OCTOBER

AAROHAN 15

NOT FOR SALE

Lean and Six Sigma Excellence Awards

DFSS –MANUFACTURING, SERVICES AND SUPPORT

DMAIC –SERVICES AND SUPPORT

LEAN SUPPLY CHAIN

DMAIC – MANUFACTURING

Difficult times disrupt your conventional ways of thinking and push you to forge better habits of thought, performance and being.

-Robin S. Sharma

Partners

Fenner J.K. Fenner (India) Ltd.

Minitab QUALITY. ANALYSIS. RESULTS.

ADAIMAP

OYO ROOMS

sixsigma.scmhrd.edu

THE EVENT

FACULTY ADVISOR

Abhijeet Bhagwat,
Assistant Professor

TEAM MEMBERS

Senior Team

Akshat Goel
Chinmay Mittal
Dhaval Malhotra
Heena Gampawar
Mohit Lakhotia
Sneha DS
Vikram Sakhuja
V Murali

Junior Team

Anjali Thomas
Arushi Agarwal
Mahesh Pawar
Pearl Garg
Rishikesh D.
Syam Menon
Shruti Dixit
Shubhendu S

The 'Lean and Six Sigma Excellence Awards' is an effort from SCMHRD to recognize and honor those Corporates who strive 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 to the Corporates for participation. 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 are then 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 eleventh 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, 2015'.

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 endeavors.

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, 2015'.

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 endeavors.

Best Wishes,
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 2015' 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 who is 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 International University

Welcome to SCMHRD 'Lean and Six Sigma Excellence Awards, 2015'.

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 endeavor 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,
Dr. Pratima Sheorey,
Director,
SCMHRD

CONTENT

- *DMAIC –Manufacturing*

WIPRO CONSUMER CARE ….....11

(Increase Distilled Fatty Acid TPD in Fatty acid Plant)

RELIANCE INDUSTRIES LIMITED 14

(Resolution of chronic Dyeability problem and lower Tensile Properties in PSF from Draw Machine #2

SKF TECHNOLOGIES (INDIA) PVT LTD ….....16

(Stabilise in house macro phosphating issues using design of experiments)

RELIANCE IND LTD POLYSTER DIV 18

(To increase the R3s Production rate in PSF -2 Plant.)

HOERBIER INDIA SERIAL TECHNOLOGY ….....20

(Elimination of customer complaint in Electrohousing)

TRACTORS AND FARM EQUIPMENT LIMITED….....21

(Electro Deposition Paint & Pre Treatment Chemical Consumption Reduction)

J. K. FENNER ……..24

(Reduction of Internal product rejection in Elastic Belt)

LARSEN & TURBO ……..25

(To reduce customer complaints of MCB de-latching)

WIPRO CONSUMER CARE ……..26

(Reduction in ST-20 Boiler Furnace Oil Consumption)

BHARAT ELECTRONICS LIMITED……28

(Cycle time reduction in testing of LNA block for Central Acquisition Radar (CAR) project)

- *DMAIC -Services and Support*

TATA CONSULTANCY SERVICES ……30

(Reduction Of Billed Receivables for SEANAP)

TATA CONSULTANCY SERVICES……32

(Improve Cure Rate in Credit Card Collections)

WIPRO INFOTECH ……35

(To improve SIM details upload processing time)

WIPRO TECHNOLOGIES. ……37

(MTRS Reduction)

WIPRO TECHNOLOGIES……38

(Incident Volume Reduction)

WIPRO TECHNOLOGIES……39

(Productivity Improvement in IT Services)

INDUS TOWERS LIMITED……40

(Improvement of DG MTBF)

INFOSYS BPO LIMITED……43

(Reduction of TAT for SOCRATES Study)

DFSS

BHARAT ELECTRONICS LIMITED…..45

(Design Of Advanced CDU Subsystem For ALNS)

SKF TECHNOLOGIES (INDIA) PVT LTD 50

(Optimize the pushout force of 70113 seal)

LEAN

MADURA CLOTHING.....51

(Efficiency Improvement in Jacket Manufacturing Line)

TATA CONSULTANCY SERVICES.....53

(Reducing Cycle Time in a Service Fulfilment Process)

WIPRO CONSUMER CARE AND LIGHTING……..55

(Improve Luminaire productivity by 40%)

TATA CONCULTANCY SERVICES…..58

(Reduction In Processing Time In Providing Analytical Business Insights)

WIPRO LIMITED…….60

(Applying Lean for Optimizing Software Implementation Cut-over Time)

CGI INFORMATION SYSTEMS AND MANAGEMENT CONSULTANTS PVT LTD.....62

(Infrastructure Prognosis)

WIPRO BPS.....64

(Improving Provider Contract Data Management Efficacy – Onyx and PVO Robotics)

J.K. FENNER INDIA LIMITED.....68

(Enhancing Contribution of Grease Seals)

DMAIC MANUFACTURING

Wipro Consumer Care

INCREASE DISTILLED FATTY ACID(DFA) PRODUCTIVITY IN FATTY ACID

INTRODUCTION

The company was incorporated on 29 December 1945, as 'Western India Vegetable Products Limited', later abbreviated to 'Wipro'. The year 1980 marked the arrival of Wipro in the IT domain. In 1988, Wipro diversified its product line into heavy-duty industrial cylinders and mobile hydraulic cylinders.

Wipro Consumer Care and Lighting (WCCLG), a business unit of Wipro Limited operates in the FMCG segment offering a wide range of consumable commodities. Established in 1945, the first product to be introduced by WCCLG was vegetable oil, later popularised under the brand name "Sunflower Vanaspati". It offers personal care products, such as Wipro Baby Soft and Wipro Safewash, toilet soaps like Santoor and Chandrika as well as international brands like Yardley Its portfolio of lighting solutions includes products like Smartlite CFL, LED, emergency lights and more.

Through its customer-centric products and acquisitions, Wipro Consumer Care and Lighting has become a fast-growing company in the FMCG segment.

OBJECTIVE AND APPROACH

Voice of Customer (VOC) (Customer-Soap Noodle making section is within location) –

Soap noodle production capacity is 200 MT per day on continuous basis. For making soap noodles Distilled Fatty acid mix is major ingredient (77%). Needs 142 MT DFA from Fatty Acid Plant

Current DFA TPD is 134 MT.

We are not able to fulfil the customer requirement and loss in location profitability.

Set the target to achieve 150 MT per day Distilled Fatty Acid in Fatty Acid Plant

DEFINE PHASE

Project has been initiated in April 2015.Historical Data on the DFA production was collected for a period of Jan'14 to March 14 and the Compliance against the target of 150 TPD was measured.

Define,

Business CTQ- Increase location profitability.

Customer CTQ- No stoppages of noodle plant due to shortfall of DFA

Internal/Project CTQ-Improve production of DFA and Improve equipment efficiency

Project Scope: Project scope starts at the receipt of oil from MADD and ends at pumping of DFA to soap noodle section storage tanks.

Outside scope: Plant startup and closer, Plant operation less than one shift (8 hrs), trials to improve productivity , Planned stoppages

MEASURE PHASE

Operational Definition: Defined the operational definition which includes extraction of data, type of data, frequency of data and unit of measurements of DFA.

Measurement System Validation: Material is in liquid states. Flow of material is measured by mass flow meter. Data transfer to SCADA of DCS system and displayed on monitor. It gives continuously calibrated reading in monitor and hence no need of GRR study.

Justification of achievements: Needs 15 samples to justify the achievements

ANALYSIS PHASE

Process baseline and improved target tested by one sample t test and observed that the project target is significant.

Root causes: Team has done brainstorming for finding out causes of low DFA TPD and from many factors selected 9 vital factors. Out of nine vital factors team arrived four significant factors by applying regression tool.

C-2 is main distillation column from where DFA take it as a product.	
X1 C-2 vacuum	C-2 vacuum required to extract DFA from CFA.
X2 C-2 Bed vacuum-	Restrict vapors to flow for condensation.
X3 DFA temp-	DFA temp is critical to prevent the oxidation of DFA.
X4 CFA feed rate	Crude Fatty Acid quantity and quality is critical to maximize the DFA productivity

From Main effect factor and counter plot it has been observed that C-2 bottom temp was also one of the significant factors for DFA production (X5). Out of five factors, three factors are from distillation column C-2 where we feed the CFA and take out DFA as products.

Team decided to carry DOE on three factors of distillation for optimisation and getting new targets for increasing DFA TPD.

IMPROVE PHASE:

Team started implementation work of all five factors

X1- C-2 top vacuum- Vacuum was affected by 6 variables. Team decided to done failure Mode Effect Analysis (FMEA) and arrived on RPN. The analysis are based on what is easy/ difficult , Inhouse/outside variables for implementation and those are easy/in-house variable made SOP/alrames and tose are difficult to implements worked on it in details.

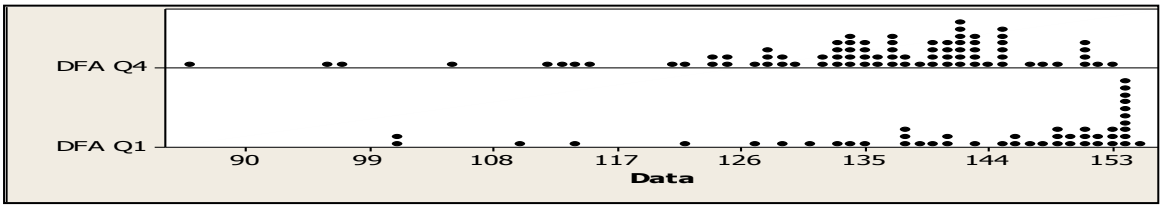
C-2 top vacuum reduced from 0.48 to 0.16 mbar

C-2 vacuum across the packing bed reduced from 6.45 to 4.94 mbar

Achieved better quality of DFA by reducing DFA dropping temp from 67.2 to 60.8 deg C

CFA feed improved 12 MT per day

DFA Productivity in MT:

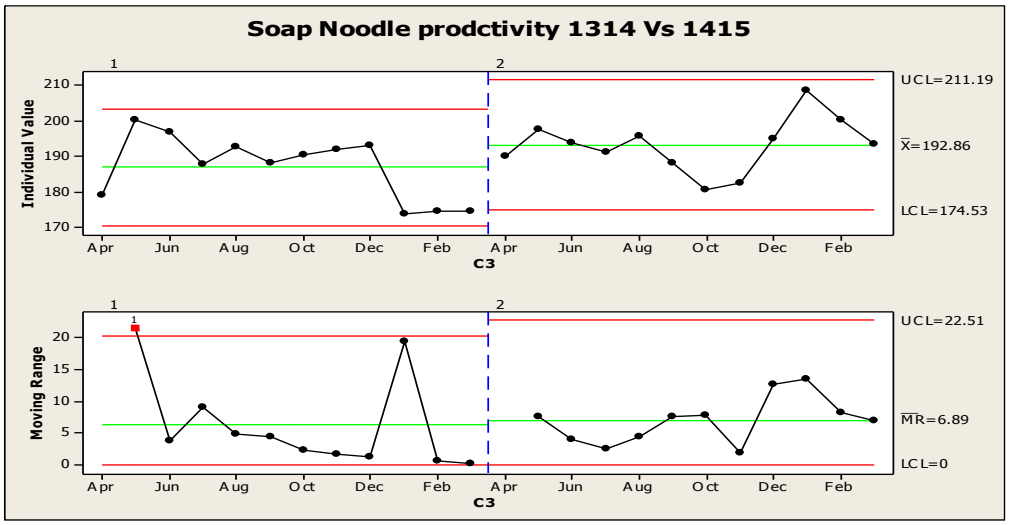


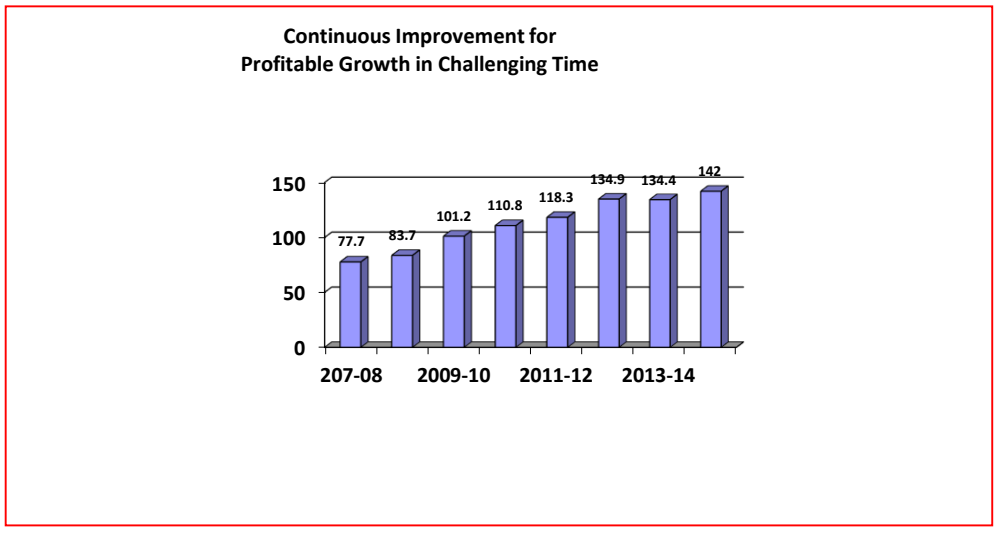
CONTROL PHASE:

- ✓ Doing process audit in each shift to check variation in process and equipments.
- ✓ Provided alarms and color coding to process parameters.
- ✓ Introduce excel made digital card for preventive maintenance schedule dates

PROJECT BENEFITS -Saving INR 30.3 Mn from Distillation and 15 Mn from Soap making section

Costumer productivity-Soap Noodle increased from 186.7 Mt to 192.8 MT





Reliance Industries Limited

Resolution of chronic Dyeability problem and lower Tensile Properties in PSF from Draw Machine #2

Polyester Staple Fibre (PSF) is a synthetic Man Made Fibre. Pure Terepthalic Acid (PTA) and MEG through polymerization reaction form Poly Ethylene Terephthalate (Polyester Polymer). This Polymer through spinning and Drawing process converted to Fibre. The Cut Fibre in Bale form supplied to external customers (Textile Mills) where it is further processed to convert into yarn. The yarn is used to manufacture fabrics.

There was a critical problem of Patchy Dyeing at Customer and also at Customer's Customer end frequently with products produced on Draw Machine #2 in spite sufficient segregation of material on account of dye variation during production and testing. The segregated material is being sold in different merge on cheaper rate. This was direct loss to business. Further Tensile Strength (Tenacity) of PSF Products from Draw Machine#2 was also around 6.21 gram per denier (GPD) on an average, which was lower than the Customers' expectations as they were not getting the desired yarn CSP (Yarn Strength) at their end. Because of these problems, Customers were reluctant to accept the material from this Draw Machine. This was matter of concern for Management. Therefore a Cross Functional Team was prepared to address the issues quickly using Six Sigma methodology.

IN DEFINE PHASE: Project Charter was prepared covering goal statement, Benefits, Scope along with Mile Stones. CTQ identified as Dye Index and Tenacity. Target fixed.

In Measure Phase Data collection plan prepared with proper stratification, Base line established. Gauge R & R carried out to ensure adequacy of Measurement System for Dye Index and Tenacity .Initial process stability, Data distribution and capability checked with Control Charts, Normality test and Capability Analysis.

IN ANALYSIS PHASE: Causes were identified through Brain Storming and Cause & Effect Diagram. Input out Put Work Sheet and Cause and Effect Matrix also used effectively to identify potential causes. Causes further prioritized through FMEA.Cause Validation plan was prepared to validate the causes using appropriate Statistical tool as per the type of cause. GEMBA, ANOVA, Regression Analysis, 2 sample t test etc. used effectively. Main cause identified for Dye variation were Improper Annealing (Low Residence Time) and Stoppages due to tow entanglement. Causes identified for Low Tenacity were Annealing temperature, Spinning Speed, Viscosity level and Quench Velocity.

IN IMPROVE PHASE: Solutions were developed for identified causes using brain storming and Statistical outputs. Annealing improved by addition of 4 Nos TSU Rolls. Steam Chest size also increased by 0.5 Mt. Draw line Stoppages reduced by installing Tow spreader system during Can Changeover. Modifications done after thorough Risk Analysis and taking all concerned Stakeholders in confidence. TSU Modifications also helped to improve Tenacity. DOE used to optimize Viscosity and QAV level to enhance Tenacity further. Results were evaluated after modifications and parameter optimization. Significant improvement observed in Tenacity level and Dye variation reduction.

