC/Station</td>
<td>Pasty due/Amount not realized Communication done by HCL/Station and Collection team</td>
<td>Streamlining of the Accrual to match the AR balance</td>
<td>Thangaraj Justin A</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>X’s</th>
<th>Potential Causes</th>
<th>Action Plan</th>
<th>Benefits</th>
<th>Contributors</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>Follow-up on balance Due for closure Not done</td>
<td>Past due/Amount not realized Communication done by HCL/Station and Collection team</td>
<td>Reduce the invoices count in the balance due bucket</td>
<td>Thangaraj Justin A</td>
</tr>
<tr>
<td>7</td>
<td>Reconcile Expensed Vs Billed not done</td>
<td>Follow up on the documents with Billing Teams, auditing with tariff and delivery of invoice once more for payment</td>
<td>Balance the Accrual amount with the AR balance</td>
<td>Rajesh Siva</td>
</tr>
<tr>
<td>8</td>
<td>Shipments Not Billed to REMY</td>
<td>Tracking of shipments to find the genuinely and updating POD status for Billing to commence</td>
<td>To have a control on the expenses incurred in the shipment processing for the account</td>
<td>Rajesh Siva</td>
</tr>
<tr>
<td>9</td>
<td>Missing documents for Entry packet</td>
<td>Audit and Follow up for the documents and resubmission of entry packets to the FPC</td>
<td>Timely realizing of the Remittance amount</td>
<td>Thangaraj Justin A</td>
</tr>
<tr>
<td>10</td>
<td>Invoice not audited against Tariff</td>
<td>Follow up with Station /Origin and collection team for the invoices and auditing with tariff that was available for that period</td>
<td>Reduce past due/Balance due bucket</td>
<td>Satish R Pillai</td>
</tr>
</tbody>
</table>
### Control Plan

<table>
<thead>
<tr>
<th>S.No</th>
<th>Control Point</th>
<th>Specification</th>
<th>Unit</th>
<th>How to Measure?</th>
<th>Who will Do?</th>
<th>Reaction Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Verification of Remittance Amount</td>
<td>Reconcile Involved to Remittance Table against the payment.</td>
<td>$Value</td>
<td>Checking the total remitted amount against the invoiced amount.</td>
<td>Justin A Thangaraj</td>
<td>Escalate to IND Station copying to RMPY INC.</td>
</tr>
<tr>
<td>2</td>
<td>Verification of Expenses</td>
<td>Reconcile expenses from Estimated to Remittance Table.</td>
<td>$Value</td>
<td>Cross checking every invoice against billed invoices</td>
<td>Rajesh Siva</td>
<td>Escalate to IND Station,copying IND station</td>
</tr>
<tr>
<td>3</td>
<td>Billed Amount</td>
<td>Consider the concept of Collect and Prepare during the audit of each invoice.</td>
<td>$Value</td>
<td>Refer and Audit the accurate shipment documents</td>
<td>Srikant Palanati / Rajesh Siva</td>
<td>Escalate to Billing team,copying IND station</td>
</tr>
<tr>
<td>4</td>
<td>Billing Match</td>
<td>Current Tariff to be verified before invoices delivered.</td>
<td>$Value</td>
<td>Refer and Audit the accurate shipment documents</td>
<td>Srikant Palanati</td>
<td>Escalate to Billing team,copying IND station</td>
</tr>
<tr>
<td>5</td>
<td>Past due bucket &gt; 60 days</td>
<td>Constant follow-up</td>
<td>$Value and # Count</td>
<td>Cross checking during weekly expenses and billing statement report generation.</td>
<td>Saktish R Pillai / Justin A Thangaraj</td>
<td>Escalate to IND Station and Collections Team (Accenture)</td>
</tr>
<tr>
<td>6</td>
<td>Verify AR Balance with Final Accrual Amount</td>
<td>Accrual amount to be checked with AR Balance.</td>
<td>$Value</td>
<td>Cross verifying is done for accuracy of accrual report</td>
<td>Saktish R Pillai</td>
<td>Escalate to IND Station and Collections Team (Accenture)</td>
</tr>
</tbody>
</table>

### End Results

![Graph showing accrual amount in millions](image)

