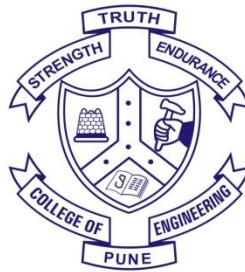


COLLEGE OF ENGINEERING, PUNE

(An Autonomous Institute of Govt. of Maharashtra)

DEPARTMENT OF PRODUCTION ENGINEERING AND INDUSTRIAL MANAGEMENT



M.Tech. Project Management

Project Abstracts



**Department of Production Engineering & Industrial Management
College of Engineering, Pune**

**S. Y. M.Tech (Project Management) [2013-2014]
List of Dissertation Titles**

Sr. No	MIS No.	Student	Guide	Dissertation Title
1	121298001	Khandeshe Purva Abhay	Dr.N.R.Rajhans	Redesigning of Layout of Multi-national company using MCDM
2	121298004	Sahasrabudhe Apurv Ravindra	Mr.J.S.Karajagikar	Design & implementation of Management Techniques in Manufacturing Industry
3	121298005	Issac Basil Varghese	Dr.B.B.Ahuja	Project Management for the Manufacturing Launch Process of New Export Variant
4	121298006	Lokhande Swapnil Murlidhar	Mr.S.U.Ghunage	Quality Management & Productivity Improvement of Sun control Films
5	121298007	Ostwal Praful Bhojraj	Dr.B.B.Ahuja	Concept to commissioning of an engine manufacturing facility
6	121298008	Nikam Rushikesh Subhash	Dr.Rajiv B	Quick response Concern Resolution (QCR) system Development and vender selection for system software development
7	121298009	Yadav Mandeepkumar Virendersingh	Dr.B.U.Sonawane	Strategic Decision Making in Sourcing Operation
8	121298010	Patel Jayeshkumar Narottambhai	Mr.J.S.Karajagikar	Time Management of Tube Knitting Dyeing Process
9	121298011	Thorat Mahesh Vithalrao	Dr.M.D.Jaybhaye	Implementation of Project Management in Market research using MS Projects
10	121298012	Patil Amey Bajirao	Dr.M.D.Jaybhaye	Reducing Rejection & Rework using Six Sigma Methodology
11	121298013	Choundhe Savita Vithal	Dr.B.U.Sonawane	HAZOP Monitoring and Reliability Estimation for Emulsion Resin Plant
12	121298014	Patil Dhananjay Uttamrao	Mr.S.M.Patil	Productivity Improvement in Customer Acceptance Inspection (CAI) of Vehicle Assembly (R Block)
13	121298015	Sardar Vicky Balkisan	Dr. N.R.Rajhans	Spare parts Inventory Management for PMPML
14	121298016	Nanir Swapnil Ashok	Dr.N.R.Rajhans	Multi-objective Optimization of PMPML Bus Transport System using TLBO
15	121298017	Mane Sunil Tanaji	Dr.Rajiv B	Productivity Improvement of General Assembly line
16	121298018	Phadtare Abhijit Kisanrao	Mr.P.D.Pantawane	Total Productive Maintenance on Automatic Robot Welding M/c workstation

Project Stage –II Abstracts

REDESIGNING LAYOUT IN A MULTINATIONAL COMPANY TO MINIMIZE PRODUCTION TIME AND OPTIMIZE RESOURCES

Khandeshe Purva Abhay (121298001) Dr. Mrs. N. R. Rajhans

Although redesigning a Layout is considered more difficult than designing at start, there are some advantages to be found as well. The most important is the amount of production history data that can be made available. Thus at this stage, modifications can be aimed not only to improve the layout, but also to modify the product mix, process flows and job sequencing.

The optimum product mix and job scheduling although don't affect the Layout design directly; it surely helps in increasing the overall productivity of the facility. Here Linear Programming is used to identify the five profitable items out of total nine products. A mathematical model is formed and the optimal quantity of these products for maximizing the profit is determined.

Job sequencing is performed to minimize the job and machine idle time. Twelve machines are merged into three and job sequencing of nine products is done using Johnson's rule. There are many types of layout applicable for different types of production. However rather than confining the facility in anyone group, exploring all types gave better solution than anyone. The solution set consists of total nine Layouts. These .include Job Layout, Process Layout, Assembly Line Layout, Cellular Layout and Systematic Layout Planning.

Simulation helped in getting the visualization of actual process flow taking place, thus giving a better understanding of the problem. All nine Layouts were simulated using PROMODEL. Thus finally multiple criteria decision making technique AHP and TOPSIS were used to select the best layout.

DESIGN AND IMPLEMENTATION OF MANAGEMENT TECHNIQUES IN MANUFACTURING INDUSTRY

Sahasrabudhe Apurva Ravindra (121298004) Mr. J. S. Karajagikar

In small scale manufacturing industries, less management techniques used as compared to MNC ' s and larger manufacturing industries. They have limited resources available and prefer traditional methods. Theirs mind set is towards completion of more and more project without paying attention to have some new techniques. Hence in this project, new methodologies were designed and implemented successfully.

First technique deals with mathematical framework of decision making through implementation of multiple choice decision techniques. Here it was proved that such techniques are not limited to academic purposes only but with some user friendly adjustments can be implemented in industries too.

Second technique provides a unique approach towards manufacturing. This technique gives manufacturing framework as well as tight control over operation. Its outputs are useful for planning of resources and associated finance. It helps towards lean manufacturing.

Lastly, sub-assembly of product oriented standardization process was implemented. Major part of company's product influencing its whole manufacturing time was successfully standardized. By implementing suggested techniques for further orders it was observed that, such methodology which is restricted to one single product helps company at various levels

PROJECT MANAGEMENT FOR THE MANUFACTURING LAUNCH PROCESS OF NEW EXPORT VARIANT

Mr. Basil Issac (121298005) Dr. B. B. Ahuja

The purpose of the present study is to understand the global vehicle manufacturing launch process and apply project management for the successful execution of manufacturing launch process in general assembly shop for the new variant. Manufacturing launch process is a common process to plan and deliver new vehicles to meet specified quality and throughput requirements with minimum production loss. Since automobile projects are complex, one-time effort limited by time, budget, resources, and performance specifications design to meet customer needs, efficient vehicle manufacturing launch execution is necessary. Project management is the application of knowledge, skill, tools, and techniques to project activities to meet project requirements. It helps to achieve the three main constraints of the project scope, cost and time. The growth in new knowledge has increased the complexity of projects because projects encompass the latest advances. So, many companies focus on project Management, as it focuses on achieving project objectives. It is important as it applies managerial process and has its tools that give managers a good opportunity to succeed in achieving objectives.

The scope of this project is the successful executions of global launch process in general assembly shop by following the procedures of the company and there by learning project management tactics in real time. Understanding the vehicle manufacturing industry operations, flawless execution of manufacturing launch process, process planning activities, project execution and control, estimation process are the added scopes of this project

QUALITY MANAGEMENT AND PRODUCTIVITYIMPROVEMENT OF SUNCONTROL FILMS

Lokhande Swapnil Murlidhar (121298006) Mr. S.U. Ghunage

From the feedback given by the customers of Garware polyesters, the management has decided to look into the quality problems faced by the sun control films. It has been found that the quality of sun control films has a very great impact on the productivity indirectly. The reason behind this is that with respect to the input given per month, the Percentage of the lower grade film i.e. B grade film is quite high. This ultimately reduces the percentage of higher Grade film i.e. A grade and thus impacts the overall productivity of the higher grade film. The result of this that the lower grade film has either to be sold at a lower price or goes into the waste category if there is no demand for it. This results in financial loss to the company. Hence it has been decided to attack the quality parameters that hamper the growth of higher grade film.

The purpose of this project is to improve the overall quality of the sun control films of Garware Polyester Ltd. and try to achieve the target of closer approximation to six sigma level so that it, along with benefiting the organization financially also maintains its reputation in the competitive market by satisfying its customers.

Focus has been given to achieve the desired 6 sigma level and applying all possible standard tools of six sigma methodology. The project uses the DMAIC methodology of six sigma to achieve the goal. The idea is to use the six sigma methodology in an effective manner so that it gives the desired results, by selecting the appropriate team members who are guided by the champion and leaders.

Not only to improve the quality and productivity, but also to sustain it for a long period of time and a regular check to ensure that the defects and waste condition doesn't occur again, is going to be the focus of this project.

CONCEPT TO COMMISSIONING OF AN ENGINEMANUFACTURING FACILITY

Ostwal Praful Bhojraj (121298007) Dr. B. B. Ahuja

Decision making process in project primarily revolves around optimization of three basic aspects viz cost, quality & time. On many occasions, original project plans undergo alterations because of various reasons. Some of reasons are

1. Capacity utilization
2. Space/layout optimization
3. Synergy in operations
4. Constraints in budgets

The project under study is one such example, where original business plan has been altered for optimization and tackling all above issues.

The project has been showcased from concept to commissioning where important principles of Project Management viz Project Planning, Design Engineering, Scheduling, monitoring and control will be touched upon.

QUICK RESPONSE CONCERN RESOLUTION (QCR) SYSTEM DEVELOPMENT & VENDOR SELECTION FOR SYSTEM SOFTWARE DEVELOPMENT

Nikam Rushikesh Subhash (121298008) Dr. Rajiv B

In today's competitive market consumers expect excellent quality, reliable delivery and economic pricing from the manufacturer. This scenario creates pressure on the manufacturer to give highly good and reliable product quality to customers.

In business portfolios, especially in manufacturing firm cost of poor quality or no. of product failures at infant mortality stages play very important role. Warranty is key element of growth for any organization as it directly related to customers, customers may be anyone; maybe internal or external.

The work involves a thorough analysis of product performance (i.e. construction equipment in this case) and their variation over the years, the processes involved and their behaviours by using event generation methods & FMEA analysis are addressed .After studying warranty problems associated with product at infant mortality stage, the development of remedial QCR (Quick Response + Concern Resolution) system to reduce cost of poor quality inside the plant is undertaken.

Keeping above points in mind, present work at (MVML Chakan) in Construction Eng. Dept. (CE) is carried out. First part of the report explains the detailed scenario of poor quality in manufacturing sectors and emphasises given on developing and implementing QCR (Quick Response + Concern Resolution) system to reduce cost of poor quality inside the plant; it again contains mathematical modelling for calculating GSR (Global Success Rate), which is key mathematically formulated indicator to access the usefulness of QCR system. And the second part explains development of software for QCR system, so that ease of data punching and centralized data collection can be achieved in order to access the goodness & mechanization of QCR system. Apart from this, application of Multi Attributes Decision Making (MADM) approach is adopted and applied to make effective decision making while selecting best software vendor for QCR systems software development.

STRATEGIC DECISION MAKING IN SOURCING OPERATIONS

Yadav Mandeepkumar Virendersingh (121298009) Dr. B. U. Sonawane

In sourcing supplier selection, freight forwarder competitiveness and total shipment time are the major cost drivers. According to past surveys and research, price is the major factor affecting supplier selection decision followed by delivery and quality.

AHP and TOPSIS method is used to evaluate a supplier in a more strategic way. For some of the TriMas Strategic Business Units (SBU's) the payment terms are 45 days after receipt of material. So, more the total shipment time more the delay will be in making payment to the suppliers. This de-motivates the suppliers and may lead to unfriendly relationship between suppliers and TriMas GSO (Global Servicing Organization) India.

Total shipment time is collected from the supplier and it is analyzed to find out the major delay during the shipping of the goods from suppliers premises to the TriMas SBU's. Previously each SBU was having its own freight forwarder and as there were limited shipments for each SBU's the freight rates were not attractive enough for good amount of savings. Here historical data is collected and based on that data new freight forwarders were approached for consolidation of all the shipments from India for all SBU's and huge amount of savings was observed from new offered freight rates. After evaluating three new freight forwarders on multiple criteria using AHP one of them was awarded the business for all the consolidated shipments from India with a saving of around 1 Crore INR. Looking at the savings from consolidation of shipment from India alone, now TriMas Corporation is conducting dialogues with the new freight forwarder for consolidation of shipments globally and the expected savings is around 1.5 Million

The sourcing performance is improved by selecting the suppliers in a strategic way using a combination of AHP and TOPSIS and consolidating the logistic freight forwarder. The new freight forwarders total shipment time is also less than previous one helping in motivating the suppliers, reducing the lead time of a product, increasing cash flow and establishing cordial relations with suppliers.

