

## A REVIEW ON 8D PROBLEM SOLVING PROCESS

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**ABSTRACT:** Investigation was conducted so that the variables influencing the customer complaints management process would be identified throughout a case study in the automotive industry. To satisfy the customer complaints, the process follows the 8D technique. The 8D technique is used to solve problems, reduce the overall quality cost and it improves customer satisfaction. The work has also improved customer complaint process which has been achieved by effective use of 8D technique. During the whole case study, the problem was defined, the variables were measured, the causes for failure were analysed. Then, improvements over these failures were planned and a defined performance level was achieved. By integrating and managing the quality of data the reorganization of tasks and methods were improved. A faster and more systematic reaction to complaints and problems were achieved, thereby, preventing problem recurrence, saving cost whenever a complaint is registered.

**KEYWORDS:** 8D process(D0-D8), Cross Functional team, 5 why, ishikawa diagram, containment action, root causes, prevent recurrence, permanent solution.

### **INTRODUCTION:**

Every company wants to be successful and wants their customers to be satisfied. Customers wishes' and needs changes from time to time because of change in technology or as a result of impulsive economic, political and cultural movements in environment. For every company, meeting the customers requirement is the basic challenge, and it's main goal is to lead towards the profit creation. In any business firms or organizations, some major or minor

problems may appear, which are sometimes easily solvable and sometimes it seems that the solution is not possible. Whenever a problem is occurred, run the proper action to solve the problem. Often, it turns out to be the same problem which occurs at crucial time. If the problem re-occurs, It indicates that the real cause of the problem is not solved but only healed (solved temporarily). To ensure a systematic way of solution to the problems, a new methodology 8D is being implemented.

Complaints are significant due to the fact that customer satisfaction can only be improved if the dissatisfaction with a specific product is clearly identified. Dissatisfaction identification is just the initial step in solving the underlying problem.

**8D :** The Eight Disciplines of Problem Solving is a technique designed to find the main cause of a problem, provide a temporary solution and implement a permanent solution to prevent recurring problems. An 8D is an best choice to solve the customer problems, improve the quality and reliability, when it's clear that the product is not satisfying.

The 8D problem solving process is mainly required when, Issues regarding safety or regulatory has been discovered or Customer complaints are received. The 8 eight discipline principles (D0-D8) starting from D0 follows a proper sequence until the problem is solved (D8). Stages of 8D include

D0- Prepare and plan for 8D

D1-Team Formation

D2-Description of Problem

D3-Interim Containment Action

D4-Root Cause Analysis

D5-Corrective Actions

D6-Horizontal Deployment

D7-Prevent Recurrence

D8-Thankyou

### **THEORETICAL PLATFORM:**

To use the 8D process, all the following disciplines should be taken into consideration. Any of these steps should not be skipped even though the time is limited. The proper solution can only be obtained when all the eight disciplines are executed properly.

8D is a problem solving method for improvement of product and process. It is structured into the following 8 steps ( the D's) :

#### **D0 - PREPARE AND PLAN FOR THE 8D**

Proper planning always leads to a good start. So, before 8D analysis begins, it is a better idea to consult an expert for their views and impressions. Before you begin to assemble a team to address a problem, you need to plan your approach. Basically this means, thinking about who should be in the team, what should be the deadlines and what are the pre-requisites or resources required.

#### **D1 - TEAM FORMATION**

The first step is to establish a team which may consist of few people ,those who have skills and knowledge to solve the problem and those who have the time and energy to commit to the 8D process. The team should be formed in such a way that the members in one team should be from different fields so that they are likely to find out a creative solution than a team of people with same outlook. The team must have a good leader who will supervise and guide the proper knowledge about processes and

products to the other members. The team leader should ensure that all the other team members including him are comfortable and helpful working with each other. The work should be distributed among the members according to their caliber. Everyone should come up with new and innovative ideas so as to solve the problems.

#### **D2- PROBLEM DESCRIPTION**

The 8D method's initial focus is to properly describe the problem utilizing the known data and placing it into specific categories for future comparison. The "Is" data supports the facts whereas the "Is not" data does not. As the "Is not" data is collected, many possible reasons for failure are able to be eliminated. This approach utilizes the following tools:

1. 5 Why or repeater Why (Inductive Tool)
2. Affinity Diagram (Deductive Tool)
3. Fishbone/Ishikawa Diagram

#### **D3-INTERIM AND CONTAINMENT ACTIONS**

Once the team understands the problem,we try to provide a temporary solution to the problem.This is important as it may affect the customers,reducing the quality of product or it may slow down the work process.The temporary solution should be quick,easy to implement and should be understandable. In this stage right containment actions are taken to prevent further defects in the product.The temporary action implemented is removed after the permanent corrective action is applied.The action to be implemented is dicussed among the team members ,the members can suggest different containment actions for the problem. Example of actions: stoppage of production, segregation goods etc.

