B.Tech | M.Tech | M.B.A.

ENGINEERING & MBA INTAKES

PG COURSES

Branch

Mechanical Engineering	
Intake	48
Electronics & Telecommunication Engineering	
Intake	42
Computer Science & Engineering	
Intake	24
Structural Engineering	
Intake	24

MBA Branch

Marketing, Finance, HRM, Production & Operation Management.	
Intake	180

UG COURSES

Branch

Mechanical Engineering	
Intake	120
Electronics & Telecommunication Engineering	
Intake	120
Civil Engineering	
Intake	120
Computer Science & Engineering	
Intake	120
Direct Second Year Mechanical Engineering	
Intake	120
Artificial Intelligence & Machine Learning	
Intake	60

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Marathwada Shikshan Prasarak Mandal

Aurangabad.

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DEOGIRI INSTITUTE OF ENGINEERING & MANAGEMENT STUDIES

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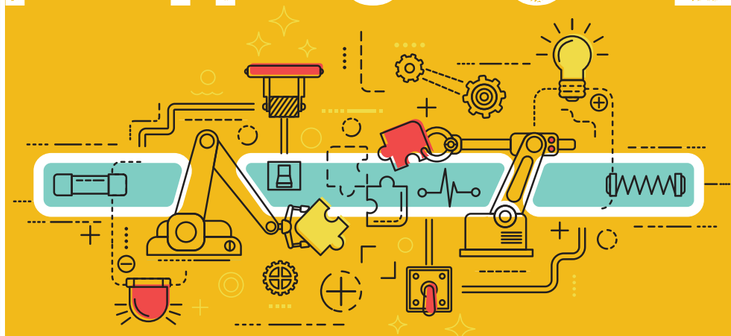
SMART LIVE PROJECTS 2019-2020



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01

AUTO COMPONENT MANUFACTURING

02

CUSTOM MECHANICAL GAUGE FOR INSPECTION TO IMPROVE PRODUCTIVITY

MSME

ASR Industries
Waluj, Aurangabad

Project category

Process Improvement

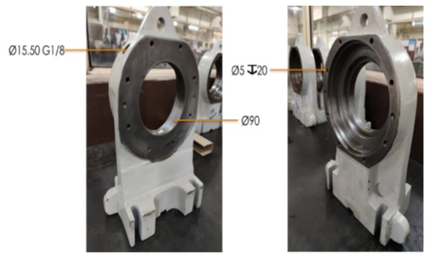
: Background and Objective :

ASR Industries has expertise in designing & manufacturing of customized fixturing solutions to almost any kind of automobile component having metal cutting operations. One of the assemblies they make is Tail Stock Support. The casting structure used in this assembly requires to have accurate positioning of the holes from both sides. A Co-ordinate Measuring Machine for the inspection which takes an hour to complete the inspection of a singular part. So, objective was to reduce the inspection time to as low as possible without any need of excess manpower.

: Challenges :

Improving the inspection time of casting structure was one of the main challenges for company. There were many ready-made solutions available to automize this process but due to huge time requirements, ASR could not invest big amount in this process, therefore they decided to give this challenge to students of Deogiri college, to develop a low-cost mechanism to improve inspection time of this process. To develop a mechanical gauge casting structure inspection process, a team of mechanical branch of engineering students formed a project team.

: BEFORE :



Pic: Tailstock Support with 4 Port Rotary Joint (Actual Product)

: Idea :

In order to achieve the desired results by developing a simple mechanical mechanism, students team understood the process very carefully and designed a low-cost mechanism which involves the mechanical fixture for holding the casting structure and checking the holes from front and rear side of the product. Students team also considered to improve the working conditions operators by developing an operator friendly auto mechanism.

03

: BEFORE :

Pic: Tool used in manufacturing

: Implementation :

Deogiri students team designed the proposed gauging mechanism with close collaboration of industry co-ordinator and developed an inhouse low cost mechanical gauge which consist of mechanical parts, in order to achieve the desired quality results in inspection process. After developing the low-cost gauge, it was implemented in ASR Industries manufacturing plant in Waluj industrial area, Aurangabad.

: AFTER :

Pic: Mechanism developed by students' team

: Results & Savings :

The newly developed mechanism reduced the inspection process cycle time from 60 minutes to 2 minutes, which resulted into increasing the productivity of this process by almost 50%, in one hour they used to process around 1 part but now with the new mechanism they can process more than 30 parts in one hour.

Now, inspection process is carried out on mechanical gauging station which can be easily operated by single operator, it has provided the ease of operation for operator and have saved the significant amount of resources like manpower, electricity for running the CMM, etc.

MANUFACTURING

02 AUTOMATIC PIPE FEEDING & COUNTING SYSTEM

MSME

Accrete Auto Pvt. Ltd.
Waluj, Aurangabad

Project category

Process Automation

: Background and Objective :

Accrete Auto waluj was established with an objective to serve the industry in the field of Special purpose machines & process automation. The highly price sensitive manufacturing industry needs special purpose machines & custom solutions that are efficient, reliable & cost-effective.

An experienced and enthusiastic team of designers equipped with latest tools in involved in providing our customers reliable, efficient and cost-effective solutions. State of the art infrastructure and skilled manufacturing hands transform the designs into reality to provide reliable products.

: Challenges :

Mini pipe thread checking, and accounting is time taking as this process is carried out manually in the industry. So, it leads to manual errors and increases work pressure on labours. To overcome all this problem, we are going to design such automatic system. To increase the productivity of the industry.

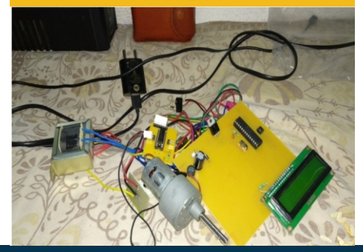
: BEFORE :

Pic: Manual assembly process of MCB.

: Idea :

In order to achieve the desired results by developing mechanism for pipe feeding, student's team understood the manual process very carefully and designed a low-cost mechanism which involves Automatic pipe feeding and counting mechanism. Student's team also considered to improve productivity by reducing the cycle time and the working conditions for operators by developing an operator friendly auto mechanism.

: AFTER :



Pic: Prototype of newly automatic pipe feeding machine by students Team.

: Implementation :

In this project Deogiri Team is going to implement an automatic pipe feeding and Counting System which will help in the manual time reduction as the work will be performed by the machine itself.

The machine will be designed in such way that thread gauge fitted with the help of bush in motor shaft. Once we start the switch of motor, shaft of motor will run as we fitted thread gauge in shaft thread gauge is also rotating as we shift the thread gauge towards inspecting job. if thread gauge is passing through the job without increasing current then job is ok, otherwise if current is increasing its block and job is not ok. Here, we used Hall sensor for sensing current. If current Consumption is more hall sensor will sense it due to which motor will stop Automatically.

: AFTER :

Pic: Students developing automatic pipe feeding machine.

: Results & Savings :

Before it was required 3 operators to achieve daily target after implementation of the machine only 1 operator can produce daily requirement of production. Thus, reduced manpower cost.

SHEET METAL

03 MONITORING EFFICIENCY OF SEMI-AUTOMATIC CRIMPING MACHINE

MSME

Essdee Industries Pvt. Ltd.
Waluj, Aurangabad

Project category

Process Improvement

: Background and Objective :

The problem statement given by the industry was supposedly to reduce the manual errors and obtain accurate uptime and downtime of machine. The reason behind this project was that, at the end of the month there were so many energy losses found at the time of audit. So the necessity behind this was, the industry should be able to produce the expected results with minimum energy loss and to monitor the operator working on that machine (mainly during the night shifts) and also to acknowledge the supervisor of the working manner of operator by sending message of the current condition.

: Challenges :

Adding a device to preinstalled machine was a great difficulty and this made us to think in a way so that we should not change the functioning of each machine instead the device needs to be fit with an ease, taking this into account we read the manuals provided by the industry and solved the problem. Another difficulty was we were told to use Arduino dev board and the program we made was unable to fit into the memory due to size issues so compressing the size of the program was also a challenge that we face but Deogiri team also handled that problem.

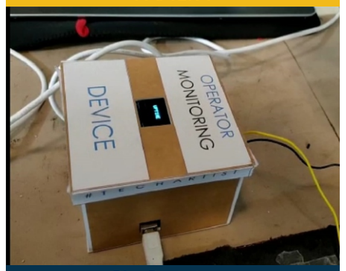
: BEFORE :

Pic: semi-automatic crimping machine in Essdee Industries

: Idea :

At first when we started to work on this project, there were many different solutions in our heads that were useful to overcome this undercut phenomenon, but we use the following idea The solution is to use a RTC Module interfaced with Arduino So, what exactly would happen is that, when the paddle will be pressed by the operator of that machine the limit switch which is placed on the paddle will also be pressed . When the limit switch is pressed a high output will be send towards the Arduino controller and the data will be processed. After that the processed data that is the exact timings of the machine will be send to the SD card module and saved in excel format also it will be displayed on the OLED display at the same time.

: AFTER :



Pic: Prototype

: AFTER :

Pic: Prototype connected with semi-automatic crimping machine

: Implementation :

Deogiri students team designed a device to save the uptime as well as downtime data directly in an excel format and to retrieve it whenever in need this was done due to the support of industry co-ordinators. The same was implemented in the industry on a trial basis on the semi-automatic crimping machine and the result was also analysed pointing out towards a little modification in the system for better accuracy.

: Results & Savings :

With the installation of this prototype the records of uptime and downtime will directly be saved in the excel format due to which the time required for entering the data manually will be eliminated which can help in increase in no. of production as compared before, also the timing of actual uptime and downtime will be more reliable due to less human intervention as it will be automated. At the time of auditing the data can be directly viewed in the digital format and no need of handling any hard copy. There is also less chance of data corruption as the backup will always be stored in an SD card. Due to less loss in time, monthly crimping can be increased up to 290 crimps per day and up to 7,540 per month (data is calculated per machine).

: Feedback From MSME :

Mr. Velangi (CEO) of the Essdee industries appreciated the efforts and creativity of Deogiri college students, also he gave an idea of connecting an OLED display so that worker can also see the downtime this feedback was taken into consideration and the same was taken into implementation.

“Students has shown a will to solve problem by using new and simple ideas”

05 AUTO COMPONENT MANUFACTURING

AUTOMATIC CEILING FAN CONTROL SYSTEM

MSME

Rucha Engineering Pvt. Ltd.
Waluj, Aurangabad

Project category

Process Automation

: Background and Objective :

Rucha Group, focused on engineering & manufacturing, robotics, and agro products. The group is a diversified business in the process developing new business verticals. The group mainly focus on manufacturing and suppling various auto components for all segment vehicles. On the other hand, they produce wide range of processed food products. Rucha engineering figured out that many times the electrical appliances such fans, light are left active even if there is no one using it causing wastage of electricity. In order to improve resource efficiency and reduce miscellaneous cost, Rucha engineering Works desired to bring a mechanism which will automatically activate and deactivate electrical appliances by recognizing person is present in that area or not. Deogiri college student geared up to fulfill the desire of Rucha Group by developing a low-cost feasible solution.

: Challenges :

As per the scenario of an industry there is a manual process for activating and deactivating fans which takes more time and there is power loss during the tea break and lunch time, so we decided to design the auto appliance control for energy conservation. In market there are many new fans which has auto on and off feature but to replace all the existing fans was not a feasible and causing more loss.

There were many challenges in designing the solution such as the device should be independent, and it should withstand power fluctuations.

: BEFORE :

Pic: Manual process of activating and deactivating fans

: Idea :

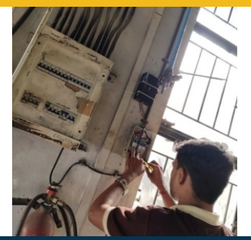
Firstly, we observed all the process in the plant. After the complete detailed observation of all process and workers pattern, we designed a solution based on it. We developed a device which will control the power supply of the fans. The device will activate and deactivate the appliance on the signal provided by the time sensor. As we observed that the breaks taken by the worker were at fixed time, so we decided to take time as signal.

Concerning the safety, we have added the kill switch, that will stop all the supply if anything goes wrong.

: AFTER :

Newly developed energy saver module by student team

: AFTER :



Pic: Installation of the newly developed Power Saving Module in the existing system in Rucha Industries.

: Implementation :

Student team designed an auto-appliance control module which consist of Sensors, SMPS and contractors. This system will help in the energy conservation and the manual time reduction as the work will be performed by module itself. The device is designed in such a way that the fans in industry which was operated manually by the worker is now automated and it also has emergency kill switch for safety during voltage fluctuations.

: Results & Savings :

The newly developed device helped in saving the electricity. Before implementation of the device one fan was using 642.2175 units/year for 12 hours of a day and as the product is implemented we have seen that a single fan is using 535.1812 units/year for 8 hours a day and the industry using 20 fans so, as per the calculations the device is saving 1443.28 units/year. The charges for a single unit are 8 rupees, so by using this device the industry is saving 12,000 rupees annually for single fan.

: Feedback from MSME :

Mr. Sanjay Kapate Bidkar, HR and Mr. Sadashiv kale HOD of electrical department of Rucha engineering works appreciated the efforts and creativity of Deogiri college students.

“Students have used their innovative ideas in developing this Automatic device, which helped us in saving electricity and money. We are willing to promote this device in our industrial groups, which will create great opportunities for student in future”

: Learning :

Students explored many new things while working on this project and has learned to think innovatively to tackle the industrial problems.

ELECTRICAL

04 IMPROVE PRODUCTIVITY OF LED LAMP LUX MEASUREMENT

MSME

Essdee Industries Pvt. Ltd.
Waluj, Aurangabad

Project category

Process Improvement

: Background and Objective :

Ess Dee Pvt ltd manufactures various dynamic leader who believed in himself and created a working space with high values and ethics. They develop, manufacture and provide solutions for wiring harness, electronic products and die cut foam products in automobile as well as home appliances. They believe in connecting with our suppliers, which advocates the experience that has created for our customers, eventually leading to long term business and partnerships.

: BEFORE :

Picture: glass module

: Challenges :

Reducing the labour cost on each machine and improving the cycle time of glass module operation was one of the main challenges for company. There were many ready-made solutions available to in market but the product available in market is costly slightly 4000-4500Rs. therefore, they decided to give this challenge to students of Deogiri College, to develop a low cost automatic Special purpose machine to reduce the LUX calculation operation. To bring electronic lux meter process, Students of electronic and telecommunication engineering department formed a project team.