TIME MANAGEMENT OF TUBE KNITTING DYEING PROCESS

Patel Jayeshkumar Narottambhai (121298010) Mr. Jayant S Karajagikar

First part of the Project study is about the application of a simulation model to assist decision making on plant layout design and planning. Here simulate the original layout as well as revised layout and the revised layout formulate from the SLP (Systematic Layout Planning). Layout design is very important in a process due to their effect in achieving an efficient product flow. Proper analysis of facility layout design could improve the performance of process line such as decrease bottleneck rate, minimize the material handling cost, reduce idle time, raise the efficiency and utilization of labour, equipment and space. The study employed Promodel package has a tool, using the model to compare the performance in term of % utilization, Entity Average time in system, Entity Average time block in system and Entity Average operation time. Here less utilization of machine due to insufficient material arrival suggest the decrease the number of machine of that type. The Physical alternative layout is selected base on easy flow of material and reduces the traffic jam of trolley and increment in output. This Project discuss on finding of optimum layout by the help of SLP and Promodel.

Second part of the Project describe the “Real Time monitoring System” Which is designed for Real Time monitoring of yarn Trolley and TKD Production. Software Developed in Visual Basic. The Objective and key area of application are considered and it is represent that System Provide flexible event driven reaction on changing of plant environment. TKD Production data stored date and Shift Wise automatically.

IMPLEMENTATION OF PROJECT MANAGEMENT IN MARKET RESEARCH USING MS PROJECT

Thorat Mahesh Vitthalrao (121298011) Dr. M. D. Jaybhaye

Implementing Project Management in the organization results in increased efficiency and also the better use of the resources of the organization along with increase in profits. It is important to every organization to keep a close eye on process happening and the use of the resources keeping in mind the time constraint. Implementing Project Management will significantly help the organization for economic growth. The project is completely based on regular activities happening in the organization and tracking of those activities with the help of MS Project software. The Project covers the various constraints of the organization such as resources available, time constraint, and the work done by each resource. This paper draws attention to adoption of Project Management in the market research organization with the case study. This successfully achieved with the help of MS Project

Various aspects of market research such as market analysis, checking the competitiveness of the market and also the generating the market research report are covered here. This project consists of tracking of such three projects of one is a simple project which needed the proper scheduling and the other two reports were much complex and needed much citation. The work resulted in the better planning the work, better efficiency of the resources and reducing the time of the work ultimately resulting in the reduced cost and high profit.

REDUCING REJECTION AND REWORK WITH THE HELP OF SIX SIGMA METHODOLOGY

Patil Amey Bajirao (121298012) Dr. M. D. Jaybhaye

Quality improvement contributes to effective satisfaction of customer which concludes to beneficiary for every organization. It is important to every organization to cope up with the all qualitative issues for surveillance in competitive market. It is also significant for economic growth of the organization. Six-Sigma is mainly based on customer needs & expectation with the use of facts & statistics, analysis & responsible approach to managing & improving current business, manufacturing capacity & services. Tools of Six-Sigma methodology are used to improve the process by enhancing the quality of product.

This project discusses the quality and productivity improvement in a manufacturing enterprise through a case study. The objective of project is with implementing steps of DMAIC methodology (Define, Measure, Analyze, Improve, and Control) maximum customer satisfaction. Project is enclosed with two different types of problems raised at forging industry for similar type of product. Respective problems are raised from end user that is customer. Case study is consider for two problems these are big end parting line width undersize and insufficient material at bolt seating area. Previous one is regarding dimensional issue at big end of connecting rod. Later one is occurred at bolt seating area with insufficient material, which was occurred at customer after machining the object. Tools of six- sigma are successfully implemented for specified problems. This project draws attention to adoption of Six-Sigma methodology in manufacturing organization with the case study. This successfully achieved by implementing DMAIC methodology.

HAZOP MONITORING AND RELIABILITY ESTIMATION OF EMULSION RESIN PLANT

Choundhe Savita Vithal (121298013) Dr. B. U. Sonawane

The purpose of the present study is to deploy various Reliability Engineering principles for the purpose of production, reliability and dependability. The Reliability Engineering techniques like Reliability Centered Maintenance (RCM), including failure modes and effects (Critically) analysis (FMEA, FMECA), root cause analysis (RCA), improves work planning, life-cost- based design and procurement strategies and other advanced tools and techniques in order to control the root causes of poor reliability.

Secondly to determine the functions of all equipments used for the manufacturing of Emulsion Resins with the help of Functional Block diagram. The function block diagram describes a function between inputs and outputs and also describes the system in one picture.

The whole idea of this project is to apply various Reliability Engineering Techniques to assure the production reliability of manufacturing plants and equipments. Reliability Engineering deals with the dependability of parts, products and systems. Reliability Engineering incorporates a wide variety of analytical techniques designed to help engineers understand the failure modes and patterns of these parts, products and systems. Nowadays reliability engineering principles are applied for the purpose of production reliability and dependability assurance.

In the present work the manufacturing of Emulsion resin plant is divided into different systems and their relation is shown with the help of FBD. The function block diagram (FBD) is used to show the relation between input and output of different systems. Further the reliability block diagram is also used to calculate the overall reliability of the plant. FMEA is carried out to analyze all potential failures of the system. The various effects these failures have on the system is evaluated. It provides detailed insight into the systems interrelationships and potentials for failure. Hazop study is carried out to identify the hazards and failures in the system. Hazop is a systematic safety study based on the systematic approach towards an assessment of safety and operability of complex process equipment or production process.

PRODUCTIVITY IMPROVEMENT IN CUSTOMER ACCEPTANCE INSPECTION (CAI) OF VEHICLE ASSEMBLY (R BLOCK)

Patil Dhananjay Uttamrao (121298014) Dr S.M. Patil

An automobile assembly plant mainly has four main sections, namely press shop, body shop, paint shop and assembly shop, with respect to assembly process stages. Each of these shops has different and special operations. The assembly shop deals with assembling the automobile parts on the painted body. To be more specific, the body moves along the assembly line by hanger or conveyer and different parts assembled on it. After the assembling activities are finished, the produced car enters the end of line consisting of adjustment and test stations (viz Roll and Brake test, head light adjustment, shower test and wheel alignment etc.), visual and manual inspections and repair or rework stations (viz paint, mechanical and electrical etc.)

The project aims at improving the productivity and achieving effective utilisation of manpower by improving Effective Working Time (EWT) and Equivalent vehicle/person/month or /year. It includes implementation of work measurement technique i.e. Maynard Operation Sequence Technique (MOST) to the direct activities so as to improve the productivity. The outcome of the project is achieving triple constraints of project management i.e. time, scope and cost.

**SPARE PARTS INVENTORY MANAGEMENT FOR PUNE MAHANAGAR
PARIVAHAN MAHAMANDAL LIMITED**

Sardar Vicky Balkrishna (121298015) Dr. Mrs. N. R. Rajhans

The purpose of this study is to reduce the cost of the spare parts inventory for PMPML and study the various procedural implemented by them. The emphasis will be on identifying the uniqueness of spare parts inventory different than any other inventory. Also the comparison of various traditional methods is to be done to evaluate which method gives the best solution to the discussed problem in this project study. Application of Multiple Criteria Decision Making methods for evaluating the best available alternatives will be done. The distribution parameters followed by spare parts inventory will be studied and best fitting distributions will be evaluated for the same. The main objective of this project will be developing new methods especially for spare parts management and forecasting and stock control policies for intermittent demand which will minimize the total inventory cost.

MULTI-OBJECTIVE OPTIMIZATION OF BUS TRANSPORT NETWORK

Swapnil Ashok Nanir (121298016) Dr. Mrs. N. R. Rajhans

The research study in this report is a culmination of ideas, views, analysis and calculations which gives a detail understanding of the two different research studies. The thesis talks about two different topics, one is the *"Multi-Objective Optimization of Bus Transport System using TLBO"* and the other is *"To develop new forecasting model for lighting Market"*.

The first topic is a research thesis on optimization of bus transport system operated by Maharashtra Government body named Pune Mahanagar Parivahan Mandal Limited. (PMPML) (India). The optimization includes the factors like maximization of profit, better transport network and minimization of cost incurred in operating the transport system. The optimization is done using the teaching learning based optimization technique. For performing the optimization analysis, data related to the PMPML buses, such as bus timetable, bus depots, routes, bus-stops and so on, was collected from the PMPML office (*the data collected was from authorized PMPML source, solely taken for research purpose and has not been misused*).

The second topic in the thesis talks about the different conventionally used forecasting methods and development of new forecasting model for the lighting market. As the lighting industry is a highly dynamic industry, so developing a forecasting model for such industry was a real challenge.

PRODUCTIVITY IMPROVEMENT OF GENERAL ASSEMBLY LINE AT GENERAL MOTORS

Mane Sunil Tanaji (121298017) Dr. B Rajiv

The report focuses on the Productivity Improvement for General assembly line at General Motors, Pune. In general Productivity is defined as the ratio of output to all or part of the resources used to produce it. Output is the quantity of goods and services produced. The resources used (i.e. the inputs utilized or the factors of production) include labour, capital, energy, raw materials, and services.

While dealing with the productivity, report also focuses on Re- balancing of assembly line for proposing improved line structure with reduced cycle time. Study also tried to identify factors which causing low productivity. Report focuses on concept of SPS (part supply system) which is used for improving productivity through Non-Value Adding activity time reduction. Report also highlights on some design improvements in packaging system for supply of parts are implemented to reduce the cost of Non-value Adding Material.

Methods such as Ranked Positional weight and Kilbridge and Wester are used for line balancing, Analytical Hierarchical process for criticality analysis, and concept of Set Part System for Non- productive time Reduction are used.

TOTAL PRODUCTIVE MAINTENANCE (TPM) ON AUTOMATIC ROBOT WELDING MACHINE WORKSTATION

Phadtare Abhijit Kisanrao (121298018) Mr .Jayant .S. Karajagikar

Quality and productivity of manufactured parts play an important role to achieve the customer satisfaction and to grab the competitive market share. Establishing a culture that maximizes effectiveness of system through prevention of losses occurring throughout the product or service life cycle and achieving the goal of zero accidents, zero defects, and zero breakdowns is a complex task. This needs an involvement of all the functional teams working in the organization and their proper coordination. The functional effectiveness of manufacturing system largely depends on the working conditions of manufacturing facilities upkeep and maintenance. Therefore in order to implement the effective maintenance program the Total Productive Maintenance is used worldwide which aims at achieving zero losses through the efficient maintenance and enhance capabilities.

The present work focuses on implementation of Total Productive Maintenance for Automatic Robot Welding Machine Workstation at Mahindra Construction Equipment Ltd, Pune (Chakan). This involves maintenance of Workstation equipment and machines used for the production of welded components used for heavy automotive. The work includes the study of maintenance philosophy used in implementation approach, difficulties in implementation and cost of implementing. Also this work takes into account the organization structure required for Total Productive Maintenance implementation, its effects on the results and the strategy for successful TPM implementation.

The goal of the Total Productive Maintenance program is to increase efficiency of production facilities which is known as Overall Equipment Efficiency through implementation of eight pillar approach which is the core of TPM methodology. This study will be directed to increase the plant efficiency and productivity through philosophy. In depth study will be conducted to improve the overall equipment efficiency through Total Productive Maintenance implementation in robot workstation.