### TATA CONSULTANCY SERVICES

**Spent Analytics - Fuel Card Cost reduction (Logistics)**

Tata Consultancy services has partnered with leading UK based utility company for supporting their financial shared services. The scope of shared services includes Finance and Accounting, Human Resource and Supply Chain Management. One of the areas in Supply chain management is where TCS provides operational support is on fuel card administration process. The objective of the fuel card process is to provide seamless operational ability and administration of fuel cards issued to service engineers operating at customer site. The service engineers cater to multiple customer services which include customer complaints and handling emergency gas and electricity leakage across various locations in UK. TCS manages the end to end administration activities for this fuel card which includes issue of fuel card, amendment, cancellation, Management information reporting and audit reviews.
The Fuel card process has got a criticality of on-time delivery with accuracy as one of the key measures. Any process measure deviation would result in a greater impact towards company’s goodwill as fuel card key measures are governed by GSOP (Guaranteed Standard of Performance) standards. The business is also regulated under OFGEM (Office of Gas and Electricity Markets) driven by GSOP and any non-compliance on GSOP to these critical points of service would result in penalty and revenue loss.

Our customer’s footprint spans all over the UK and some parts of Scotland areas. Year on Year millions of liters of fuel is consumed to fuel all the fleet vehicles and to address customer queries at various locations. Areas with minimal customer traffic have been outsourced to alliance and coalition partners who execute operations on behalf of our customer. These alliance and coalition partners were charging 6% – 7.5% of management fees towards fuel card administration activity. E.g. if the fuel cost is £100,000 alliance partners would charge £107,500.

Customer’s global procurement team have identified this cost saving opportunity on management fee and price per liter (PPL) and proposed to partner with TCS. The scope of this project includes providing fuel card management activity for all the alliance and coalition vehicles along with their fleet.

TCS used the LEAN improvement methodology to map the end to end activities of the fuel card process covering the order to delivery cycle. In this process, TCS in collaboration with the customer identified challenges in the value chain, where overall delivery period for Fuel card from order to dispatch to the requestor is currently 7 working days.

The Alliance Partners fuel card processes to receive the card in 4 working days. As there was a mismatch in the number of days to issue the fuel card between the customer and alliance partner, there was a strong business case for initiating this improvement project. There is a potential revenue loss due to fuel card administration cost to an extent of GBP 100k annually across all partners and hence this project has greater significance to reduce the customer spent on fuel card. The criticality of this project timeline was that it had to be done less than 4 weeks, as otherwise the next contract renewal will get expired with alliance partners.

**Project Identification:**
Fuel cards team is responsible for prompt and timely closure of fuel card request raised by business units.

With current model - the overall TAT for card delivery is 7 days. For the new “Buys” (Fuel card outsourcing) project which is to be implemented from April 2012 as per expectation of the End customers, there is a need to reduce the TAT to 4 days. Reducing the TAT of card process activity would increase the credibility of our customer with alliance partners, else creating dissatisfaction among partners and also might result in not winning the project. By implementing the fuel card admin activity for alliance and coalition partners our customer would save 6 to 7.5% of management fees levied on the fuel card every month. The project was done in collaboration with customer at the customer premises.

**Goal Statement:**
- To Reduce Turn Around Time of Fuel Card process from **7Days to 4Days by end of Apr’12.**
**Adopted Methodology:**
Cross functional team comprising of SME, Global procurement contract manager and fuel card provider was formed for brainstorming to identify the possible causes along with detailed process map. Then we have built the VSM (Value Stream Mapping) in order to identify the value added, Non value added & operationally value added activities.

**Solutions Deployment:**
Detailed implementation plan prepared & weekly reviews with project team were conducted to ensure smooth implementation and observe the progress of the project. Implementation of the solutions was monitored closely and clear responsibilities were defined for project team members to observe the impact post implementation. Dedicated SPOC’s were setup to address alliance partner’s queries.

**Sustenance of Gains**
Control Plan was put in place clearly defining Measure, Frequency and Responsibility. Control charts were prepared to monitor the performance closely and ensure that the process stays in control.

**BENEFITS REALIZED**

**Tangible**
- Savings of GBP £308,000 /- per annum for the client.
  - Removal of the management Fee (linked to total fuel spend) £218K
  - PPL (pence per liter) discount saving through contract leverage £89K

**Intangible**
- Fuel consumption has reduced From 4.82 M liters to 2.78 M liters, which is 42% reduction

TCS team, through this project, created value through quality data delivery and delivered experience certainty to Customers.