: Idea :

The aim of this project was to establish or replaced manual work into automatic wok. So, we used special purpose machine with improved reliability and fast working performance of system to get quick response of a system. In Company problem is that, employ check a glass manually one by one, by using a LUX Meter, so drawback of system time requirement is maximum. We must develop board, so company employ can do its execution very quickly. We must use some electronic component to get system get fast and required less time to performance its operation.

: AFTER :

Pic: LUX Meter developed by students' team

: Implementation :

Deogiri students team designed the proposed design special purpose machine called LUX Meter which help to increase the testing process result in a limited time period it can be check maximum glass module, so the production rate is increased. After developing the LUX Meter, it was implemented in Less Dee research and development team works in waluj. Industrial area, Aurangabad.

: Results & Savings :

The newly developed Special purpose machine helps to reduce the time process. The LUX meter hardly gets 4 seconds to check one glass module. In the market price of lux meter is 4500Rs but our system takes only 1500 Rs per LUX meter System.

: Feedback from MSME :

Mrs. Rajvi velangi, Project head of Ess Dee group appreciated the efforts and creativity of Deogiri college students.

“Students gives a great response and completed this task in minimum time and developing this LUX meter, which helped us in saving time and money by improving the time reduction operation and this project may be selected for start-up. we are thankful to GIZ for coordinating the project and look forward to work with academia in coming years forward to work with academia in coming years”

SURFACE

06

EFFECT OF FILLER WIRE ON FORMALITY BEHAVIOUR OF FERRITIC STAINLESS STEEL

MSME

Shree Tube Mfg. co. Pvt. Ltd.
Waluj, Aurangabad

Project category

Study

: Background and Objective :

Shree Tube Mfg. Co. Pvt. Ltd., Aurangabad, is a professionally managed company promoted by a group of engineers with wide experience in the field of tube manufacturing. Since 1989 company manufacturing quality stainless steel tubes & pipes in various grades as per relevant specifications catering needs of different customers globally. Company manufactures so many applications in the field of automobile, sugar & pharmaceutical industries, fertilizer & chemical industries. Out of this, our problem is related to automobile sector.

Pic: Shows crack formation along a fusion line

: Challenges :

To avoid crack formation in ferritic stainless-steel grade 409L after TIG welding. Amongst the numerous welding methods, TIG welding is the most commonly used method for stainless steel. Generally, cracks are seen after certain duration of time at weld line or near a weld zone. They started manufacturing of silencers in June 2019. Out of 100 components 20 found defective. So, our task is to eliminate crack formation along fusion line & increases productivity & save material.

: Idea :

1) Preheating: Heating the sheet of metal before it reaches to the first operation in the tube forming process will settle down the residual stresses generated in cold forming process.
2) Limited Weld Current: By keeping the weld current limited will reduce heat affected zone near weld line and proper weld will be there.
3) Use of ASS Filler Wire of Grade 304L & 308L.

: Implementation :

1)Collect 6 samples of sheet of size 300*300mm.
2)Cut it into 2 equal pieces.
3)Join first 2 with the help of without filler wire.
4)Next 2 join with the help of ASS filler wire of grade 304L & last 2 join with the help of 308L Grade of ASS filler wire.
5)Perform weld decay test to find good welding zone.
6)Cut a piece from that area & perform tensile test.
7)Finally, we get percentage elongation of 3 samples. Out of 3 only one gives more % elongation.
8)With the use of ASS filler wire we add certain amount of austenite in ferrite phase. It means we increases the ductility of material & decreases brittleness.

: Results & Savings :

By using the ASS filler wire of grade 304L & 308L percentage elongation increases & that's why it will helpful for following things:

1)To eliminate crack formation along fusion line.
2)Save material.
3)Save money.
4)Increases productivity.

CONVEYOR MANUFACTURING

07

STUDY ON SURFACE BEHAVIOUR OF LOW CARBON STEEL

MSME

Swajit industries Pvt. Ltd.
Waluj, Aurangabad

Project category

Study

: Background and Objective :

Established in 1992, swajit engineering pvt. ltd. has made a name for itself in the list of top suppliers of chains and chain link fence fittings, conveyor and industrial belts in India. The supplier company is in A'bad, Maharashtra and is one of the leading sellers of listed products. Swajit Engg. Pvt. ltd. is listed in trade of India's list of verified sellers offering supreme quality of slate conveyor chain, haulage chains, paul retarder chains etc. Swajit engg. pvt. ltd is a major supplier of some of the most recognized names both in domestic and international market.

: Challenges :

Most products in the factory are obtained from low carbon steel (LCS) through a thorough heat treatment process.
However, with LCS there are some tradeoffs that need to be compensated, such as Wear, and corrosion takes place faster than specified cycles in parts manufactured with low carbon steel. Poor wear and corrosion resistance is one of the key disadvantages of products manufactured with low carbon steels. This leads to the lower life span of the manufactured product using a low carbon steel. The objective is to reduce corrosion and wear rate of low carbon steel products by improving the heat treatment process

: BEFORE :

Pic: Corrosion in a linkage.

Pic: cryogenic hardening

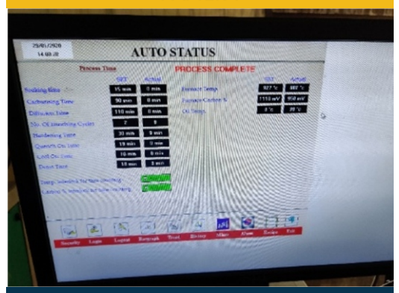
: Idea :

One of the major reasons behind corrosion and war in the LCS is the presence of retained austenite (RA). Greater the share of RA in the LCS higher the chances of wear and corrosion in the steel. The idea is to keep the share of RA as minimum as possible. There are many methods to reduce the share of RA in the LCS. One of the most effective and efficient methods is the cryogenic hardening method. Also, there is pack and pit type carburizing methods. However, these methods vary in terms of efficiency and effectiveness.

: AFTER :

Pic: sealed quench furnace in working

: AFTER :



Pic: Heat treatment cycle

: Implementation :

To advance further into the studies we obtained the material from the factory and send it to the lab to get the essential data about the material like material composition, RA% etc. The tests were conducted on 2 samples i.e 1 raw material piece and 1 heat treated piece. Also, on of our objective was to find out a more efficient method of heat treatment. As mentioned, the most efficient and effective method is the cryogenic hardening one. But this method is the most expensive one to operate and requires skilled operatives. Also pack and pit carburizing method are not used in the industry no more.

: Results & Savings :

In order to find the changes occurred in the chemical structure of the material it was subjected to various tests. These tests were focused on chemical composition, microstructure and hardness of the material. two material pieces were given for testing i.e one prior to heat treatment and one after the conclusion of the heat treatment. The results of these tests is Before subject to heat treatment the microstructure of the material shows elongated grains of pearlite in the ferrite matrix. And after the heat treatment is over the material the % of RA was found out to be in range of 8-10%. The RA is in combination with martensite. Also, the ferrite % was found to be in between 5-6% The hardness of material before and after the heat treatment process are 232-234 BHN and 56-57 HRC (core), 309-311 (HRC) respectively.

MANUFACTURING

08 VISITOR MANAGEMENT SYSTEM

MSME

Rucha Engineering Plant-7 Pvt. Ltd.
Waluj, Aurangabad

Project category

Process Digitization

: Background and Objective :

Rucha Engineering pvt. Ltd is a very big manufacturing company it has a total 7 to 8 plants in Aurangabad. It manufactures various mechanical auto parts. So various visitors come in the plant from different plants for work and they have to maintain manual work for that so develop an software. Security guard is allowing visitors to enter the plant without having prior appointment. Also, visitors are spending extra time in plants which may affect the schedule of persons who are busy in their work. Lack of professional approach towards Visitors. Require Easy, Fast and Error Free Visitor Registration. Easy Retrieval of Past Visitors Data. Improve Organization's Security. Managing visitors at student's accommodations is one of the major problems faced by the APU administration that deals with student's visitors' accommodation. Present system of working by the security management is that the security staff at the guard houses of these APU student's accommodation, visitors come and provide identity proof and then they provide unit and block number which they wish to visit. The security guard at the guard house will call the student of the unit number given by the visitor then the student resident will acknowledge that the visitor at the guard house is his visitor, once the resident has been acknowledged the security guard shall allow the visitor to enter the accommodation. Visitor management at the APU student right now is manual which consumes a lot of time for the visitors who need to wait for the security guard to call the APU student to acknowledge he has a visitor.

All this is time consuming more so when there is a rush of visitors at the guard house. For the student resident it is more discomfort when there is a get together of friends since for each visitor, he has to attend phone calls from the guard house which leads to consuming much of his party time attending calls. On the other hand, from the management point of view it is difficult to deal with visitors during rush hours with the manual system of working making the visitors wait in long queues.

: Challenges :

To maintain the whole record of visitors and another problem is that if light turns off then data which is entering so it saves automatically. First when we started there was a problem of IP address and server creation. Then when we started developing actual software then the problem was about connecting with the database and server. So our mentor helps in the problem and we overcome it. Visitor Management Software is a working system that allows the visitor to call the inmates from the gate and requires someone to answer from inside the house. Visitor Management Software is the outcome of motivation that has come out of the drawbacks or loopholes of the present system of working. Visitor management system (VMS) is developed using the trends in information technology which provides a feature to capture visitor information by using.

: BEFORE :


RUCHA ENGINEERS PVT. LTD.
L-23, MIDC Waluj, Aurangabad- 431136
VISITORS GATE PASS
No.: 6051 Date 01/10/19
Visitors Name Mr. Kaushal, Ashish, Ashitosh
Representing Deogiri college
Wish to See Mr. Sanjay Kapate
Purpose Meeting
Time in: 1625 Time out :
Visitors Sign. Security Sign. Auth. Signatory

Pic: manual visitor pass

: Idea :

To develop a software for allotting appointment time and managing visitor's entry time in plant also software will be able to provide data management of visitors. Desktop based Visitor Management Software. Store Visitor's Personal, Official and Visit Information. Automatically Notifies the Hosts about a Visitor's Arrival. Store Visitor's Record for Future Purpose. To analyse, design and implement a web-based system for a company.

: Implementation :

Deogiri students team designed the proposed application system with close collaborationof industry coordinators and developed a Visitor management system application consisting of the details. After developing the application, it will be implemented. System architecture gives a detailed specification of the requirements that provides developers with a detailed picture of the objectives of the system development. Software System architecture comprises components and the interactions that take place between these components.

: AFTER :

Pic: Application UI

AUTO COMPONENT MANUFACTURING

09

AUTOMATIC QUALITY INSPECTION SYSTEM

MSME

Rucha industries Pvt. Ltd.
Waluj, Aurangabad

Project category

Digital Image Processing

: Background and Objective :

Rucha industries performs designing, developing & mass manufacturing of industrial products for automotive and other applications. Amongst which there are multiple assembly parts. One of such assembly parts is VW6RF803285 which is an assembly part of Volkswagen. Currently there is no inspection system in industry to carry out inspection of this part. And due to which there is no record of how many parts are generated and out of which how many are defective. In order to enhance quality control measures, productivity and efficiency, the industry thought to implement automatic inspection system. The main objective is to increase accuracy in sorting system: This will cause less rejection and will increase the efficiency of the process. And, to increase speed of sorting: This will result in inspection of more no. of jobs to be inspected per year.

: Challenges :

Developing a low-cost system which will automatically segregate the perfect and defective modules was the main challenge. Currently such automatic systems are implemented in many industries, but it is of high cost. Rucha industries being a small-scale industry could not afford such systems for each part in their industry. And therefore, they decided to give this challenge to students of Deogiri Engineering College, to develop a low-cost quality inspection system. To bring automation in inspection process, Students of Electronics and Telecommunication engineering department formed a project team.

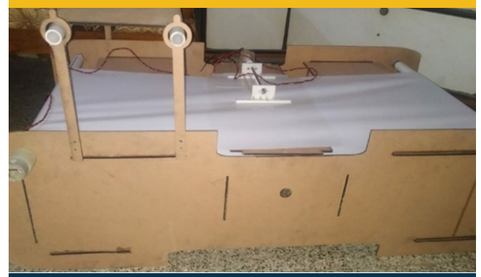
: BEFORE :

Pic: Part which is to be inspected

: Idea :

In order to achieve the desired results by developing mechanism for quality inspection, student's team understood the process very carefully and designed a low-cost mechanism which involves image processing techniques using Raspberry pi interfaced with camera module. To inspect more no. of jobs per day, the speed can be controlled by motors and by means of software.

: AFTER :



Pic: Prototype of automatic inspection system designed by students.

: Implementation :

Deogiri students team designed the proposed automation system with close collaboration of industry co-ordinator and developed a conveyor belt system consisting of rejection mechanism which will be controlled by using python programming. After developing the mechanism, it will be implemented in Rucha Industries in waluj industrial area, Aurangabad.

: Results & Savings :

The automatic system designed will increase the productivity by inspecting more and more no. of jobs per day. Due to which there will be no need of manual inspection system which in turn will reduce the labour cost. This system will bring the industry one step closer towards fully automation.

In addition to this, defective pieces will be rejected in initial stage and only perfect pieces will be supplied to the end client, due to which reliability will be increased.

10 AUTO COMPONENT MANUFACTURING

SMOOTH ENTRANCE FOR SENIOR VEHICLE

MSME

Kirdak Auto comp Pvt. Ltd.
Waluj, Aurangabad

Project category

Process Automation

: Background and Objective :

At the entrance of company, the gate is opened manually by security guard for defined vehicle. The time required for opening the gate is more, hence the defined vehicles must be wait for a time. While keeping the entry and exist report of the vehicle manually, the information may get lost and human error may occur. Smart Security system at entrance of company. Allow automatic gate opening for defined vehicles. The data will be saved long time need is to reduce manual efforts need is to reduce timing need is to reduce mismatch of the data.

: Challenges :

While entry of defined vehicle we observe that the time required to get entry is more. The authentication process consumes more time. When the defined vehicle comes the security, guard must open the gate manually which consume more time. That is the big challenge for us we must design a mechanism which provide security and the accurate data entry and opening as well as closing. they could not invest big amount in this process, therefore they decided to give this challenge to students of Deogiri College, to develop a low-cost automatic mechanism to reduce the idleness of operation. To bring automation in gate opening process, Students of electronic and telecommunication engineering department formed a project team.