#### **D4-ROOT CAUSE ANALYSIS**

The core and the most important section of 8D is to identify the root causes. Identification of actual causes requires the basic and prior

knowledge of the problem so that corrective measures and actions can be taken to permanently solve the problem. Here we can use 5-WHY methodology to find the actual cause. Different activities are included in D4 such as data collection to verify the root cause, using process flow diagram for locating the root cause, determining the escape points. To find the root cause of the problem you can conduct cause and effect analysis (fishbone diagram, ishikawa diagram). This is mainly useful because it highlights other problems that you might not be aware of. Once the main cause of the problem is identified you can develop several permanent solutions to solve it.

#### D5-CORRECTIVE ACTIONS

Once the team decides on a permanent solution make sure that it is tested completely before it is implemented in next step. The permanent solution is decided taking into consideration the cost, quality, reliability of the product. Pre-production programs are used to quantitatively confirm that the selected corrective actions will properly solve the problem. Different kinds of activities included in D5 are create the acceptance criteria which will include compulsory requirements and needs, perform a risk assessment on corrective actions, verification of the corrective actions. Corrective actions ensures improvement in product and elimination of causes for further reoccurrence of same kind of problem.

#### D6-HORIZONTAL DEPLOYMENT

To successfully implement a permanent solution to the problem, a proper and systematic planning is necessary. A proper project plan should consist of communication, steps to complete, improvement, quality and cost of product, success ratio, and lessons learned. Activities included in D6 are developing a project plan, communication of

all the planned activities to team members, validating corrective measures. Example such as supplier delivers goods of better quality.

#### D7-PREVENT REOCCURANCE

The next step is to determine what actions are needed to be taken to prevent the further occurrence of the problem. Here we define the action system to replace the actions which are defined in D5. To improve the future use updating document and work instructions are expected in this step. Activities in D7 are review of similar products and process for problem prevention, develop and update work instructions, assurance of control plan capture standard work and reuse. For example changing documentation, procedures, process parameters to prevent problems.

#### D8- VERIFY AND CONGRATULATE

In this step it is verified that the actions introduced in D7 are correct and effective. It is recommended that the verification should be done by comparing the scale of the problem. During the verification it is necessary to draw conclusion about how the team worked, what the individual members have learned and what are the conclusions, what can be further improved on problem solving etc. The verification must be done on measurable data.

#### **LITERATURE SURVEY:**

1. Marjanca Krajnc: During the first three months of 2011, the research was conducted and mainly was carried out in a large scale organization operating in metal processing field. Throughout the time, the organization has continuously been upgrading the 8D method in terms of methodology and information technology. Since 2005, The company has had the 8D method integrated in its business information technology. After 2005, neither the method nor the information support has undergone any further changes. The two methods Qualitative Method and Quantitative Method were used.

Qualitative Method: The partly structured interview was the method selected for data collection. Interviews were conducted with representatives of seniors and operative management for more than hours atleast 3 times. The interview was held in a such a way that it seemed to be a conversation in relaxed atmosphere. All the documents related to the topic were obtained during the interviews. The method of data analysis is a case study. We dealt with the problem solving method used in the organization and business firm in great detail, as compared to the international literature.

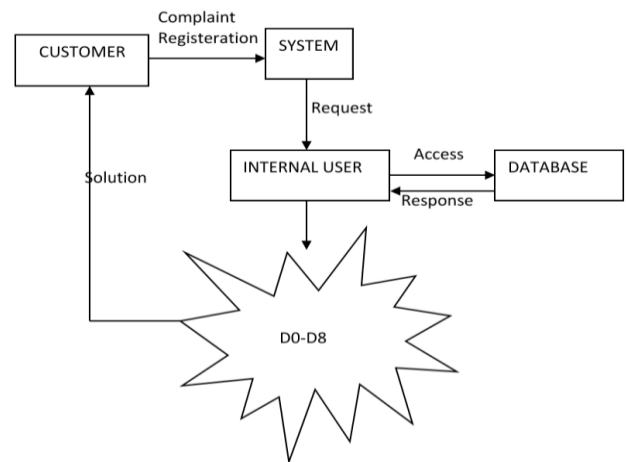
Quantitative Method: In the same organization, the data obtained in the quantitative part was same as that of qualitative part. During the use of 8D method, data which was collected into the information system was further integrated into business system. In this paper, all the data which was dealt with, have been obtained from the information system. The data obtained in 2008-2011 period will be analysed and presented.

2. Carlos A. Riesenberger and Sergio D. Sousa: For the response time rules data already existed, however, to validate the measurement system it was somehow important to understand if all the customer assistants were measuring in the same way that is if they considered the correct time for the rules which were defined and report accurate measures to the file to track them. When each customer assistant was interviewed about the perception of the definition of each rule, their opinions seemed to be diverge and originate controversy among them. Each of them gave distinct definitions for each and every 8D step which led to no agreement between them. From a sheet used by the customer assistance to report the time needed to complete each of the rules which were defined before, this is where the controversy was reflected in the data from the sheet. Therefore the measurement system was currently being used was not reliable enough to guarantee an accurate measure, so another measurement system had to be used.