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College of Engineering, Pune**

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Sr. No	MIS No.	Student	Guide	Dissertation Title
1	121398001	Ankita Mishra	Dr.N.R.Rajhans	Optimization of Employee Transportation system using Vehicle Routing Problem & “Pharmaceutical Supply Chains: A Study”
2	121398002	Bholendra Shakar	Prof. M.N.Shaikh	Process Optimization in Bearing Manufacturing Industry using Six Sigma Methodology & Industrialization of new truck pinion unit in the Indian Market: A Case Study”
3	121398003	Chavan Chetan Hiranman	Dr.M.D.Jaybhaye	Supplier selection & application of MS Project for electrification of residential Building
4	121398004	Chole Sulakshan Meghraj	Dr.M.D.Jaybhaye	Risk Management and Analysis of Software Development Project
5	121398005	Desale Snehal Bapurao	Dr.B.B.Ahuja	-
6	121398007	Kamble Yashpal Gautamrao	Dr.B.U.Sonawane	Analysis of Reorder point and Safety Stock
7	121398008	Khollam Vaibhav Sudhir	Dr.A.V.Mulay	Development of ERP system at Production Dept. COEP to integrate Procurement, Production & Sales using SAP
8	121398009	Lomate Shivali Prasad	Dr.Rajiv B	Cutting Stock Problem & Space optimization
9	121398010	Manekar Rohan Rajesh	Mr.J.S.Karajagikar	New Truck Hub Wheel Bearing Industrialization for Indian Market
10	121398011	Maske Gauri Gajanan	Dr.B.B.Ahuja/ Dr.N.R.Rajhans	Analyse the effectiveness of positioning Gel pads in prevention of Pressure Ulcers
11	121398012	Mokal Nilesh Krishna	Dr.M.D.Jaybhaye	Resource Allocation in Manual assembly Job shop Manufacturing for improving Productivity
12	121398013	Nanaware Swapnil Rajendra	Dr.P.D.Pantawane	To optimize Process Parameters & to improve Machine Capability on SHG Machine (Bore Grinding)
13	121398015	Umesha Kumar Sabat	Dr.N.R.Rajhans	World bank data indicator country index management & growth of economy inflation control
14	121398016	Taksande Pravin	Dr.B.U.Sonawane	Project planning and tracking of GSM cell site installation
15	121398017	Kulkarni Narsinha Manik	Dr.N.R.Rajhans	Scheduler system mismatch removal & generation of statistical model for quality loop in Die Production System
16	121398018	Bharambe Chetana S	Dr.N.R.Rajhans	Statistical Model for quality loop and rework reduction in Die Production System

Project Stage –II Abstracts

OPTIMIZATION OF EMPLOYEE TRANSPORT SYSTEM USING VEHICLE ROUTING PROBLEM

Ankita Sushil Mishra(121398001) Dr. Mrs. N. R. Rajhans

Employee transportation is one of the most concerned issues and a part of HR policy in today's work culture. Optimization of these routes and analysis of scenario needs to be done to leverage cost benefits for the organizations of today. Traditional studies focus on goods delivery and pickup, but employees are a totally different entity, which change the type of problem to be solved. As the entity to be considered changes new constraints get added up to the existing solutions and new study needs to be proposed, for getting better and reliable solutions. Though the problem can be considered as one of vehicle routing, but solving it imposes many restrictions on the predefined techniques. The heuristics need to be evaluated, and selection of the most optimal one is the challenge. Clustering of data is done using two approaches i.e., K means and Sweep heuristics. Results obtained were permuted and again tested to get the best and real time solution to the problem being considered.

PROCESS OPTIMIZATION IN BEARING MANUFACTURING INDUSTRY USING SIX SIGMA METHODOLOGY

Bholendra Shakar(121398002) Mr. M. N. Shaikh

Quality is a prominent issue in most of the manufacturing industries. Improvement in quality of the product need to be done to leverage cost benefits for the organizations. In this regard various quality initiatives have been initiated by the expertise and adopted by various organizations. This project report presents a quality improvement study applied at a bearing manufacturing company based on Six Sigma methodology. More specifically the DMAIC (Define – Measure – Analyze – Improve – Control) project management methodology is used to streamline processes and enhance productivity.

Defect rate causes a direct effect on the profit margin of the product and decreases the quality cost during the manufacturing of the product. . It plays a vital role for the improvement of yield & financial conditions of any company. Defects rate of rollers in bearing manufacturing process is so important from industrial point of view. A lot of defects opportunities create during roller processing of bearings. That's why it is decided to do work and implement DMAIC methodology in roller manufacturing department where rollers are processed. This project report discusses the implementation of Six-sigma methodology in reducing defects in rollers in a Bearing manufacturing industry.

Kaizen technique has tremendous effect on operations of a firm, including design, distribution, marketing etc. and thus all level of a firm's management. Thousands of automotive parts manufacturing industries are present in India. All are facing certain problems resulting in shortage of production and quality issues. Poor quality of product results in scrap/wastes (MUDA's in Japanese), which directly affects the throughput rate and the time taken to produce one product ordered by customer i.e. Takt time. Therefore, the actual time taken to complete a set of activities, known as cycle time increases. This case study deals with the kaizen implementation in an industry in an assembly line in India that manufactures bearings, hub units, seals and housings for all light, medium and heavy commercial vehicles. Case study of implementation of Kaizen has been discussed.

SUPPLIER SELECTION & APPLICATION OF MICROSOFT PROJECT FOR ELECTRIFICATION OF RESIDENTIAL BUILDING

Chetan H. Chavan(121398003) Dr. M.D.Jaybhaye

Supplier selection is one of the critical activities for firms to gain competitive advantage and achieve the objectives of the whole supply chain. Selecting the right suppliers and determining the appropriate orders from them can bring significant benefit in the reduction in purchasing cost, decrease in supplying risk and improved product quality. Therefore, by selecting appropriate supplier thoroughly, it can contribute success advantages to the organization in confronting competitive environment.

Implementing Project Management in the organization results in increased efficiency and also the better use of the resources of the organization along with increase in profits. It is important to every organization to keep a close eye on process happening and the use of the resources keeping in mind the time constraint. Implementing Project Management will significantly help the organization for economic growth. The project is completely based on regular activities happening in the organization and tracking of those activities with the help of MS Project software. The Project covers the various constraints of the organization such as resources available, time constraint, and the work done by each resource.

RISK MANAGEMENT AND ANALYSIS OF SOFTWARE DEVELOPMENT PROJECT

Sulakshan Meghraj Chole (121398004) Dr. M.D.Jaybhaye

Risk management is the process of measuring or assessing risk and then developing strategies to manage the risk. In general, the strategies employed include transferring the risk to another party, avoiding the risk, reducing the negative effect of the risk, and accepting some or all of the consequences of a particular risk. Risk management involves identification, monitoring and control of the risks.

Risks related to the Software Development Project are identified in project. Each one of the risk is analyzed in detail. Finally the risks are prioritized so as to resolve the risks according to their priorities.

Project Management in the organization increases efficiency and also enables better use of the resources of the organization along with increase in profits. It is important to every organization to keep a close eye on process happening and the use of the resources keeping in mind the time constraint. Implementing Project Management will significantly help the organization for economic growth. The project is completely based on regular activities happening in the organization and tracking of those activities with the help of MS Project software. The Project covers the various constraints of the organization such as resources available, time constraint, and the work done by each resource.

ANALYSIS OF REORDER POINT AND SAFETY STOCK

Yashpal Gautamrao Kamble (121398007)Dr. B. U. Sonawane

Traditionally, in the practice of inventory planning, the desired safety stock & reorder point is determined by first estimating risk and then setting the safety stock to a single appropriate level to be applied for future time periods. Safety stock levels are typically calculated under the following assumptions stationary (and usually normally distributed) demand and stationary (and usually certain) replenishment lead time. More advanced methods are sometimes employed which dynamically update the safety stock value as conditions change.

In VEGA controls, they are using static reorder point & safety stock in there ERP system. They are facing problem with excess inventory cost, stock out condition, demand & lead time variation problem in C-Class material. To reduce the problem forecast-based dynamic inventory control approach is used in this paper. In this approach, forecasts and forecast uncertainties are assumed to be exogenous data known in advance at each period over a fixed horizon .Finding forecasting technique which suits company condition & apply in the formula.

Designed an algorithm to implement the mathematical formula in the ERP system. The algorithm designed such that it adopts service level according to defined condition. If something went wrong in the formula then it send message to concern person. The algorithm also reduces the effect of outliers on the formula.

So Analysing company inventory reorder point, safety stock & converting into dynamic inventory reorder point & safety stock reduces the excess inventory cost & stock out condition. Optimizing the inventory by striking appropriate balance between inventory investment & customer service level.

DEVELOPMENT OF ERP SYSTEM AT PRODUCTION DEPARTMENT, COEP TO INTEGRATE PROCUREMENT, PRODUCTION AND SALES USING SAP

Vaibhav Sudhir Kholam (121398008)Dr.(Mrs). Arati Mulay

A proper ERP solution has become a vital need of this era for the enterprises due to the market globalization and day by day growing competition. For the very fact, the ERP solution has become mandatory for an enterprise to run the business in an effective and efficient way.

Compared to a firm, College of Engineering too is an enterprise with many processes of a manufacturing unit like procuring, production, sales, marketing, etc. The production department too has different sections like a stores, computer labs, workshop, shop floor with manufacturing machines, storage location, inventory etc. where real-time manufacturing processes are carried out.

In store mainly activities like procurement, storing and their right-off are focused. Day to day transactions regarding material management, documentation, goods receipt and invoicing, inventory management, internal supply of materials for other departments, sale of finished goods etc. are carried out. In sections like carpentry, workshop, black smithy, moldings manufacturing processes like shearing, turning, pressing, cutting, dressing and many more can definitely be seen.

Hence a real-time manufacturing scenario can be viewed across production department and so considering the above factors the main objective of this project is to develop the ERP system where the Production, procurement and sales cycles can be integrated with each other enabling to track and record all daily transactions for future reference.

Therefore an ERP system can be developed at college level for business process while focusing on core business cycles of MM, PP and SD using SAP.

CUTTING STOCK PROBLEM & SPACE OPTIMIZATION

Lomate Shivali Prasad (121398009) Dr.Rajiv B

Generation and Selection of optimal cutting patterns in order to minimize the raw material wastage known as the cutting stock problem. Solving a CSP has become a key factor to improve the productivity of industries. The approach followed in this research is to decompose the CSP as a mix integer program for total cutting cost reduction and greedy heuristic algorithm for pattern generation in order to reduce overall solve time. Tricky part is how to use Greedy technique to produce enormous cutting pattern and selecting local optimal patterns which then will be feed to mathematical formulation. Here we consider only rectangular and square shape raw material and finals are consider with allowing limited rotation to finals.

Defining and implementing the hybrid methodology for one dimensional and two dimensional CSP so as it will full fill customer demand for finals by minimizing overall wastage subjected to limited supply constraint of raw.

Overall objective of CSP is to minimising the total cost of industry. But there are different way to achieve this objective, and to achieve this we need scientific approach to solve this problem. In this regard, we set the following specific objective.

- Invent novel decomposition technique to solve CSP to minimize overall solve time.
- Minimize total cutting stock waste by full filling demand and supply constraints.
- Increase space utilization of cutting stock material (raw).
- Develop pattern generation algorithm to producing efficient patterns for given combination of raw and finals.
- Solve CSP for one dimensional and two dimensional cutting stock by considering different shapes (square and rectangular) and orientation of final and raw.

ANALYSE THE EFFECTIVENESS OF POSITIONING GEL PADS IN PREVENTION OF PRESSURE ULCERS

Gauri Gajanan Maske (121398011) Dr. B. B. Ahuja/ Dr. Mrs. N.R.Rajhans

Pressure ulcers attributable to the operating room (OR) are not uncommon; they account for up to 45% of all hospital acquired pressure ulcers. This dissertation mainly focuses on pressure ulcer incidences the comfort and effectiveness provided by gel positioning pads during surgery and post-surgery period. A comparative study was conducted between pressure distributions on OR table pad and using the 100% silicon and the visco gel pads. The study mainly focuses on pressure ulcers in supine and the prone position, the different gel pads of silicon and visco gel for different locations that confined the anatomical structure for preventing the pressure ulcers. The experimentation clearly shows how the pressure measurement were taken using TeckscanCONFORmat System and the overall analysis of pressure distribution for all the subjects.

RESOURCE ALLOCATION IN MANUAL ASSEMBLY JOB SHOP MANUFACTURING FOR IMPROVING PRODUCTIVITY

Nilesh Krishna Mokal(121398012) Dr. Rajiv B.

In case of any manufacturing company controlling shop floor activities and meeting deadlines is difficult task. In VEGA controls Pvt. Ltd. it manufactures control panels for different automation companies. As it is work order based manufacturing it is difficult to analyze shop floor efficiency by using traditional methods applied for fixed assembly line manufacturing systems.

Most of the work is manual assembly at the same time skill levels of workers are variable considering to different parameters. As it is work order based industry type of work is variable on every work order. So learning ability of workers is key point of concern.

In this project it is suggested that by comparing worker skill on different parameters in different sections we can give rankings to the workers. These rankings are considered while assigning worker to particular type of work during scheduling.