IN CONTROL PHASE: Control Plan prepared to sustain the improvement achieved. Control Chart used effectively using OCAP (out of control action plan). Change in SOCs and Modifications were documented properly and incorporated in ISO system. Training provided to all concerned regarding changes.

No Patchy dyeing complaint received since last one year. Both the respective CTQs i.e. % CV of Dye Index & Tenacity improved significantly after taking actions. Customers now prefer our material due to higher CSP (Yarn strength at Customer end) and improved uniformity in Dye Index. Optimized Viscosity also helped to improve performance of other Draw Machines. Improvement also shared with other sides during Tech Converge 2015 which is organized by Reliance Technology Group for all Reliance sites.

SKF Technnologies

STABILIZE IN HOUSE MACRO PHOSPHATING ISSUES USING DESIGN OF EXPERIMENT

PROBLEM STATEMENT

The current in house macro Phosphating process was having process issues, not able to get the uniform phosphate coating & this was resulting Quality rejection in initial process stabilization stage & hence complete shutdown of the in house macro Phosphating process.

Factory is purely depending on outside supplier & whose quality is having many process variations & which was not having consistency & also cost is very high.

Metrics	Baseline Y's (before project)	Project goal	Best case	Forecasted savings (at project close date)
Stabilize macro Phosphating process by in maintaining the coating weight	487 mg / sqft	800 – 1500 mg/Sqft	1150 mg/Sqft	6.59 MINR

PROJECT SUMMARY

Design of experiment carried out for 2 major factors & optimized the settings

MEASURE/ANALYSE

x_1: Optimize Iron Content x_2: Optimize activation x_3: Stabilize DI water

IMPROVE

- Iron content optimized to 2.30 to 4 points
- DI water Conductivity stabilized
- Coating weight of Macro Phosphating maintained between 800 to 1500 Mg-sqft

CONTROL

- Process capability of Coating weight of Macro Phosphating CpK – 2.03

CUSTOMER SATISFACTION BENEFITS

- Zero defect
- Zero loss-making

.

Actual Savings 8 Months – 6.048m INR

Reliance Industries Limited

R3S PRODUCTION RATE (MT/DAY) IMPROVEMENT

COMPANY DESCRIPTION

The Polyester - Patalganga Manufacturing Division was established way back in 1982; in Maharashtra state. Reliance – PMD Polyester is an integrated Petrochemical unit developed with the backward integrated processes.

Following are the polyester end products manufactured with the in-house backward integrated processes supplying the raw materials.

- **Polyester Staple Fiber [PSF] :106 KTA**
- Polyester Filament Yarn [PFY**]** **:** 232 KTA

Why this Project?

Reliance is Leader in Polyester Staple Fiber market. In order to sustain and expand its leadership position Reliance is introducing Speciality products based VOC & R & D.

The challenge was being faced that even though the ***PSF plant unit CP6 production was Export oriented the margins were low.***

The R3s product, a Speciality product developed in house, is in demand along with more margins. But to achieve the targeted productivity with the existing facility was a real challenge.

DEFINE: The project was identified in response to the **VOC** as Internal management & PSF business.

R3s Production rate (MT/Day) was chosen as the Critical to Quality (CTQ) parameter. The impact of project is identified as revenue generation.

A cross functional team was formed and the ***Project charter*** was prepared with benefits, scope, constraints CTQ & timelines.

Problem and goal statement was **"Increase the production rate from 43.44 MT/Day to 56 MT/Day** . Benchmarking is based on entitlement study of the machine.

Project kicked off after financial validation by Finance Manager.

MEASURE: Team collected baseline data of project Y. Baseline mean & standard deviation was calculated. Sigma level calculated after conducting normality & stability test.

Base line production rate 43.44 MT/Day

Target production rate 56 MT/Day

Sigma level -1.23

ANALYZE: Series of ***Brainstorming*** sessions were conducted to identify potential X's .

Further Screening of X's done using ***Control impact matrix.***

Total 13 X's out of 32X's identified for FMEA study.

6 numbers of vital X identified on the bases of RPN .

The relationship of these vital X with production rate is validated at each stage.

IMPROVE: ***Annova, system modification, SOP change and Design of Experiment*** tools used to optimize 6 X's.

After confirming positive result in trial, full scale implementation of all solutions carried out.

CONTROL: Significant improvement in production rate is observed & same confirmed using ***2 sample t tests.***

Improved Sigma level also calculated & observed Sigma level improved from -1.23 to 1.19

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: *The improved production rate is 53.26 MT/day.*

(29.5% improvement from baseline production rate)

This project is in control phase since November 14.

A savings of Rs 310 Lacs/Annum achieved & validated by Account Dept.

Team effectively improved and controlled the production rate without compromising the quality.

Hoerbiger

ELIMINATION OF CUSTOMER COMPLAINTS IN ELECTRO HOUSING

We are a MNC engaged in manufacturing and exports of Air Compressor valves & components of Hydrocom. Electro housing is one of our important export component used by our sister company at Vianna in Hydrocom division. Electrohousing consist Electronic circuits is precisely mounted in valve housing. HydroCOM gives many options to the compressor manufacturer for controlling capacity of reciprocating compressor. HydroCOM, achieves best results in terms of speed, energy saving for efficient capacity control.

During Jan 2014 to June 2014, 1117 nos Electro housings are delivered to Vianna, out of which 117 pcs are rejected for Dia 99 H7 oversized & variation , this amounts 104745 ppm Quality failures from External Quality (QE) which is one of the important KPI of Hoerbiger production plants. Secondly, the customer plant could not do further assembly process due to diameter oversized & loss of production at their end.

The top management of Hoerbiger decided to take up this complaint under six sigma project. The first step was formation of cross-functional problem solving team consist of supplier quality assurance member, In house quality assurance Engineer & production Engineer. This team used the Six Sigma DMAIC problem solving process to identify opportunities for improvement under leadership of flow Manager.

First, we conducted brain storming to find out the “Xs” for the effect “Y” related to customer complaint. The identified potential causes for the variation in CTQ diameter 99 H7 & formulated a fish bone categorized in different groups. Next, we set up a data collection plan to meticulously collect and tabulate data. Here, we inspected and recorded various key input variables for different sampling sizes. As the input variables were continuous scale and the response was also on a continuous scale, we used ANOVA, process capabilities & T –test to identify the significant causes.

The primary conclusions were discussed within team and the team decided to conduct further trials/ data collection on indicated 3 input variables as the suspected cause of the problem after conclusion with analytical tools.

The result of gauge R&R from MSA & capability studies as the red ’X’ of our problem. Further confirmatory trials proved us right once again, and control measures adopted at our machine shop during machining & changed measurement system and casting tool.

Result: We achieved process capability & capability index > 2 from Nov 2014 and no further customer complaint from Dec to till date in 2015 and the objective of this project was achieved.

Key learning from this project: Use of ANOVA, MSA & process capability study to identify the variations in the process output & control the process with statistical tools to sustain the results for predictable output quality. This also benefited to decrease manufacturing cost & material cost.

Tractors and Farm Equipment Limited

ELECTRO DEPOSITION PAINT & PRE-TREATMENT CHEMICAL CONSUMPTION REDUCTION

About the company: TAFE, the flagship company of the amalgamations group, was established in 1961 with financial and technology participation from Massey Ferguson of the world renown, manufacturers of a wide range of tractors and agricultural machinery. TAFE is the second largest manufacturer of tractors in the country.

Goal /Objective of the Project: The Scope of the project is to reduce the excess consumption of Electro deposition paint and pre-treatment chemicals consumption in Painting line from 2.45 kg/ Tractor to 2.20 kg/ Tractor by using the Six sigma tools and techniques.

Problem Identification:

There is an increase in process chemicals & Electro deposition paint consumption which directly impact on the increase in overall manufacturing cost of tractor.

- Excess consumption of pre-treatment chemicals & Electro deposition paint in the painting process.
- Excess Generation of phosphate chemical sludge.
- Excess Consumption of Fresh Water.

DEFINE PHASE:

Business Case: This project focuses on the consumption reduction of paints & chemicals by optimizing the painting process and minimizing the wastages, this also reduces the excess consumption of water and save the environment.

Opportunity Statement: For the period of April'13 to March'14, the average chemical consumption per tractor is 2.45 kg which directly impact on the process cost of tractor. There is an opportunity to reduce the consumption from 2.45 kg to 2.20 kg per tractor by 28.03.15.

MEASURE PHASE: Below 5 X's are prioritized from 105 X's:

1	Degreasing chemical losses in the process tank.
2	Phosphate chemical loss due to manual addition.
3	Low DFT due to earth fault issue
4	High DFT variation in CED components
5	Variation in % NVM in ED bath

CURRENT SIGMA LEVEL (BEFORE) – 0.21

ANALYZE PHASE:

Sl no	Analysis of Main causes	Root cause
1.	Degreasing chemical losses in the process tank.	Overflow of degreasing solution during rinsing process of the component.
2.	Phosphate chemical loss due to manual addition. (Tri cationic phosphate Zn / Ni / Mn)	Manual error during measuring the chemical addition (Beaker)
3.	Variation (High /Low) of DFT on the Electro deposition component	Low DFT in CED – Paint loss
		High DFT in CED - Paint loss
4	% of nonvolatile matter addition	Addition of Electro Deposition paint based on tank level

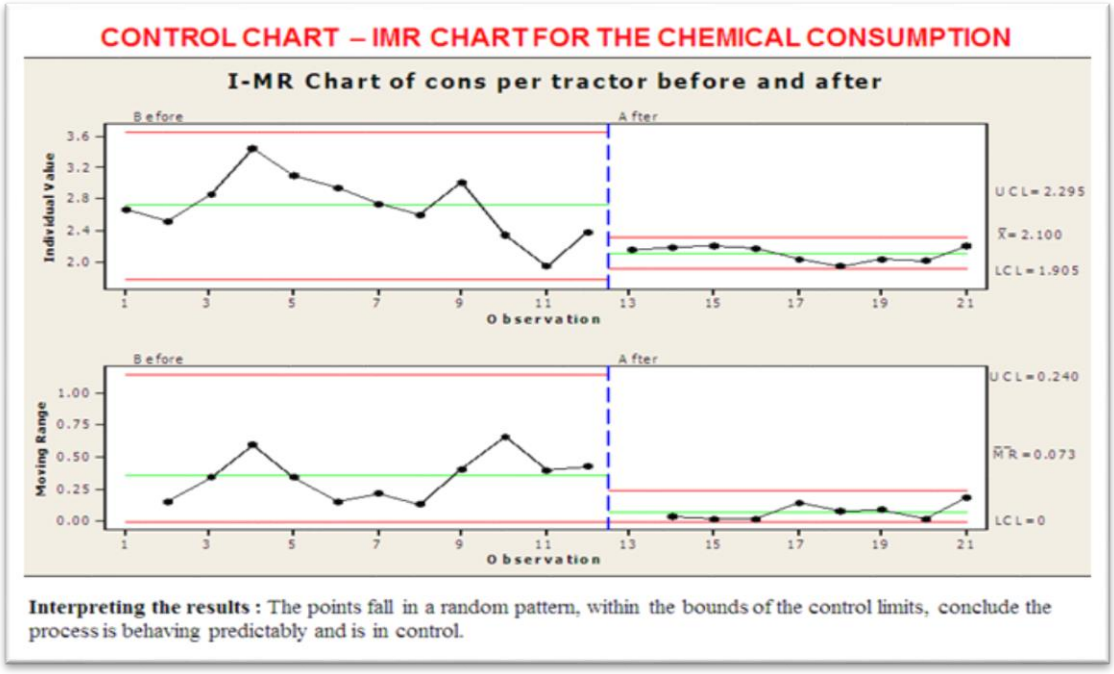
Sigma level after process improvements (After) – 2.70

IMPROVE PHASE:

- KOD I & II over flow line closed to prevent chemical losses during processing.
- Spray pressure in KOD I & KOD II kept at 0.8 Kg / cm2 during initial heat up to prevent evaporation losses.
- Jig modification done to eliminate carryover of chemicals from one tank to another through components.

- Auto chemical dosing implemented
- Manual addition with dispensing to avoid excess usage of chemicals in the tanks.
- Earth leakage in the jigs due to insulation failure is eliminated through design change.
- Meggar checking for jigs to change the washer and avoid the earth fault issue
- Process Optimization done to reduce the variations in DFT on components through Design of Experiment (DOE)
- Emulsion & Paste addition being done daily based of tractor production.
- Tank level maintained only for component dip in the electro deposition bath.

CONTROL PHASE:



Interpreting the results : The points fall in a random pattern, within the bounds of the control limits, conclude the process is behaving predictably and is in control.

BENEFITS :

- ✓ Water consumption reduced from 124 KL to 76 KL per day
- ✓ Phosphate sludge reduced from 82 g per tractor to 53 g per tractor.
- ✓ Chemical consumption per tractor reduced from 2.45 to 2.13 Kg/tractor.
- ✓ Chemical cost per tractor reduced from Rs. 359 to 314 per tractor.

J.K. Fenner

Elastic Poly-V Belt Rejection Reduction

Elastic Poly-V belts are called as 4th generation belts. Speciality of this belt is, No need to adjust the Tension after fitment. This belt will occupy more share of business in Industrial & Automobile sector in future. Hence it is necessary to be strong in the Process.

Business need for this project:

- Our current process rejection is 13.5%
- Customer return is high 1250 PPM.
- Unable to capture the new market and expand our sales
- Delivery performance is low

The consequential metrics taken for this project is Reduction of internal rejection in the process & Elimination of customer complaint. It is considered that there will be no change in the selling price of the product.

The % improvement in rejection reduction achieved from this project is 66 %

Achieved Benefits:

- Rejection level reduced from 13.5% to 4.5%
- Internal Rejection - DPMO reduced from 10447 to 3537
- Sigma level improved from 3.81 to 4.19
- Delivery performance improved from 90% to 100%
- Customer complaint reduced from 6 to " 0 "
- Cost savings: 10 L / Annum recurring
- Expected cost savings: 18L / Annum recurring

Expected Business results :

- Good opportunity to capture the new market and expand our sales.
- At present we're supplying this belt to washing machine application and parallely developing for automotive application as all worldwide new generation passenger car vehicles are switching over to these type of belt.

Larsen & Turbo

To Reduce MCB De-latching customer complaints from 2070 DPM (4.36 sigma) to 300 DPM (4.93 sigma)

Need for the Project: The need for the project originated from Customer Feedback; where the product was intermittently getting de-latched. Customer was not able to switch on of MCB hence primary function of MCB to make contact was getting defeated.

DEFINE: In Define phase, the charter was filled up to determine the objective of removal of de-latching issue. Problem Description and Defect Definition were prepared. SIPOC diagram was drawn to get knowledge about Suppliers supplying their inputs and Sub-assembly to the assembly process. These process output are supplied to the customers. Customers were identified and their feedback was collected.

MEASURE: In order to measure the data, a Data Collection Plan was prepared and baseline data was collected. Sigma Level was calculated based on the baseline data. Brain Storming & Cause and Effect Diagram were prepared to identify all Possible Causes. NGT (Nominal Group Technique) was used to convert probable causes to root causes. Later, cause validation was done to arrive on significant root Cause.
At the end of Measure phase all root Causes found to be significant for de-latching issue.

ANALYZE: Inference from Measure Phase was that our existing manufacturing processes were capable & stable. To understand the reasons of occasional de-latching one healthy unit was taken and DOE was performed. In defective unit pivot component certain cavity observed to be defective. Also braided wire more length causing bulging of braid wire. This was resulting in spring back & "U" frame & not seating in housing observed. The above said factors were the real root causes for the de-latching.

IMPROVE & CONTROL: Now as the Real Root cause was known, brain storming was done to arrive at different possible solutions & to come out with best possible solutions. Best possible solutions were

1. Restoring the latching dimension of defective cavities of pivot
2. Pivot & Lock lever latching dimensions measurement started for each cavity samples for every lot
3. Reducing the braid wire length so that spring back effect will not happen
4. Gauges implanted to arrest moving contact bending.

Results & Benefits: Sigma level improved from 4.36 to 5.03. The cost (Rs. 6.5 L, approx) saved on account of reduced braid wire length. Also replacement cost of about 27 L on product level saved.