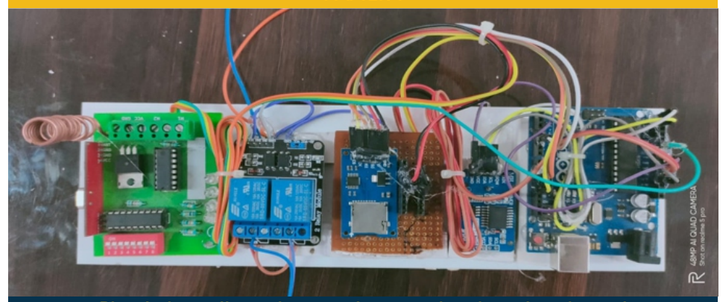
: BEFORE :

Pic: Manual Gate opening and closing process

: Idea :

In order to achieve the desired results by developing mechanism for opening and closing of gate and data entry, student's team understood the manual process very carefully and designed and developed low cost RFID based automatic gate opening and closing system. During designing we found that the RFID tag is easier way to implement the logic, and it consume less power. While analysing we observed that the operation speed of RFID is faster. So we conclude and develop the mechanism which is low in cost and has good accuracy and security.

: AFTER :



Pic: Automatic gate opening mechanism developed by students' team

: Implementation :

Deogiri students team designed the proposed automation mechanism with close collaboration of industry Co-ordinator and developed low cost RFID based automatic gate opening and closing system and was implemented in Rucha Engineering 2.0 in waluj industrial area, Aurangabad.

: Results & Savings :

The newly developed Automatic mechanism reduced the one labour cost per month of Rs 12000. Reduce time for entry and exist of reporting. Provide high security that means if the other vehicle come in front of the gate the gate will remain close.

Now, the gate opening, and closing is done by the newly developed device and there is no need of human. It has provided the ease of operation and have saved the significant amount of resources like manpower, and data entry which is time consuming process.

MANUFACTURING

11

TIME STUDY & PROCESS IMPROVEMENT

MSME

Swajit Industries
Waluj, Aurangabad

Project category

Process Improvement

: Background and Objective :

Swajit Engineering Private Limited is Manufacturer, Supplier & Exporter of Industrial Chains and slates, and supplying chains slates to Sugar, Cement, Steel, and many more industries, they produce numbers of sizes of chain according to the customer required. The basic parts of the chains are pin, bush and roller. The time required to produce the unit piece of pin is 1min 11 sec, for the bush is 5min 32 sec, and for the roller is 2 min. Other than this, these materials also pass through some heat treatment and that process required 24 hours. Before going to the basic operation, these materials are stored in specific section, the drawback of that section is to material handling of the row material is so lengthy and time consuming that will be replaced by using customized rack for that specific section.

: Challenges :

Reducing the wastages of time and increasing the production by improving the cycle time was one of the main challenge in company There were many solutions (software) available in the market but bring a small /medium industry swajit engineering did not wanted to invest big amount in it Therefore they decided to give this challenge to students of Deogiri college to study and analysis by using various techniques. To reduce the wastages of time and to Avoid idleness of the machine Students of mechanical department formed a project team.

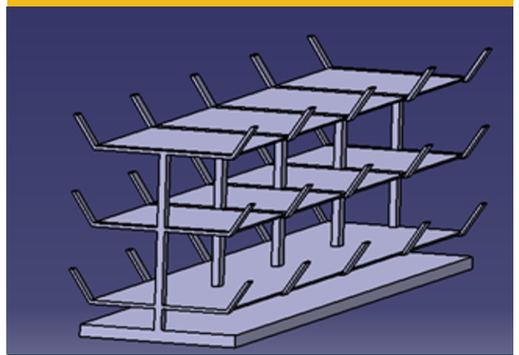
: BEFORE :

Pic: raw material.

: Idea :

By using analysing method such as DMAIC method we made a video to analyse time wastages in the company, we found that for the removing of the flats was the most important thing, were most of the time would waste. nearly 8 hrs to reduced that we proposed idea of the rack system which would the material according to the size so that the removal of the flats as per the required would be easy.

: AFTER :



Pic: Rack design for raw material flats

: Implementation :

Deogiri students team studied and analysed the operations with various time study techniques with close collaboration of industry co-coordinator and designed a suitable rack system for the company. The rack system is made of M.S which has loading capacity of 3 to 5 ton; The rack is doubled sided so that more material can be placed on it by using the rack system, we have optimized the available space and most importantly sorted the flats. This is implemented in Swajit engineering manufacturing plant in waluj industrial area, Aurangabad.

: Results & Savings :

By using time study we found major time losses in flats storage and transportation on it take Removing of certain flat would nearly require 6 to 8 hrs Or 4 to 6 hrs depending on how many flats are kept on it by using new design for flats storage system it requires 1 to 2 hrs means it savings up 65 to 75% time for removing certain flats

And eliminates hydra Crane and save its rental cost. we have design and propose rack storage system which is size is 6.5m×6m×6m and load capacity is up to 3 to 5 ton we use in MS material it is adjustable according to size and weight of flats.

MANUFACTURING

12 PRODUCTION QUALITY MAINTENANCE APPLICATION

MSME

Sandeep Enterprises
Waluj, Aurangabad

Project category

Digitization

: Background and Objective :

Sandeep Enterprises is a Pioneer Group engaged in manufacturing of various types of Customized and Precision Quality Auto parts and Components for all types of Automobiles from 2-wheelers to 4-wheelers. Their manufacturing facility is duly ISO Certified and equipped with latest in machinery from CNC Turning Machine, TROUB Machine, centre less Grinding, Lathe Machine, Drilling and Tapping, Cutting Machines, STL-Second operation, Hydraulic Power Press, CO2 Welding etc. to produce high precision quality products. Our core specialization lies in TROUB and CENTERLESS GRINDING for Auto parts and components. Group is led by well experienced management and manpower.

To manage the details of production and machines we are providing an application. It will maintain the details of amount of production that is produced without any defects and with defects on machine. Such information maintained will be used to determine the efficiency of machines and quality of production. Using this app, the user can find out efficiency of production and defect full or defect less products. We are providing an application to manage the details of production and machines which is cost efficient.

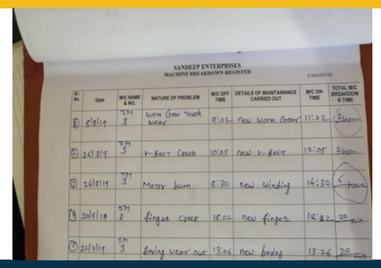
: Challenges :

As OEE calculation of an equipment is tedious task, it is a challenge to make calculations properly to get required result. Overall equipment efficiency is depending on many factors like runtime, shift time, quality of products, to calculate and manage this data is a challenge while making fully functional error free software.

Another part is to create an app which looks great. Include graphics, usable features, and intuitive design. Aim at providing a wholesome experience. Consider interactions well in advance to save time during the design phase. And aim for a comprehensive app experience.

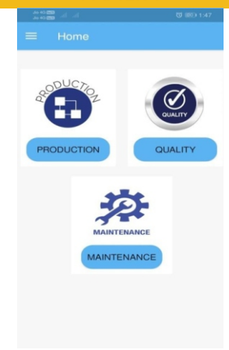
Don't restrict yourself to tap and swipe gestures. Use buttons with various click options and consider overlays to display additional information. There are various tools available in market to maintain and monitor machine production. But they are not cost efficient so PQM should be a solution of this problem.

: BEFORE :



Pic: Manual sheet of machine maintenance

: AFTER :



Pic: Rack design for raw material flats

: Idea :

The PQM app is providing an application to calculate overall equipment efficiency by managing the details of production and machines which is cost efficient. There are various tools available in market to maintain and monitor machine production. But they are not cost efficient and even they are not fulfilling all the requirements. The factors like availability performance and run time will be get calculated. Such information maintained will be used to determine the efficiency of machines and quality of production.

: Implementation :

Deogiri students team designed the proposed application system with close collaboration of industry co-ordinator and developed a Production quality maintenance application system consisting the details of production and machine. And calculate efficiency of machine by using android studio. After developing the application, it will be implemented in Sandeep Enterprises in waluj industrial area, Aurangabad.

: Results & Savings :

The PQM system designed to manage the details of production and machine which is cost efficient. We will maintain the details of machine maintenance. Due to which there will be no need of manual inspection system which in turn will reduce the labour cost. This system will bring the industry one step closer towards fully automation.

We will calculate the efficiency of machine for its maintenance and determine the quality and efficiency in the production.

AUTO COMPONENT MANUFACTURING

13

IMPROVE PRODUCTIVITY & SAFETY IN BURR REMOVAL PROCESS THROUGH

MSME

DNR India Auto tech Pvt. Ltd.
Waluj, Aurangabad

Project category

Process Improvement

: Background and Objective :

The problem statement given by the industry was supposedly to remove burr from objects occur while cutting. The reason behind this project was that, burr removal process is time taking & also affects operator safety. So the necessity behind this was, the industry should be able to produce the expected results with safety and to monitor the operator working on that machine (mainly during the night shifts.

: BEFORE :

Pic: An object from which burr is to remove

: Challenges :

Adding a device to preinstalled machine was a great difficulty and this made us to think in a way so that we should not change the functioning of each machine instead the device needs to be fit with an ease, taking this into account we read the manuals provided by the industry and solved the problem. Another difficulty was we were told to use Arduino dev board and the program we made was unable to fit into the memory due to size issues so compressing the size of the program was also a challenge that we face but DIEMS team also handled that problem.

: Idea :

At first when we started to work on this project, there were many different solutions in our heads that were useful to overcome this burr removal, but we use the following idea. The solution is to use a Arduino, So, what exactly would happen is that, when the paddle will be pressed by the operator of that machine the limit switch which is placed on the paddle will also be pressed. When the limit switch is pressed a high output will be send towards the Arduino controller and the data will be processed. According to the programming burr will get removed.

: Implementation :

Deogiri students team designed a device to save the uptime as well as downtime data directly in an excel format and to retrieve it whenever in need this was done due to the support of industry co-ordinators. The same was implemented in the industry on a trial basis on the semi-automatic crimping machine and the result was also analysed pointing out towards a little modification in the system for better accuracy.

: Results & Savings :

Automatic system to remove the burr developed for 2000 pieces per month with operator safety.

14 AUTO COMPONENT MANUFACTURING

WEBSITE DEVELOPMENT FOR DB ENGINEER

MSME

DB Engineer Pvt. Ltd.
Waluj, Aurangabad

Project category

Website Developement

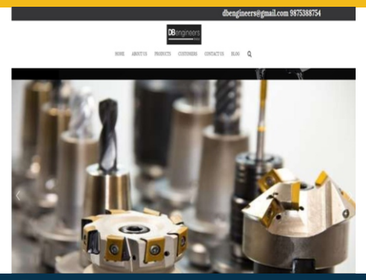
: Background and Objective :

DB Engineer pvt. Ltd. Is a quality manufacture of all type of cutting tools holder, holding system and special tools as per ISO 9001:2008 standard norms. So, this company want, customized to suit client requirement and specifications. For this, they were recommended website, especially attractive website for introducing their all products, their customers list for their guaranteed product company, their less cost with qualitative product.

: Challenges :

Our main aim is to clarify the process to customers that helps to increase sales of product and increasing productivity. So, challenge we was faced is that the themes that we selected which is not satisfied to company, they recommended us live chatbot, moving sidebar in front page. And all this recommended in website was wanted to be made through a WordPress. It's easy to update or control any information through WordPress to any handler with small information.

- WEBSITE -

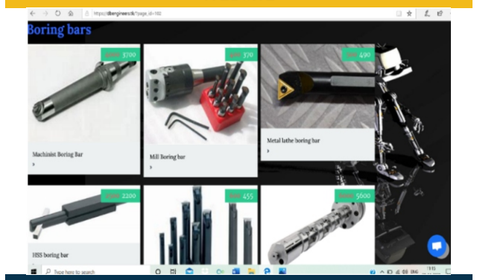


Pic: Front page or home page of website

: Idea :

In order to give them attractive website, we was chosen some templates, themes , and we had taken feedback for website to analyse what about website themes, templates best for customers, for their attractiveness we used sidebar on front page also add chatbot to help customers if they found any difficulty while checking some information, we also use google map to track location of company. When we added step by step one more things, we were taken feedback from other people.

- WEBSITE -



Pic: Product list

: Implementation :

Deogiri students team designed the proposed attractive website for DB Engineers pvt. ltd. company. By developing this website DB Engineers satisfy about this website. They are getting more connected to their customer. The main moto behind that developing website is achieved.

: Results & Savings :

The developed attractive website increases their productivity, all customers easily link to company, and also new customers also impressed, they get information about customer list of DB Engineers. So, they get granted about DB Engineers products.

: Feedback From MSME :

Mr. Dipak sir, HR of DB Engineers pvt ltd. appreciated the efforts and creativity of Deogiri college students.

- PROJECT TEAM -

Pic: Mr. Dipak sir Jahagirdar with Deogiri student.

WEBSITE

15 WEBSITE DEVELOPMENT FOR ANUJA INDUSTRIES

MSME

Anuja Industries Pvt. Ltd.
Waluj, Aurangabad

Project category

Website Developement

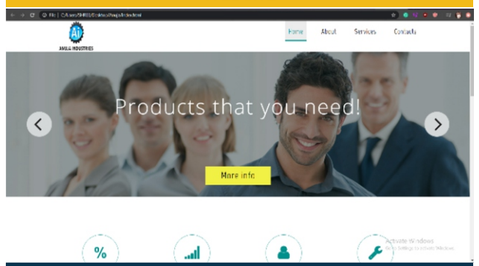
: Background and Objective :

Anuja Idustries works manufacture various precision machining components. boss buffer 1657, sprocket 264, 266, 282, diffuser for turbocharger and water pump housing are the products which are being supplied to Varroc Engineering pvt ltd, L.G. Balkrishnan & Bros Co. And Lakson Industries in Aurangabad. All the products manufactured by using CNC and VNC machines. Many dealers and companies are not aware about these products manufactured in Anuja Industries pvt ltd. Having a web site will give social platform and many people come to know about these products and industry.

: Challenges :

Making an attractive UI which can be user friendly and should give more information in less number web pages. To select appropriate domain name according to company during hosting of website. Adding company's location on google map accurately is one of the tough challenge.

- WEBSITE -



Pic: Webpage developed by students' team

: Idea :

In order to achieve the desired results by creating website which have attractive and more informative UI. Student's team also considered to improve social connectivity by adding location of industry on the google map which helps people to reach Anuja Industries without getting any difficulty.