TO OPTIMIZE PROCESS PARAMETERS AND TO IMPROVE MACHINE CAPABILITY ON SHG MACHINE (BORE GRINDING)

Nanaware Swapnil Rajendra (121398013) Dr. P. D. Pantawane

Internal grinding finds a large number of applications in bearing and automobile industry. Typical applications are bore grinding of inner rings, bore grinding of gears, track grinding of outer rings and steering nuts etc. In Internal grinding, on account of grinding of internal surfaces the arc of contact and thereby the conformity between the wheel and work-piece, is substantially higher. Internal diameter (ID) grinding delivers perfect functional surfaces in components which need to establish a non-positive connection with an axle or shaft.

In project management, a project charter, project definition, or project statement is a statement of the scope, objectives, and participants in a project. It provides a preliminary delineation of roles and responsibilities, outlines the project objectives, identifies the main stakeholders, and defines the authority of the project manager. It serves as a reference of authority for the future of the project. The terms of reference are usually part of the project charter.

The project charter is usually a short document that refers to more detailed documents such as a new offering request or a request for proposal. The project charter establishes the authority assigned to the project manager, especially in a matrix management environment. It is considered industry best practice.

WORLD BANK DATA INDICATOR COUNTRY INDEX MANAGEMENT & GROWTH OF ECONOMY INFLATION CONTROL

Umesha Kumar Sabat (121398015) Dr. (Mrs.) N. R. Rajhans

The thesis represents results of conceptual analysis and construction of World Bank data indicators. World Bank site has data stored for more than 500 factors and about 201 countries during 1980 - 2014. The data represents the factors from all the sectors. The analyzed data are World Bank indicators having all factors in the periods before the onset of crises. This states Conceptual hierarchy of World Bank data which represents the relationship between objects or concepts in a hierarchical form. The work presented here focuses on creating hierarchies which have relationship between parent and child nodes but not between siblings. A multi-level hierarchy (conceptual relationship knowledge) can be generated from a set of questionnaire survey of World Bank data by applying factor analysis and decision tree induction techniques which presents results of analysis and calculation of countries growth that experienced banking crises in the period 1980-2014. The analyzed data are World Bank indicators having all factors in the periods before the onset of crises.

The work is carried out using analytical hierarchy process (AHP) of only factors which have contribution towards growth in each sector & checked by statistical analysis & Pareto analysis of all factors from those which govern the economy of a country's overall growth. It is possible that this will allow for more systematic and integrated approaches to addressing economy as well as long-term development in all sectors of each country. In order to minimize unintended harm to the natural resource base of these countries finance, social, environmental, science, trade & commerce, agricultural issues should be addressed & developed together. Some methods for solving Multiple Criteria Decision-Making problems, of which one is the TOPSIS method. This represents which is best alternative and possession of India comparing to 201 alternatives more than 500 factors from the year 1980-2013 of World Bank data. Criteria taken are 18 most contributing factors which analyzed using Pareto's rule and their consistency checked using analytic hierarchy process (AHP).

This presents country's economy growth considering with all future indicator data of 201 countries from 1980-2014. Analytic hierarchical process, Pareto's rule and TOPSIS methodology helps us deriving country's economic progress.

PROJECT PLANNING AND TRACKING OF GSM CELL SITE INSTALLATION

Pravin Maroti Taksande(121398016)Dr. B.U.Sonawane

Supplier selection is one of the critical activities for firms to gain competitive advantage and achieve the objectives of the whole supply chain. Selecting the right suppliers and determining the appropriate orders from them can bring significant benefit in the reduction in purchasing cost, decrease in supplying risk and improved product quality. Therefore, by selecting appropriate supplier thoroughly, it can contribute success advantages to the organization in confronting competitive environment.

Implementing Project Management in the organization results in increased efficiency and also the better use of the resources of the organization along with increase in profits. It is important to every organization to keep a close eye on process happening and the use of the resources keeping in mind the time constraint. Implementing Project Management will significantly help the organization for economic growth. The project is completely based on regular activities happening in the organization and tracking of those activities with the help of MS Project software. The Project covers the various constraints of the organization such as resources available, time constraint, and the work done by each resource.

SCHEDULER SYSTEM MISMATCH REMOVAL & GENERATION OF STATISTICAL MODEL FOR QUALITY LOOP IN DIE PRODUCTION SYSTEM

Narsinha Manik Kulkarni (121398017) Dr. Mrs. N. R. Rajhans

PE division of Tata motors uses a system known as Fastrack for tracking the jobs or to see the live status of the job. For any particular work order, Fastrack shows two kinds of dates i.e. actual date & planned date. Actual date comes only after physical completion of the job on the shop floor. Planned dates are stored in the system to get an idea as to when the user can expect the job to finish, based on the current scenario. Planned date also helps the planner to decide as to when to release the news jobs available. Presently, planned dates vary mostly with the load on the shop floor.

Currently in the Fastrack system, plan dates are prepared based on thumb rule depending on the size of the job. There is scope for improvement as the thumb rule is not precise and doesn't take into consideration type and material content in the die. Also the data taken into consideration during modeling of the thumb rule is right now considered very old. Also, during the die making process the die goes through a Quality loop known as Q-loop. The time which the die will spend in the q-loop can't be defined totally at the start. Q-loop hours spend by the die are very random in nature for a given sample size. Planning can be greatly improved if these Q-loops are included during the planning phase, which doesn't happen in current scenario.

Hence there is the need for new improved mathematical equation which takes into account more recent data & involves variables which critically affect the die making process. This will ensure planned date becomes very close to the actual date. This will ultimately help in better planning & forecasting the work content in PE division.

Therefore regression equations are developed for booking hours & Q-loop depending on the type of the die & the material content in it.

It has also been found out which die has maximum Q-loop %. These Q-loop hours can also be used in the Scheduler system which will help in scheduling the shop floor operations in accordance with the real scenario.

STATISTICAL MODEL FOR QUALITY LOOP AND REWORK REDUCTION IN DIE PRODUCTION SYSTEM

Chetana Subhash Bharambe(121398018)Dr. Mrs. N. R. Rajhans

Production engineering division of Tata motors uses a system; Fas track for tracking the jobs or to see the live status of the job. For any particular work order, Fas track shows two kinds of dates i.e. actual date & planned date. Actual date comes only after physical completion of the job on the shop floor. Planned dates are stored in the system to get an idea as to when the user can expect the job to finish, based on the current scenario. Planned date also helps the planner to decide as to when to release the news jobs available. Presently, planned dates vary mostly with the load on the shop floor.

While planning for different sections in die production, designer plans for time and budget only for the first release and do not consider time required for Quality Loop. Due to which report shows more difference between planned and actual data. But if the time required for quality loop will be considered, difference will be shown less. Sheet metal is pressed between the die. Based on the pressure exerted on the metal sheet, die quality is checked. If the quality is not up to the mark, operations are performed again and again until it assures the quality. This is known as Q-Loop (Quality Loop).

So, to precise and accurate the planning and minimizing the difference between actual and planned data, forecasting or prediction of time required in Quality Loop is necessary. This will ensure planned date becomes very close to the actual date. This will ultimately help in better planning & forecasting the work content in PE division. Different forecasting methods are studied and out of that regression method best fits the data.

Therefore regression equations are developed for Q-loop time depending on the type of the die & the material content in it.

**Department of Production Engineering & Industrial Management
College of Engineering, Pune**

**S. Y. M.Tech (Project Management) [2015-2016]
List of Dissertation titles**

Sr. No	MIS No.	Student	Guide	Dissertation Title
1	121498001	Patil Digvijay Suhas	M.R.Dhanvijay	Managing & Improving the supplier on-Time Delivery
2	121498002	Chaitali Gogari	Dr.Rajiv B	Elimination of Oil Leakage in V series Diesel Engine using Six Sigma Techniques
3	121498003	Gaikwad Sangramsingh	Dr.B.U.Sonawane	Optimization of powder metallurgy process line using simulation technique
4	121498004	Kalwaghe Pankaj Ravikant	Dr.P.D.Pantawane	Performance of DOE to reduce cost of non-quality
5	121498005	Kanadkhedkar Kalyani Vilas	Dr.Rajiv B	Design of Rotary Table System of 1 degree indexing for Horizontal Machining Centre
6	121498006	Kumkar Chetan Vanraj	Dr.N.R.Rajhans	System Development of Human Resource Management in Tech-Mahindra
7	121498007	Madke Pranita Baburao	Dr.M.D.Jaybhaye	Development of a Fuel Theft Detection System for Commercial Vehicle
8	121498008	Salunkhe Mahendra Sadashiv	Dr.Rajiv B	E-Commerce operation Optimization using Logic Simulation Tool
9	121498009	Sutar Prashant Maruti	Dr.P.D.Pantawane	Reduction of cost on energy consumption by factory units
10	121498010	Toufiq Iqbalkhan Pathan	Prof. M.N.Shaikh	Implementation of ERP system for Casting Production Process using SAP
11	121498011	Lilhare Tushar Pritlal	Dr.B.U.Sonawane	An optimization of maintenance policy using FMEA/FMECA in Power Metallurgy based Industry
12	121498012	Nazarkar Nikhil H	Mr.M.R.Dhanvijay	Improvement in Project Acquisition Process
13	121498013	Dhanorkar Shantanu S	Mr.S.U.Ghunage	Implementation of Gen-3 process in Commercial Vehicle Business Unit
14	121498014	Balany Suman	Mr. J.S.Karajgikar	Application of Lean Manufacturing & Industrial Engineering in Aero Structure Components Manufacturing to optimize the resources
15	121498015	Patil Jyoti Prakash	Dr.A.V.Mulay	Implementation of ERP System using System Application and Product in Data Processing (SAP)
16	121498016	Kale Vaidehi	Dr. N.R.Rajhans	Identifying the emerging customer needs & Product Attributes for Commercial Vehicles
17	121498017	Laidwar Kedar	Dr.S.M.Patil	Development of Project Tracking system and reduction of Project Time
18	121498018	Surve Abhijeet	Dr.B.B.Ahuja	Management of a Piping Installation Project
19	121398005	Desale Snehal Bapurao	Dr.B.B.Ahuja	Analysis of Inventory Management in Foundry by using Traditional Inventory Techniques, Multi criterion analysis and EOQ Model

Project Stage –II Abstracts

MANAGING AND IMPROVING THE SUPPLIER ON-TIME DELIVERY

Patil Digvijay Suhas (121498001), Mr. M. R. Dhanvijay

In manufacturing industries around 60% price of finished goods consists of raw materials and parts purchased from suppliers, the importance of supplier management and its performance is an on-going problem. Therefore to remain competitive in market, to meet standard requirements and also for continuous improvement in business, companies need to monitor the performance of their suppliers.

Delivery performance is one of the most important indicators of supplier performance. Poor supplier delivery performance leads to production, market and customer goodwill loss. Objective of this study is to realize that the supplier on-time delivery is affected by both buyer and supplier processes and to identify those elements of the buyer and supplier processes that affects the supplier on-time delivery. Weighted cause-effect matrix is developed and ranking of the most critical parameters affecting on-time delivery is attributed to both buyer and supplier processes.

In order to improve the supplier on-time delivery we need to resolve these issues on top priority. Methods such as Supplier audits, Corrective and preventive actions (CAPA), Vendor managed inventory (VMI) and Early vendor involvement (EVI) are developed to address these issues.

OPTIMIZATION OF POWDER METALLURGY PROCESS LINE USING SIMULATION TECHNIQUE

Sangramsingh M Gaikwad (121498003) Dr.B.U.Sonawane

Powder Metallurgy is the Production and working of metals as fine powder which can be pressed and sintered objects, thereby drastically reducing losses in manufacturing process. They manufacture automotive components like synchro hubs, synchro rings, Gears, spockets, valve plate, forks etc. The company wanted to increase the production of Camshaft gear. The purpose of the paper is to check the feasibility of increasing the production. This study helps in the decision making of the various components using simulation model generated using Promodel. This study is based on the 80/20 rule, i.e. the model will be made only of those parts which make 80 percent of the total quantity is generated. The components which contributed to 80% of total quantity generated were listed and arranged in descending order, since the camshaft was produced in large numbers it is selected for further study. A simulation model of the existing manufacturing process was developed using Promodel software. This model was simulated for pre defined period of time to find the number of parts that could be generated. Comparing results obtained with required valve it was found that the number of parts which could be manufactured are more than the required number of parts. From the results the requirement of company can be fulfilled theoretically. However practically problems such as Single minute Exchange of Die(SMED), Furnace temperature not maintained arise due to which the number of parts actually manufactured is fractionally less than the predicted number of parts. But the number is certainly more than the number of parts currently produced.