**HCL TECHNOLOGIES**

**Billing revenue improvement (Supply chain)**

**Business Case**
- Client is one of the leading Computer Hard Disk manufacturers. Client-HCL engagement is for the warranty operations support. The Hard Disk Goods Received quantity has to be increased in order to benefit the Billing Revenue as HCL bills the client on the no: of successful Hard Drives received.
- For warranty replacement customers raises RMA ticket (Return Material Authorization) in order to get the replacement.
- HCL bills the client on the no: of Hard Drives received physically and not on the no: of RMA tickets raised.
In order to Increase the goods received rate, HCL started to implement an approach which is so called as the “Golden Approach” which will increase the GR rate benefiting in increased billing to the client and also gaining immense customer satisfaction

**Project Y: Total no: of drives received / Total number of RMA’s created**

<table>
<thead>
<tr>
<th>Months</th>
<th>% of drives received which contributes to the billing % to the client</th>
</tr>
</thead>
<tbody>
<tr>
<td>May’12</td>
<td>85%</td>
</tr>
<tr>
<td>Jun’12</td>
<td>88%</td>
</tr>
<tr>
<td>July’12</td>
<td>83%</td>
</tr>
</tbody>
</table>

**Problem Statement**
- The No: of successful Hard Drives received contributes to the billing amount to the client. HCL bills the client on transaction basis (only on the no: of Hard Drives received physically and not on the no: of RMA tickets created) Those Hard Drives not received will fail to meet the billing to the client.

**Goal Statement**
- To increase, from the current Average billing from 85% up to 100%

**Golden Approach**

- Pending GR drives report is being generated on a daily basis.
- Dedicated resources have been assigned to perform certain tasks to ensure defective drives are being returned.
- By Coordinating with the DOL/DCP to approve/GR physically received drives on the system
- By Constantly following up with customer to return the defective drives, providing them information where and how to return their drives.
- Sending SMS to customers about their pending drives
- Arranging bulk pick-ups.
- Sending the DOL/DCP address to the customers via email
- Sending the long pending reports of those customers to there respective regional RM’s
- Informing the customers to submit the drives directly to the DOL/DCP instead of submitting it to the dealers as the dealers take a long time to submit the drive to the DOL/DCP.
Results after the implementation of the Golden Approach is seen below (Increase in GR% rate)

GR trend summary before & after the project

Graphical presentation of revenue trend
Tata Motors Ltd.

To Eliminate LPT 909 Spring Sagging Complaints (Supply chain)

This project depicts Tata Motors commitment for addressing issues proactively and involving, parenting its suppliers towards achieving customer excite.

Suspension all along is treated C category. Commercial vehicle customers remove OE fitment and add leaves to cater to overloading conditions.

Tata Motors team proactively visited field and addressed issue of spring sagging which was not of any time highlighted issue from any warranty data. Team aggressively took target of resolving the issue within 2 months with adequate Intermediate correction in the field as well as in-house.

The sagging issue was addressed through DMAIC methodology at Supplier end and supplier has been brought up from Raw stage to one of the data oriented, process cautious supplier. Actions
initiated by identifying potential causes, screening the causes using statistical tools and implementing corrective actions.

Effectiveness is monitored for more than 8 months by keeping in touch with dealer and customer. The modified spring was fitted on the same customer vehicle and the issue was eliminated completely.

**Tata consultancy services**

**Supply Chain Cost Reduction for Coatings business in APAC (Supply chain)**

TCS has strong capabilities in manufacturing domain and has a specialized team for strategic supply chain consulting. The key differentiators and capabilities in supply chain are Sourcing and Network optimization, Warehouse optimization and Strategic Inventory planning and management through simulation and Implementation cost & time reduction through Onsite-Offshore model.

The client is one of the largest chemical companies in the world with operations spread across all the continents and businesses in Energy & Feedstock, Bulk & Specialty Chemicals, Plastics, and Agro-Sciences products. Consistently regarded as a leader in its category by AMR Supply Chain Research, the client has been able to exceed customer expectations through its demand driven supply chain network. A multi-billion dollar chemical company, the client’s primary focus has been to enhance its Supply Chain to consistently achieve customer satisfaction. The company plans to invest for strategic growth in Asia Pacific region and compete as a local supplier for coatings material by establishing a manufacturing presence. The company strives to achieve an optimum balance between cost, service levels and market participation through changes to business models to accommodate the growth initiative.