WIPRO Consumer Care

REDUCTION IN ST-20 BOILER FURNACE OIL CONSUMPTION

INTRODUCTION:

About Wipro Consumer Care & Lighting

Wipro Enterprises Limited is headquartered in Bangalore, India. Wipro Enterprises Limited comprises of two main businesses namely Wipro Consumer Care & Lighting which includes soaps, toiletries, personal care products, baby care products, wellness products, electrical wire devices, domestic and commercial lighting and modular office furniture. We have a strong brand presence with significant market share in identified segments. In addition, we have a strong presence in the personal care and skin care products market in South-East Asia and Middle-East. Wipro Consumer Care is today among the top FMCG companies and amongst the fastest growing FMCG companies in India.

About Wipro Amalner Plant

At this factory our company is making toilet soap under the aegis of Santoor brand. This factory is the earliest factory of Wipro. It was established in 1945. Manufacturing of Santoor soap was started in 1986 on a modest level. Since then, Santoor soap has achieved a remarkable growth. Santoor soap, on the basis of market share, is presently at number three on all India basis and numerous uno in AP and Maharashtra. It is at number two position on the basis of market share in Gujarat.

Wipro Enterprises Ltd is also into the business of Personal Care Products like Hand & Body Lotion, Handwash, Safewash, Glocovita, Glycerine soap are some of the products to name. We also have operations in Vietnam, Indonesia and Malaysia. Presently the Santoor brand is more than 5000 Cr brand.

Our company believes in meeting the customer needs with distinctive offerings, supported by an able distribution system. New products are added through a continuous process of innovation and up gradation.

Executive summary of Project

- Processing of oil is the primary step in making soap. Furnace oil is used to generate high pressure steam for processing of oil. It is a major cost element and reduction as such would be a saving in natural resources.
- As the fuel consumption decreases, it will offset price escalation and we would be able to offer product at the same price to customer.
- Reduction in fuel consumption would help increase efficiency of operations and reduce cost of processing.
- Present FO consumption is 23.3 Liters per MT of oil feed. It is to be reduced to 22 Liters per MT of oil feed - a reduction of about 9%.

- Six sigma tools used in the projects, one sample T test, two sample T test, I- chart.
- Process Approach – Process flow adopted for this project was, Team formation, process flow, data collection, brain storming, root cause analysis, corrective actions and control mechanism to sustain the improvements.
- We have taken the target of reduction of Furnace Oil consumption to 22 Ltrs per MT of Oil feed. Based on the data we have validated that the target is statistically significant and not belongs to the ASIS data population.
- Outcome of the brain storming session are, Low temperature of feed oil, Splitting of oil at high pressure, More Running of ST 20 Boiler and Low heat recovery in the process.

- Outcome of the project –

a. Tangible Gains:
    - Furnace oil consumption reduced to 22.01 Ltr per MT of oil feed
    - Financial gain of Rs 7.05 L in seven months

b. Intangible Gains:
    - Reduction green house gases
    - Reduction in depletion of natural resources
    - The team is now empowered with new tools and ready to take more challenges.

c. Return on Investment:
    - Total expenses 8.5 L
    - Accrued benefits 12.0L per annum
    - Return on investments is 7.1 Months.

d. Opportunity for replication:
    - The project can be replicated at our other plants

Bharat Electronics Limited

CYCLE TIME REDUCTION IN TESTING OF LNA BLOCK FOR CENTRAL ACQUISITION RADAR (CAR) PROJECT

LNA Block is a critical subsystem in phased Array Antenna system of indigenously developed 3D-CAR. 3D-CAR is designed by LRDE, manufactured by Bharat Electronics Limited-Ghaziabad and it is used as early warning surveillance system for AKASH surface to air Missile system by Indian Air Force and Indian Army. Currently 48 Radars are deployed at various sites all over India and 40 are to be deployed in next 4 years. These are to be maintained for next 20 years.

LNA Block is common to all variants of 3D-CAR (Rohini, Revathi, TCR, Akash-Army & Akash-Airforce) and its testing was time consuming so there is need to improve process to meet the project timeline.

LNA Block is tested for various parameter (eg. input VSWR, output VSWR, Gain, Isolation, Dynamic range, Noise figure, BITE measurement etc) with the help of various test instruments (VNA, Noise figure analyzer, Spectrum analyzer etc) to ensure its performance.

With the combined use of Lean and DMAIC six sigma methodology, we analysed value added time, non value added time, Muda in each testing process and C-factors (eg. manually setting of instruments, manually applying TTL for Bite and isolation measurement, manually transporting instrument data to excel sheet in PC, manual verification and wait time) using VSM, poke-yoke, SIPOC analysis, process map, Cause & effect, CNX.

C-factors were addressed by developing and using automated programs in NI-LABVIEW platform (based on Virtual instrument software architecture), which automatically configure instruments for various tests, ensure mistake proofing in applying TTL for bite measurement & isolation, auto report generation and auto verification.

Following the updated process the cycle time for testing of LNA Block is reduced to 14 hrs (approx. 2 days) from 41 hrs (approx. 5 days).

DMAIC SERVICES & SUPPORT

Tata Consultancy Services

FREE CASH FLOW IMPROVEMENT BY REDUCTION IN BILLED RECEIVABLES AGED GREATER THAN 60 DAYS FOR SEANAP

COLLECTION PROCESS:

Our client is a leading global information and measurement company that enables companies to understand consumers and consumer behavior. It measures and monitors what consumers watch (programming, advertising) and what consumers buy (categories, brands, products) on a global and local basis. The company has a presence in approximately 100 countries spread across Africa, Asia, Australia, Europe, Middle East, North America, South America and Russia.
TCS operates as shared services for their Global Finance Operations which includes E-to-E processes of Procure to Pay, Record to Report, Financial Planning & Analysis & Order to Cash with a headcount of 500 FTE. Customer has been growing with different acquisitions and the cash flow improvement has been an area of focus for them.

CUSTOMER BUSINESS VALUE CHAIN AND PROJECT BACKGROUND:

In Order to Cash, Billing & Invoice stage takes care of contract creation upon service agreement and generating invoice to customers. Collection team identify the Good AR & Dispute AR category and then follow up the respective team based on the outstanding reasons to resolve the issues and collect cash.
This collection process is executed in two stages process as described below. The baseline data suggested that the receivables aged greater than 60 days at the project start was at $4.1MN (20% of total receivables) and it was outstanding due to various reasons in collections to cash stage impacting the working capital for the customer. Average DBO was at 72 days for AU & 63 days for NZ. A DMAIC project was undertaken to reduce the aged receivables greater than 60 days from $4.1MN to $3MN (25%) TCS Confidential

ABSTRACT:

DEFINE PHASE: Project was identified in order to align with customer strategic objective. Discussion with the customer & leadership team was done to scope the project. Aged receivables greater than 60 days was taken as the “Big Y”. Joint team along with SME’s were identified to work in the project. Stakeholder analysis was done to create a shared need and aligned all the stakeholder with the common business objective.

MEASURE PHASE: Data collection plan was set up to baseline receivables aged greater than 60 days. MSA study was done and found that measurement system is adequate and acceptable. Process capability analysis was done. A detailed end to end value stream mapping was done to identify the initial bottlenecks in the process. List of quick wins (like prioritizing aged invoices, adding reminder note in emails, reviewing dispute coding system & SAP note update etc..) were identified via process maps to rectify the initial constraints identified in the process and 7 key areas of improvements are implemented. CTQ drill down tree was done to identify the key metrics to align and achieve customer strategic objective.

Identified the vital X's using pareto tool on the reason codes and 5 why analysis was done for each of the vital X's & detailed root causes were identified based on brainstorming. Root causes were prioritized using Cause & Effect matrix. A data collection plan was set up for the X's.

ANALYZE PHASE: A detailed analysis was done to validate the root causes. Graphical tools and statistical tools were used to validate the X's. The analysis finding helped in identifying and prioritizing the solutions.

IMPROVE PHASE: Solutions were identified for significant X's via team brainstorming. Discussed with the customer and obtained consensus on solution implementation. Improvement was tracked for each of the X's on Y and statistically validated. Benefits were quantified for Y.

CONTROL PHASE: Detailed control plan was prepared to sustain the improvement. Weekly monitoring of the AR aging & dispute coding was initiated. Also initiated regular review with collectors & client on the collection performance to address any early warning signals. SOP were revised and review mechanism was set up to revise them.

BENEFITS FROM THE PROJECT:

Financial Benefits:

- Reduced Aged receivables > 60 by $3.4 MN for Australia & $0.2 MN for New Zealand.
- Overall Cash flow Impact is $ 3.64 MN & Cost of capital impact is 0$.25 MN

Operational Metrics Improvement:

- Reduced DBO by 17 days for AU & 7 days for New Zealand
- Reduced Aged receivables > 60 % out of total billed receivables by 22% for Australia & 1% for New Zealand.
- C-SAT score increased from 87% to 96% post project improvement.

Replicability & Other Benefits:

- Solution Implementation in the projects identified across 4 other region which has a potential impact of $9MN

Tata Consultancy Services

IMPROVE CURE RATE IN CREDIT CARD COLLECTIONS

CLIENT INTRODUCTION:

As part of one of the world's largest financial services companies with a presence in more than 100 countries, our client has provided financial services to Australian consumers, corporates, institutions and governments for more than 30 years. Recognized for its innovative range of global products and services, this financial institution today counts for more than one million Australians and one thousand local corporate and institutional clients as valued customers.
TCS manages Credit Card Collections portfolio for this client and the project below was undertaken to increase Account Resolution Rate

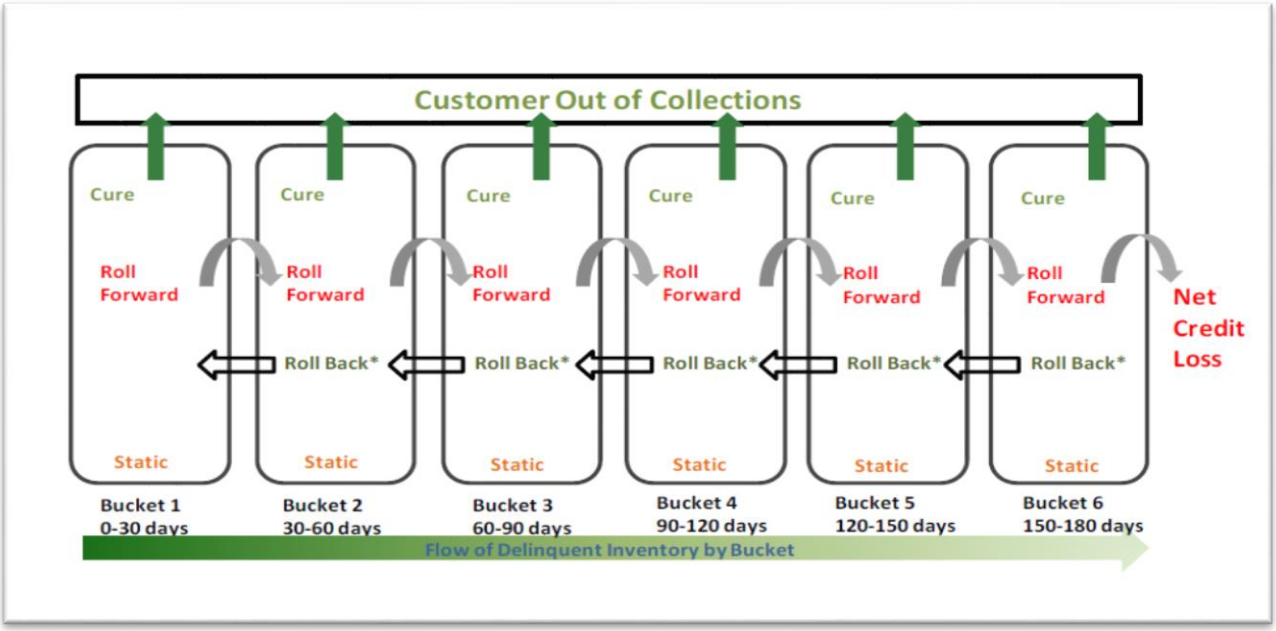
CUSTOMER BUSINESS VALUE CHAIN AND PROJECT BACKGROUND:

A collections portfolio for Credit Cards is segmented into various buckets basis the days past due on the delinquent accounts. For instance 1-29 DPD is bucket 1, 30-59 DPD is bucket 2 so on and so forth. The last level is bucket 6 which is 120-180 DPD. Post bucket 6 the accounts are charged off (all the accounts charged off minus the recoveries become Net credit loss).

The main objective of a collections process is to meet the NCL plan for the year, which in turn is tied to the flows performance (Namely Roll forward, cure, static and roll back) at each of the bucket level. However, the performance of bucket 1 has the highest impact on the NCL performance as it has highest inventory and the maximum probability of collecting payment on the accounts. Hence, it becomes imperative to have the highest **Cure** (thereby reducing the stabilized pool of accounts) and lowest **Roll Forward** in Bucket (Refer figure below).
Imminent business need for the project arose due to customer focus on expanding business. This meant Credit Cards being offered at cheaper rates which meant higher inventory in Collections. If the customer had to minimize amounts being charged off (not collected for 180 days+) the focus had to be on collecting entire due payments and moving the accounts out of Collections.

Also based on customer surveys the finding was that market was shifting towards lenders behaving as Delinquency Managers and helping customers out of delinquency and not use classical approach of behaving as a Collections agent. If a customer has to be relieved of debt he/she needs to be showcased benefits of making entire payment and moving out of Delinquency.

So Cure Rate (explained above) became the key metric to be improved and bucket 1 (earliest bucket) became the focus to target maximum inventory



KEY FINDINGS:

1. More than 55% time was spent on wrap and preview on the dialer
2. Dialer associates were tracked and incentivized majorly on the productivity metrics like Number of Promises to Pay taken and Number of Promises Kept
3. No account level ownership was given to the dialer associates where the possibility of collecting on maximum number of accounts existed.
4. This propagated a tendency amongst the dialer associates to take single payment dues, which had an incremental impact on the ENR as the static% kept increasing every month
5. As a result of the above mentioned point only 36% of account were cured and 45% of account were static
6. Incentives calculation happened on the individual performance of an associate. There was an absence of a comparative methodology which would inculcate a sense of competition within the team

Key Solutions Implemented:

A. **Introduction of ABS methodology (Adjusted Balances Saved) for an effective tracking and accountability of the dialer associates**: The ABS mechanism assigns weight ages or multipliers to each of the flow rate (effectiveness metrics) depending on the number of payments required and thereby drive the collectors to collect as many dues as possible as it gives them a higher chance of meeting their ABS target. This improves the cure rate and significantly curtails the roll forward rate, which has a positive cascading effect on the NCL performance

B. **Revised Incentive Structure aligned with ABS scores**: Incentive structure was changed from each individual getting incentivized on his own performance to a competitive structure where top20% scorers on ABS points got 50% of allocated incentives

C. **Reduce Non Productive hours** by introducing targets for Pre and Post call work to reduce Non Calling hours (Analysis showed a strong correlation between Talk hours and Customers contacted)

BENEFITS FROM THE PROJECT:

- **Financial Benefits:**
  - Credit Losses worth $4.68MM were avoided for the client
  - Cure rate improved from 36.04% to 45% , static rate reduced from 47.25% to 38.45% and the roll forward rate reduced from 18.62% to 16.15%.
  - Preview% reduced to 14% and wrap% reduced to 9%. The non productive hour rate was slashed by 50%.
  - The total ENR in Bucket 1came down to $ 80 Million from a $161.04 Million in a year. A delinquent inventory reduction of more than 50%

- **Replicability & Other Benefits:**
  - Solutions Implemented across all collections processes within Organization
  - Processes where the solutions were replicated also saw an increase of 5-7% Cure Rate

Wipro Infotech

TO IMPROVE SIM DETAILS UPLOAD PROCESSING TIME

THE CLIENT:

The Client is India's fifth largest and fastest growing GSM mobile service provider with a subscriber base of 84 Million. Client is a PAN India operator with a presence across 23 circles. Client offers voice & data services ranging from postpaid and prepaid plans, 2G and 3G services. Wipro is Strategic Partner for System Integration, build, operate and maintaining their IT system and centralized data center.

BUSINESS SITUATION:

Across India, almost every state and every region celebrates a festival every month, for example "Diwali, Pongal, Navratri, Durga Pooja, Raksha bandhan, Baisakhi, etc." and also regular promotions are carried out in which various Regional Business Heads, Circle's Sales Teams always plan for excessive marketing and campaigns, and aim to sell more than 20-30% Mobile connections in order to increase subscriber base.