PERFORMANCE OF DOE TO REDUCE COST OF NON-QUALITY

Pankaj R Kalwaghe (121498004) Dr.P.D.Pantawane

Scrap costs are a manufacturing reality impacting organizations across all industries and product lines. Scrap costs are caused by many things—when the wrong parts are ordered, when engineering changes aren't effectively communicated or when designs aren't properly executed on the manufacturing line. Six sigma techniques are used for reduction scrap cost through DMAIC approach. In this study prioritisation of scrap causes in channel is carried out using AHP. This study is an attempt to reduce the problems of manufacturing cost of non-quality by implementing the process DOE.

DOE is a powerful tool to optimize the amount of information needed for use in making management decisions. Statistical techniques provide an understanding of the business baselines, insights for process improvements, communication of value and results of processes, and active and visible involvement. DOE provides real time analysis to establish controllable process baselines; learn, set, and dynamically improve process capabilities; and focus business on areas needing improvement. SPC moves away from opinion-based decision making. Statistical Process Control (SPC) is a control mechanism whereby measurements of product quality are actively obtained and charted simultaneously as industrial products are produced. Control is obtained when a statistical measurement such as means of a group of products are within certain control limits drawn on the statistical process chart. Implementing DOE in a manufacturing process starts with defining the process its self. Consistent measurements cannot be expected from software processes that are not documented and generally followed. The following tools have been used in designing experiments for the current project sequential analysis. Purpose of conducting DOE on outer ring groove grinding machine is to decide the optimum parameters of machine. The performance of machine was analysed on baseline parameters i.e. - parameters on which machine was running, readings of groove diameter was measured.

DESIGN OF ROTARY TABLE SYSTEM OF 1 DEGREE INDEXING FOR HORIZONTAL MACHINING CENTRE

Kanadkhedkar Kalyani Vilas (121498005) Dr.Rajiv B

Rotary Table is a precision work positioning device which is used to hold and rotate the work piece at a desired angle for various operations on the HMC, VMC, SPM machines.

There are many international companies which offer precise Rotary Index Tables. But with these imported products there is a concern of cost, delivery period and service availability for Indian machine tool users. This project deals with the design of a Rotary Table System which is made economic and free of the above concerns for Indian machine tool users. It presents a new technical solution to Rotary Indexing Tables used on machining centres, which offer a high positioning precision, by using a curvic Hirth coupling.

Also, Design Failure Mode and Effect Analysis (DFMEA) is used to analyse the potential failure modes and the current design controls have been implemented accordingly. This design also takes into consideration the feasibility for manufacturing, assembly and maintainability of the system.

Selection of the drive system for rotary index table is of the most concern while finalizing the specification. It becomes a multi-criteria decision making problem based on fuzzy, imprecise information which includes both qualitative and quantitative factors. Thus, multi-criteria decision making (MCDM) approach is used for the selection of the drive system. The selection procedure uses Technique of Order Preference by Similarity to Ideal Solution (TOPSIS) along with the Analytical Hierarchy Process (AHP).

Also, the major components are tested under Finite Element Analysis for improving the overall positioning accuracy, reliability and surface finish qualities of the machine.

System development of Human Resource Management in Tech Mahindra

Chetan Vanraj Kumkar (121498006) Dr.N.R.Rajhans

The project focuses on the working and development of Human Resource Management (HRM) at Tech Mahindra. Hence in this report I am going to identify the differences between HRM and Personnel Management, and evaluate 'hard' and 'soft' approaches to HRM, illustrate how diversity is an issue in Human Relations (HR) practice. It concludes with a discussion about 'hard' and 'soft' models of HRM like Analysis of Recruitment process, Analysis of current trainings process and designing effective training model, by using some statistical method's like Likert – Type scaling technique was used for designing of Training Feedback forms, Objective Type questionnaire was used for Pre and Post conceptual Test, The Training Effectiveness Index was calculated on the Rating scale of 5 points, Tabulation Method. Graphical method – Pie diagrams, Kirkpatrick's four-level model. Analysis of Employee Performance Management System by using Performance Compensation Maturity Model.

Why and how Tech Mahindra personnel functions should reorient their activities to take a more strategic and developmental approach to human resource management (HRM). Currently, human resource (HR) policies are, in the main, centrally determined and developed. There is a commitment to decentralize and devolve HR responsibilities. Allied with this additional strategic focus is that the idea of devolution of responsibility for every day human resource matters to line managers. The necessity for informed analysis in relevance the professionalization of HRM and therefore the devolution of HR responsibilities has been given specific stress by the recent publication of the fifth national social partnership agreement as well as the Programme for Prosperity and Fairness (2000).

DEVELOPMENT OF A FUEL THEFT DETECTION SYSTEM FOR COMMERCIAL VEHICLES

Madke Pranita Baburao (121498007) Dr. M. D. Jaybhaye

The rate of fuel theft is accelerating as fuel prices climb, tempting more thieves to steal fuel. Thief can either siphon fuel from fuel tanks or use special devices making it hard to detect that fuel would gradually be leaving the fuel tank. This practice is often employed by Drivers for their own personal use or for resale. It is difficult to find this theft as the amounts taken may be just 30 litres each time, however, if this is replicated every week and throughout the fleet, it soon puts a significant dent in a Fleet owners' profit. To put an end to this problem it is essential to develop such a system which will monitor Fuel level in the tank of the vehicle and notify fleet-owner in case of any theft there by enabling them to manage and protect their fuel.

Heavy commercial vehicles for transportation and construction segment have a fuel tank of 400 litres capacity and Telematics unit as a standard fitment. In this Project, the high resolution fuel level sensor was selected using Decision Making Tools. Performance and Repeatability testing of the selected Fuel Level Sensor was carried out. Further the Fuel level sensor was integrated with Telematics to transfer Fuel volume data to the Fleet Management server. Fuel Theft Detection logic was defined and implemented within Telematics. Vehicle Level Testing was conducted to validate the defined logic. DFMEA of the system was prepared alongside. Simulation using Proteus was prepared to explain the logic of theft detection.

REDUCTION OF COST ON ENERGY CONSUMPTION BY FACTORY UNITS

Prashant Sutar (121498009) Dr.P.D. Pantawane

Electric power supply is the most important primary factor to run a manufacturing company. Also it is important to control the usage of power. The cost of Energy plays a major role for the company expenses. Reduction of power consumption is the major challenge in the field of manufacturing which minimises the cost of production and hence is the goal of present study. Identifying and controlling of the consumption of power over the factory can be optimized by Six Sigma techniques. Six Sigma methodology used to identify the problem areas which contribute to over consumption of power and application of effective and efficient controlling system to minimise energy utilization. Six Sigma is the technique or process which can be used to minimise error and improve the quality of the product by using various approaches like DMAIC methodology, FMEA analysis etc.

In this project, to enlist the most electric power consuming fields, analyse the appropriate approaches and to execute them DMAIC methodology is used. DMAIC is the abbreviation of Define, Measure, Analyse, Improve and Control. All the power consuming areas are enlisted and obtained their individual impact on consumption of electric power. In this, it would be convenient to make a classification between Illumination system and Manufacturing system.

By measuring the relative data, it will be easy to analysis systematically. For the further analysis Kaizen approach, poka yoke, Failure mode effective analysis, Control Plan , Cause and effect analysis, 5S etc.

To improve the current status of the field Kaizen approach is the appropriate approach in which with the technical analysis cost analysis can be done. FMEA gives the strength of the product or it helps to identify the quality and reliability of the product or tool. Cost on consumption of electric power reduced by DMAIC methodology and its various tools.

IMPLEMENTATION OF ERP SYSTEM TO INTEGRATE THE CASTING PRODUCTION PROCESS USING SAP

Pathan Taufiq Iqbal (121498010) M.N SHAIKH

Today Enterprise Resource Planning (ERP) system is most important requirement of organization. It is Single data source and sharing of data among all the units of an organization. Supplies real-time information whenever required and provides synchronized information transfer in between different functional areas such as sales, marketing, finance, manufacturing, production planning, human resource, logistics, etc.

The Foundry has accumulated numerous spreadsheets and accounting software program for essential functions ranging from financial management to production control. Foundries are able to manage the individual task well but such system does not provide easy access to real- time information and it demands a lot of manual effort to access the required data.

Involvement of different departments like production, sales, purchase quality, finance etc is important in casting process till the final product is produced. For manufacturing of the final product, different operations are needs to be performed like melting of raw material, molding, then molten metal passes to production line where pouring molten metal in molding box then break the runner riser, shot blasting, fettling, painting, machining etc. The manufacturing environment is simply too complex and involves too many components for uncoordinated efforts in process.

After implementing ERP-SAP, it help to centralize the system and connecting all of the components necessary to get a product produced as efficiently and reduce administrative and operation cost. ERP will make real-time information available to managers and staff, and improve work-in-process and delivery performance.ERP system provides invaluable benefits to manufactures seeking to reduce cost, empower streamline, monitor and control entire production cycle.

There ERP system can be developed for manufacturing of product by casting process focusing on cycles of MM, PP and SD of SAP.

AN OPTIMIZATION OF MAINTENANCE POLICY USING FMEA IN A POWDER METALLURGY BASED INDUSTRY

Tushar P Lihare (121498011) Dr.B.U Sonawane

Seeing the hard core competition in automobile market, the automotive industries stand in need to be fast, reliable and also economical in the competitive market. Maintenance serves an important role in an automotive industry for its continuous operation. In order to meet the market demand, the industries are required to reduce their lead time by utilising the concept of Lean manufacturing (LM) i.e. in order to reduce the maintenance cost lean techniques are required. One of the methods to analyse includes Root Cause Analysis (RCA) i.e. Maintenance Failure mode and effect analysis using Risk Priority Number (RPN) Technique. In this work an attempt has been made to implement Maintenance FMEA (MFMEA) in a powder metallurgy based industry, not only to optimise the machines but also to achieve disturbance free operation. The failure modes and their causes were identified for critical machines in the industry, using the three key indices (occurrence, severity and detection). We reassessed and the analysis was carried out with the help of Maintenance FMEA Worksheet. Finally necessary corrective actions were recommended.

IMPROVEMENTS IN PROJECT ACQUISITION PROCESSES

Nikhil Harivijay Nazarkar (121498012) Mr. M.R. Dhanvijay

If a project is planned and begun well, it can be finished within a deadline. Delays occurred during planned activities can affect the project completion in specified time.

In this project work, major focus is given on finding reasons for delay in starting projects and suggesting corrective actions and methodologies. A late started project impacts project costs, Customer relationships, resource availability and related business needs.

A sample case study of IT/ITES department is taken under consideration. An online project work inventory is created using Microsoft share point. A project manager fills all the project details including expected start date, actual start date and remarks in input form and after submitting it; all the project details are displayed in tabular format. If project is started late then primary, secondary and tertiary reasons for delay are mentioned in remarks. For analysis, the data from project work inventory is exported into a Microsoft excel file. Pareto analysis (80-20 rule) is applied to data to figure out major contributing reasons for delay in starting projects. In this case study, the major reasons for late start are no system access, unavailability of human resource, less information from customers. Root causes for all the reasons are investigated. Corrective actions and methodologies, which should be applied during project acquisition phase, are suggested to mitigate the delay.

This methodology can also be adapted for construction and fabrication industries by considering issues of the relevant fields.

IMPLEMENTATION OF GEN-3 PROCESS IN COMMERCIAL VEHICLE BUSINESS UNIT

Dhanorkar Shantanu Suresh (121498013), Mr.S.U.Ghunage

Automobile Industry is majorly customer driven. Hence, to meet the customer demands and to attain a strong position in the market a New Product Introduction Process (NPI) is used. NPI Process gives more structured and robust way of launching product in order to earn multiple objectives like profit, market position, revenue increment, customer retention etc.

Tata Motors has its own NPI Process based on the Stage Gate Process. This stage gate process has been followed since 2003. However, after the evaluation of present competition a need was felt to improvise and adapt to the new NPI Process with major objective to maintain customer retention and product value. To avoid time lapse, it has been decided to adopt Generation-3 Process of Passenger Vehicle Business Unit.

To adapt to any new NPI Process, it is necessary to determine the structure of the changes which needs to be adapted. So, mapping was done with respect to activities in order to provide basic analysis of the process. SWOT Analysis of Generation-2 Process was done and problem in the project timeline deviation .Another, major concern was found to be design changes due to continuous cost reduction activities(Value Analysis and Value Engineering Activities), which were hierarchically affecting the product launch date.