: Implementation :

Deogiri students team created the proposed website with close collaboration of industry Co-ordinator and developed an in house low cost website which consist of company's location map and attractive UI for the user which contains most information about the Anuja Industry and their working and also this website can be access on any platform like mobile, laptop, tablets and computer system. After lockdown is over website will be hosted on google and hosting will be implement in Anuja Industries works in waluj industrial area, Aurangabad.

: Results & Savings :

This newly created website can be accessible on any digital platform like Mobile, Laptop, Computer and Tablets. Because of attractive and informative UI people will spend their most of the time on the website while they are searching for this industry. Adding location on google map and google map on website it will helps people to reach accurate location without getting any difficulty. Creating website will help Anuja industry to increase their customers and dealers. Adding social platform is always beneficial for any industry. It will Improve Company's advertising effectively. It will save money on printing and distribution costs and it provide easy access to new customers. It will be very easy to use, and update and it will improve productivity of the industry. Having a website will expand Anuja industries market.

: Feedback From MSME :

Mr. Dilip S. Aher, CEO of Anuja Industry pvt ltd. appreciated the efforts and creativity of Deogiri college students.

“Creativity and knowledge of the students is very extra-ordinary and they showcase their knowledge, great creativity and dedication in developing this website, which will definitely help us in saving time and money by expanding contacts via this website”

: Feedback From MSME :

Students got the hands on experience of actual coding and what are the standards to be taken care of while designing a website. Professionalism while writing a code is a key aspect learned during this project cycle. This project activity has helped student to gain courage to start a business activity by developing website for MSMEs.

AUTO COMPONENT MANUFACTURING

16

ELIMINATE REJECTION DUE TO OVER TRIMMING

MSME

Rudra Industries
Waluj, Aurangabad

Project category

Process Improvement

: Background and Objective :

Rudra industry pvt. ltd. manufactures various mechanical component. Press working has been defined as chip less manufacturing process by which components are made from sheet metal parts. RBL is one of the parts which being produce in the press machine is supplied to Mahindra and Mahindra pvt. ltd. Situated in Ahmednagar. Press working is one of the major process in manufacturing the RBL components is being used in the front wheel E-Rickshaw. The process of making a RBL components has 4 steps such as blanking, piercing, cutting, trimming. This process takes about 4 dedicated workers to do the job. In such a process takes being used. They are the main component of press working operation. The die is being worn out after several components. The problem after warning out the die is that RBL components are getting over trimmed which are the jobs which going the waste. Hence the Rudra Industries pvt. ltd. Works thought to thereby reducing the cost of production, reducing the rejection rate, reducing the tool were etc.

: Challenges :

Reducing the rejection rate as well as maintenance cost of tool and increasing the life of the tool and clamping arrangement of die and punch. There were many solutions were present to atomise this process by using various sensors as the rudra industries is being a small industry cost of such solution is more. And the company could not invest such a big amount. Hence, they decided to give this challenge to students of deogiri college, to develop a low-cost solution for the problem in order to reduce the rejection rate of the component.

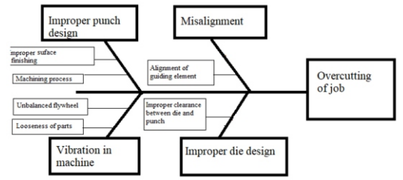
- DEFECT -

Pic: RBL of front rim

: Idea :

In order to achieve the desired results by developing the solution to problem. Students team understood the process very carefully by using various techniques such cause and effect diagram. And they finally got the causes which are causing the problem or effect. Then student team works on the problem and finally got the solution.by this situation the productivity increases, and rejection rate of the components is being reduced.

: AFTER :



Pic: cause and effect diagram

: AFTER :

Pic: Die and insert assembly

: Implementation :

Deogiri students designed the proper arrangements for the die with the help of the industry coordinator. The solution given is the providing and insert on the die plate the material for the insert is as same as the die with the same hardeness.by using nut and bolt arrangement fix the insert on the die plate and use this die for the trimming operation. After this the die is being used in the industry.

: Results & Savings :

The big investment on replacing the die is being reduced to greater extent.by this solution the rejection rate of the components produced is decreases by 10%. The maintenance costs for the tool is also reduced. The quality of the product produced get increased and the productivity increases. The insert cost is less as compared to replacing of the die.

AUTO COMPONENT MANUFACTURING

17

TO IMPROVE MIG WELDING PROCESS

MSME

Sheet Shapers India Pvt. Ltd.
Waluj, Aurangabad

Project category

Process Improvement

: Background and Objective :

Sheet Shapers India Pvt ltd manufacture various mechanical auto parts. Platina Shock Absorber is one of such part which is being supplied to Metal Man Auto Pvt. Ltd. in Aurangabad. Welding various subcomponents like stud, bush, D-bracket on the main body of shock absorber is main process done in the industry. In order to enhance the process, improve welding efficiency, and reduce welding defects Sheet Shapers India Pvt ltd thought to bring the solution for it.

: Challenges :

Reducing the welding defects on each machine was one of the main challenges for company. There is no ready-made solution available for the problem because the welding machines are customised and the operating range of the various parameters like current, voltage, gas flow rates are predefined therefore they decided to give this challenge to students of Deogiri College,to develop a low cost solution to reduce the welding defects of machine. To bring the optimised solution Students of mechanical engineering department formed a project team.

- DEFECT -

Pic: Platina Shock Absorber.

: Idea :

In order to achieve the desired results by developing solution for reducing welding defects, student's team understood the process very carefully and designed a Design Of Experiments (DOE) which involves a chart containing the columns of readings and parameters.

- DOE -

Exp. No.	Voltage	Current	Gas flow	Wire feed
1	16	130	10	8
3	16	190	12	10
4	16	220	13	11
5	18	130	11	10
6	18	160	10	11
7	18	190	13	8
8	18	220	12	9
9	20	130	12	11
10	20	160	13	10
11	20	190	10	9
12	20	220	11	8
13	22	130	13	9
14	22	160	12	8
15	22	190	11	11
16	22	220	10	10

Pic: DOE

: Implementation :

Deogiri students team has given the optimum range of various input parameters like current, voltage, wire feed rate, gas flow rate which helps to carry smooth welding to the Sheet Shapers India Pvt Ltd to overcome the welding problems that Sheet Shapers industry used to face during welding of Platina shock absorber welding through thoroughly conducting the DOE process which is conducted by selecting the combination of various input parameters.

: Results & Savings :

Due to implementation of optimum welding parameters the defects which were occurring earlier such as incomplete welding, spatter, cut blank has reduced to the greater extent and eventually it results in smooth welding operation of Platina shock absorber bracket.

Around 20% rejection out of which spatter and incomplete weld can be reworked but the total cost of rework is about Rs. 5000 - 5500 per month. Apart from this time required for rework is more and in addition to this for the cut blank Rs. 63.77 is the rejection cost per part. So due to new suggested input parameters this wastage of the cost and time is reduced.

AUTO COMPONENT MANUFACTURING

18

TO IMPROVE MIG WELDING PROCESS

MSME

Sheet Shapers India Pvt. Ltd.
Waluj, Aurangabad

Project category

Process Improvement

: Background and Objective :

The formability of sheet metal forming is the ease with which a sheet metal can be made into useful product. The formability indices are the indirect measure of the strength and resistance to failure. The ductility or resistance to failure is given the primary importance. The type of forming operation decides the techniques used to measure the formability. Forming Limit Diagram (FLD) is also used to quantify the sheet metal's formability. The FLD is the locus of normal surface strains that make the sheet to fail. Either the onset of thinning or fracture is the limit for the magnitude of these surface strains namely major strain and minor strain. The main objective of this study to improve formability of tailor welded blanks by varying process parameters.

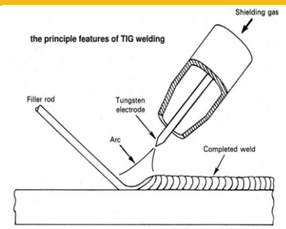
: Challenges :

Automotive engineers have also been successful in reducing weight, part counts, and cost and in streamlining the assembly process using steel tailor welded blanks (TWBs) to replace multiple blanks that must be stamped separately and then assembled. Tailor welded blanks are consist of over two materials with similar or different strength and thickness joined together to form a single part before forming. The main advantage of using a tailor welded blank is that gives thicker or stronger materials at critical parts of the sheet metal blank so much increase the local stiffness. Nowadays there are challenges to improve formability of automotive materials after welding due to brittleness in the fusion zone.

- DEFECT -

Pic: Tailor welded blanks

- Welding Setup -



Pic: Welding setup

: Results & Savings :

After experimentation tailor welded blanks are subjected to testing after testing it was found that AISI304L filler welded blanks showed good result and formability of blanks has improved by 10%. Also compared to preheating post heating has showed good result. By post heating of blanks formability has improved by 8%.

SURFACE TREATMENT

19

SURFACE IMPROVEMENT OF AISI 310

MSME

Saurabh Heat Treatment
Waluj, Aurangabad

Project category

Surface Improvement

: Background and Objective :

SAURABH GROUP is a professionally managed group of companies, providing one stop solutions in all types of heat treatments and boasts of having all the in-house modern facilities for heat treatment and induction Hardening. Hardening & Tempering are the two important processes. In which, the parts are heated through 'Mesh Belt' with constant speed to ensure uniform soaking for each part and no damages to the part. Sheet metal parts like spring steel can also be hardened. Case Hardening set up includes one Pre-Heating, Two Sealed Quench Furnace, One Washing Machine and One Tempering Machine, with each of 650Kg capacity. It can case Harden, Carbo-nitride & Harden Parts in it. The setup has SCADA facility which is being supplied So many other Medium & Small-Scale Industries. For this process, the bracket (through which gears goes under heat treatment) used, having material SS310 dimensions 670*570*13 (in mm) when goes under heat treatment process at constant temperature 450 under applied load of around 600-800kg, it limits up to 150 cycles.

: Challenges :

In order to enhance the productivity and contain initial cost of bracket. Saurabh Heat Treatment though want to Improve surface life of material handling tray. To improve the cycles of AISI 310 material tray on which high temperature and static load is applied. Main objective is to get cycles more than 150.

: BEFORE :

Pic: Existing manual tray

: Idea :

In order to achieve the desired results by coating mechanism for material handling tray, student's team understood the manual process very carefully and suggest the required coating to be done on bracket which involves surface improvement of material handling tray. This tends to improve productivity by increased in the cycle time and reduced in initial cost.

: Implementation :

Deogiri students team designed the proposed coating mechanism with close collaboration of industry Co-ordinator and developing the new coated material handling tray. After developing the mechanism, we are looking forward to implementing Saurabh Heat Treatment in Waluj industrial area, Aurangabad.

: Results & Savings :

Thermal Barrier Coating are advanced material systems usually Applied to metallic surfaces. The thermal barrier coating consists of two layers bond layer and top layer. These coatings find application in aerospace industry as it allows various parts to operate at elevated temperatures. TBC increases part life by reducing thermal exposure of structural components and reducing thermal fatigue. This work deals with to improve life of AISI 310 bracket. In present study AISI 310 exposed to static and thermal loading, static loading acting on the bracket is 650 kg. Furthermore, the bracket kept in the furnace which is at 450 . In this work TBC shall be decided to apply on AISI 310 bracket to reduce thermal exposure and to improve life of bracket. However, some characterization needs to be carried to check the strength of coating.

What will this coating Do?

1) Willimprove mechanical bond.
2) Actasthermalinsulation.
3) Willimprove surface finish.
4) Higher porosity.
5) Will get more than 150 Cycles.

20

STEEL METAL

MULTI-GAUGING INSPECTION TO MINIMIZE MEASUREMENT ERRORS TO REDUCE ISPECTION COST

MSME

Manish Engineering
Waluj, Aurangabad

Project category

Process Automation

: Background and Objective :

Manish Engineering was established in the year 1998. We are into the manufacturing of heavy sheet metal and tubular welded sub - assemblies required for automobile industries. Their Philosophy is implemented by having detailed quality instructions regarding raw material, in process and finished components. The company intends to achieve leadership in the domestic market with highest ethical standards. The company is committed to ensure quality, safety, health and environmental protection.

The aims in designing a real time application which helps in testing of the objects of any kind using Raspberry pi. This system helps in achieving effective communication between objects using multiple sensors to monitor parameters like shape, size, holes on job etc. The modules interfaced with the Raspberry pi for this system are, Photo sensor and Limit switch are used to detect any object, conveyor A Raspberry pi is used to establish communication between sensors for measuring continuously the above real time process. This work introduces an Automatic system with a combination of Raspberry pi having high impact on Object inspection. The main aspect of the project is to automate the process of manual multi-gauging inspection using Sensors and Raspberry pi.

: Challenges :

Scenario was that there is a manual process for inspection of crank pin, which takes more time and human resources so to check all the parameters of the crank pin so the challenge it to make the system automated.

: BEFORE :

Pic: Crank pin

: Idea :

In this our Team is going to make a automated inspection system which will help in the manual time and cost reduction as the work will be performed by the system itself. The system will be designed in such way that all the jobs will be check automatically by the inspection system. Here we are also going to insert LDR so that when the light is fall in the hole and LDR measure the intensity of light by which we get the proper hole readings according to the intensity of light. And for other measurements the raspberry pi camera is used to check the outer dimensions of the crank pin to get the proper and accurate crank pin.

: BEFORE :

Pic: Intermediate system development and interfacing with raspberry pi

: Implementation :

Firstly, we saw all the process in the plant. After seeing all the process, with the help of industry mentor and our project guide we have identified the problem statement and started working on it. Under the guidance of industry mentor and our project guide we have made all the drawing and design.

As per requirement, we searched for the components and by keeping the reference drawing and design, we made the model with help of industry mentor and our project guide. Once we were done with mechanical model, under the guidance industry mentor and our project guide we made all the electrical connections with timers, sensors & SMPS. For the safety purpose, we have also installed same safety sensors.

: Results & Savings :

The newly developed Automatic system is more accurate in dimension and the percentage of error is also reduced. Before this system to check the crank pin there was requirement of 4 workers for the inspection but now by installing this system, we will require only 1 worker to monitor the jobs not to inspect. Thus, reduced manpower as well as inspection cost.