For supporting this initiative, marketing teams set up stalls/sale points at public places like famous markets, malls, etc. and try to covers all major cities/business hubs.
Sales and Distribution Teams support marketing teams and start aligning their sales channels and partners/vendors.

During all these planning activities, Sales team approaches backend team for immediate supply of SIM's for distribution.

Backend Team coordinates with "CS – Customer support" Team for provisioning of 10 lakh SIMs in IT system and asks to confirm the status ASAP however "CS – Customer Support" Team informs Backend team that there is already a backlog of 5 lakh SIMs for different campaign/promotions which is currently being processed in IT system and will take approximately 3-4 more days to complete.

With this status, backend Team informs Sales and Distribution Team that SIM availability in market is not feasible before 5-7 days as there is already a backlog of 3-4 days. Having only physical SIM is meaningless until the SIM details exist in IT systems. Due to this, Sales and Distribution Teams are able to plan only limited campaigns and informs the same to the Regional Business Head.

Regional business head realizes that this is again an opportunity lost and competitors may benefit from our restricted drive. This issue needs to be fixed ASAP so that SIMs can be made available faster in market. We have had such opportunities lost in past as well where we were not able to capitalize the favorable conditions for higher sales during festive seasons.

Due to this, Circle Sales Team/CSD, approaches IT Team for reducing SIMs information uploading process for immediate availability of SIMs in market to help increase the share in trade and also tap the higher sales during campaigns or festive seasons.

IT team understands the demand/requirement for lowering the processing time for uploading SIM details in IT system. After analyzing the data, IT team comes to know that at present, processing time varies from 2 hrs. ~ 35 hrs. for uploading SIM

details in OMIM application for 50,000 records (Maximum records allowed in one JOB to be processed by OMIM application) this resulted in not meeting business expectations.

Lower the processing time for uploading SIM details, faster the activation services for customer end users.

How Wipro's Delivery Excellence Framework helped:

There has been customer demand for lowering down the processing time for uploading SIM details in OMIM application which resulted in not meeting business expectations. Lower the processing time for uploading SIM details, faster the activation services for customer end users which will contribute to more subscriber acquisition and profitability

Without impacting any client business process and with available Infrastructure and application support in order to avoid any cost to client, IT team has shaken hands with client business team for proactively reducing variations and improving processing time for uploading SIM details in OMIM application within 5 hrs. Also, defined the Operational and defect Definition of project CTQ.

In order to understand the capability of present process. IT team has analyzed 4 months data and found that the process is running at 0.34 sigma level.

With the help of Fishbone/Ishikawa diagram, listing down the cause of high processing time for uploading SIM details in "OMIM" application. Listed Seven factors were identified which were further prioritized through Multi-voting session. Based on Multi voting & SME knowledge, following 3 factors were taken into consideration for screening.

After setting up the test environment and making of hypothesis, comparing means of two data set and screening of vital few factors out of trivial many solutions. Also, analyzed the factors after removing outliers with the help of SME knowledge and support and found 2 out of 3 factors are significant.

After Screening of 3 vital few factors, we found that 2 are Vital Factors required for optimization with 2 Levels. So, 22 experiment is applied with single repetition with 4 possible combinations. On basis of Main and interaction plot, we are able to see the impact of 2 vital factors. All these combinations were tested in the test environment and cube plot helped in finding out the best possible combination which has less processing time. Based on the test results, optimized combination deployed in production and performed data analysis on improved process. Maximum range of the data is less than targeted value with lower standard deviation and PPM has reduced to 1,823 with Z bench as 2.91.

After setting up of hypothesis, comparing means of before and improved processing time and found there is a significant improvement in the data points. 2 Sample T test results indicates the improvement achieved is statistically significant.

BUSINESS BENEFITS:

Client business and regional teams realized the improvement made by IT team which resulted in formal appreciation received.

Faster availability of SIMs in market resulted in faster activation services for client end users (subscribers). Month-On-Month 5-7% improvement can be seen (w.r.t Baseline data) on activation count after taking minimum activation cost as Rs. 20/- only.

Note: Annually, INR 35-40 Mn increased in client revenue

ADAAP Process Solutions

Committed not to Provide any Solutions to Customer

चरैबेति

To get the solutions evolved by the Customer

- Incorporated in 2008 as private sector company, ADAAP has grown to become a single window enterprise in providing a variety of services to enhance market penetration, organizational speed & reducing cost of doing business both in India and overseas
- ADAAP provides world class quality education, training, diagnostic and consulting services in the field of Quality & Business Management that will enable client organizations to transform their culture through skill transfer by building people capability and harnessing Total Human Potential
- Its Associates operate from : Australia, India-Bangalore, Kolkata, Mumbai and Pune, Iran, Taiwan, UK and USA
- Standard & Customized Products / Services

- **Strategic Business & Marketing Analytics,**
- **Training & Development of Software tools, ,**
- **Training & Guidance in use of Continuous Improvement Tools,**
- **Internal Auditor Training Course (for ISO , EMS &ISO standards),**
- **Guidance in implementation & improvement of Quality Management Systems (ISO 9001, TS 16949, EMS 14001, COPC, CMM(I)),**
- **Training in Application of Advanced Statistical Methods,**
- **Process Improvement & Management Principle,**
- **Guidance in implementation of Business Excellence Models, DOE Training & Implementation**
- **Including Taguchi Methods**
- **Training , Implementation & Certification of Green Belt, Black Belt & Master Black Belt for Lean Six Sigma (DMAIC & DFSS)**

As Spoke a Client:

ADAAP trained key Managers in our International FMCG company in India and guided them through Six Sigma projects leading to improved effectiveness and efficiency across our organization. Having attended their course, I can say that ADAAP has an extremely engaging teaching style and makes the subject relevant to the audience - especially working managers. Their subject matter expertise, unbridled passion and dedication to improvement have earned them our respect and admiration.

The trainers 'of ADAAP never forgets a name or a project and I have known them to go out of his way to help the students even if meant an hour at Mumbai airport en route somewhere….

Contact Us

Corporate office: **#24, 1st Cross, 1st Main, Govinda Reddy Layout,**
Near Arekere MICO Layout, Off Banerghatta Road, Bangalore 560 076.
Phone: +91 80 2648 2792, +91 80 23663403 Mobile: +91 98451 64301, +91 9900245551.
Email: akcadaap@gmail.com, debabanerjee@gmail.com, contactus@adaap.org, gctalukdar@gmail.com

Everyone Can Improve Quality

Thousands of Organisations in more than 100 countries
Trust & Use Softwares by Minitab, for their Quality Initiatives.

Minitab® 17

Confidently Analyze your Data

Quality Companion

Execute Improvement Projects Faster

Devize™

Perform Monte Carlo Simulations Easily

Quality Trainer

Learn Statistical Concepts Online

Minitab
www.minitab.com

Qsutra™
www.qsutra.com

Authorized Representative for India, Sri Lanka & Bangladesh

Fenner

J.K. Fenner (India) Limited

engineering greener environment

We provide state of the art Mechanical Power Transmission Drive Solutions for various automotive and industrial applications, that ensure higher efficiency, more energy earnings and longer product life.

These advantages enable industry to have an optimal use of energy, improve productivity, lower down time and lessen inventory-thus achieving more with lesser impact on nature.

We serve the following industries:

Automotive | Textile | Sugar
Cement | Paper
Steel | Power | Mining
Agriculture | Ceramic
Food Processing & Dairy
Engineering | Chemical | Fertilizer

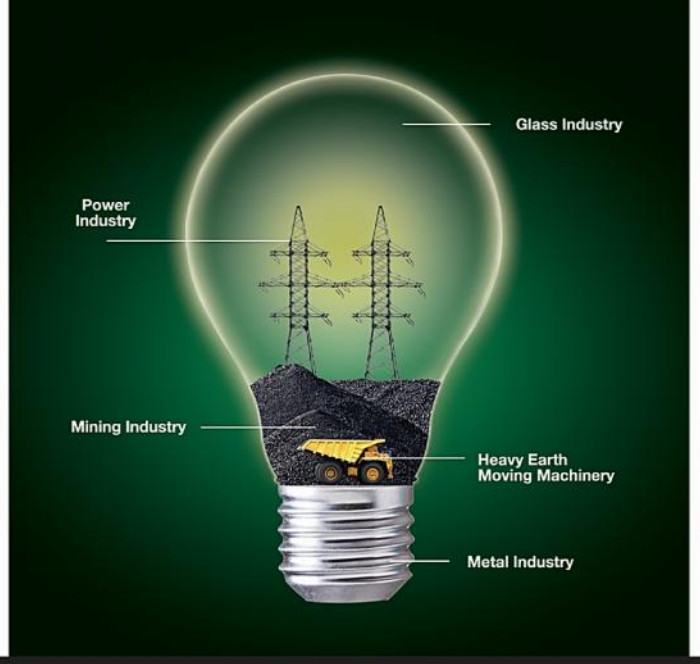
BELTS | PULLEYS | COUPLINGS | GEAR BOXES | OIL SEALS
VIBRATION DAMPER | RUBBER GASKETS | BEARINGS | HOSES

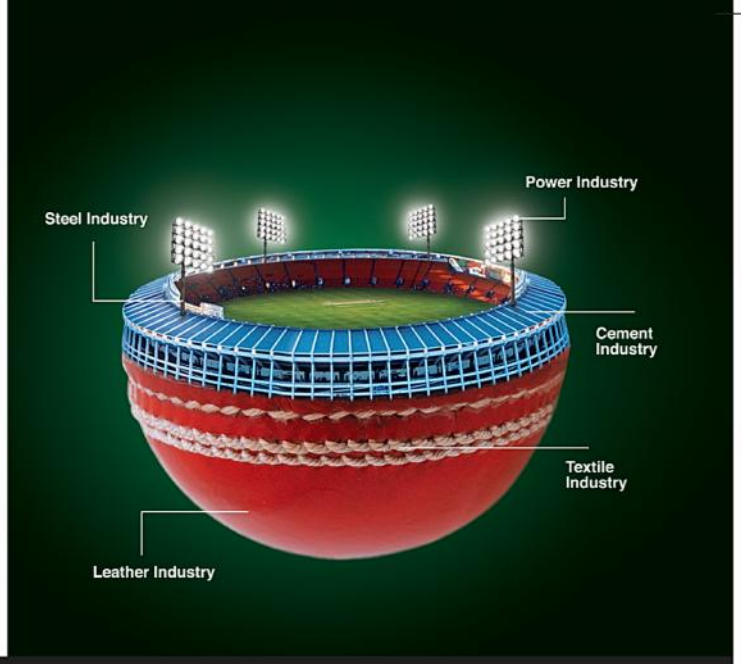
Corporate Office: Khivraj Complex, II Floor, 480 Anna Salai, Nandanam, Chennai - 600 035,
Tel: 044-2431 2450 - 57, Fax: 044-2432 0193, E-mail: ptd_mhq@jkfenner.com, Website: jkfennerindia.com

Scan and get connected with us

www.facebook.com/jkfennerindialtd

www.linkedin.com/company/fenner-india-ltd





Fenner helps industries run seamlessly, so that you can add quality to your life every day.

Working behind every industry, there's a silent performer – Fenner. With a wide range of mechanical power transmission and sealing products, Fenner is the driving force for every industry including textile, automobile, food, cement, coal, mining, steel, agriculture, paper, power and many more. Developed to enhance production efficiency and help save energy at the same time, Fenner products last longer and are trusted as the most reliable by industries across the globe.

No wonder customers choose 'Fenner First', which has made Fenner the undisputed market leader with a rich legacy of over five decades. So, every facility that helps you live conveniently and every movement you enjoy in life, do remember that Fenner has been working tirelessly behind the scenes for it.

Fenner

J.K. Fenner (India) Limited,
Khivraj Complex - II, 480, Anna Salai, Nandanam, Chennai - 600 035.
Phone: +91 44 2431 2450 - 57 **Fax:** +91 44 2432 0193
Email: ptd_mhq@jkfenner.com

www.facebook.com/jkfennerindialtd

www.linkedin.com/company/fenner-india-ltd

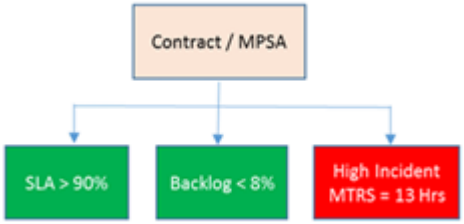
Wipro Technologies

MTRS REDUCTION

BUSINESS CASE:

Client is a leading provider of food and agriculture products and has outsourced their IT application services to Wipro. Proactive improvement initiative is one of customer talking point. MTRS (Mean Time to Restore Service) reduction is one of the key process improvement that we wanted to perform for them before they move into new version of ticketing tool.

This initiative is to improve the mean time taken for High tickets by 20%.



PROBLEM STATEMENT:

More than 25% of overall tickets are in High priorities. Current MTRS is trending between 13 and 16 hours for HIGH incidents for the past 1 year. Pending tickets are @30% in the last 6 months, impacting end users satisfaction.

GOAL STATEMENT:

Baseline the existing MTRS (Mean Time to Restore Service) for HIGH severities and bring in a 20% reduction for HIGH incidents defects.

Wipro Technologies

INCIDENT VOLUME REDUCTION

Wipro technologies applies Six Sigma as the Way of doing business with customers. It strives to improve quality of services thus by making process more efficient. WIPRO understand the philosophy of efficient and effective services will drive improved customer satisfaction.

Expectation from one of key WIPRO customer, who is one of the biggest Utility provider in Europe and this customer provides daily 2 Giga liters of Clean drinking water to the various part of Europe, is to maintain environment stability and end user customer satisfaction. This forms the objective of this six sigma project.

DMAIC methodology was used for this six sigma project. In Define phase VOC was drilled down for the incidents and service requests that end customer raise for any issues they face. CTQ was identified as incident volume reduction. Data was collected from various CRM systems and other customer tools. Baseline process capability was found to be Zst 0.79 of and DPMO was 761131 and this was impacting end user satisfaction. Project team identified various root causes that impacts project CTQ using tool like 5 Why, Fish Bone, Pareto. Later on the team went on to identify critical X's using statistical tools like Regression, ANOM.

Further process parameters were optimized using DOE optimizer and identified the critical levels for the X's. Improvement actions like training and awareness for products, Mobile towers were installed for Mobile synchronizations. Wireless Hot Spot were installed for device synchronization for field JOBS. Rolling of patches for firmware. Billing was automated using devices.

Post implementing actions, the process capability improved to Zst 1.93, with DPMO of 222232, 70% of DPMO reduction. The improvement is statistically verified using 2 sample T test. All the X's are in Statistical process Control. This also led to TCSAT improvement from 3.95 to 4.32 on scale of 1-5. This also resulted in benefit of 150K USD.

Phase	Tools Used
Define	CTQ Drill Down, Process Mapping, VOC
Measure	Data Collection Plan, MSA, Run Chart, Process Capability Analysis, Control Chart to study variation
Analyze	5 Why, ANOM, Pareto Charts, regression (PPM), Optimum X's values are obtained through DOE optimizer.
Improve	2 Sample T test for Statistical validation of improvement in X's and Y.
Control	Control Chart for Statistical process Control, FMEA for sustaining improvement in X's and Y, Control Plan for sustaining improvement.

Wipro Technologies

PRODUCTIVITY IMPROVEMENT IN IT SERVICES

In today's service industry customers are trying cut down the budget on production support. So IT industries manage the margin by improving the productivity by driving process improvements

In any improvement initiative the goal is to reduce the process cost and process variation, increasing quality, reducing product delivery time and at the same time improving the customer experience...

While all businesses need to optimize their processes, most have no idea where to start with. This paper discusses about productivity improvement by using six-sigma methodologies which has a positive effect on cost, quality, and delivery.

The scope of this six-sigma project includes both application and infra support in a managed service framework. The goal was to improve the incident productivity (i-e the number of incidents closed by each engineer level). The analysis includes the past data like, knowledge article, application monitoring effort, waiting time in the queue etc. to come up with the baseline and the parameters which impacts the incident productivity. The key improvements were towards automation; improving user experience by click-to-chat etc. those resulted in reducing the elapse time by 60%, an automated linked knowledge base and hence the productivity by 40%, which provided a saving of $200K.