With multiple projects running in the company, it becomes difficult to monitor such changes now and then. To overcome the major concerns, a new function was developed as per the Gen-3 process in order to monitor the design changes with cost as the only element. The activities of VAVE are now integrated with the system .These design changes are now being monitored and tracked for every project giving us the clear idea of design changes keeping the opportunity for cost reduction activities intact.

APPLICATION OF LEAN MANUFACTURING AND INDUSTRIAL ENGINEERING PRINCIPLES IN AERO STRUCTURE COMPONENTS MANUFACTURING TO OPTIMIZE THE RESOURCES

Suman Ishwar Balany (121498014) Prof. J.S. Karajagikar.

Now-a-days many of the industries are implementing Lean Manufacturing and Industrial Engineering principles to increase the productivity. To survive in a competitive world and to transform their business, companies has to think out of the box, has to improve continuously. Enhancing productivity is the demand of the current & upcoming environment. This continuous improvement directly or indirectly affects company's financial statements. To increase the productivity we need to produce maximum output with the minimum input (resources).

Tools and Techniques used in this study are: 1) Work study 2) Line balancing 3) Kaizen 4) Pareto analysis. Kaizen is not a one-time activity; it is a continuous activity which requires the participation of all the members from top to bottom. This case study deals with the application of kaizen in assembly line of aero structure components manufacturing. There were six processes in assembly area those cycle time are greater than their takt time, due to which it was not possible to achieve the target. Therefore it became necessary to debottleneck the processes. Process can be debottlenecked by identifying the possibility to distribute the workload equally, to make substations, to make activity offline, to automate, to improve the method, or to eliminate the wastes etc. Therefore flow process chart was prepared and analysed to identify the kaizen in the assembly area. There are two types of kaizen a) Spot Kaizen b) Flow Kaizen. Spot Kaizen focuses more on workstation/workplace improvements and flow kaizen focuses more on wastes occurs during the flow like movement of the man and material. This study has given more focus on Spot kaizen. This study was conducted to find the factors of low productivity and to support the increasing customer demand. It was found that Kaizen tools helped to identify the reasons of increased cycle time and to reduce the cycle time by 10-20%.

IMPLEMENTATION OF ENTERPRISE RESOURCE PLANNING USING SYSTEM APPLICATION PRODUCTS IN DATA PROCESSING

Patil Jyoti Prakash (121498015), Dr. Mrs. Arati Mulay.

Enterprise Resource Planning (ERP) is planning for optimum utilization of resources. ERP gives centralize database for all these departments, such a versatile system can be put into practice for big organization as well as for tiny manufacturing constituent. One case in point for tiny manufacturing constituent can be Additive Manufacturing (AM) also known as Rapid prototyping (RP). Rapid prototyping is printing a model as per graphical design such that continuous layers upon layer of raw material.

ERP system developed for Rapid Prototyping process using SAP (System Application and Product in data processing). In production department of COEP, Rapid Prototyping lab is working like that; first step is taking request from customer through enquiry form. Customer can be student or any company. One website is developed to collect this information from customer. Website implementation is done with web dynpro which is tool of ABAP (Advance Business Application Programming). ABAP is a SAP's development language. SAP have different modules like material management (MM), sales and distribution (SD), production planning (PP), finance and control (FICO), Project System (PS). To implement this project, different functions from Rapid Prototyping lab have highlighted and respective functioning modules, identification of area where customization is required and last but not least is proper and require data gathering from Rapid Prototyping lab which is base for implementation. Appropriate configurations of all modules and clear execution of these modules result an implemented ERP system to Rapid Prototyping Lab using SAP.

Second step is creation of quotation by considering factors- machine name, machine charges, raw material, its quantity, cost, tax. Quotation gives estimated budget of job print. Quotation is developed with help of Cost estimate of PP Module. If customer accepts that quotation then third step is he/she/they will send conformation to Rapid Prototyping Lab. Authorized person's email id provided on website to accept this conformation. Then production will start. Lab keeps stock of raw material up to certain quantity and when quantity goes under certain level then they again put purchase order to vender for raw material. This operation is done with MM module. In this module Material Requirement Planning (MRP) cycle implemented to keep track of material. After production last step is Rapid Prototyping lab sends bill receipt which contents- name of machine used and how long it used, name of raw material used and quantity, total costing. Finally goods will be post to customer. Again bill receipt generated with help of SD module. PS Module is used to do project planning.

IDENTIFYING THE EMERGING CUSTOMER NEEDS AND PRODUCT ATTRIBUTES FOR COMMERCIAL VEHICLES

Kale Vaidehi Vinayak (121498016) Dr. Mrs. N. R. Rajhans

Problems are needs in disguise. The customers intend to solve these problems with the purchase of products and services. The success of every company is dependent on its ability to create products and services that address unmet customer needs. Understanding Customer Needs is the first step to helping them solve their problems.

Actions have to be taken in order to solve the customers' problems. The company solves these problems by modifying their existing products or launching new products. It is important to identify the attributes of these products accurately for maximum customer satisfaction.

The project work involves identifying these customer needs for commercial vehicles and converting them to product attributes. The project is divided into three distinct parts.

Part 1 of the project involves the study of various macro and micro environment factors which directly or indirectly affect the agriculture sector. These factors indicate the attractiveness and growth prospects of the sector. This study will help to formulate the product strategy for commercial vehicles used for transportation of agricultural products.

Part 2 of the project involves identifying the ergonomic needs of staff transportation buses used by the companies in Pune. An online survey was conducted in which questions related to the ergonomic aspects such as safety, sitting comfort, ease of entry/exit were asked. The data collected through this survey was analyzed to find the pain points. It was found that safety and sitting comfort are major concern areas. Further, modifications were suggested in order to improve the comfort and safety of the buses.

Part 3 of the project involves analysis of the Voice of Customer of Medium and Heavy Commercial Vehicles. A pan-India survey was conducted of customers plying their vehicles in various applications. The questionnaire comprised of questions related to business environment like concern areas, opportunities, competition, consigners, drivers and vehicles. The problems are then prioritized and appropriate action items are listed.

Thus, the entire project revolves around studying the customers and end users of different segments of commercial vehicles and suggesting solutions to their problems.

DEVELOPMENT OF PROJECT TRACKING SYSTEM AND REDUCTION OF PROJECT TIME BY GENERATION OF GENERIC PFMEA

Laidwar Kedar Shivshankar (121498017) Dr.S.M.Patil

Every project has different activities and each activity has given certain stipulated time. For that purpose we try to make timing plan for those activity according to their sequence of performance. Project manager's responsibility is to follow timing plan and track all those activities and try to complete them from responsible person within time duration and try to reduce projects duration.

In this thesis in first part is about development of tracking system for timing plan with the help of MS PROJECT. Try to find out late going activity and eliminate problem which are arriving during when MS EXCEL using for making timing plan.

PFMEA is one of the activity which have to be performed for every new project while PPAP submission. It also helps us to find out possible occurring error and try to reduce them by applying recommended actions.

In order to reduce the project time duration, it is suggested that product should be generalised according to their family which are having same process flow so accordingly product are generalised in two categories sprocket and synchro hub.

Root causes of problems arriving in processes, their effects on customer end and further process were listed out. Accordingly fishbone diagrams for each process is made giving detail explanation of potential causes in process. The problems were analysed and Area wise contribution of problems and their trend of repetition are discussed. Problems are distinguished according to man, machine and management. According to necessity of problems recommended actions are given and reduced failure rate. Reduced the failure rate of sintering process for two failures by 56%

MANAGEMENT OF A PIPING INSTALLATION PROJECT

Surve Abhijeet Uday (121498018) Dr.B.B.Ahuja

Within an industry, piping is a system of pipes used to convey fluids one location to another. Piping material and the inline components (fittings, valves, etc.) can be manufactured steel, aluminum, fiberglass, etc. and can pass number of fluids through them.

Materials constitute a large portion of the total cost in projects, be them mechanical or constructional. It may account for 50-60% of the total project cost. As a result the focus is proper management and tracking of materials and so as avoid sudden shortages thus affecting the project duration and consequently the costs. Apart from this, another important perspective is from where has the material been purchased. It should be purchased at a minimum cost but not at the expense of quality. Hence it becomes essential to select those vendors who can deliver the right product to us at the right time and a good quality. To assure this, AHP and TOPSIS methods were applied to different vendors under consideration. They have been judged under the following parameters: price, delivery time, reliability and professional comfort. After the application of AHP & TOPSIS, the vendors who proved to be suitable for business were selected as the material suppliers for the project.

Considering the planning of the project a schedule of the same has been prepared using the MS Project software. The project schedule is the tool that communicates what work needs to be performed, which resources of the organization will perform the work and the timeframes in which that work needs to be performed. The project schedule should reflect all of the work associated with delivering the project on time. In the execution stages of the project an actual on site work was looked after. This included executing the actual plan by facing various practical issues and finding out a way out of them. Issues included reworks, interdependencies on other contractors, internal material issues, management issues, etc. All the possible applications of 5S and other IE techniques have been undertaken with a view to improve the project performance and quality. Tools such as NPV, IRR and Payback period have been used to understand the financial feasibility of the project with respect to the investments and the returns into and from the project.

ANALYSIS OF INVENTORY MANAGEMENT IN FOUNDRY BY USING TRADITIONAL INVENTORY TECHNIQUES, MULTI CRITERION ANALYSIS AND EOQ MODEL

Desale Snehal Bapurao (121398005) Dr.B.B.Ahuja

With today's uncertain economy and market conditions companies are always looking for alternative methods to stand up high in growing industries. Every organization needs inventory management for smooth running of its activities. As it serves as link between production, store and purchase department. Thus, it is very essential to have proper control and flow for management of inventories.

Being a new plant and manufacturing industry, company facing many problems for production process among which inventory management is most challenging area. Where management's main aim is to get an idea of inventory in terms of consumption, availability, deterioration and lead time of items. Study includes collections of all items data available with store department and its categorization in terms of direct and indirect materials. Items selected on the basis of consumption rate to carry out ABC and HML analysis and graphical results are analysed with respect to all critical factors which are demand, unit price, shelf life and lead time. New approach of using multi criteria decision making methods is used for ranking and categorization with the help of AHP & TOPSIS method so that all criteria's can be considered. Weights are assigned to all critical factors in AHP and TOPSIS method helped to ranked, categorized and analysed results by plotting graphical representation. Comparative ranking is plotted for traditional techniques and MCDM method. Thus, analysis is helpful for management to categorize materials with respect to all critical factors and to distribute authority to keep eye on materials by senior level.

Economic order quantity is another inventory management technique to calculate what quantity should be purchased which will be effective for inventory investment cost for company. Basic Wilson's EOQ model for highly consumed item is estimated to check whether company is following any model. Results are plotted for both the models current and EOQ in terms of no. of orders and monthly ordered quantity. Further Safety stock and Re-order point is calculated for the same. This study helps management to review and decide their purchase pattern for respective materials and to have control on purchase. It will be beneficial for company to avoid blocked money due to excess inventory.