21

AUTO COMPONENT MANUFACTURING

SMART MATERIAL TRACING

MSME

Dhananjay Enterprises Pvt. Ltd.
Waluj, Aurangabad

Project category

Material Tracking

: Background and Objective :

Dhananjay Enterprises is one of the well reputed industry in waluj MIDC Aurangabad. Dhananjay Enterprises are nothing but the manufacturing industry which is basically a production company and they manufacture mainly clutch plates for the vehicle manufacturing industries. The Dhananjay Enterprises have vast number of clients which also includes very big names such as royal Enfield, Bajaj , honda , etc. We are very glad and thankful to both Dhananjay and MASSIA that they gave us such a great opportunity. The problem statement given by the industry was supposedly to reduce the manual errors and obtain accurate analysis of material throughout the all process from which it undergoes through number of machines. The reason behind this project was that, at the end of the month there were so many energy losses and gain losses observed at time of storage check between the expected and actual outcomes. So, the necessity behind this was, the industry should be able to produce the expected results with minimum energy loss and to monitor the operator as well as the actual machine working on a single click and make its access for remote authorities as well. All the processes will be monitored through a centralized system. Individual process breakdown (bugs) can be monitored without disturbing other processes. Each system will be monitored for every output stage and, the central system will pass the command for next operation. This will eliminate the threat of onsite accidents

: Challenges :

Centralized monitoring of all processes. Visualizing and programming of the PLC. Connecting all systems to a common platform (IoT). And most importantly Material tracing.

: BEFORE :

Pic: Project prototype

: Idea :

Monitoring input and output process remotely. Material tracing for every process. Monitor the efficiency of the production line. Remote access to the system. Tracing the efficiency of the production line.

: AFTER :

Pic: Project prototype

: Implementation :

The software programs can be loaded into the system through the online server. This will improve the efficiency and save the time of production line. Online alerts will reduce the dependency on human monitoring. Material can be traced for every process. Efficiency can be monitored.

: Results & Savings :

Web server allows the access to data related to production.
The system failures are detected through analysis.
System provides monitoring of all the processes, contributing towards quantitative analysis.
The quality of production can be enhanced by continuous monitoring of the processes.

AUTO COMPONENT MANUFACTURING

22

ELIMINATE HANDBRAKE LEVER REJECTION

MSME

Dhananjay Enterprises-2 Pvt. Ltd.
Waluj, Aurangabad

Project category

Process Improvement

: Background and Objective :

Dhananjay Enterprises-2 manufacture various electrical and mechanical auto parts. Lever Hand-Break is one of such part which is being supplied to Bajaj Industries plant in Aurangabad. Bending process is one of the major process in Handbrake Assembly and was carried out manually, which involves 6 different machines and operations carried away one by one. This process was carried out by 5 dedicated operators, one of them handle 2 machines' simultaneously and others handled one machine respectively, 6 machines took 24 second for manufacturing one handbrake. In order to enhance the productivity and reduced rejections, Dhananjay Enterprises thought to bring the alternative process for handbrake manufacturing process.

: Challenges :

It was very important to avoid the holes overlapping at the time of bending operations was one of the main challenges for company. There had their own workshops to manufacturers dies so Dhananjay enterprises could not interested to change the die-set. therefore, they decided to give this challenge to students of Deogiri college, to develop in working dies of lever hand brake control to improve the productivity of this process. To bring development in bending process, a team of mechanical branch of engineering students formed a project team.

: BEFORE :

Pic: Lever Handbrake Control Assembly.

: Idea :

In order to achieve the desired results by developing a bending process of lever handbrake. we understood the working process very carefully and designed a low- cost mechanism which involves the Dowell pins and locators for holding the metal sheet and proper fitting of sheet metal inside the dies. We also considered to improve the working conditions for women operators by developing an operator friendly mechanism.

: AFTER :

Pic: Project prototype

: Implementation :

Deogiri students team designed the proposed design mechanism with close collaboration of industry Coordinator and developed a fixture which having Rowell pins, locators and clamping devices in order to achieve the desired quality results in lever handbrake manufacturing process. After developing the fixture, it was implemented in Dhananjay Enterprises-2 plant in waluj industrial area, Aurangabad.

: Results & Savings :

The new fixture reduced the fitting problem of sheet metal and proper bending process occurs. which resulted into decrease the rejections rate of this process in one hour. they used to process around 400 parts, but 240 parts was rejected where new fixture they can process 400 parts and around 25% of parts are rejected in one hour's compared to fixture, they rejection rate is decrease by 35%.

Now, bending process is carried out on fixture which can be easily operated by single operator, it has provided the ease of operation for operator and have saved the significant amount of resources like manpower, electricity for running the old process for more time.

23

AUTO COMPONENT MANUFACTURING

IMPROVEMENT IN OVERALL EQUIPMENT EFFECTIVENESS

MSME

Dhananjay Enterprises
Waluj, Aurangabad

Project category

Process Improvement

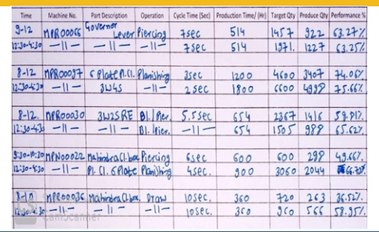
: Background and Objective :

Dhananjay enterprises manufactures various auto parts on press machines by using various operations like blanking, piercing, planishing, forming etc. And it is seen that the overall equipment effectiveness of press machines in industry is very much less as compared benchmarking i.e.,85%. OEE consists of three factors, i.e., availability, performance & quality, out of which machines are lacking in performance factor. The reduction in percentage of performance factor affects the overall equipment effectiveness. So to improve the OEE, Dhananjay enterprises allotted us random 5 press machines with different manufacturing operations. The objective of improving OEE is to improve productivity, increase and secure output, improvement in quality, increase in production rate, reduction in losses and to improve the performance of machine.

: Challenges :

Despite of having the OEE software for process improvement, Dhananjay Enterprises had very much less overall equipment effectiveness as compared to benchmarking i.e.,85%. And to find out reason behind that was the main task. To do that Company needed to allot manpower, which they were not willing to do. So, they decide to give this task to students of Deogiri Institute. The challenge for students was that, they had to observe and note down all the activities related to machines for the shift of 8 hrs. And by using observations, to calculate the overall equipment effectiveness and to find out the losses. And main aim of students was to reduces the losses to improve the OEE.

: BEFORE :



Pic: Current Performance factor for 5 Machines

: Idea :

In order to achieve the desired results by reducing the losses in the press machines, student initially understood each factor related to OEE. In OEE, there is a consideration of different losses and these losses needs to be defined under factor out of Availability, Performance and Quality. Then students started actual working by observing the machines, that they needed to take down each activity of machine and operator. The observations also include details of product being manufactured on machine like, product name, quantity, manufacturing operation, time require, cycle time for each product etc.,

After observing machines and calculating OEE Students found out the following losses for 7 days,

: BEFORE :

Reason	Total Time Loss (in Min.)
Delay in M/c Start after JH	369 Min.
Die Setup Time	402 Min.
M/C Breakdown	159 Min.
Operators Unnecessary Movement	294 Min.
Material Shortage	399 Min.

Pic: Total Time Loss for 5 Machines For 7 Days

: Implementation :

Students calculated total time loss and it is observed that Performance of machine is low because - Operator does not start machine on time after JH, There is operators unnecessary movement for material transport, Workers take too much time for Die Setting, And Planishing machine has low performance because of not getting input material on time. Suggestions by Students:

1.There is need to provide one more casual worker to eliminate operator's unnecessary movement. So that operators can work efficiently.
2. Operators should strictly instruct to start machine on time after JH.
3.Operators and workers should instruct to finish the Die Setting in minimum time.
4.There is need to look after Deburring machine as it has very much load, because of which Planishing machine didn't get input material on Time.

After this, plant head and production manager agreed, and they took action to minimize the losses.

: Results & Savings :

After acting on the losses, percentage of Performance factor is increased, and losses are minimized.

Machine	Performance[%]
MPR00066	87%
MPR00097	89%
MPR00030	79%
MPN00022	72%
MPR00036	67%

Pic: Increase in Performance Factor

As performance factor is increased there is also increases in percentage of OEE

Machine	OEE [%]
MPR00066	79%
MPR00097	84%
MPR00030	78%
MPN 00022	67%
MPR00036	62%

Pic: Improved OEE

24 AUTO COMPONENT MANUFACTURING

LOGISTIC TRACKING APPLICATION

MSME

Dhananjay Metal Pvt. Ltd.
Waluj, Aurangabad

Project category

Process Automation

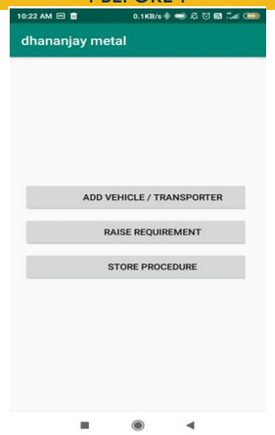
: Background and Objective :

Dhananjay Metal Craft Pvt Ltd, Manufactures Various auto parts, precision sheet metal stamping components and their welded assemblies which are being supplied to Automotive, Textile, Home Appliance and Chemical industries. Their plants are fully equipped with state-of-the-art Tool Room followed by other facilities like Fine Blanking, Mech- Hydraulic Presses, Spot-Projection- MIG - TIG Welding Machines, Liquid Nitriding, Fully Automatic Electroplating and Powder Coating Plants. They must deliver their auto parts to clients across the Marathwada n Pune region. Previously they use traditional method contains human intervention for booking transport vehicle, creating paperwork, checking prerequisites of vehicle, client requirement making LR slips, tracking delivery time, paying their bills doing this they use register to keep all records, this process makes many human errors. In Order to reduce time, paper, employee cost we proposed a android application to make their process digital, reduce errors.

: Challenges :

At the time of Implementation of this project we have faced many challenges, our main challenges are generate PDF reports, LR slips , customer received slip, GPS tracking of vehicles they have .For tracking of vehicles Dhananjay Metal Craft is not ready to buy GPS devices , so we proposed a software solution for tracking vehicles to use drivers' mobile phones.

: BEFORE :

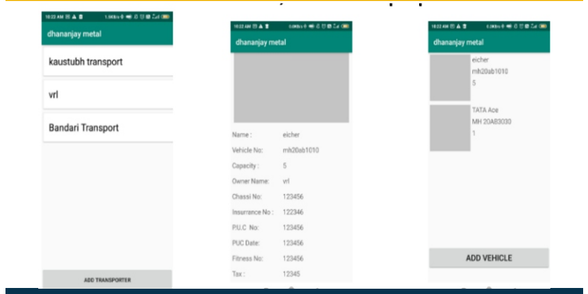


Pic: Software UI

: Idea :

To develop an android application software for Dhananjay Metal Craft which will help them in tracking logistics, transports, vehicle owners, drivers, clients, plant and their addresses vehicle details, L-R slips, tracking delivery details. For implementing their process and methods we decide various sections in android application software.

: AFTER :



Pic: Testing of mobile application in industry

: Implementation :

Deogiri Students team designed and proposed automation mechanism with close collaboration of industry coordinator Aarati Wadkar and developed in house java based mobile android application which consist Different modules which reduce human intervention, written paper work.

: Results & Savings :

The newly developed android application reduced store person cost, paper cost, Phone bills, error in generating bills, late in delivery of goods

Now the store person is free to do their extra work, able to complete his daily tasks Make sure of timely delivery of auto parts.

AUTOMOTIVE SERVICES

25 IMPROVE TWO-WHEELER UNLOADING PROCESS

MSME

Cherry corporation
Chikalthana, Aurangabad

Project category

Process Improvement

: Background and Objective :

Royal Enfield traces of foundation go back to 1893 when the company was known as Enfield Cycle Company. Enfield Cycle Company made its first motorcycle in 1901. Cherry Corporation is working under Royal Enfield from 2010. Owner of Cherry Corporation is Mr. Manish M. Dandgavhal.

2011, Royal Enfield riders around the world are encouraged to go for a ride on the inaugural one ride event .it becomes an annual ride, taking place on each first Sunday in April, the company acquires 50 acres of land at oragadam for its new plant. 2012, Royal Enfield launches its first highway cruiser, the all-black Thunderbird 500. Work on the new Oragadam factory continues briskly while the Tiruvottiyur plant sets a new production record to meet 113,000 motorcycle sales

: Challenges :

Improving the cycle time of unloading of the bullets from the truck. Due to which lots of accidents used to take place. While unloading the vehicles workers have also faced injuries and damages in the vehicle. The current damage percentage is 30% and the rework cost goes up to 40,000 to 45,000. this happens due to the less safety support on the ramp which is used to unload the bullets from the truck. 2 of the industry workers have faced serious health injuries. The process of unloading vehicles was a very time-consuming process.

We also noticed that for unloading vehicles all the workers and mechanics used to be needed at the site of unloading.

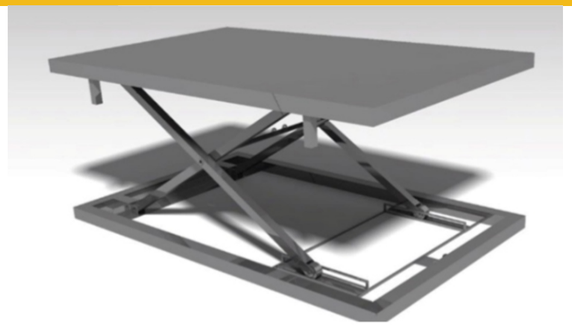
: Idea :

In order to achieve the desired results by designing hydraulic ramp, students team understood the manual process very carefully and designed a low-cost mechanism which involves the hydraulic ramp.

: BEFORE :

Pic: Total Time Loss for 5 Machines For 7 Days

: BEFORE :



Pic: Total Time Loss for 5 Machines For 7 Days

MANUFACTURING

26 DESIGN OF SCARP BAILING MACHINE

MSME

Swajit Industries Pvt. Ltd.
Waluj, Aurangabad

Project category

Process Improvement

: Background and Objective :

Swajit industries pvt ltd in waluj manufactures chain and chain links fence fittings conveyers and conveyers. Swajit engineering pvt. ltd. Is listed in trade India's list of verified sellers offering supreme quality of slate conveyor chain, haulege chains, paul retarder chains etc. This industry more focuses on the quality products along with cost optimisation their customers are cement and automobile industries. There are milling machines and cnc machines. Their focus is to optimise operation time and quality products and to reduce labour cost.