This also talks about post improvement, sustenance plan and mistake proofing.

KEYWORDS

– service industry, incident productivity, customer experience

KEY TAKE AWAY:

- Implementation of automation in incident management cycle
- Incident review approach
- Customer experience

Indus Towers Ltd.

IMPROVEMENT OF DG MTBF

PROJECT AIM/OBJECTIVE

To increase the Mean Time between Failures for MM and KOEL Diesel Generator (DG) sets used in Telecommunication Passive Infrastructure sites from ***19*** to ***30*** days by 31-Dec-14.

BACKGROUND

Indus Towers Limited is the worlds largest telecom tower company with a portfolio of over 1,15,000 towers. Indus' vision of '***transforming lives by enabling communication***' has been instrumental in providing accelerated growth through increased connectivity. The main task of Indus to provide a regulated supply of 48V DC to the active telecom companies on a shared basis. Towards this objective, the DG sets provide the power backup in the absence of electricity supply.

Indus has approx. 96000 DG sets out of which approx. 86000 DG are of MM and KOEL make. These DG sets are being run and maintained by Indus outsourced partners. For corrective (breakdown) maintenance, tickets are being raised on Trouble Ticketing (TT) software based on which work is carried out on field and the tickets are closed. For preventive maintenance, tickets are again raised on TT software based on 600 run hours / 6 months, whichever is earlier and then the job done on ground followed by TT closure on the software. Since the DGs are scattered across the country including in some remote areas, proper maintenance and correct root cause analysis of the problems with DGs have been chronic problems.

In 2014, Indus was faced with a huge number of DG faults and replacement requests. In order to reduce the number of DG faults and to delay the replacement by a new DG, a project was undertaken to improve the reliability of the DG sets by measuring the MTBF as the metric. MTBF base-lining was carried out prior to the launch of the project which was a dismal 19 days.

IMPROVEMENT METHOD

Approach to problem solving: DMAIC methodology was used to tackle the challenge of MTBF increase. The team first went to the basics of the problem by defining the life parameters and performance parameters to be evaluated for DGs. This was followed by carrying out the Root Cause Analysis of all the failures based on the data captured for 6 months. Root Cause Analysis of the major faults was further analyzed and both product and process changes were recommended. Original Equipment Manufacturers were roped in for product improvement and the process change initiatives were tackled in-house. Processes were redefined and SoP for DG Maintenance was prepared. SoP was shared across all Circles for implementation. Maintenance drive with focused approach was carried out as part of Pilot implementation in two clusters. Findings of the same were analyzed and fine-tuned before the final roll-out pan India. Post verification of results the findings were tabulated and actions dove-tailed into SOPs.

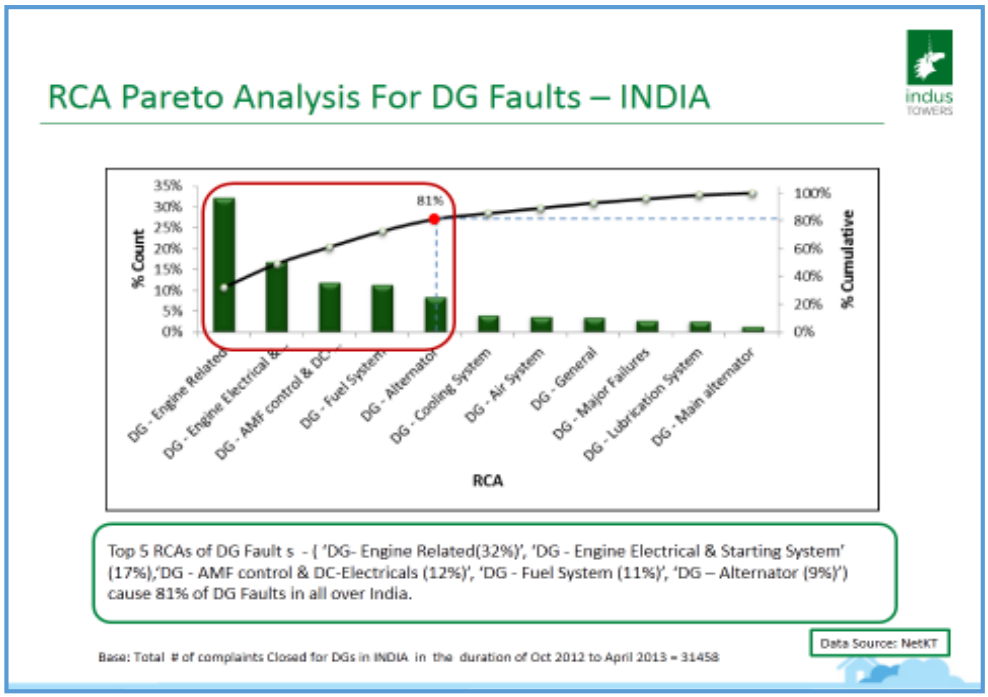


Figure 1. Pareto analysis of major DG failures

Tools and techniques employed: The project team used the following tools during the course of the project:

- Ishikawa – Root Cause Analysis of the faults recorded
- Pareto – Targeting the 20% faults contributing to over 80% failures
- Brainstorming – Identifying the major reasons for failures after conferring with industry experts as well
- Impact Control Matrix - Choosing the correct actionables
- Sample implementation – Changes implemented in pilot areas to gauge and verify actionables before going for mass roll-out of plan.
- Interval & Box plots – Verification of results using Interval and Box plots
- Sustenance plan – Post verification of results, sustenance processes dove-tailed into Standard Operating procedures

Key Milestones: Key milestones in the project were:

- Identification of Life cycle and Performance parameters
- Failure Analysis – RCA
- Targeted actionable items
- Pilot Roll-out
- Pan India roll-out
- Verification of results

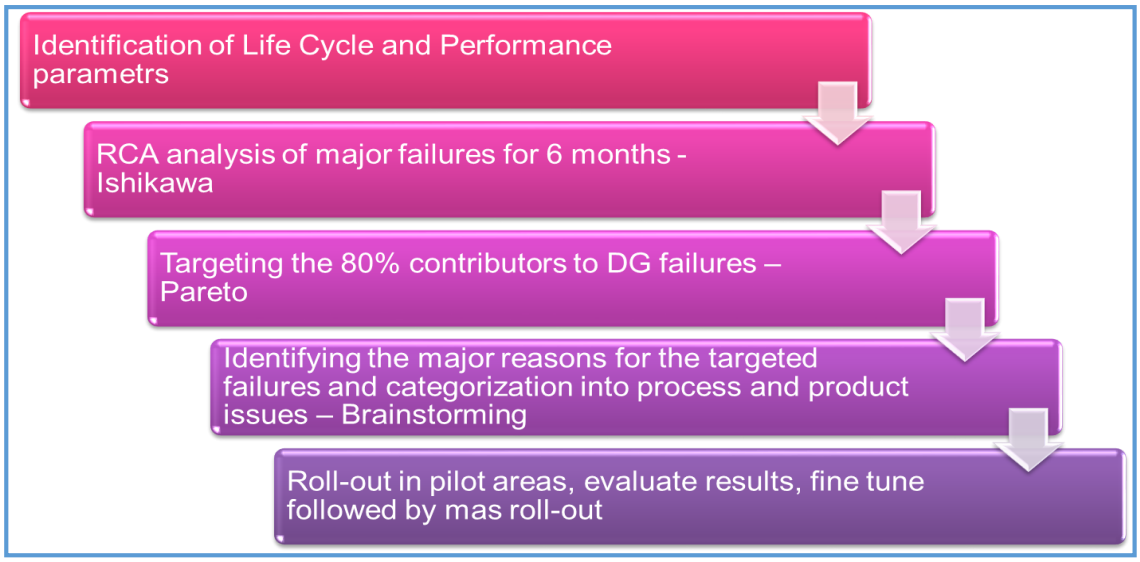


Figure 2. Methodology adopted for the project

RESULT

The MTBF at the end of 19 months, had increased from the base-lined figure of ***19*** days to ***34*** days in Oct 14. As we stand today the figure has now touched ***45*** days.

PROJECT CONCLUSION

Project was finally closed in Dec'14, after its results were validated. Learnings of the project have been dove-tailed into the Preventive Maintenance procedures and are being driven with zeal and passion.

Infosys BPO Ltd.

REDUCTION OF TAT FOR SOCRATES STUDY

Executive Summary:

This was a sourcing project done for one of the clients of Infosys which lead to reduction of critical TAT by 9.5 days and a savings of $ 3,012,120.

Overview of client and highlights:

Client is a global healthcare leader engaged in research, development, manufacturing and marketing of prescription pharmaceuticals and supplier for healthcare services business. Client recorded a turnover of US $26 billion in 2015 with major income from sale of gastrointestinal, cardiovascular, neuroscience, respiratory, oncology and infection products. Market share from Europe is 32%, Asia Pacific is 33.5% and US is 23.5%.Client is listed in the Dow Jones Sustainability Index (Global) as well as the FTSE4Good Index.

PATIENT Study Projects and it's importance:

PATIENT Study is a client project "aimed at understanding impact of it's medicine on patients" across globe. A report is prepared for each of the patient studied and this report will be in local language of that country/province. These reports are later translated to English for the use of central R&D team in UK. Delay in translation of these patients directly impacts launch of medicine and application of patent.

Problem Statement:

Translation of the document TAT is 18 days which is very high and client budgetary constraint.

Business Case:

Client regularly checks the performance of it's medicine on patients from across globe. These performance reports are in local language and later translated to English for the use of R&D (called Study teams internally) team for analysis. Client was looking at improving the process efficiency of translation services and cost reduction and hence gave project to Infosys.

Methodology used:

A combination of lean and six sigma methodologies were used and the prime reason for improvement was eliminating NVA (non value added steps) which helped us improve the process cycle efficiency from 42% to 84%.

Best practice replication:

Infosys later identified a similar project and implemented the best practices to deliver client higher savings than the original sourcing project.

Project Team:

It comprised 3 resources from operations and 1 resource from quality team to deliver optimum results.

DFSS

Bharat Electronics Limited

DESIGN OF ADVANCED CDU SUBSYSTEM FOR ALNS

INTRODUCTION:

Bharat Electronics Ltd **(BEL)** is a Navratna Public Sector Enterprise manufacturing Defense and Civil grade professional electronics components and equipments. In the Year 2014-15, its turn- over was 7608 Crores. It has 9 Manufacturing Units spread all over India. BEL Chennai unit was established in the year 1985 for the development and production of Gun Control Systems, Fire Control systems, Gun upgrades and Navigation systems. Some of the products include ALNS, Tank intercom system, L70 gun,T90, BMP-II &T72.

PROJECT SCOPE:

To design and develop a MAP based Display system for the Advanced Land Navigation System of AERV Mk-II.

GOAL STATEMENT:

To meet Map Application requirements specifications with 10.4' LCD display as requested by customer Indian Army.

BRIEF INTRODUCTION:

ALNS – Advanced Land Navigation System is meant to guide the crew members of the vehicle in which it is fitted, to navigate even in featureless terrain both during day and night.

The ALNS system consists of the following major sub systems:

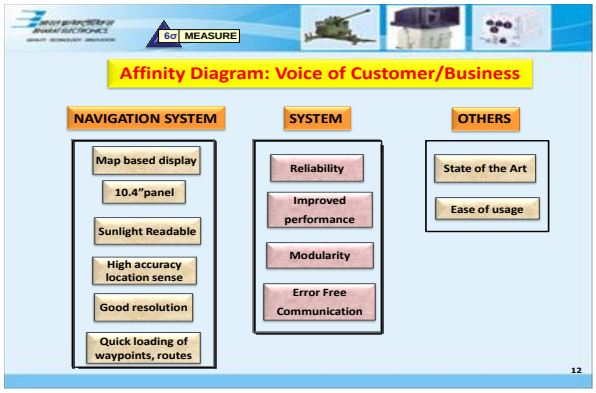
- Inertial Navigation Unit
- **Control and Display Unit (CDU)**
- Driver Display unit
- GPS Position indicator
- Antenna active - GPS
- Capacitor Box Assembly

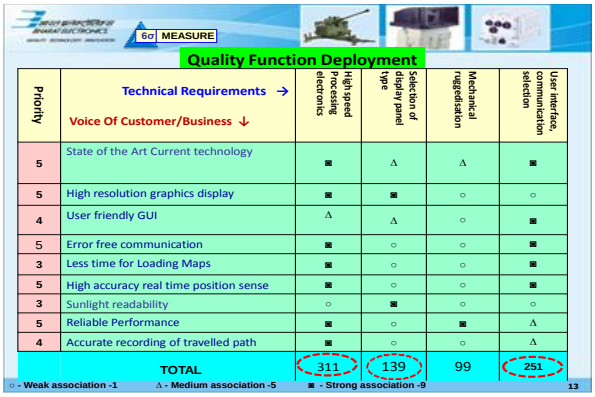
The present position of the vehicle is displayed in LAT/LONG coordinates in the CDU. The ALNS- a ring Laser Gyro based system, guides the commander as well as the driver on real time indicating the path to be followed to reach the pre-determined destination. The system operates in three different modes namely- Inertial Mode, GPS Mode, Hybrid Mode.

The existing version of CDU is simply an Electro Luminescent display. But due to rapid progress in the technological front, customer's demand was for a Map based navigation system with quick loading of waypoints, real time position sense in a 10.4" display panel with sunlight readability.

TOOLS USED:

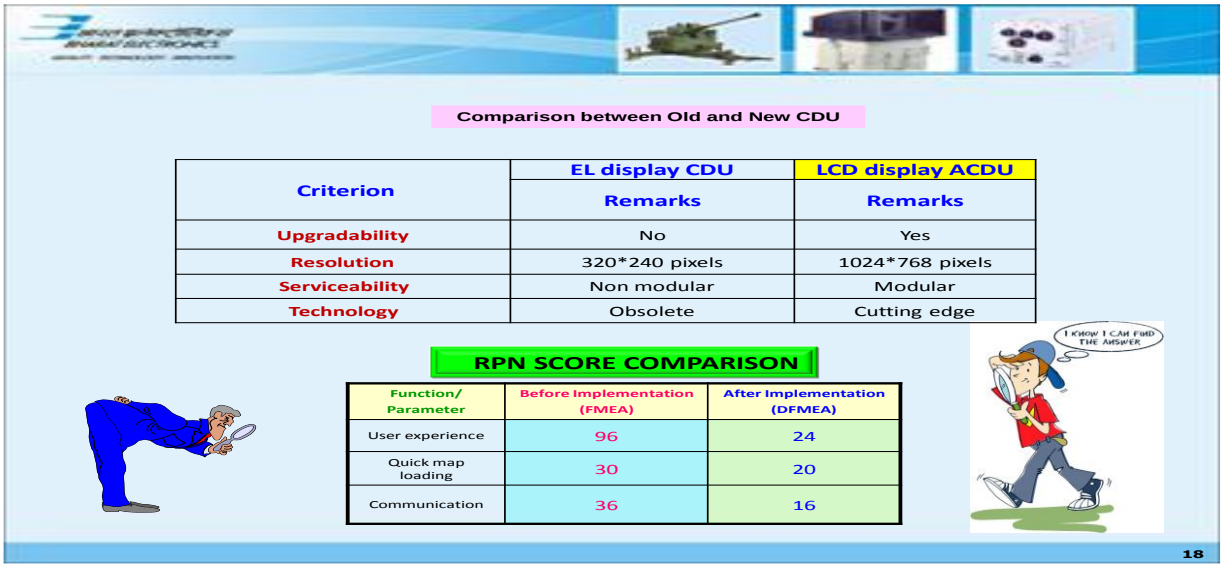
DFSS tool: Define Measure Analyse Design Verify & Validate (DMADVV) has been used for developing the Map Based CDU for ALNS system.





Definition of problem was done using SIPOC, Design Flowchart, CTQ tree diagram, CTQ specification table.

The Measure phase of DFSS was performed using Affinity Diagram: Voice of Customer and Quality Function Deployment.



FMEA was done to find the high RPN functions of the system. Pugh Matrix was used for the selection of LCD panel, processing module, User interface for the CDU system and thus Analysis was done. DFMEA was performed and design work was carried out based on the above findings, and the RPN score comparison was made.

RESULT:

The Map based CDU unit developed not only satisfies the mandatory customer requirements but also includes customer delight features. It was successfully tested with the ALNS system at BEL Chennai and validated at Babina cantonment field trials.