**Department of Production Engineering & Industrial Management
College of Engineering, Pune**

S. Y. M.Tech (Project Management) [2016-2017]

List of Dissertation Titles

Sr. No	MIS No.	Student	Guide	Dissertation Title
1	121598001	Bavdhankar Aniruddha Milind	Mr.J.S.Karajagikar	Application of Lean Six sigma Methodology to improve Supply chain efficiency in an electronic goods Manufacturing Industry
2	121598002	Chavan Atul Malahari	Dr.M.D.Jaybhaye	Optimal Scheduling of Crude oil receipt and Blending Operations
3	121598003	Chaudhari Harshal Bansilal	Dr.N.R.Rajhans	Small Scale fodder Harvester An Ergonomic Perspective -Analysis
4	121598004	Pathak Ameya Gajanan	Dr.N.R.Rajhans	Case studies on Inventory Management & Make or Buy Analysis
5	121598005	Polshettiwar Anurag Ashokrao	Mr.M.R.Dhanvijay	Efficient planning and execution of Third Generation Wheel Bearing (HUB- 3) Manufacturing Channel
6	121598006	Prabhu Tushar Prakash	Dr.N.R.Rajhans	Small Scale fodder Harvester - An Ergonomic Perspective - Design & Fabrication
7	121598007	Raut Snehal Mahadevrao	Dr.S.S.Anasane	Qualitative and Quantitative Risk Assessment in Project Execution Life cycle of Box type Heater
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9	121598009	Sonawane Sagar Sharad	Dr.B.U.Sonawane	Elimination of Sticky soot and rust in order to improve productivity
10	121598010	Sujata	Dr.S.M.Patil	Project Management in IT HealthCare
11	121598011	Suryawanshi Anurag Ashok	Mr.M.N.Shaikh	Warehouse management for improving Human Efficiency in order picking system
12	121598012	Thakare Shraddha Satish	Dr.N.R.Rajhans	Design of Lifting Mechanism of Hospital Bed
13	121598013	Thakkar Dhawal Manish	Dr.A.V.Mulay	Logistics planning using Optimization Techniques
14	121598014	Trivedi Divyesh Prakash	Dr.B.B.Ahuja	Process Optimization Using Model Simulation, Automation And Ergonomics
15	121598016	Degaonkar Ronak Rajshekhar	Dr.Rajiv B	Design & Simulation of Machine Shop Layouts with Selection using MCDM Techniques and Development of Centralised Project Management System(CPMS)
16	121598017	Deokar Ameya Yogiraj	Dr.P.D.Pantawane	Process optimization and Productivity improvement of Assembly line under New Product Launches Division
17	121598018	Vairagade Harshwardhan R	Mr.S.U.Ghunage	Operation Excellence and Productivity Improvement in Engine Manufacturing Facility

Dissertation Phase -II Abstracts

Application of Lean Six Sigma Methodology to improve Supply Chain Efficiency in an Electronic Goods Manufacturing Industry

Bavdhankar Aniruddha Milind (121598001) Mr.J.S.Karajagikar

In today's competitive market, companies are looking for top line growth and opportunities to reduce their total cost structure. The senior management of such companies would like to increase quality, efficiency, and capability without increasing capital investment. The Six Sigma DMAIC1 problem-solving methodology and Lean thinking offers the greater efficiency and capability to write the company processes of business. To achieve continuous growth and success in today's market nearly every business process needs improvement. Improvement means in- creasing On Time Shipment (OTS), increasing inventory turnover, reduce total operational hours per unit, reduce process variation and cost, and improving the quality. By improving the business processes, we can achieve these changes. The practice of Lean methods targets to waste reduction, Six Sigma methodology targets to reduce process variation. This project explores and implements the Lean Six Sigma methodologies, tools, and techniques in supply chain within Electronic devices manufacturing environment. The advantage of implementation of our solution is that it will reduce total cost of operation, improve supply chain efficiency, and increase customer satisfaction. The project discusses the implementation of DMAIC methodology to improve Key Performance Indicators (KPI's), Lean tools such as 5S program, Value Stream mapping also discussed Kaizen for redefining roles and responsibilities, Corrective and Prevention Action Process, improvements in yield and Symtronics' cost savings with Lean Six Sigma implementation.

Optimal Scheduling of Crude oil receipt and Blending Operations

Chavan Atul Malahari (121598002) Dr.M.D.Jaybhaye

The thesis focuses on the development of algorithms in the mathematical model in order to optimize the crude oil scheduling operations. Various methods used in solving the problems are discussed briefly giving importance to the ones which are most relevant for finding the optimal solution. The prime objective in problem is to maximize the profit of the crude oil refinery. This can be done by either using single objective or by using multi-objective optimization. We use different solving techniques and compare them according to their efficiency and accuracy. Much research has been made in this area.

The crude oil scheduling problem is the one which has been in the research for a long time. The reason being the fact that millions of dollars can be saved by optimizing the operations in the crude oil refineries. This thesis concentrates on solving the problem partially using heuristic algorithm and partially by the MINLP formulations and connecting the two to achieve a near optimum result using linear and constraint programming. Evolutionary computing algorithms are used for solving multi-objective mixed integer non linear programming. One of the objectives of the problem is to translate the real world processes in the crude oil refinery into a mathematical formulation. Many a times it is not possible to completely translate all the scenarios due to the algorithmic and computational complexity, in which case, we make reasonable assumptions which suits the scenario most. Every process in the refinery is discussed in depth so as to get better insights in order to formulate the mathematical model more precisely. Linear programming and all the different types of formulations have been used and discuss them accordingly with the relevance of the problem in hand.

Small Scale fodder Harvester An Ergonomic Perspective -Analysis

Chaudhari Harshal Bansilal(121598003) Dr.N.R.Rajhans

Animal feeding is very important aspect of livestock husbandry. Various equipments are available in the market for harvesting the feed and further cutting them into smaller pieces. Every fodder grass has its importance in the diet of the livestock. Grasses like Lucerne are a rich source in proteins while Maize, Elephant grass provide other nutrients. Presently, there are different manual as well as automatic equipments in the market available for feed harvesting.

However, there are shortcomings like uneven height of cutting, design shortcomings, space requirements, smaller areas under feed cultivation, higher cost of harvester for small-scale farmers. Due to all these factors the feed harvesting is carried out by human labour in major parts of the country. Farmers can develop MSD's - due to incorrect posture, stress and continuous work. The equipments and methods also have ergonomic shortcomings which need to be addressed. Also, non-availability of skilled labour and their higher wages is also a prime concern. Cutting of crop into small pieces (crushing) then feeding to the livestock, increases the consumption and palatability of feed, hence reducing the wastage. This gives an idea of a new product for harvesting of fodder at a uniform height.

Considering factors like cost, ease of operation, ergonomics, height of cut, size, weight, etc. a new product has to be designed. The prototype should fulfil various requirements of the farmers. The design should be robust enough to sustain the stresses while operation. The prototype should also reduce the load on the operator, posture issues and addresses other ergonomic issues.

Case studies on Inventory Management and Make or Buy Analysis

Pathak Ameya Gajanan (121598004) Dr.N.R.Rajhans

Spare parts Management contributes in achieving the desired product availability at an optimum cost. Presently, the industries are going for mass production and complex technology to improve their profit percentage. The downtime for such plant and machinery is expensive. Specifically in case of service providing industry, inventory and stock management is main issue because providing a better service is their utmost priority. Reducing dead stock and money blockage in inventory is often an important goal of inventory management. Accurate demand forecasting helps optimizing all goals of inventory management team as well as organization. Spare parts inventory deals with intermittent data and a large amount of variations in the inter arrival period while dealing with item to item. Traditional statistical forecasting methods such as exponential smoothing and moving averages that work well with regular demand but in case of intermittent demand it tends to give faulty result. The main objective of this paper is to analyze data using different analyzing techniques to see whether a particular analysis helps in saving total inventory cost, reducing money blockage and also forecast the growth rate to meet certain future demand.

Make-or-buy decision is one of the key techniques for management practice. Due to the global outsourcing, make-or-buy decision making has become popular and frequent. Since the manufacturing and services industries have been diversified across the globe, there are a number of suppliers offering products and services for a fraction of the original price. This has enhanced the global product and service markets by giving the consumer the eventual advantage. If you make a make-or-buy decision that can create a high impact, always use a process for doing that. When such a process is followed, the activities are transparent and the decisions are made for the best interest of the company.

Efficient Planning and Execution of Third Generation Wheel Bearing (HUB 3) Manufacturing Channel

Polshettiwar Anurag Ashokrao (121598005) Dr.M.R.Dhanvijay

SKF India Ltd. Pune is a leading bearing and seal manufacturing company. The manufacturing of bearing rings are done by different manufacturing processes like Forging, Turning, Heat Treatment, Grinding and then Final Assembly.

The purpose of SKF APQP (Advanced product quality planning) and Project Management department is to ensure the launch of new product, process and channel and or their modification are performed in a controlled manner which focuses on a Zero defect/ Flawless approach to minimize the risk of failure, through a detailed realistic time plan covering all the activities of the project using MS Project Software as a tool for Project Management. The manufacturing of bearings are done by using automated manufacturing channels. The channel consist of machines linked with one another in a linear manner. The bearings are transferred from one machine to another by conveyors. The scope of project is in the field of project management. A new manufacturing channel is about to launch by SKF India Ltd. This new channel is for HUB3 bearing units. The project management activities like Planning, Scheduling, Risk identifying and addressing by effective Time plan preparation and Tracking was done by using MS-Project software. The planning and execution for this project was huge. This manufacturing channel and product is complete new for the SKF India and it is the first time they are in a process of establishment of this channel in Pune facility. Initial Process capability study of HUB3 machines were found out to check weather machines are working as per requirement or not.

The project also consist cost reduction of bearing manufacturing case study. The bearing rings are produced by forging process as forging gives high strength, aligned grain flow, and better physical properties as compare to other manufacturing processes except the waste associated with the forging is high. The manufacturer has to pay cost on input weight required for the forging. By optimizing the design of forging die it is possible to reduce the waste which in turns save the cost of manufacturing.

Small Scale Fodder Harvester An Ergonomic Perspective - Design and Fabrication

Prabhu Tushar Prakash(121598006) Dr.N.R.Rajhans

Animal feeding is very important aspect of livestock husbandry. Various equipments are available in the market for harvesting the feed and further cutting them into smaller pieces. Every fodder grass has its importance in the diet of the livestock. Grasses like Lucerne are a rich source in proteins while Maize, Elephant grass provide other nutrients. Presently, there are different manual as well as automatic equipments in the market available for feed harvesting.

However, there are shortcomings like uneven height of cutting, design shortcomings, space requirements, smaller areas under feed cultivation, higher cost of harvester for small-scale farmers. Due to all these factors the feed harvesting is carried out by human labour in major parts of the country. Farmers can develop MSD's - due to incorrect posture, stress and continuous work. The equipments and methods also have ergonomic shortcomings which need to be addressed. Also, non-availability of skilled labour and their higher wages is also a prime concern. Cutting of crop into small pieces (crushing) then feeding to the livestock, increases the consumption and palatability of feed, hence reducing the wastage. This gives an idea of a new product for harvesting of fodder at a uniform height.

Considering factors like cost, ease of operation, ergonomics, height of cut, size, weight, etc. a new product was designed and the prototype has been developed which fulfil various requirements of the farmers. The design was robust enough to sustain the stresses while operation. The prototype was light weight which reduce the load on the operator, posture issues and addresses other ergonomic issues.

Qualitative and Quantitative Risk Assessment in Project Execution Life Cycle of Box type Heater

Raut Snehal Mahadevrao (121598007) Dr.S.S.Anasane

Project Management is a set of principles, methods and techniques for effective planning of objective-oriented work, thereby establishing a sound basis for effective scheduling, controlling and re-planning in the management of projects. In other words, it provides an organization with powerful tools that improve the organization's ability to plan, organize, implement and control its activities and the ways it uses its people and resources. These principles are applied to project on construction and fabrication of a box type heater following each step in project execution. At initiating stage, a survey using Delphi technique is performed which helped in assessing the probabilities of future project risks based on lessons learned from previous projects to take preventative actions for current projects. Thereafter, SWOT analysis has been performed. Today it is one of the most important to have efficiency in project management in order to survive in competitive market. To improve this all organizations must audit their projects and their strengths and weaknesses. Also take initiatives to compensate for their deficiencies. At planning stage job no is created and work is divided into several parts using work breakdown structure. Schedule is prepared using Primavera P6 software. Now, top management needs decision making tools to support them in identifying, analyzing, and evaluating potential risks.

The objective of this research is to develop a model of risk management by integrating several tools. This integration is intended to improve decision making by providing quantitative and qualitative analysis at each step of project. Qualitative risk analysis is performed to discover probability of a risk event occurring at the planning stage and the impact the risk will have if it does occur. Quantitative risk analysis is done on the basis of schedule. Project progress is tracked using primavera software, risks are identified and it is found that major risks are associated with schedule delays, root cause analysis is done using fishbone diagram, identified risks are prioritized by setting risk priority numbers to them to focus on the risks having high priority number first. Required contingency/crash plans are taken in order to mitigate those risk and acquire catch up plan to meet the schedule delays.

Throughput improvement of Crank Machining Line by eliminating Waste and improving changeover process

Garhewal Shritesh Kumar (121598008) Dr.Rajiv B

The report focuses on the Throughput Improvement for Crank Machining line at General Motors, Pune. In general, productivity is defined as the ratio of output to all or part of the resources used to produce it. Output is the quantity of goods and services produced and the resources used (i.e. the inputs utilized or the factors of production) include labor, capital, energy, raw materials, and services.