: BEFORE :

Picture: condition of scrap on floor

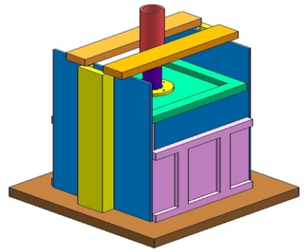
: Challenges :

There are lots of space occupy by the. Machining scarp and to store such scarp was one of the main challenges for company. There were many ready-made solutions available to problem. But being a small industry, swajit industries could not invest big amount in this pathway for scrap trolley, therefore they decided to give this challenge to students of deogiri college, to develop a low-cost design to reduce cost of buying large bailing machines. To start and developing design of scarp bailing machine students of mechanical engineering department formed a project team.

: Idea :

The space occupied by machining scrap can be reduced by compressing the scrap into rectangular bales and effective utilization of space can be done so, the idea of small baling machine is coming from this problem. This also save space along with the effort of operator. Firstly, the operator collects the all scarp and put it in the trolley this step is loading stage. After this operator unload trolley in the bailing machine from back door of the machine. After this hydraulic ram presses scarp to bale. Bailing machine has shape of (750×750×65) in mm.

: AFTER :



Pic: CAD design

: Implementation :

Deogiri students team designed the proposed design with close collaboration of industry co-ordinator and developed a design of scarp bailing machine in order to compress the scarp into bale shape in order to store them within less space and to reduce cost. After designing bailing machine, it was implemented in swajit engineering pvt. Ltd. Waluj industrial area, aurangabad.

: Results & Savings :

The newly design bailing machine results in space and cost saving. Apart from this 30% space now used for other machines. Their is also reduction in trolley movement and its time. Accident due to scarp disposal also reduced. Due to effective utilization cleanliness on shop now increasing. Loading and unloading of bales use less effort by an operator.

Due to space saving industry uses this space for effective use. Before this project space disposal and storing was main problem. Now industry can install more machine and due to this production of conveyors are increases. Labour effort also gets reduce to carry the trolley. Due to this idle time also decreasing.

27

AUTO COMPONENT MANUFACTURING

LEAKAGE TESTING MACHINE FOR ROCKER ARM COVER ASSEMBLY

MSME

Swagati Engineering pvt ltd
Waluj, Aurangabad

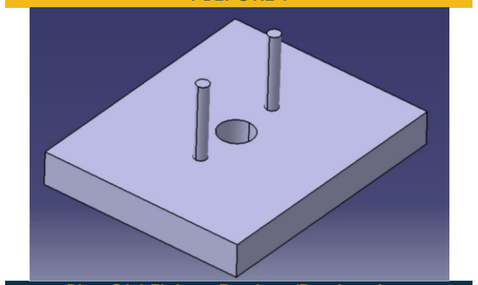
Project category

Process Improvement

: Background and Objective :

Swagati Engineering is a company established in 1979. Located in W-52, Chikalthana MIDC, and Aurangabad. The company registered in small-scale industries & Certified with ISO 9001:2008 & TS 16949 Quality Management Systems. Swagati Engineering has numerous certifications, a testing for product quality & focus on customer satisfaction. The Company is mainly in the business of development & manufacture of various types of CNC, VMC turned components, precision auto components & engineering job work, Swagati have been granted authorization to engage in the business of providing services within the practice of professional engineering in the Province of Ontario in accordance with the provisions of the Professional Engineers Act. They have a capability to do any kind of precision engineering component as per customer requirement.

: BEFORE :



Pic: Old Fixture Design (Rocker Arm Cover Assembly)

: Challenges :

For Clamping job and dipping into water they provided multiple switches. Also for filling pressurized air into cavity, they provided lever operated 2/2 DCV all the system working on pneumatic circuit. Multiple switches are used for various operations that is taking time in product testing cycle and inspection. Inspection is done physically by human eyes, hence there may be chances of error in testing. The cycle completed in 40 sec (before) with the help of automatic switches and fixture we can reduce up to 20 sec(after).

: Idea :

We can operate all the function by time delay valve, or sequencing valve, solenoid valve, by this we can reduce the time and improve the accuracy in quality check. Also, we can reduce stress on worker while inspection, by using the auto-clamp fixture we also reduce the mistake while loading and unloading the job. Another idea is to check leakages by using electronic pressure gauge as well as PLC system.

: AFTER :

Pic: New Fixture Design (Rocker Arm Cover Assembly)

: Implementation :

Deogiri students' team has given idea that saves production time (20 hours of saving on 1000 components) of Swagati Engineering pvt.ltd.to overcome the leakages problems. Helps to reduce the stress on operator as well as increase the productivity of the company. It has especially useful in mass production applications, leak detection and locating the job faster this makes testing cycle very economical.

: Results & Savings :

Due to implementation of new fixture design for leakage testing machine, the part is easily located and get firmly clamped on the machine and easy to detect the leakages from part and reduce worker activity that ultimately reduces fatigue of operator.
Saves the production time i.e. 20 hours saves on 1000 component because of this, the productivity is increases, makes the testing per job is more economical and more accurate inspection.

28

AUTO COMPONENT MANUFACTURING

5s IMPLEMENTATION AT SHOP FLOOR

MSME

Alka Auto Industry
Waluj, Aurangabad

Project category

Process Improvement

: Background and Objective :

Alka Auto Industry, waluj, Aurangabad, Maharashtra, India inaugurated in 2008, is a total engineering solution provider wherein the product is designed as per the customer requirements, prototype is manufactured, tested and validated before mass production.
Alka Auto Industry is specialized in Manufacturing Gear Blank and steering Levers as well. The products are manufacture at various locations depending upon the availability of skilled labours and logistics benefit organization drastically, right from the working conditions to the employees working satisfaction. Also, the Alka Auto Industry, Aurangabad aims for building it to a standard level organization. Thus, organization adopted the concept of ''5S'' for enhancing the profit, class of the company, working conditions, etc. and implemented the '5S' technique successfully. Also, the organization have various departments such as assembly, stores, maintenance and tool room, administration where the implementation of "5S'' would result in a huge enhancement in productivity, proper workplace condition, increased profits and motivation to employees. '5S' in simple terms is a Japanese technique consisting of five 'S' terms namely Seiri (sorting), Seiton (set in order), Seiso (shine), Seiketsu (standardize) and Shitsuke (sustain) having a deep sense for managing the workplace.

: Challenges :

No place defined for raw material, in process material, finished goods, tooling causing underutilization of available space, unnecessary movements of man and material.

: Idea :

5S' is one of the Japanese techniques which was introduced by Takashi Osaka in the early 1980s. It is basically a workplace management methodology which helps for improving working environment, human capabilities and thereby productivity. The word '5S' represents the 5 discipline for maintaining visual workplace. '5S' is workplace management to minimize the loss of time and unnecessary movements as well. The 5S technique is a structured program to systematically achieve total organization cleanliness, and standardization in the workplace. The benefit of 5S technique is improvement in productivity, quality, health and safety. Every organization aims for profit. In today's global market of decreasing profit margins, the profit made from the waste as well as through proper workplace management is mandatory. Thus, it is directly related to the competition of the organization with the competitor. Hence the profit from the waste and through the proper workplace management can be made only when there will be a stringent implementation of some workplace management technique and tha technique is '5S' concept.

: Implementation :

Whenever implementing 5S in an organization, the best place to start is with the easy fixes. These opportunities are typically very easy to identify, and they can be addressed quickly and without too many resources. Starting with simple fixes offers the facility many benefits including the following:

Momentum - Any time a new project is starting, it is important to build momentum. Starting with multiple small and simple issues that can be dealt with right away will show everyone that the 5S implementation is not only happening, but it is benefiting the facility.

Practice - Whenever starting something new, it is a good idea to try simple things to begin with so people learn how the project will go. It is much easier to address problems on smaller and easier projects than it is on a major issue

: Results & Savings :

Many manufacturers have implemented tactics towards a “5S” workplace organization and housekeeping methodology to constantly improve or to supplement lean manufacturing processes. 5S is designed to decrease waste while optimizing productivity through maintaining an orderly workplace and using visual cues to attain more consistent operational results.
5S refers to five steps – sort, set in order, shine, standardize and sustain (also known as the 5 pillars of a visual workplace). These programs are typically put in place by small teams working together to get materials more accessible to operations, and to foster operations with the smallest amount of wasted time and materials.

: Results & Savings :

Mr. Ashok Mohrut, Owner of Alka Auto Industry, appreciated efforts and observations of Deogiri college students.

“Students report help me to know the actual working condition of shop floor of our plant. They found out the losses and by working over it we were able tO increase percentage of Implementation at shop floor”

29

AUTO COMPONENT MANUFACTURING

IMPROVING PRODUCTIVITY BY REDUCING CYCLE TIME

MSME

Renuka Industries
Waluj, Aurangabad

Project category

Process Improvement

: Background and Objective :

Renuka industries is one of the MSME situated in MIDC area Waluj, working for the brand components of Ashok Leland, Royal enfield, volkswagen and many more MNC'S. This company was started in year 2000 with basic machines like CNC and now working with the high-tech machines like VMC's.

The improvements of the products have been exceedingly increased in this year due to Automation. At this stage the company manufactures more than 100 parts for the OEM'S/MNC'S. To specifying the problems by discussing with superior authorities, workers and analysis, consumption of time and proper utilization is stated. Hence, considering the load on machines and quality of product, increase in the productivity by time study and implementation is done. By decreasing the cycle time, the objective is been achieved.

: Challenges :

As per the working hours and the load of material on machines the most important challenge is to decrease the load without varying the efficiency and increase productivity of materials. The time and quality is the most important factor for the industry to achieve the oriented goal. Hence, considering this value and factors the work should be implemented. This work was to be done before new existing component comes to the machines, limited time of completing project. Also, enduring the “POKA-YOKE” system the same objective must be achieved.

: BEFORE :

Pic: Implementation of POKA YOKE System

: Idea :

After discussion of the problem the initiation of the project started the phase is as follows a) Focusing on the machine, manufacturing gear component, and study the time and cycle study. b) Analyzing, calculations, the new method to decrease time for single cycle also POKA YOKE System. c) Suggesting proper clamping devices for fixture to reduce time. d) Implementing on machine.

: AFTER :

Pic: Illustration of toggle clamp (low duty).

: Implementation :

The implementations have done on step wise procedure to analyse how efficient system was before and after.

1) POKA YOKE SYSTEMS:
Before Installation of “POKA YOKE” system the indication insertion of job was by non-technical vision and time Consumption was more i.e. approx. 7 seconds, thereafter, installing the “POKA YOKE” the time reduces to 4 seconds approx. Hence at each job the time of 4 seconds reduced, and the 3 seconds can be used and added in further cycle time for process.

2) Implementation of Toggle Clamps:
As per the previous design of Jig and Fixture in VMC, the loading of job i.e. Gear taking 30seconds loading and unloading time of 10 seconds. Albeit the whole cycle time from start to end for individual job was 1 minute 45 seconds approx. 105 seconds. The loading was brought to be fixed by Alan Key hence taking more time to load and unload.

: Results & Savings :

The result shows the minimum consumption of time i.e. 18 seconds.
Whereas, the previous case without toggle clamp consumes more time i.e. 40 seconds.
Hence increase in productivity in one day is: 31jobs and productivity for month is (except off days) 806 jobs.
The efficiency of the product with same quality increases with 11.7%

30

MANUFACTURING

REDUCE COLLECT LOCATING TIME

MSME

Birla precision technologies
Waluj, Aurangabad

Project category

Process Improvement

: Background and Objective :

Birla precision technologies ltd manufacture various holding part of CNC and VMC. organisation is concerned with the quality of its product while it is important that quantity requirements be satisfied and product schedules met it is equally important that the finished product meet establish specification because customers satisfaction is derived from quality product and services stiff c competition because customer international level and consumer awareness require production of quality goods and services for survival and growth of company quality of work and improve quality of work life. However, the management looks to achieve customer satisfaction by running its business at the desired economic level. Both these can be attained by properly integrating quality development quality maintenance and quality improvement of the product the integrating of these three aspects of a product can be achieved through a sound quality control system.

: Challenges :

Improving waste time because poor arrangement of collet storage. this company facing the problem of storage of collet because of they do not have the Keep proper arrangement or size. Avoid searching things. proper arrangement of the storage of the collet. So in which situation more time is waste .so that the first objective of company is to reduce waste of time & set a proper arrangement of collet storage. To reduce space utilization of collet. set the standard & proper arrangement and proper design of the bin. In which reuse the space between two collet so that in a single bin storage the more job as compare the first bin and bin are store or keep to each other so its help to reduce the floor space improve space utilization by proper planning layout , reduction of waste of time. To change the material of bin because of reduces of the weight. to use the plastic as a material of a bin.so that it helps to reduce the weight of bin and most important that life of the plastic is more than the life of wood .and it not effect on the any environmental condition like moisture.

: BEFORE :

Pic: Mixed collection of collet existing in industry

: Idea :

to reduce the waste time, we use bin for different size of collet .and make bin as per the size of collet and arrange them in order to reduce the space. And by arranging like this helps to reduce the working time it improves wasting time .and this is very helpful to worker it helps in easy handling.

: AFTER :

Pic: Designed bin box by students' team

: Implementation :

Deogiri student's team designed the bin its box like structure to reduce working time and for good arrangement. Material use for it is wood and it have box like structure, and it have holes in it in that it has to place the collet. it is design in cad software. And it implemented. Its weight also very less and bin has handled to carry. It helps to reduce time and it implemented in Birla precision pvt ltd waluj Aurangabad.

: Results & Savings :

In result we found that worker saves their time by doing use of bin. This makes them fast working experience. And bin reduces space utilization in store. It makes clean and neat floor. We implement the 5S and kaizen to reduce problem in Birla precision pvt ltd waluj Aurangabad.

FORGING

31

PROCESS IMPROVEMENT IN FORGING OPERATIONS

MSME

Vardhaman Precession works pvt ltd
Waluj, Aurangabad

Project category

Process Improvement

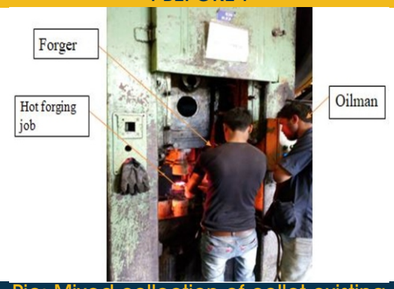
: Background and Objective :

Vardhaman Precession works Pvt ltd manufacture various mechanical auto parts. Gear blank is one of such part which is being supplied to Varroc Engineering pvt ltd in Aurangabad. Hot Forging Process is one of the major process in manufacturing of gear blank and was carried out manually by two workers on each forging machine, which involves punching and lubrication of blank in punch and die assembly. This process was carried out by 2 dedicated operators, one for Forging and other for Lubrication, whole operation took place in around 15 second. In order to enhance the productivity, improve resource efficiency, and reduce labour cost Vardhaman Precession Works thought to bring the mechanism in forging operation process.