SKF Technologies

OPTIMIZE THE PUSHOUT FORCE OF 70113 SEAL

Problem statement

SKF Grease seals Shifting / dislocated / displaced from bearing cup in the TBU & grease oozing due to seal shifting.

Goals

Metrics	Baseline Y's (before project – 6 Years)	Project goal	Best case	Forecasted savings (at project close date)
Seals Rej / Failure %	0.20%	0	0	Improves the product performance

Quantity supplied : 1,760,701

Seals Rej / Failure : 3,571 (0.2%)

Project summary

To optimize the current dimension on seal OD & Nose profile using FEM analysis and real time simulation on the 5 factors which will improve seal retention and increase the press-out force required to dislocate seals to an average value of 3500 lbs.

Identify / Define / Develop

- Optimize the current dimension on seal OD & Nose profile using FEM analysis and real time simulation.
- Analyzed and identified through FEA & DOE 5 factors that effect Seal retention force / Press-out force .
- Design of Experiment to determine which aspects of the stamping design influence the Press-Out Load.
- Stamping and Bearing Cup design, Boundary conditions, Stamping removal from housing study and FEA study

Optimise

- Optimised the factors that affect the seal retention / press out force

Validate

- Optimised the factors that affect the seal retention / press out force
- Based on the FEA results for Press-out Force for the 3 stamping configurations, we made 15 stampings with profile similar to configuration 2 for physical trials.
- There is an improvement in the press-out force of the optimized stampings with respect to the current design.

Customer satisfaction benefits

- Improved Product performance
- Zero defect
- Zero loss making business

	Before	After	% change	Result
Press-Out Force (lbs)	3500	5513	57.5	

LEAN

Madura Clothing

EFFICIENCY IMPROVEMENT IN JACKET MANUFACTURING LINE

TOOLS AND TECHNIQUES USED

The Six Sigma DMAIC methodology was used in this project. The DMAIC (Define, Measure, Analyze, Improve and Control) approach was followed as detailed below.

DEFINE PHASE– In the define phase the business case, Jacket sewing process and project CTQ were defined with tools such as project charter, SIPOC and CTQ specification table respectively.

CTQ Specification Table

CTQ	Operational Definition of measure	Specification	Defect Definition	KANO Status
Line1 Efficiency/day	**Recovered Mins / Contracted Mins**	**Equal or Greater than 70% Efficiency.**	**Lesser than 70% Efficiency**	**MUST BE**

MEASURE PHASE– In the measure phase data collection was carried out for the project CTQ. The current status of the CTQ was measured using process capability analysis. The observed PPM, mean and standard deviation was established.

#	CTQ	N	Normality Test	Process Analysis	Mean	S.D	PPM	Sigma Rating
1.	Line1 Efficiency/Day	20	Normal	I Chart	0.476	0.032	1000000	0

ANALYZE PHASE – In analyze phase the potential causes that lead to the problem were identified by using cause and effect diagram through brainstorming. (PFMEA)Process Failure Mode Effect Analysis was used to prioritize potential causes.

Three major root causes emerged out of the analyze phase,

- Inadequate Skill Level of Operator
- Individual Operator Efficiency below 50%
- Rework

Further Time study was done to identify **inadequate skill level** of Operator to produce 65 pieces / hour for all section i.e. Parts, Sleeve, Lining, Body ,Sleeve Assembly and Body Assembly, eg. Sleeve section.

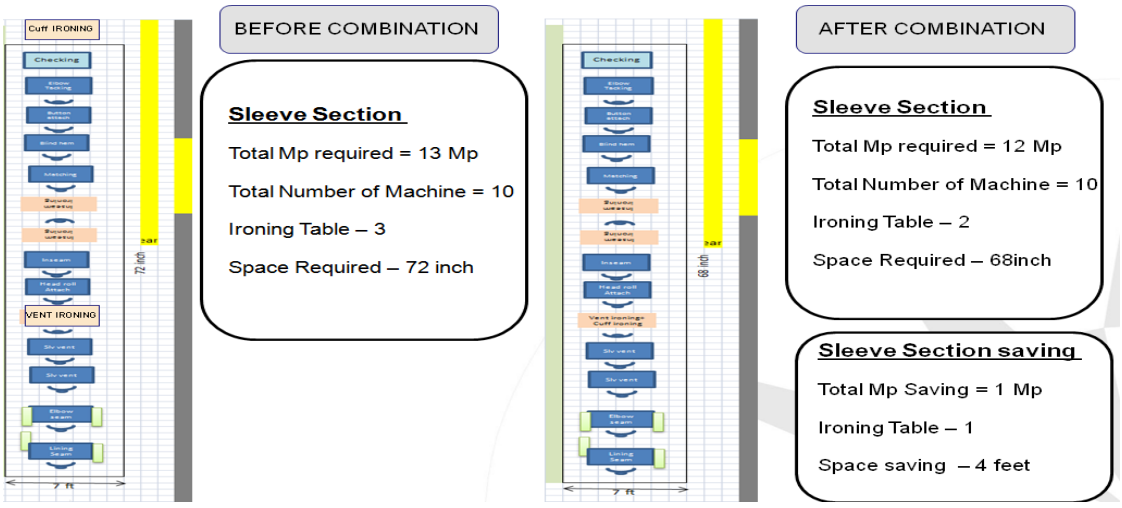
IMPROVE PHASE

#	Cause	Solution
1.	NVA elements in Operation	Train operator with Benchmarked Element. Automation/ Folder development

2.	NVA due to poor Work station design	Design new Work station
3.	Low work Content by design of Layout and Operation	Combination of Operation and Multiskill Operator to balance line. Design New Layout for combined operation.
4.	Rework due to defects	Design Right First Time System to identify defect in line. Folder development and New Handling Method to eliminate the defects

Having identified the solutions, complete improvement implementation plan was made by involving cross functional team.

Work Station Improvement: Work station layout was changed to eliminate the excess motion which is one of NVA in operation.



BENEFITS AND SUSTENANCE

The solutions were and results were evaluated using two sample t-test as well.

#	CTQ	N	Normality Test	Process Analysis	Mean	S.D	PPM	Sigma Rating
Before	Line1 Efficiency/Day	20	Normal	I Chart	0.476	0.032	1000000	0
After	Line1 Efficiency/Day	20	Normal	I Chart	0.69.4	0.013	665907	1.39

Tata Consultancy Services

CYCLE TIME REDUCTION FOR ORDER FULFILMENT PROCESS FOR A TELECOM CLIENT

CLIENT INTRODUCTION:

The esteemed client is Australia's largest provider of Telecom services. It has a robust presence in fields such as Fixed line and Mobile telephones, Digital TV, internet and data services, and network services. It has a strong presence in the Asia Pacific region, and they also have operations in the US and Europe with a customer base of more than 30 million, spread across these regions. It reported a revenue to the tune of $26.3Bn in FY -15.

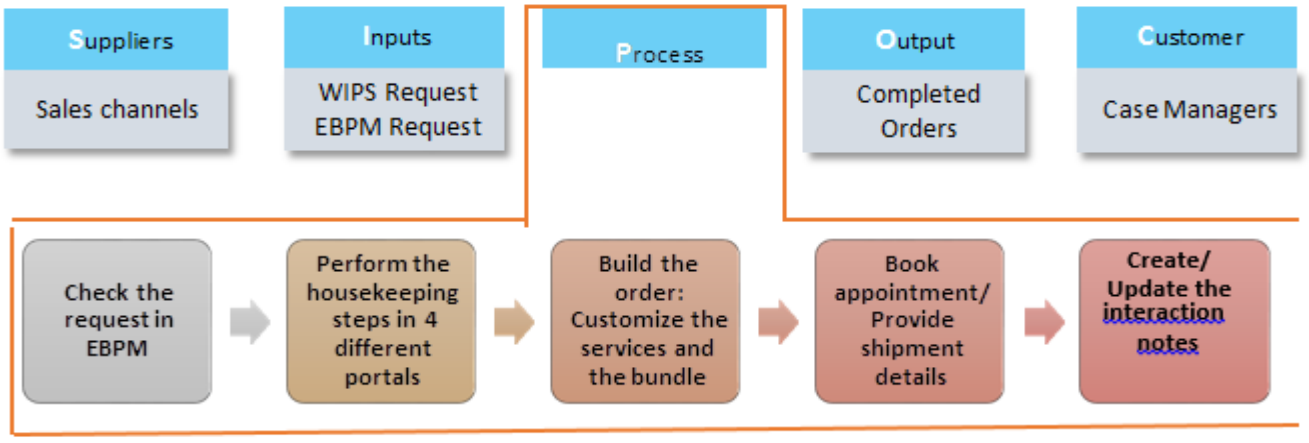
Founded in 1975, the client continues to pave the way for innovation and cutting edge new- generation telecom services in Australia and beyond, with them serving 6.7 million customers with their 4G network presently. Headquartered in Melbourne, Australia, they employ more than 30,000 professionals and cater to both enterprise customers and individual consumers.

The engagement with TCS began in December 2011, and it has gone from strength to strength ever since. TCS has been entrusted with running a plethora of lines of businesses for the client, including (yet not limited to) copper order to activation, fiber order to activation, asset management, field services and billing and revenue assurance. The engagement is a vibrant and growing one, with more than 4000 TCS employees presently working for this client. As a testimony to the incredible growth and the thriving relationship that TCS and the clients have built up over the last few years, they were recognized as the account of the year in the TCS Disha awards 2015.

CUSTOMER BUSINESS VALUE CHAIN AND PROJECT BACKGROUND:

As part of the aim to modernize the communications infrastructure in Australia, the Australian government has established a governing body that will oversee the phasing- out of the existing copper infrastructure with the newer, faster and less costly optical fiber network. Our client, as the leader in Australia in telecom services, have strategically aligned their goals with this initiative. As the partner for the client who are tasked with handling the order to activation value chain, this means that TCS will be handling more and more requests pertaining to fiber line connections over the next few years.

To this end, it is imperative that TCS provides value additions to the client operations by proactively identifying scopes to reduce the cycle time for the order- building process and ensure superior customer experience, as has been the case from the very start of the journey with Telstra. This implies that TCS will be able to build more orders with the existing workforce in shorter timelines, and this will in turn help the clients to receive a better return on their investments.



ABSTRACT:

Identify Phase: The project was identified based on the customer's voice, which was, in turn, aligned to the strategic objective of the client. We started with defining the ecosystem of the process with a SIPOC. AHT samples were collected from the floor to validate the baseline and the data was proven to be normal.

Design Phase: A VSM was created for the process, to break the process down at a click level; and identify process steps with wastes. Once the process steps were arrived at, a value analysis was done to identify the VA/ NVA/ OVA steps and determine waste types. It was found that there were a substantial amount of over-processing happening in the process, among other processes.

Evaluate Phase: A project team was formed, with a 360 degrees stakeholder coverage. Client Subject Matter Experts (SMEs), Operational excellence manager, the TCS process owner and SMEs were part of the initiative. The project team studied the process and the available tools and platforms to suggest an optimized path. This corresponded to 22 suggested improvements, out of which 6 were finalized and put forward to the process owner and the client BE manager. They conducted an effort- impact analysis, and determined that 4 of the 6 would be applicable. These 4 were primed for implementation.

Apply Phase: A detailed implementation plan was laid out for each of the 4 solutions. The implementation phase lasted over a month, and required help from various quarters such as the client IT team (For a systemic change), a team member from a different LOB as well as the process SMEs and owner.

Sustain Phase: A detailed control plan was prepared to sustain the improvement. 3 of the solutions were of the error- preventive nature. For the other two solutions a rigorous audit schedule was set up to ensure that these solutions are deployed effectively and continue yielding the desired outputs.

Benefits from the project:

- Financial Benefits:
  - FTE Benefit: A cost benefit of US$91,920 passed on to the clients.
- Operational Metrics Improvement:
  - Average lead time reduction for 9.09% orders
  - 44% improvement in the firs-time-right metric for the corresponding process steps
- Replicability & Other Benefits
  - The interaction generator tool has been replicated in all LOBs of the client operations

Wipro Consumer Care

IMPROVE LUMINAIRE PRODUCTIVITY BY 40%

About Aurangabad plant:

We manufacture following production at our plant

- GLS bulbs
- CFL lamps
- Commercial & Industrial light fittings
- Modular furniture

Luminaires in Brief:

- Luminaires are devices which houses control gear (Ballast), directs the lights and protects the light source.
- Major sku's are softlite (3type), Fusion (3type), Spacio(2type), LED spacio , Immaculate.
- In these luminaires CFL/T5/LEDs are used and major raw materials are CRCA, Epoxy powder for powder coating and different accessories & Mostly used in offices and commercial buildings for lighting purpose

Reason for taking up this project:

- Luminaries production plan increased by 50% over the previous year from marketing hence need to meet the production plan. Both Furniture and Luminaries are manufactured in same plant and press shop & Fabrication machines are common for both. Hence m/c availability is a concern

Problem Statement:

Current Luminaire productivity is

- 31.0 /person/shift in Fabrication and 20.5 /person/shift in Final Assembly

Hence

- Furniture production is getting delayed to meet its production plan & High man power cost

GOAL STATEMENT

Improve Luminaires productivity

- From 31.0 to 44 no / person / shift – In fabrication
- From 20.5 to 27 no / person / shift - In assembly
- Luminaires assembly should get completed in single shift &No additional manpower cost

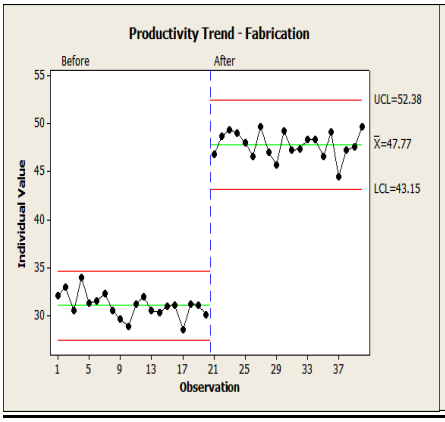
Solutions for X's

X's	Root cause	Solutions/Action taken
Bending capacity Constraint	Both furniture and luminary production s has to be carried out in common bending m/c	New Dies made for the side plate forming which can run on the Press Mc. Bending m/c constraint eliminated
Higher time in Fabrication assembly	Manual fabrication process Manual shifting to next stations	Conveyor introduced for online fabrication assembly. Conveyor (18 meter) made in-house.
Shifting of housing to spot welding area	Spot welding m/c is off line	Layout modified and spot welding brought in online. Modified the Pneumatic and water pipe lines accordingly.
Rivet nut fixing	Manual locating of rivet nut & insertion &manual mallating	Jig introduced with pre locating position for rivet nut positioning.
Higher process time in side plate assembly& body	Twice the housing has to be manually lifted and rotated by person to fix the side plates.	Revolving fixture provided to reduce the handling time and to simply the process

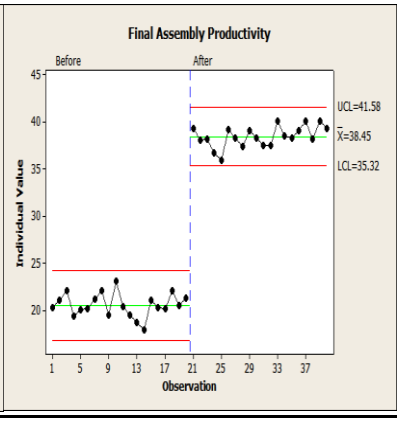
Higher process time in bracket fixing with side plates	Twice the housing has to be manually lifted and rotated	Revolving fixture provided to reduce the handling time.
Higher time required for locking of lamp shield and gear cover bracket	Locking position done for lamp shield and then to gear cover bracket (multiple handling)	Fixture introduced so as to lock both the brackets simultaneously
Higher process time in corner gap removal (bottle neck process)	Corner gap to be removed from four corners.	Inhouse Automation introduced to close the all four corner gaps in single stroke.
Fixture assembly on table / manual shifting	Batch process at one table by same personal and then it was shifted for the glow test.	Conveyorised process established. ON & OFF time provided in conveyor (20 sec ON and 5 sec OFF) based on individual station timing
High time in transfer of housing for powder coating	Manual transfer	Trolleys fabricated for moving assembled softlite to powder coating
Glow testing	- Glow testing was off line - In each luminary need to install lamps and	- Online operation with conveyor . Holder Jig provided by connecting with lamps fixed permanently outside No need to put the lamp for every fitting.
Ballast wiring assembly off line	Keep subassembly ready for next days production	This sub assembly made online to ensure pull system and increase in productivity and eliminate WIP
Storage of packed boxes for strapping	Strapping m/c availability is an issue	New Strapping m/c provided Online strapping of Boxes started

Improve

Productivity Fabrication
Before & After



Productivity Final assembly
Before & After



Benefits

Area	Benefits
Productivity/person/shift in Fabrication	Increased by 54%
Productivity/person/shift in Final assembly	Increased by 87%
Assembly Production	Assembly gets completed in single shift even with increased plan
Financial savings	1.10 Mn
Quality	Less handling of powder coated product ensured nil scratches
Ergonomics	Repetitive lifting/bending operations for operators eliminated.