While dealing with the productivity, this study cuts down the resources use and not only focuses on the elimination or reduction of waste but also on identification of waste to achieve more efficient line. Value stream Mapping (VSM) is a wonderful tool for identification of waste and to attack them. This Study also tried to identify Critical activity and machine causing low productivity and loss. The major loss was due to Set-up change process. And to reduce this loss, this report also highlighted the critical machines responsible for set-up loss and improvements to reduce the loss due these Machines.

Methods such as Value stream mapping and Single minute Exchange of Die is helpful not only in waste removal and cost cutting but also a systematic approach for efficient

Elimination of Sticky Soot and Rust in order to Improve Productivity

Sonawane Sagar Sharad (121598009) Dr.B.U.Sonawane

Soot is a mass of impure carbon particles resulting from the incomplete combustion of hydrocarbon. Soot as an airborne contamination in the environment has many different source, all of which are results of some form of pyrolysis. Root cause of soot basically coal burning, internal combustion engine, power plant boiler, central steam-heat boiler, fireplaces and furnaces.

Due to un-burnt hydrocarbons soot get generated during heat treatment. Generation of soot may be from different sources and from different effect in each condition. Basically soot gets generated due to coal burning, internal-combustion engine, power plant boiler, central steam-heat boiler, fireplaces and furnaces. In company basically manufacturing of nozzles takes places due to humid condition and deviation in process sticky soot formed and found at 100% visual inspection and undergoes various losses including major loss of productivity.

Objective of this project is to find out root causes of soot by using various quality tools and eliminate the soot and rust from nozzle body which frequently occur in pre-monsoon and in monsoon season due to humid condition and detect in visual inspection process. Also improve productivity, efficiency and reduces overall cost of nozzle bodies.

Project Management in IT HealthCare

Sujata (121598010) Dr.S.M.Patil

Healthcare is a most critical and important service. To make it more effective in Today's world it is combined with Information Technology. Information Technology helps the service make more reliable and error free. Physician Quality Reporting System (PQRS) helps to improve the quality of care provided to patient. To submit the data to CMS (Center for Medicare and Medicaid Services) through registry, there are deadlines and accuracy required while submitting data to PQRS. Due to the lack of communication and centralized file system, company can not achieve the deadline. To meet the deadline efficiently and to achieve different programs like EHR (Electronic Health Record) Incentive of CMS, there is a need of project management improvement.

This project work is carried out to improve the project management using the tools Teamwork, Request Tracker Queue and Alfresco with excel, Google sheet, Microsoft Visio, Microsoft Project, go-to meeting, draw io etc. Thorough results shows that proposed solution has improved the communication and file access, which results in on-time submission compared to previous year.

Warehouse Management for improving Human Efficiency in Order Picking System

Suryawanshi Anurag Ashok (121598011) Mr.M.N.Shaikh

In Warehouse operations, Order Picking is one of most important task. Order picking is the process of picking items from their storage locations to fill customer orders. It involves the scheduling and releasing of customer orders, the picking of items from their storage locations and the disposal of the picked items. Order picking is considered to be one of the most labor intensive and expensive operation among all other operations. For a typical warehouse, order picking may account for 55% of all operating costs. Improving the order picking efficiency plays a vital role in reducing supply chain costs and improving productivity in the warehouse. In general, more emphasis has been given to the process of improving the efficiency of order picking system and specifically, on the required distance which travelled during the order picking operation.

In Order picking system, there are various factors which affects the overall process. These factors are Storage policies, Travelling distance, Routing policies, etc. This study considers Warehouse storage policies as well as clustering items according to machine requirement to reduce overall order picking tour distance. Current order picking tour distance is considerably high due to nature of storage of parts in warehouse. It also affects on the total number of items picked per day. Considered parameters of improvement of order picking process are number of items picking in a day and total distance travelled by picker to complete the order.

To achieve improvement in order picking, whole processes of warehouse are needed to be observed and should study them. From this process, problems can be identified that causes undesirable results. These problems are analyzed and solutions given to resolve them. These solutions are checked for their feasibility. Feasible ones are implemented in to the warehouse and once again all processes are observed to conclude improvements.

Design of Lifting Mechanism of Hospital Bed

Thakare Shraddha Satish (121598012) Dr.N.R.Rajhans

Pressure ulcers pose a significant problem for patients and healthcare providers. Pressure ulcers are preventable. Hospital bed is a medical device that prevents or delays occurrence of pressure ulcers by alleviating contact pressure exerted on a patient due to a contact with a bed. Normally a patient recovering in bed for an extended period of time will experience pressure ulceration due to insufficient blood flow to tissues in the areas that carry body weight. A typical recommendation for prevention of bedsore is to roll over the patient every two hours to alleviate contact pressure. Turning patients regularly helps to reduce interface pressure which helps in reduction of pressure ulcers. Some patients who recuperate at home need to expensively hire a personal caretaker to do this work. Such luxury is not available for poor patients.

In this work , Survey of different beds have been taken from different hospital to designed a bed which gives maximum turning of patient , and as per requirement bed is designed which helps in repositioning of patient in five ways. Lateral tilting from both sides, leg up-down movements of individual, Head up-down movement. It helps to reduce pressure between patient and bed surface. Turning of patient is done by Smart shelter super heavy duty bed lifts mechanism. Enable easy access to storage with a flick of a finger with this pneumatic bed lift mechanism available in various weight lifting capacity,which helps in reduction of efforts required by healthcare during turning of patient.

There are three types of bed designed to reduce weight and cost of bed. Comparison of theses Bed is done using Multiple Criteria Decision Making (MCDM) techniques. Analytic Hierarchy Process (AHP) is used for calculating the weights of criteria and Simple additive method (SAW) and Weighted Product (WP) method and Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) is used to evaluate the alternatives, By comparison, most suitable bed is selected.

Logistics planning using Optimization Techniques

Thakkar Dhawal Manish (121598013) Dr.A.V.Mulay

Discrete-event formulation and mixed-integer linear programming are widely used for logistics planning and production planning problems. This report presents a general framework to support the operational decisions for supply chain networks along with integrated production planning and material routing between work centres using a combination of an optimization model and discrete-event formulation. This model includes linear and stochastic elements, whereas the optimization model represents a simplified version. Based on initial data history runs cost parameters, production, and transportation times are estimated for the optimization model. The solution of the optimization model is translated into decision rules for the discrete-event formulation. This formulation is eventually applied to the organization's data provided to fulfil the requirement stated by them. This method is applied successfully to several test examples and is shown to deliver competitive results. It provides the possibility to model and solve more realistic problems in an acceptable way. The limitations of this approach are given as well.

Process Optimization Using Model Simulation, Automation and Ergonomics

Trivedi Divyesh Prakash (121598014) Dr.B.B.Ahuja

Project aims at understanding a plastic tap manufacturing process in detail, carrying out an in-depth study of all the factors affecting the manufacturing process, highlighting critical factors that hinder its smooth functioning and use project management techniques to find possible solutions to those critical factors. The project aims to achieve this by using Witness simulation software to study the current process in detail, generate future results, compare them with the desired outcome, generate what if scenarios in the simulation software and use project management tools like MADM (Multi Attribute Decision Making) involving methods like AHP, MODIFIED TOPSIS, and Weighted Product Method to find the best possible functional strategy that will lead to the desired outcome of minimum 30% increase in production output. It further involves presenting the company with a conceptual design of a new product based on ergonomics using SOLID Works designing software, Designing a concept of an automated assembly process and studying its effect on the manufacturing process and lastly using ergonomics to study the working conditions for the labours in the factory and suggesting proper ergonomic solutions to their problems.

Design & Simulation of Machine Shop Layouts with Selection using MCDM Techniques and Development of Centralised Project Management System(CPMS)

Degaonkar Ronak Rajshekhar (121598016) Dr.Rajiv B

Jaya Hind Industries Ltd. is a leading foundry in the area of aluminium casting components in Pune. It manufactures components for major automobile companies worldwide. Currently the company is facing the increments in production volume which forces the requirement of designing and simulating the new machine shop layout. This project focuses upon design and simulation of new layouts. Various layouts are generated and simulated using computerized simulation tool. Comparison of these layouts is done using Multiple Criteria Decision Making (MCDM) techniques. AHP is used for calculating the weights of criteria and TOPSIS is used to evaluate the alternatives. By comparison, most suitable layout is suggested for constructing the new machine shop. Also, currently the company is handling multiple projects. Many of these projects are under the development phase. Hence multi-project complexity is at high-level.

This project focuses upon development of the new Centralised Project Monitoring System (CPMS). This system enables the improved collaboration and communication in cross functional teams, single storage and access location for documents sharing, saving in time and efforts which ultimately reduce the project delays. Various platforms are tested for development of CPMS. Comparison of these platforms is done using Multiple Criteria Decision Making (MCDM) techniques. AHP is used for calculating the weights of criteria and TOPSIS is used to evaluate the alternatives. By comparison, most suitable platform is suggested for development of CPMS.

Process Optimization and Productivity Improvement of Assembly Line under New Product Launches Division

Deokar Ameya Yogiraj(121598017) Dr.P.D.Pantawane

Optimization and continuous improvement have now become an integral part of our lives. We continuously strive to perform better each day and stay updated in order to adapt with the developments in this modern world.

Some Japanese concepts like Kaizen, TPM, 5S, Poka-Yoke etc. have taken over the world and have become the key to improvement when it comes to implementing any value adding activity. This project talks about how these concepts can be used for optimizing routine activities, systems and even improve productivity of manufacturing processes. The project is divided into 2 parts.

Part 1 of the project talks about productivity improvement of the assembly line of Volkswagen Polos tail lamp in order to meet the increased demand and cater to their export requirements. Volkswagen manufactures Polo, Vento, Ameo and Skoda Rapid in their Pune plant. Out of these, Volkswagen Polo has a planned production of around 250 cars per day. Hence 250 sets of tail lamp (LH+RH) are required for the production of this vehicle every day. The tail lamp for Polo is manufactured by a major tail lamp supplier based in Pune who supplies these 250 sets/day on an average based on the stock availability at the VW plant. Volkswagen plans to supply additional 100 sets/day of the Polo tail lamp to another VW plant outside Asia for supporting their production requirements. These lamps are also needed to be manufactured at the same supplier location in Pune. Thus a capacity enhancement activity had to be carried out on the critical workstations of the Polo tail lamp assembly line in order to improve the quality, reduce rejections and in turn increase the productivity to meet the new production requirements. Also the cycle time has been reduced at bottle neck stations in order to get the desired output.

Part 2 of the project talks about successful implementation of a new document management and retrieval system for the Project Management and New Product Launch department of Volkswagen India Pvt. Ltd. It implements the rules of 5S to make document management easy, to find required data in least possible time and to maintain its files systematically.

Thus the entire project revolves around optimizing processes and improving productivity for saving time and increasing efficiency of the users.

Operation Excellence and Productivity Improvement in Engine Manufacturing Facility

Vairagade Harshwardhan R (121598018) Mr.S.U.Ghunage

Project dissertation will show the past and present work done by various research authors in the field of six-sigma projects. This project also reveal the not much touched area where six-sigma projects will be seen very effective and efficient in terms of gaining the fruits of the projects. Here particularly an automotive industry is considered for assembly processes and exceeding of cycle time beyond the Standard Cycle time (SCT) is considered as defect. To support this type of defect methodology is developed to provide evidences. The evidences are available at assembly shop floor; need is to validate this evidences with the statistical analysis of assembly line cycle time variation. At assembly line of automobile parts or assembly of an engine; a manufacturing feature called 'Andon' is facilitate to notify concerned authority about quality problem, this 'Andon' are the main evidence for the proposed study. Supportive literature is studied to understand various areas where six-sigma projects have applied effectively to bring aimed results.

It has been claimed that Six-sigma aids organizations to become more ambidextrous by substituting structure, act organically when being challenged by new ideas and operate mechanically in focusing on efficiency. Statistical thinking is a method used as part of Six-sigma methodology. Statistical thinking relates processes and statistics, and is based on the following concepts: action occurs in a system of interrelated processes, difference exists in all processes and is very important to understand and deal with it (reducing variation is the key to success), understand and use the appropriate statistical tools for a systematic approach to process improvement. from the literature review it is found that none work has been done on assembly operations and no one has considered cycle time as judging parameter. Cycle time since is an intangible aspect of the assembly process, this project tries to put some light on this untouched area of the manufacturing processes and implementation of six-sigma to reduce cycle time variations and to increase productivity if the engine manufacturing facility.