: Challenges :

Reducing the labour cost on each machine and improving the cycle time of forging operation was one of the main challenges for company. There were many ready-made solutions available to atomize this process but being a small industry, Vardhaman precession works could not invest big amount in this process, therefore they decided to give this challenge to students of Deogiri College, to develop a low cost automatic mechanism to reduce the idleness of operation. To bring automation in forging process, Students of mechanical engineering department formed a project team.

: BEFORE :



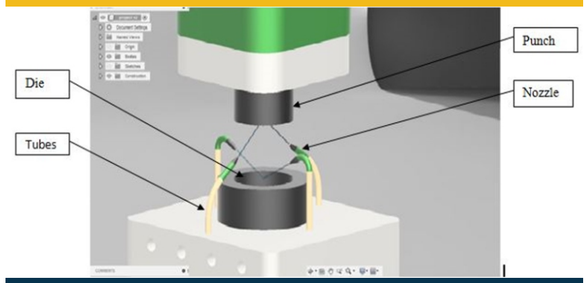
Pic: Mixed collection of collet existing in industry

: Idea :

In order to achieve the desired results by developing mechanism for lubrication, student's team understood the manual process very carefully and designed a low-cost mechanism which involves foot operated lubrication spraying mechanism. Student's team also considered to improve productivity by reducing the cycle time and the working conditions for operators by developing an operator friendly auto mechanism.

Pic: Mr. Dinesh Jahagirdar discussing project with academic guide Mr. B.G. Marlapalle and us.

: AFTER :



Pic: Designed bin box by students' team

: Implementation :

Deogiri students team designed the proposed automation mechanism with close collaboration of industry Co-ordinator and developed an in-house low-cost foot operated lubrication spraying mechanism which consist of nozzles with copper tube and other accessories in order to achieve the desired quality results in spraying the lubrication in punch and die assembly. After developing the mechanism, it was implemented in Vardhaman precession works in waluj industrial area, Aurangabad.

: Results & Savings :

The newly developed Automatic mechanism reduced the one labour cost per machine per month of Rs 12000. Cycle time of Forging operation from 15 second to 12 second depending upon job, which resulted into increasing the productivity of this process by almost 25%, in one shift they used to process around 1920 parts but now with the new automatic mechanism they can process more than 2215 parts in per shift.
Now, Lubrication and forging operation is carried out by only one worker instead of two on forging machine. It has provided the ease of operation for operator and have saved the significant amount of resources like manpower, cycle time for running the old manual process for more time.

: Feedback From MSME :

Mr. Dinesh Jahagirdar, HR of Vardhaman precession works appreciated the efforts and creativity of Deogiri college students.

32

STEEL METAL

DEVELOPING AUTOMATIC STACKER ASSEMBLY MECHANISM FOR CTL MACHINE

MSME

Keshav Metals pvt ltd
Waluj, Aurangabad

Project category

Process Improvement

: Background and Objective :

Keshav metals pvt Ltd. has expertise in manufacturing of CRCA steel strip coils. So, the main objective was to reduce the manpower cost and minimize collecting time of cutter metal strip from a coil by developing automatic stacker assembly mechanism.

: Challenges :

Reducing the manpower cost was one of the main challenges for company. There were many ready-made solutions available to automize this process but due to huge time requirements, Keshav metals could not invest big amount in this process, therefore they decided to give this challenge to students of Deogiri college, to develop a low-cost mechanism to improve inspection time of this process. To develop a automatic stacker machine. a team of mechanical branch of engineering students formed a project team.

: BEFORE :

Pic: CRCA steel strip (Actual Product)

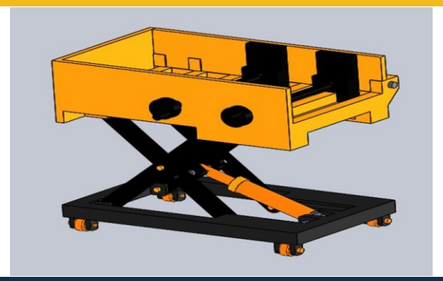
: Idea :

In order to achieve the desired results by developing a simple mechanical mechanism, students team understood the process very carefully and designed a low-cost mechanism which involves the mechanical fixture for holding the casting structure and checking the holes from front and rear side of the product. Students team also considered to improve the working conditions operators by developing an operator friendly auto mechanism.

: AFTER :

Pic: Tools used in manufacturing

: AFTER :



Pic: CAD design of prototype

: Implementation :

Deogiri students team designed the proposed automatic stacker assembly with close collaboration of industry co-ordinator and developed an inhouse low cost mechanical gauge which consist of mechanical parts, in order to achieve the desired quality results in inspection process. After developing the low-cost gauge, it was implemented in Keshav metals pvt. ltd.

: Results & Savings :

The newly developed mechanism reduced manpower cost up to 10,000 RS, and also decrease cycle time of production. Due to this mechanism stacking of strips is easy.

Now, inspection process is carried out on this machine which can be easily operated by single operator, it has provided the ease of stacking or collecting the cutter strips from a coil and have saved the significant amount of resources like manpower, etc.

33

AUTO COMPONENT MANUFATURING

TO PRODUCE CYCLE TIME OF VARIOUS MACHINES & ENHANCE PRODUCTIVITY

MSME

Multi Technology pvt ltd
Waluj, Aurangabad

Project category

Process Improvement

: Background and Objective :

Multi Technology Pvt Ltd manufactures various mechanical components such as Link LH, Link RH, Backplate DI, Backplate Cargo, Master cylinder, Inlet Flange, Auto adjuster LH, Auto Adjuster RH And Bearing Cup. The organisation provides service to the companies like Greaves Cotton, Kalyani Forge, Cooper Corporation, and Bajaj Motors. In the process of manufacturing these components, the main problem faced by the organisation is the target completion and the idle time by the machines and the labour. The main objective of the project is to enhance the productivity by carrying out ways to reduce the cycle time of the machine and idle time of man and machine.

: Challenges :

There are many challenges with reduction of the cycle time of the machine and the idle time of the operators. The operators are used to the working conditions and are most of the time reluctant to change their habits to enhance the productivity. Following were the challenges faced by us during the project are change in the setup in order to reduce the operator's travel to collect the tools, equipment, raw material, etc. and analysing and producing a report on proper distribution of workload. Other challenges were asking the Manager to make the required tools and equipment available for individual operator.

: Idea :

In order to achieve the desired result by providing solution for reducing the cycle time of a machine and enhance the productivity, student's team studied all the process very carefully and started the observations and recorded them. The time study was done in which the factors such as loading time, unloading time, cleaning and inspection time and idle time. Also, the operators and their movements were observed. The reason for which the operators had to move were recorded.

: AFTER :

Pic: Components Manufactured by Multi Technology Pvt. Ltd.

: Implementation :

Student's team has given the optimum range of various solution regarding idle time saving, loading and unloading time saving, reducing operator movement, reducing worker fatigue, etc. which helps to carry smooth out smooth operation and manufacturing. The organisation was glad to see the effort of students and were happy to see the parameters which could save the time and enhance productivity. Also, these untouched parameters were properly noted down and the set of solutions were provided to the organisation.

: Results & Savings :

Due to implementation of the set of solutions while considering the parameters, the lack of productivity which was occurring due to operator leisure, operator movement, machine cycle time and improper operator – manager communication has reduced to the greater extent and eventually it results in smooth operation and effective working environment.
The targets are now almost achievable, and the rejections have been reduced by around 10%. So due to new suggested input parameters this wastage of the cost and time is reduced.

34

FIXTURE TESTING

DESIGN OF HYDRAULIC LEAKAGE TESTING FIXTURE FOR PTO 435

MSME

Swagati Engineering pvt ltd
Waluj, Aurangabad

Project category

Process Improvement

: Background and Objective :

Swagati engineering is a company established in 1979 and registered in small scale industries. The company is mainly in the business of development and manufacture of various types of CNC, VMC turned components and engineering job work. We do have a capability to do any kind of precision engineering components as per customer requirement.

: Challenges :

Reducing the labour effort on each machine and improving the Productivity. There were many ready-made solutions available to atomize this process but being a small industry, Swagati engineering could not invest big amount in this process, therefore they decided to give this challenge to students of Deogiri College, to develop a low-cost automatic fixture For the Leakage testing operation. To bring automation in leakage testing process, Students of mechanical engineering department formed a project team.

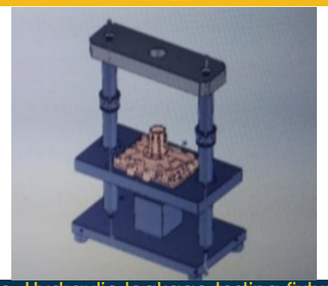
: Idea :

In order to achieve the desired results by developing Fixture for leakage testing, student's team understood the manual process very carefully. This manual process is very time consuming therefore we have decided to create low cost fixture for time Consuming. Student's team also considered to improve productivity by reducing the cycle time and the working conditions for operators by developing an operator friendly auto Fixture.

: BEFORE :

Pic: PTO cover for ape three-wheeler diesel engine used for leakage testing in Swagati Engineering Pvt Ltd.

: AFTER :



Pic: Hydraulic leakage testing fixture developed by students' team

: Implementation :

Deogiri students team designed the proposed automation fixture with help of software CREO for leakage testing operation. This fixture developed an in-house low cost for Hydraulic leakage testing fixture for PTO cover which consist of Aluminium base plate, middle plate with hydraulic cylinder and other accessories in order to achieve the desired quality results in hydraulic leakage testing fixture. After developing the Fixture, it was implemented in Swagati engineering in Chikalthana industrial area, Aurangabad.

: Results & Savings :

The newly developed Automatic Fixture reduced labour effort and consuming time which resulted into increasing productivity. We create fixture after that they more parts check as compare to previous performance.
Now, Leakage testing operation is arrived on hydraulic leakage testing fixture. It has provided the ease of operation for operator and have saved the significant amount of resources like manpower, cycle time for running the old manual process for more time.

35

FIXTURE MANUFACTURING

DEVELOPMENT OF FIXTURE TO REDUCE CYCLE TIME

MSME

GBB Industries pvt ltd
Waluj, Aurangabad

Project category

Process Improvement

: Background and Objective :

GBB Industries was established in 2006 at Aurangabad, Maharashtra, they are leading manufacturers of hydraulic clamping VMC and HMC fixtures, hydraulic cylinders, work supports, sequence valve and a dealer of Agama VMC machines. Their clients include Kalyani forge, Sanjeev, Samaddar mother son, Bajaj, Bharat forge, FANUC and many more.

Objective:

1. Fixture design to achieve higher accuracy for the milling operation
2. Decrease in cycle time
3. Increase in manufacture rate and production capacity
4. Decrease in cost of manufacturing
5. Reduction in manufacturing lead time.
6. This development involves study of stresses and Deformation acting on a fixture.

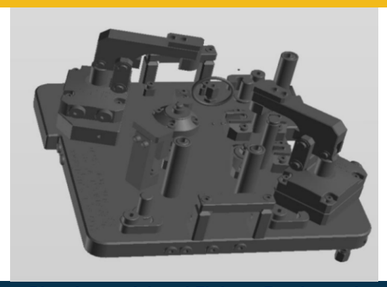
The stresses will be predicted theoretically. These results will be validated by comparison with the analysis using software.

: Challenges :

There is no fixture available in industry to hold the work piece; there is need of designing new fixture to achieve higher accuracy for the milling operation, Decrease in cycle time, Increase in manufacture rate and Production Capacity, Decrease in cost of manufacturing, Reduction in manufacturing Lead Time, This development involves study of stresses and Deformation acting on a fixture. The stresses will be predicted theoretically. These results will be validated by comparison with the analysis using software

: Idea :

In order to achieve the desired results by developing Fixture student's team understood the various steps and considerations to be followed for design of fixture. we have decided to design a low-cost fixture with lesser time Consuming. Student's team also considered to improve productivity by reducing the cycle time and the working conditions for operators by developing an operator friendly auto Fixture.



Pic: Assembly of Fixture Designed

: Implementation :

Deogiri students team designed the proposed automation fixture with help of software CREO. This fixture developed is an in-house low-cost fixture. It consists of number of various parts and accessories in order to achieve the desired quality results of minimum time and maximum quality production. After designing the Fixture, it was validated in GBB Industries in MIDC, Waluj industrial area, Aurangabad.

The newly developed Automatic Fixture reduced labour effort and consuming time which resulted into increasing productivity. We create fixture after that they would be able to produce a greater number of parts check as compare to previous performance.

36

MANUFACTURING

ELIMINATE OF SPRING BACK EFFECT DURING TUBE BENDING OPERATION

MSME

Yashwant Industries pvt ltd
Waluj, Aurangabad

Project category

Process Improvement

: Background and Objective :

Yashwant industries are one of the emerging industries in providing engineering solutions. This industry Specialized in mfg. of various special purpose machines such as Tube Notching Machine, Welding machine, Panel Bending & Rolling SPM, Progressive Press Tool, Transfer Line Press Tool, Conventional Press Tool, Robotic Welding Fixtures. Currently they are working on development of CNC tube bending machine. So, with the help of CNC tube bending we are going to bend tube. But after the bending process is complete and the tooling have been withdrawn the bent tube spring backs due to the elastic nature of the Tube material. This is called spring back or the elastic recovery of the tube. Due to this spring back problem we are not getting an accurate bent angle and getting approximately 30 to 40 percent rejection during bending of erw tube.
So our main objective is to reduce this spring back problem by using various methods such as;

1. To find the appropriate spring back angle for different material.
2. How much load should be applied in a way to achieve minimum spring back.
3. To analyse the bending operation over a bend analysis software.
4. Time period to hold job under load to minimize effect.
5. Seamline detection on a tube and holding it in a way under machine.

: Challenges :

Due to this spring back problem on Erw tube we are not getting a accurate bent angle and getting approximately 30 to 40 percent rejection during bending of erw. To solve this problem company wanted effective solutions, advanced software, and main causes of this spring back problem. So, for getting solution of this problem students of mechanical engineering department formed a project team.