ABSTRACT:

IDENTIFY PHASE: The project was identified based on the customer's voice, which was, in turn, aligned to the strategic objective of the client. We started with defining the ecosystem of the process with a SIPOC. AHT samples were collected from the floor to validate the baseline and the data was proven to be normal.

DESIGN PHASE: A VSM was created for the process, to break the process down at a click level; and identify process steps with wastes. Once the process steps were arrived at, a value analysis was done to identify the VA/ NVA/ OVA steps and determine waste types. It was found that there were a substantial amount of over-processing happening in the process, among other processes.

EVALUATE PHASE: A project team was formed, with a 360 degrees stakeholder coverage. Client Subject Matter Experts (SMEs), Operational excellence manager, the TCS process owner and SMEs were part of the initiative. The project team studied the process and the available tools and platforms to suggest an optimized path. This corresponded to 22 suggested improvements, out of which 6 were finalized and put forward to the process owner and the client BE manager. They conducted an effort- impact analysis, and determined that 4 of the 6 would be applicable. These 4 were primed for implementation.

APPLY PHASE: A detailed implementation plan was laid out for each of the 4 solutions. The implementation phase lasted over a month, and required help from various quarters such as the client IT team (For a systemic change), a team member from a different LOB as well as the process SMEs and owner.

SUSTAIN PHASE: A detailed control plan was prepared to sustain the improvement. 3 of the solutions were of the error- preventive nature. For the other two solutions a rigorous audit schedule was set up to ensure that these solutions are deployed effectively and continue yielding the desired outputs.

Benefits from the project:

- Financial Benefits:
  - FTE Benefit: A cost benefit of US$91,920 passed on to the clients.
- Operational Metrics Improvement:
  - Average lead time reduction for 9.09% orders
  - 44% improvement in the first- time- right metric for the corresponding process steps
- Replicability & Other Benefits
  - The interaction generator tool has been replicated in all LOBs of the client operations

Tata Consultancy Services

REDUCTION IN PROCESSING TIME IN PROVIDING ANALYTICAL BUSINESS INSIGHTS

CLIENT INTRODUCTION:

Client delivers huge volume of projects, out of which 25-40% of the projects are high end deliverables with complex analysis, insights and recommendations. Currently associates are spending extensive time on basic data extraction and charting to understand the trends and generate logical charts, across markets, categories, competitors and facts, which is primary to comprehend macro and micro level performance.
This reduces the time spent on providing good quality insights and recommendations to the end client. Thus there is a business need to reduce the time taken for basic data extraction and charting, which if not implemented, will impact client satisfaction adversely.

Customer Business Value Chain and Project background:

During the period January 2014 to July 2014, Client on an average received 4,688 projects per month. 36% of these projects (1,706) had scope of Category Overview analysis which takes about 19 hours per project. Thus approximately ~50% of the total project time is used up in data extraction and charting task. This reduces the much wanted time to be invested in providing actionable insights to the client. Therefore the time for data extraction and charting has to be reduced.

ABSTRACT:

Define Phase: Project was identified based on customer VOC. Discussions with the customer team was done to scope the project. Cycle time was taken as the "Big Y". Joint team along with SME's were identified to work in the project. Stakeholder analysis was done to create a shared need and align all the stakeholder with the common business objective.

Measure Phase: Data collection plan was set up to baseline cycle time. MSA study was done and found that measurement system is adequate and acceptable. Process capability analysis was done A detailed end to end value stream mapping was done to identify the bottlenecks in the process. SCAMPER was used as it can lead to meaningful conclusion when regular brain storming session was not sufficient to come up with solutions. There were 20 X's identified. And 11 were shortlisted, below are these shortlisted X's

– Tool dependencies/expertise
– Tenure of the Analysts
– Interpretation of charts
– Category Complexity
– Initial preparation time in Min
– Trends
– Time to conduct Quality check
– Back & forth communication between Client & onshore
– Region specific rules
– Absenteeism

Analyze Phase: A detailed analysis was done to validate the root causes. Graphical tools and statistical tools were used to validate the X's for each of the Y's. The analysis finding helped in identifying and prioritizing the solutions. Validated X's are:-

- High QC Time
- High Data Preparation Time
- Tool Dependency
- Category Complexity
- Less Tenure

Improve Phase: Solutions were identified for significant X's. Quick wins were identified after with discussions with the clients. Improvement was tracked for each of the Y's and statistically validated. Benefits were quantified for each Y.

Control Phase: Detailed control plan was prepared to sustain the improvement. Different reports were prepared for getting any warning signals and regular review. SOP were revised and review mechanism was set up to revise them. Each Y's identified was included Governance mechanism was set up with the clients.

Benefits from the project:

1. Analytical GPS is an innovative "One View tool" providing multiple analysis and increases efficiency multi-folds
2. Varied outputs stemming down to their individual capabilities and experience were simplified in standardizing and identifying the categories to help comparison across different brands/ categories/ geographies and thus optimizing the process
3. The tool helps in highlighting the pain areas quickly giving more time to work on deep dives and presentations
4. Piloted in Europe and Replicated across all Client Account (North America, APAC and Global teams)

- **Financial Benefits:**
  - $ 4.2M worth soft savings

- **Operational Metrics Improvement:**
  - Average cycle time reduction from 19 Hrs to 7.5Hrs

- **Replicability & Other Benefits:**
  - Solutions Implemented across Replicated across all Client Account (Europe, North America, APAC and Global teams More visibility of End To end process and location performance to the clients

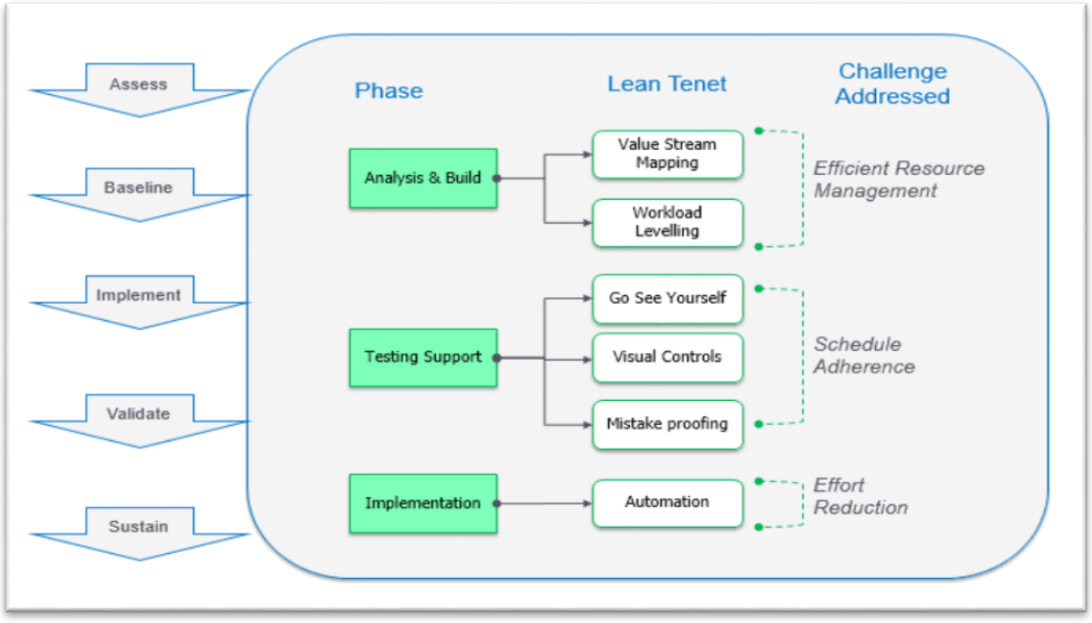
Wipro Technologies

APPLYING LEAN FOR OPTIMIZING SOFTWARE IMPLEMENTATION CUT-OVER TIME

PROBLEM STATEMENT

Application being upgraded is critical for the bank with a complex approach that had been tried by other vendors before and got black listed as they failed to implement. Hence success of this project is very critical to Wipro at BU level due to exposure to loss of business. During the build phase, the average implementation time was 10 days against the expected time of 48 hours. Since the customer is a bank the project would fail unless cut-over window is shorter than a weekend.

APPROACH TAKEN



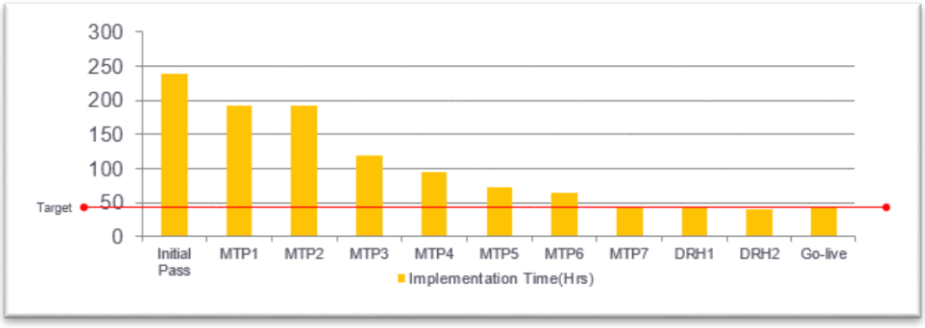
LEAN TOOLS IMPLEMENTED

Tenet Name	Benefit
Go See Yourself	Early detection of out of scope defects and timely escalation – saved verification efforts. Reduced additional effort spent on triage calls from 1050 to 360 person hours.
Value Stream Mapping	Improved process cycle time (Analysis phase: From 12 to 9 weeks, Build phase: from 12 to 9 weeks, Testing phase: from 12 to 6 weeks. Reduced overall Analysis & Build effort from 3055 person days to 2050 person days. Schedule delay of 22 days in Analysis phase was reduced to Zero delay in Testing phase

Mistake Proofing	Zero post go-live defects for one of the major tracks. This helped to eliminate the Type 2 Waste categories of Defect and Rework thereby reducing the build-time of track#3 and defects across different test cycles.
Workload Levelling	Reduced build phase effort from 1395 to 1200 person days. Reduced average defect TAT from 4 hours to 3.5 hours. Reduced total efforts for defect resolution from 8000 person hours to 7000 person hours.
Automation	Reduced overall data conversion effort by 40%. Reduced the report analysis effort by 90%. Reduced instance consolidation effort by 35%
Visual Controls	Visual board helped reduce the additional wait time for defects having onshore dependency thereby resulted in gaining 15hours per day per task across 5 months of build and test cycles.

RESULTS AND BUSINESS IMPACT

- The major challenge of 48 hour cut-over window has been achieved



- Customer has addressed the success of the project in many internal and external forums where the competitor vendors have failed in implementing the solution prior to Wipro
- Effort Reduction of 5% achieved (840 person days) during all the phases of the project
- Received accolades from the customer on the proactive collaboration of the Wipro delivery team towards success of the project

CGI

INFRASTRUCTURE PROGNOSIS

ENGAGEMENT SUMMARY

Monitoring and Triage team provides proactive monitoring of infrastructure and applications (in some cases) and ensures incidents are passed on to the right support teams to reduce the service outages for the customers.

CGI has been providing Command Centre 24/7 monitoring service for more than 7 years now and has been providing this service to the customers across the globe. This service has received lot of accolades from various customers.

The Command Centre provides 24/7 monitoring service for various infrastructure technology domains such as servers, networks, storage, backup and databases. This service is delivered proactively via the Enterprise Management Toolset Monitoring and Alerting Solution. The service is also delivered reactively via incoming service desk calls. At present the Monitoring and Triage team is staffed by a combination of technical and operational members. The Monitoring and Triage team enables the real-time visibility and management of an entire service operation and provides a stable infrastructure platform to the Client users throughout the tenure of the service contract.

SERVICE STRATEGY

Command Centre is the 1st Line support function which ensures service availability to Wintel, SAN, DBA, UNIX, TELECOMS teams.

CGI provides Command Centre service in a shared service mode wherein customers across the globe are supported by the Shared Service. Service is provided from the state-of-the-art command centres located at Bangalore and Chennai and all the delivery processes are ITIL aligned.

As part of service, apart from 24/7/365 days monitoring service for Network Devices, databases, applications, storage and backup, service also offer Level-1 Troubleshooting and Batch Job monitoring. Optionally on customer request, Ad-hoc and checklist monitoring activities and manual health check is also provided.

This service is delivered proactively via the Enterprise Management monitoring and alerting solution. Service ensures that the SLA's are met based on the scope and agreement as-per Command Centre Monitoring and Triage Services.

IMPROVEMENT STRATEGY

As part of improvement it was planned to transform monitoring service to next level of service in terms of providing technical solutions where possible and proactive problem management. As part of this improvement, plan was to provide analytics to help the organization in a seamless support to the customer and increasing throughput to the business.

This improvement aimed at increasing the process efficiency of the service and this improvement was planned to be implemented using Lean Methodologies.

Also, as part of improvement we planned to bring a culture of knowledge sharing not only within the service but extending the same across other technical teams within the Unit.

Continuing monitoring alerts, improvise on providing appropriate technical inputs to the team and building a robust and reliable knowledge database for the Command Centre.

APPROACH

Approach for this improvement was to take simple effective baby steps and at the same time reaching the destination within the planned timelines.

Following steps were adopted for tackling the planned the strategy:-

- Collation of alert data over a period of 3 months
- Analyse the existing skill levels of the team and identify the required trainings if we have to improve their technical skill index.
- Collation of the cycle time involving alerts across various skill levels (skill index of 2/5 to 4/5)
- Understanding the existing documentation and chalking out the improvement needed
- Existing tools and making use of them most, rather than investing in new tools.
- Training the team around the Root Cause Analysis Techniques and problem management techniques.\
- Means of motivating the team.