Business has planned expansion in APAC region in line with its growth objectives with emphasis on capturing market share and first mover advantage in the emerging markets of China and SE Asia. Currently 13 plants are operational in Asia and 3 more are coming on-stream by Q4 2011. The additional plants coming on-stream are expected to bring in new dynamics in the existing supply chain and lead to sub-optimality. Network optimization is key to ensure product availability to customers and gaining market share while sustaining the low cost of supply chain.

In line with the company’s vision & goal for strategic growth, every business needs to reduce their supply chain cost on annual basis. Cost of supply chain for the baseline period (Jan ’10 to Dec’ 10) exceeded the budgeted cost of $ 280 Million by $ 1 Million and was not matching with the business goal of $0.89/KG unit supply cost. A Six Sigma project was undertaken to identify the causes of high supply chain cost and thereafter, apply the findings to the business model for improvement in their operational performance. The goal statement was decided as Reduction of cost of supply chain for Coating business in APAC by from $0.90/KG to $ 0.89/KG thereby achieving savings of $ 1 Million by Dec 2011.

A series of quality tools and methods were used to carry out this project using the DMAIC methodology. As-Is process map was reviewed with brainstorming in detail to identify potential opportunities for cost reduction through process improvement and through further process analysis
and statistical tools, the contributing factors for high supply chain cost were identified. A network design model was developed in a third party software and the findings from the six sigma study were incorporated to propose a robust supply chain that is balanced in terms of cost and service level. The model proposed the optimal supply chain network and optimization of supply chain cost resulting in savings of $ 2.6 Million.

The overall cost to the business with the service level requirements was quantified and changes to the business models were proposed. Annual savings of $ 1.2 Million upon implementation were verified by the client, thereby exceeding the project goal. The successful completion of this project helped in building pipeline for similar projects for other business for TCS.

**Project Identification:**
Cost of supply chain for the baseline period (Jan ’10 to Dec’ 10) exceeded the budgeted cost of $ 280 Million by $ 1 Million and is not matching with the business goal of $0.89/KG unit supply cost. There is scope for improvement.

**Goal Statement:**
Reduce cost of supply chain for Coating business in APAC by from $0.90/KG to $ 0.89/KG thereby achieving savings of $ 1 Million by Dec 2011

**Adopted Methodology:**
Cross functional team comprising of Operations, Supply Chain consultants, and Process Excellence was formed for brainstorming to identify the possible causes of high supply cost of the coatings business. Detailed process mapping was done to understand the end to end process in detail. Fishbone Diagram and IPO metrics were used to identify all possible causes. C & E matrix was created to screen the root causes. FMEA was done and action plan was put in place for the top failure modes to bring down the possibility of occurrence. The shortlisted Xs were validated through hypothesis testing to obtain the root causes. A network design model was developed in a third party software and the findings from the six sigma study were incorporated to propose a robust supply chain that is balanced in terms of cost and service level. The model proposed the optimal supply chain network and optimization of supply chain cost resulting in savings of $ 2.6 Million. The overall cost to the business with the service level requirements was quantified and changes to the business models were proposed. Annual savings of $ 1.2 Million upon implementation were verified by the client, that exceed the project goal. Sign off was obtained by the client and the project was leveraged for similar activities for other businesses.

**Solutions Deployment**
TCS proposed the network optimization solution and a detailed implementation plan through a structured approach deploying statistical analysis in addition to extensive stakeholders’ participation from cross-functional teams. Periodic review meetings were conducted to monitor the changes made in the business model and clear responsibilities were defined for project team members to observe the impact post implementation and quantify the realised savings subsequently.
**Sustenance of Gains**
Control Plan was put in place clearly defining Measure, Frequency and Responsibility. Control charts were prepared to monitor the performance closely and ensure that the process stays in control.

**Benefits Realized**
Tangible
Supply Chain Cost reduction by $1.2 Million annually
Intangible
Opportunity creation for more high value projects as client’s confidence with TCS got stronger.