: Idea :

In order to achieve the desired results, students team understood the manual process very carefully. After doing research our team finds some important factors which affecting the output. So, we decided to do some testing on Erw tube to overcome this problem and, we compare this CNC bending machine with other std machines and suggested some software to minimizes this spring back problem.

: Implementation :

In order to reduce spring back effect over the tube we have done a comparative study of similar characteristics material of tube and found out that this problem can be solved by effective use of load and physical properties of material. By using trial and error method i.e.by overbending the tube we can able to get the desired angle (possible when tube place properly). Holding the material under the load is another specific way to minimize the spring back effect. For these the holding time is calculated by implementing trials over different load for specific time. Also, we given suggestion during this CNC tube bending machine development on seamline detection software which minimizes the spring back problem by proper placing of the tube.

: Results & Savings :

We also suggested advance tools, software's like as bendtech which is plc communicating software, and sensors such as seamline detection are useful for getting perfect bend on Erw steel pipe. By using this advance technology and selecting proper bending techniques we can be able to minimize this spring back effect on Erw steel tube. By doing some research we also found that material properties such as carbon percentage which should be less, thickness of tube (min. as possible), hardness should be less, also bend radius should be minimum as possible. So, by taking proper material selection we can minimize the spring back effect. We also found that holding time after bending operation and trial error base method also reduces the spring back effect.

SHEET METAL

37 IMPROVE THE SAFETY OF MACHINE AND RECORDING VARIATION OF PARAMETERS

MSME

Rucha yuntrana Shendra, Aurangabad

Project category

Process Improvement

: Background and Objective :

The problem statement given by the industry was Real-time data monitoring (RTDM) is a process through which an administrator can review, evaluate and modify the addition, deletion, modification and use of data on software, a data base or a system. It enables data administrators to review the overall processes and functions performed on the data in real time, or as it happens, through graphical charts and bars on a central interface/ dashboard.

To improve the efficiency of machine.

To fulfil the requirements of the industry and provide better results.

To make it cost efficient.

: Challenges :

Adding a device to preinstalled machine was a great difficulty and this made us to think in a way so that we should not change the functioning of each machine instead the device needs to be fit with an ease, taking this into account we read the manuals provided by the industry and solved the problem. Another difficulty was we were told to use Arduino dev board and the program we made was unable to fit into the memory due to size issues so compressing the size of the program was also a challenge that we face but Deogiri team also handled that problem.

: BEFORE :

Pic: Hydraulic press machine in Rucha Industries

: Idea :

At first when we started to work on this project, there were many different solutions in our heads that were useful to overcome this undercut phenomenon, but we use the following idea The solution is we are making an dashboard on the software to display the real time condition of the machine and the manufacturing data can be stored in data base and the all the real time work as we are making the type of website. the manual work can be reduced, and the press machine can be interfaced with the ESP8266 to take and real time data on server and user can be monitored from the server.

: BEFORE :

Pic: Real time data management

: Implementation :

Deogiri students team designed Real-time data monitoring (RTDM) is a process through which an administrator can review, evaluate and modify the addition, deletion, modification and use of data on software, a data base or a system. It enables data administrators to review the overall processes and functions performed on the data in real time, or as it happens, through graphical charts

: Results & Savings :

With the installation of this prototype the records of uptime and downtime will directly be saved in the excel format due to which the time required for entering the data manually will be eliminated which can help in increase in no. of production as compared before, also be more reliable due to less human the timing of actual uptime and downtime will intervention as it will be automated machine monitoring gives the ability to see what your machines are doing in real-time and show all physical and electrical parameters on display on dashboard.

AUTO COMPONENT MANUFACTURING

38 SCREW TIGHTENING PROCESS PRODUCTIVITY IMPROVEMENT THROUGH AUTOMATION MECHANISM IN MCB SWITCH PRODUCTION UNIT

MSME

Kirdak Auto comp pvt ltd
Waluj, Aurangabad

Project category

Process Automation

: Background and Objective :

Kirdak Auto comp Pvt ltd manufacture various electrical and mechanical auto parts. Miniature Circuit breakers is one of such part which is being supplied to Siemens Industries plant in Aurangabad. Screw tightening process is one of the major process in MCB Assembly and was carried out manually, which involves placement of 6 screws and tightening one by one by manual torque wrench. This process was carried out by 2 dedicated operators, one for screw placement and one for screw tightening, 6 screw tightening took place in 16 second for one MCB Assembly. In order to enhance the productivity and improve resource efficiency, Kirdak Auto comp thought to bring the automation mechanism in screw tightening process.

: Challenges :

Improving the cycle time of screw tightening process was one of the main challenges for company. There were many ready-made solutions available to automize this process but being a small industry, Kirdak Auto comp could not invest big amount in this process, therefore they decided to give this challenge to students of Deogiri college, to develop a low cost automatic mechanism to improve cycle time of this process. To bring automation in screw tightening process, a team of electronics and mechanical branch of engineering students formed a project team.

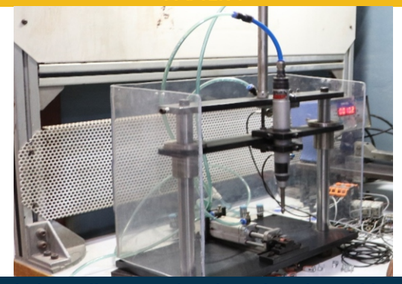
: BEFORE :

Pic: Hydraulic press machine in Rucha Industries

: Idea :

In order to achieve the desired results by developing an automation screw tightening mechanism, students team understood the manual process very carefully and designed a low-cost mechanism which involves the pneumatic fixture for holding the screws and auto vertical movement of screwdriver. Students team also considered to improve the working conditions for women operators by developing an operator friendly auto mechanism.

: AFTER :



Automation mechanism developed by students' team

: Implementation :

Deogiri students team designed the proposed automation mechanism with close collaboration of industry co- Ordinator and developed an inhouse low cost automatic fixture which consist of pneumatic, electronics and mechanical parts, in order to achieve the desired quality results in screw tightening process. After developing the low-cost fixture, it was implemented in Kirdak Auto comp plant in waluj industrial area, Aurangabad.

: Results & Savings :

The newly developed Automatic mechanism reduced the screw tightening process cycle time from 16 second to 8 second, which resulted into increasing the productivity of this process by almost 50%, in one hour they used to process around 350 parts but now with the new automatic mechanism they can process more than 500 parts in one hour.

Now, Screw tightening process is carried out on automatic fixture which can be easily operated by single operator, it has provided the ease of operation for operator and have saved the significant amount of resources like manpower, electricity for running the old manual process for more time.

: Feedback from MSME :

Mr. Sunil Kirdak, Managing Director of Kirdak Auto comp appreciated the efforts and creativity of Deogiri college students.

Students have showcase the great creativity and dedication in developing this Automatic mechanism, which helped us in saving time and money by improving the cycle time of screw tightening process, we are thankful to GIZ for coordinating the project and look forward to work with academia in coming years

SERVICES

39 ONLINE CAR WASH BOOKING APP

MSME

Om Sai Car Wash
Chikalthana, Aurangabad

Project category

Digitization

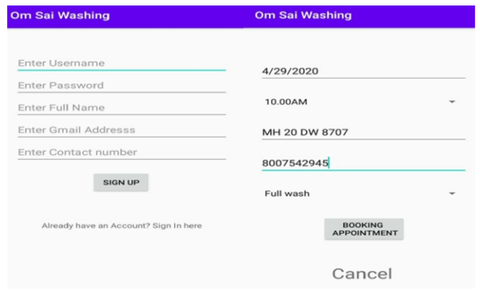
: Background and Objective :

Om Sai Car Washing Centre is a centre where cars are washed and cleaned and, they have many types of wash for that purpose. The washing centre was facing a problem regarding the waiting time of customers as they were not having any system for booking an appointment due to which customers had to wait for a long time resulting in inefficient service by the centre and also had to face too bad reviews from customers as they would have to wait for a long time in the waiting queue. Our objective is to increase efficiency of the washing centre by automatically managing the appointments and to reduce the chaos and waiting time for customers at the washing centre.

: Challenges :

Developing an online appointment booking system was the main challenge as getting this task done by any software industry was costlier so they decide to give this task to students of Deogiri Engineering and Management Studies. Students from computer science department formed a team to complete this project by developing a mobile based application which will automatically manage the appointments of the customers and will reduce the waiting time of customers.

Online Booking App



Pic: Application UI

: Idea :

In order to decrease the chaos near the washing centre, an online appointment booking application was suggested to industry by the students. The mobile based application increased the efficiency of the washing centre by managing the appointments automatically and decreased the chaos near the washing centre.

: Implementation :

Deogiri students team designed the proposed appointment booking system with close collaboration of industry co-ordinator and developed a mobile based application that will automatically manage the customers appointment. After developing the mechanism, it will be implemented in Om Sai Car Wash, Chikalthana, Aurangabad.

: Results & Savings :

The application will manage the appointments of the customers automatically and will reduce the waiting time of customers due to which there will be no chaos near the washing centre resulting in efficient service by the washing centre.The application will also be having all the records regarding all the types of services provided so that the manual efforts of the owner will be reduced.

40

ADVERTISING

IMPROVE EFFECTIVENESS AND REDUCE TIME REQUIRE IN CLIENT DATA CAPTURING

MSME

Om Sai Ads
Aurangabad

Project category

Digitization

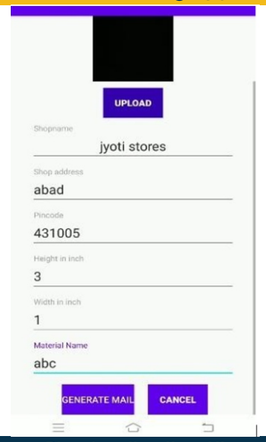
: Background and Objective :

Om Sai Ads is a company where the hoardings, banners, flex are made for a branding for advertisement purpose. For that they must go to the sites and view the exact place for hoarding and according to that they decide which material is suitable for that place. In all this process they gather all information manually. One person goes at every site and remember all the information and click the photos of the place where that hoarding is going to placed. After collecting all data that person remembers all data and told to the person who is going to make a presentation orally. The objective is to reduce the time required for capturing the data for ads

: Challenges :

Developing a data capturing application was the main challenge as getting this task done by any software industry was costlier so they decide to give this task to students of Deogiri Engineering and Management Studies. Students from computer science department formed a team to complete this project by developing a mobile based application which will capture data correctly and reduce the time required for making presentation.

Online Booking App



Pic: Application UI

: Idea :

In order to reduce the time required for making a presentation, a data capturing application was suggested to the industry by the students. The mobile based application help to collect the data correctly and reduce the time required for making the presentation of the collected information.

: Implementation :

Deogiri students team designed the proposed data capturing application with close collaboration of industry co-ordinator and developed a mobile based application that will capture data correctly and reduce the time required for making presentation. After developing the mechanism, it will be implemented in Om Sai Ads, Aurangabad.

: Results & Savings :

The application will capture all the data required for making the presentation of the product hoarding or branding purpose. It also reduces total time required for all this process.

AUTO COMPONENT MANUFACTURING

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IMPROVE PRODUCTIVITY OF STRIP MEASUREMENT

MSME

Keshav metals pvt ltd
Waluj, Aurangabad

Project category

Process Improvement

: Background and Objective :

The problem statement given by the industry was supposedly to reduce the manual errors and actual strip width measure. These strips are then rolled into huge coils before sending them off s raw materials to their client industries. This industry can be majorly termed as the raw material manufacturer for their clients. These strips are then rolled into huge coils before sending them off s raw materials to their client industries. This industry can be majorly termed as the raw material manufacturer for their clients. Each client has their own requirements regarding the dimensions of the coils. So coils with huge variations in their dimensions i.e. thickness and width are manufactured. In this process the most important aspect is accuracy and thus a worker is appointed who has to check the dimensions by having to stop the rolling machines and using vernier calliper and then if there are no errors the worker resumes the machine work, this stopping of machine and checking of dimensions is done many times in order to maintain accuracy. The objective is to design a low-cost system for real time monitoring of the dimensions of plates.

: Challenges :

In this they process thickness and width are manufactured. The most important aspect is accuracy and thus a worker is appointed who has to check the dimensions by having to stop the rolling machines and using vernier calliper and then if there are no errors the worker resumes the machine work, this stopping of machine and checking of dimensions is done many times in order to maintain accuracy. Using manual width and thickness measurement methods for these plates or strips may result in human errors and is a time-consuming process as the machines must be stopped and then again resumed once the checking of dimensions is done.

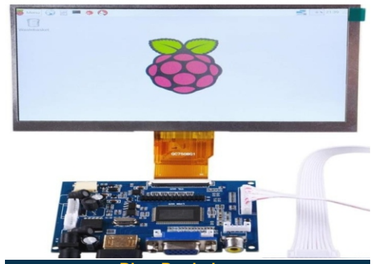
: BEFORE :

Pic: CRC rolling machine

: Idea :

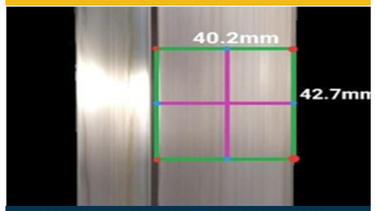
At first when we started to work on this project, there were many different solutions in our heads that were useful to overcome this undercut phenomenon, but we use the following idea. The solution is to use a Raspberry pi module with camera module So, what exactly would happen is that, when the roll will start and strip will cut camera capture the image and process that image and calculate image width or length and display on HDMI display and also show on LCD display showing width of strip

: BEFORE :



Pic: Prototype

: BEFORE :



Pic: Results of CRC strip width

: Implementation :

Deogiri students team designed a device to save the time and accuracy to measure strip width and length it needs this was done due to the support of industry co-ordinators. The same was implemented in the industry on a trial basis on the CRC rolling machine and the result was also analysed pointing out towards a little modification in the system for better accuracy.

: Results & Savings :

The system consists of two parts which are object detection and object measurement. In the first part, raspberry pi camera used to achieve the frames. In the second part, computer vision module will be applied to the captured frames to determine the objects, then, we will measure each object. The detected object of the current frame immediately will be processed to extract dimensions of objects. In the proposed system, firstly, we need to pre-process our image. The camera will capture a frame and the frame will convert to greyscale to increase quickness and accuracy. Objects are detected via canny edge detector algorithm. It is used to detect only one object or multiple objects. By the help of canny edge detector, the converted image will be processed. The canny edge algorithm scans the entire image. After that, execute dilation and erosion algorithm to close holes among edges in the edge frame for running the old manual process for more time.