METHODOLOGIES USED

- Work flow mapping
- 5 S and RCA
- Left shift Approach
- Value Stream Mapping
- Statistical Analysis

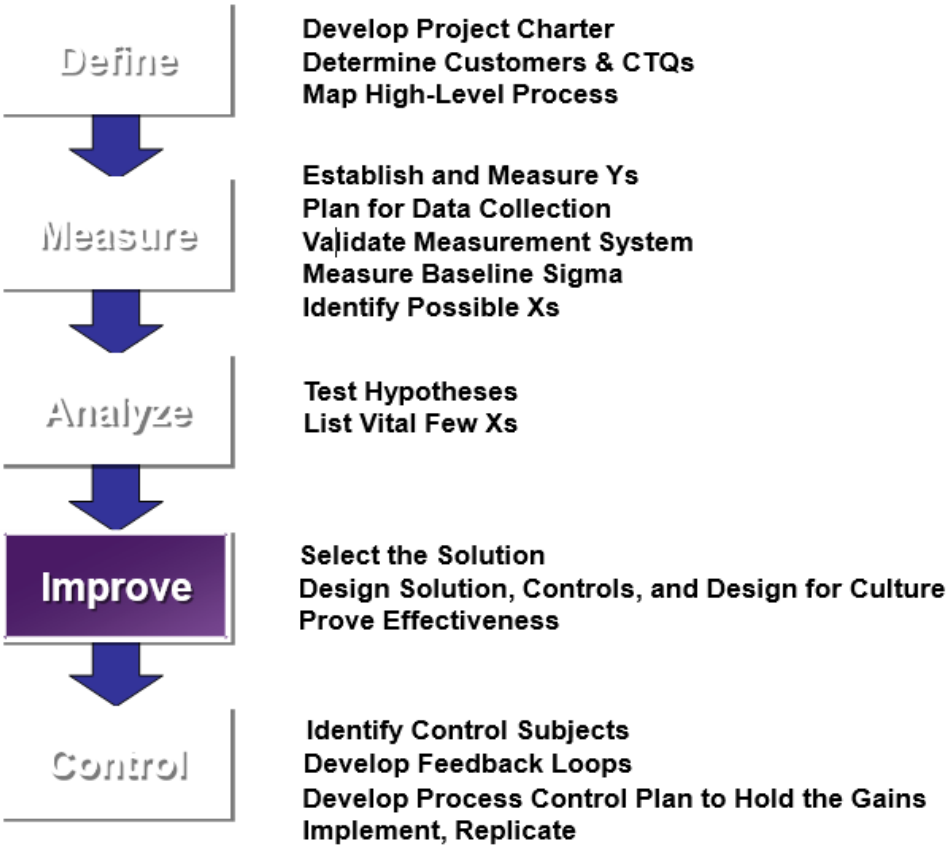
BENEFITS

- Alerts occurrences have reduced from 1.5 Lakhs in May ‘14 to 70 thousand in August ’15, although number of servers has remained fairly constant at 3000.
- Reduction in Cycle time by 50 minutes. Pre improvement, execution of task took around 85 minutes and post improvement it is 30 minutes.
- Process efficiency achieved with an improvement from 30% to 55 % using VSM method
- Shift Left has resulted in increasing the skill index. Skill Index tending towards more in acquiring more technical skills. Service Skill Index for Technical skills at the beginning of the improvement was 2/5 (January ‘14) now it is around 4/5
- Shift Left concept implementation in the Command Centre scenario which has resulted in curbing attrition from 14% to 4%
- Improved productivity of Problem/Change management teams since a total 90 problems/changes created between June ‘14 and August ‘15.
- Helped infrastructure stability by identifying capacity and performance issues on servers – 19 out of 90 problems/changes logged.
- Historical data has helped to fix issues quickly using best practices across clients. All 90 have the resolution and best practices stored

J.K. Fenner

ENHANCING CONTRIBUTION OF GREASE SEALS

Project Metrics	UOM	Base	Target	Current
Increase in contribution	%	9.95	15	15.75



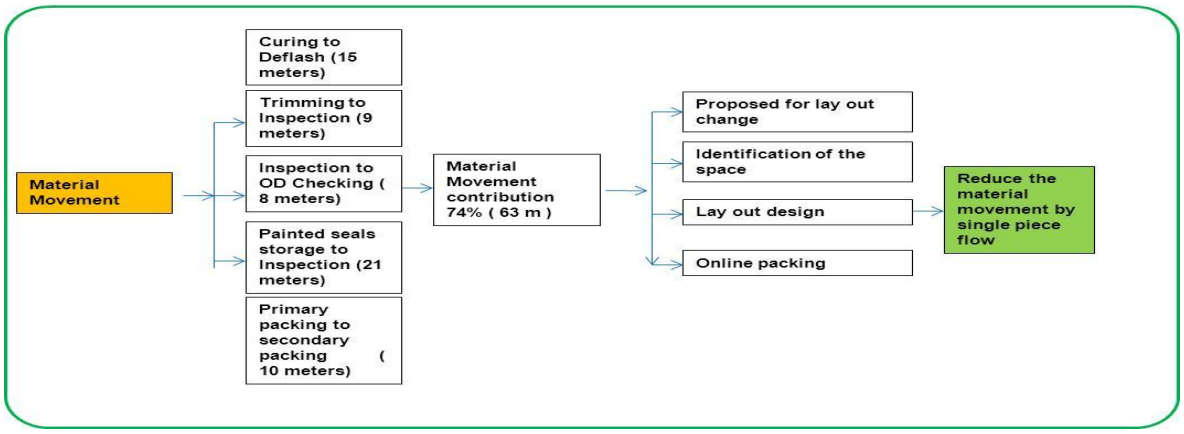
Lean Flexibility

- Small transfer batch sizes
- Small lot sizes
- Under capacity scheduling
- Often labour is the variable resource

Lean Tools Matrix

Tool	Define	Measure	Analyze	Improve	Control
Project Charter	■				
VSM Maps		■			
Data Collection		■			
Causal Analysis Matrix			■		
Kaizens & VE				■	■
SOP's				■	■

Critical Causes Identification

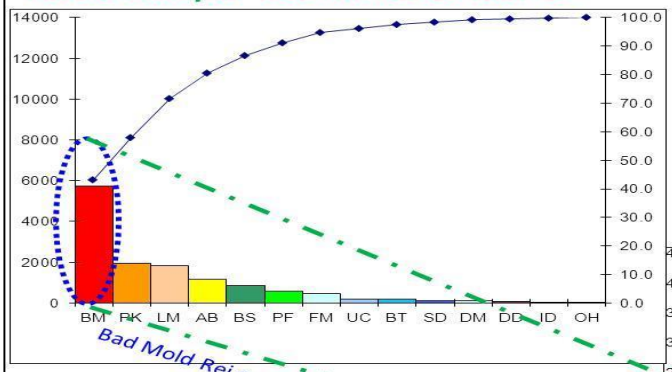


Causal Analysis

Need	1st Level factor	2nd Level Factor	3rd Level Factor	Cause Validation Plan	Counter Measures	Respon sibility	Target Date	Status
Reducti on of Material handling & Cost of grease seal	Input Material	Sealant	Less Productivity	Seal Holding mandrel capacity will be revisited by Kaizen	Seal Holding Spacer thickness reduced from 6mm to 4 mm	KSN & MVKR	25/3/15	Compl eted
			Sealant wastage while spraying	EHS Complaince	Painting booth scrubber is provided	RST & VS	30/5/15	Compl eted
	Curing Press	Cavity Cleaning	Inadequate cleaning	Cleaning procedure to revisit by Kaizen	Introduced structol compound to clean the cavities	KSN & MVKR	10/3/15	Compl eted
			Uneven application mold releasing agent	Mold releasing agent application will be upgraded	Introduced spray gun system for even application mold releasing agent	RST, Nagu & VS	25/5/15	Compl eted
	Method	Material Handling	Zig Zag Material Movement & More no of times movement	Manufacturing Process Layout will be revisited by VSM study	Modified the layout with single piece flow	MLR, VGR, Nagu, KSN & MVKR	10/6/15	Compl eted
		Sealant	Sealant drying time is more	Adequate Sealant drying time will be alloted	Heating element provided to reduce the Sealnt drying time	CDS & VS	30/5/15	Compl eted

Pareto Analysis

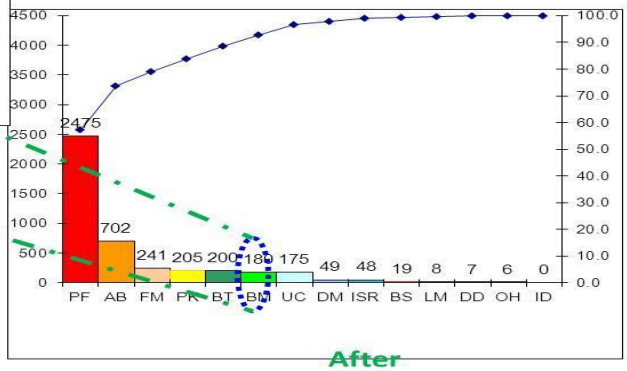
Pareto Analysis from Jan'15 to Mar'15



Bad Mold Rej contribution reduced from 43 to 4.20 %

Before

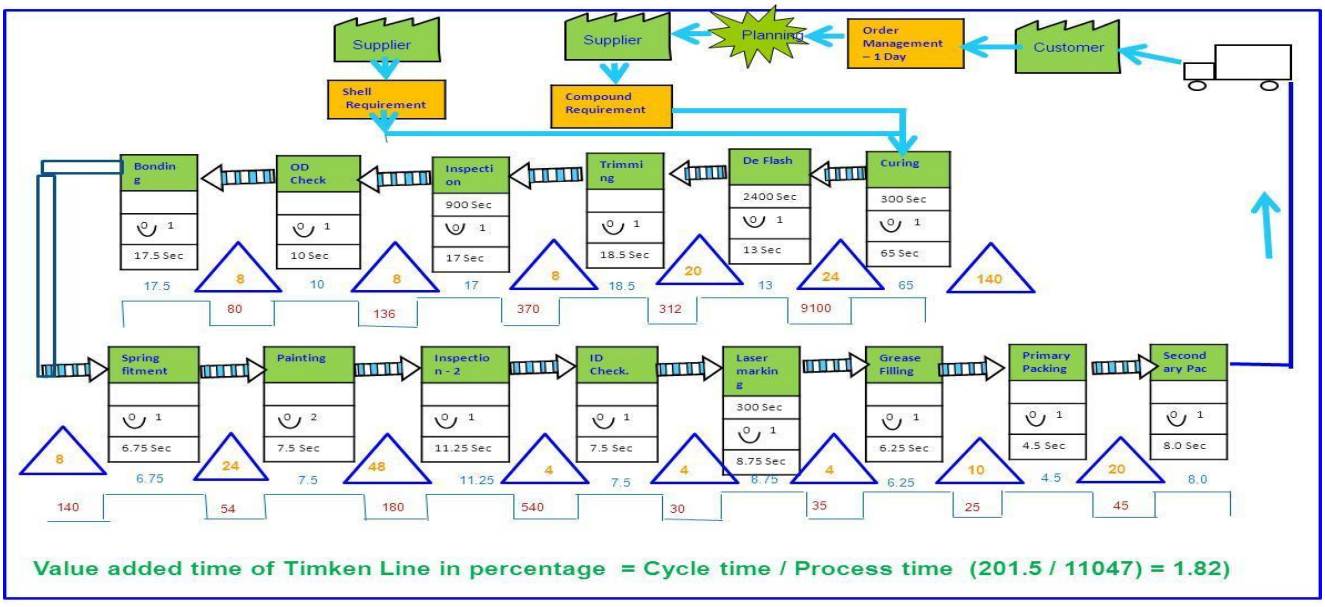
Pareto Analysis from Jun'15 to Aug'15



After

16

Value Stream Map – After modification



Value added time of Timken Line in percentage = Cycle time / Process time (201.5 / 11047) = 1.82)

Material Movement From Curing to Packing : 26 m

Cost Comparison

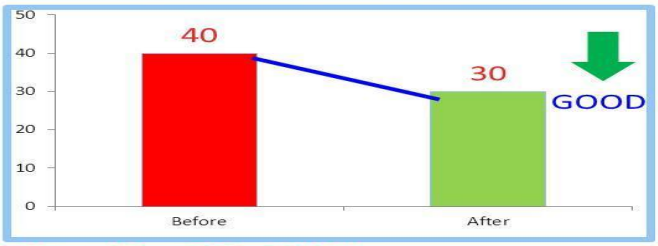
- Total investment for new lay out: ₹ 1.25 Lakh
- Avg Out put /month : 60K

	BEFORE		AFTER	
Description	**Per month**	**Cost**	**Per month**	**Cost**
Sealant Consumption - Lt	208	6,65,600	173	5,53,600
Defects (BM) - No's	1912	273368 (Opportunity cost)	60	8580
Man power	40	5,14,350	30	4,01,375
Total		1453318		963555
Saving per month		₹ 4,89,763		
Savings per Annum		₹ 58,77,156		

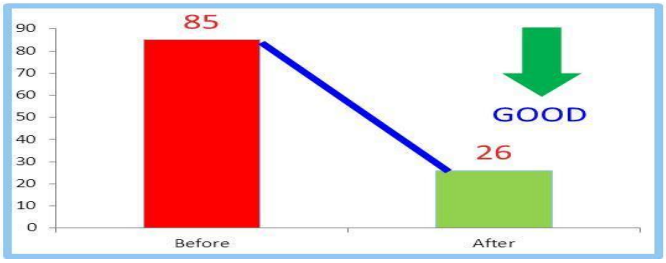
Results

WIP Reduced from 2100 Nos to 330 Nos

Man Power Reduced from 40 to 30 Members



Material Movement Reduced from 85 to 26 Mts



Tangible Benefits

- Cost saving ₹ 59 Lakhs per Annum
- Material movement reduced from 85 to 26 m
- WIP Reduced from 2100 No's to 330 No's
- Lead time reduced
- Value added time (VAT) Increased from 0.08 to 1.82 %

Intangible Benefits

- High Productivity
- Optimum space utilization
- Reduced Operator fatigue
- Customer Satisfaction.

Risk Analysis

- No deterioration in product quality
- No change in Selling price

Wipro BPS

Improving Provider Contract Data Management Efficacy – Onyx and PVO Robotics

Client Overview:

Our client is one of the leading US Healthcare Payer serving 70 million individuals nationwide. This business unit aims at resolution of Appeals & Complaints from Members & Providers related to their claim reimbursement. Wipro has an association with the client for more than 10 years.

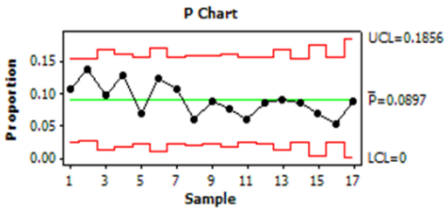
Problem Statement & Goal:

Historical data for last 17 weeks shows that the Defect Proportion for the Provider Contract Data Management (PCDM) LOB stands at 0.0897 against a desired target of 0.05. This is resulting in rework generation and increased TAT, hence impacting productivity and capacity. The overall impact is to the tune of USD 0.5 Mn

Baseline Data – 0.0897 Goal – 0.05

Business Challenges:

- Incorrect Research / determination
- Validation and Re-Validation by processors
- Most of the processing steps require screen flipping and navigation, multiple times
- Skipping mandatory fields while demographic and contract load



Lean tenets Deployed:

1. Value Stream mapping
2. Jidoka
3. Poka Yoke
4. Andons

Solutions Deployed:

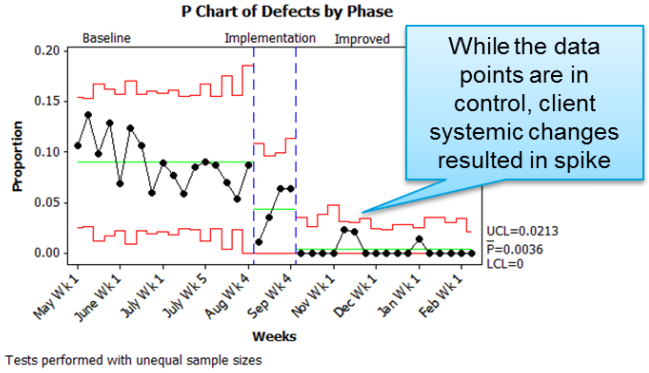
1. PCDM Robotics – Search and Flag, Specialty identification, DIV Check, DIV upload
2. Cosmo Comment Tool - Auto populates DIV, Cosmo Provider and Comments
3. Auto Auditor to audit 100% of the processed inventory
4. SOP Search Tool - Curtails SOP search time by linking the correct SOP to the Reason Code

Benefits to Client:

1. Saving Rework cost with improved accuracy = $90,400 annualized
2. Business Value meter @ 8% of ACV
3. Aged Inventory Reduction

Benefits to Wipro:

1. Productivity benefit (20% Increase) @ $355,045
2. Defect Proportion Reduced from 0.897 to 0.0035
3. 100% Reduction in QA headcount compared to baseline
4. Operating @ Zero Error for 6 months
5. 67% of the Manual Steps robotized
6. Replication Benefits @ 0.63 Mn USD
7. Enhanced client satisfaction



Activity	Processor
VA	46 Seconds
NVA	102 Seconds
ENVA	129 Seconds
Cycle Time	**277 Seconds**
PCE	**16.61%**

Pre Project

Activity	Processor
VA	38 Seconds
NVA	4 Seconds
ENVA	40 Seconds
Cycle Time	**82 Seconds**
PCE	**46.34%**

Post Project

Stakeholder Commendations:

100% BPQM Quality is Great
Please share this tool workflow to replicate for the onshore staff.
- BUSINESS MANAGER

Excellent results here. Reducing the inventory by almost 40% (6,075) in 6 days truly demonstrates Teamwork!
Thank you all for your efforts and continued dedication to providing outstanding customer service.
- BUSINESS MANAGER

LSSEA 2015

AAROHAN 15 not to be reproduced or distributed without permission of SCOPE
Supply Chain & OPErations Club of SCMHRD

Symbiosis Infotech Campus, Rajiv Gandhi Infotech Park,
MIDC, Plot No. 15, Hinjewadi,

Partners

J.K. Fenner (India) Ltd.

QUALITY. ANALYSIS. RESULTS.

ROOMS

sixsigma.scmhrd.edu