From different information systems, a random sample of 8D reports was chosen and the necessary dates were manually taken, to calculate the time which was used for each step to be completed and to

know which rules were accomplished in time or not. According to the specifications, by collecting each date and information, it would guarantee that the quality evaluation and time of response would be respected. Thus generated data resulted in an average quality level of 50% for the complete 8D report.

**SYSTEM ARCHITECTURE:**



The system architecture for 8D process is shown in the above figure.

Whenever the customer has some problem with the product it may be any kind of problem he registers his complaint to the system. The customer gives his information such as name, address, contact no., and other related information. The customer also gives information regarding the problem with the product. It may be any major or minor problem. The customer registers his complaint to the system. The system accepts the complaint and then it passes the complaint request to the internal user. Here the internal user is the person who checks whether the complaint registered by the customer needs 8D process or not. If the problem does not need 8D process it is stopped and if the problem requires 8D process it acquires all the information from database. From database it is easily predictable whether the problem has occurred first time or it is reocurred. The problem then goes through various stages from D0 to D8. The stages from D0 to D8 are

described above. Finally the solution is provided to customer. As a metric to relate the ability of a process, a sigma value was used to perform defect free work. The higher the sigma value the better the process was performing. Thus the probability that a defect will occur would be lower.

**FLOWCHART:** This diagram depicts the flow of 8D process.



6.2.4 Flow Chart

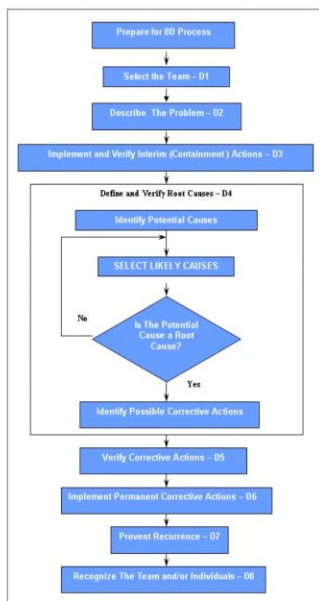
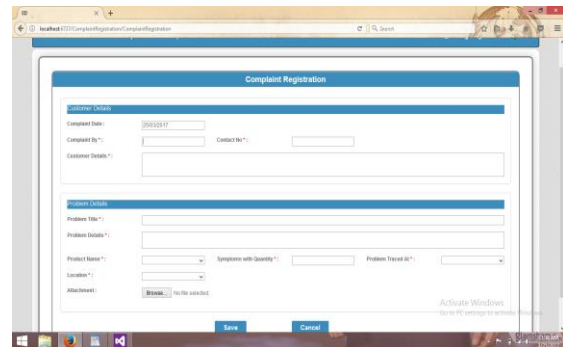


Figure 6.2: Flow Chart diagram

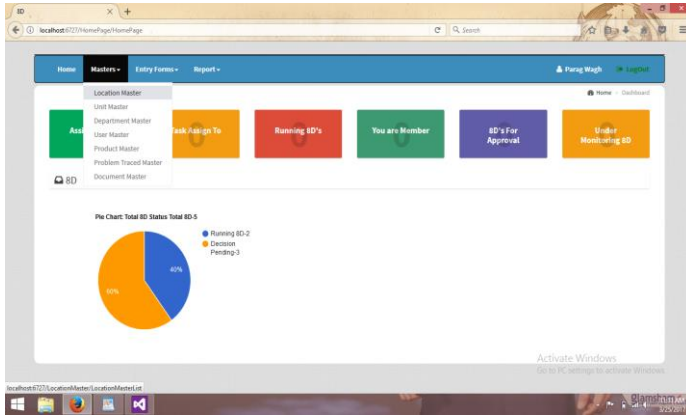
**IMPLEMENTATION OF 8D-**

The process begins with the complaint which is registered by the customer through complaint registration form. This form contains the basic details of customer such as name, address, contact number and so on. The customer gives the brief description about the problem that has occurred. He can even provide the image or picture of the problem.

The image below shows the complaint registration form.



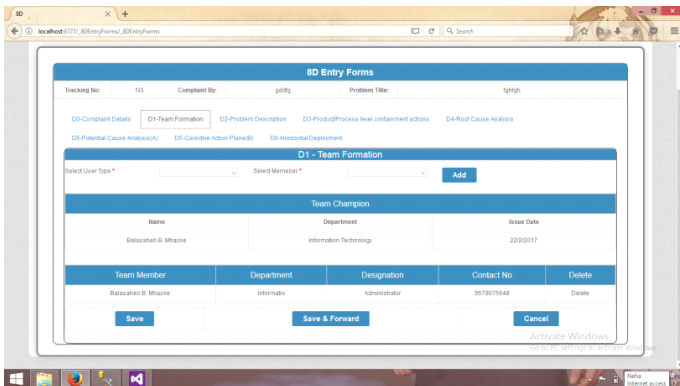
After the complaint is registered, the administrator checks whether the problem can be solved with or without 8D process. If not, then it goes through 8D process that is from D0 to D8 which is explained in introduction section. Initially a temporary solution is given to the customer so that he can carry out his work. Here each process is dependent on the other. When D0 is completed then D1 starts and further D2 and so on it continues upto D8. There are different masters in the process which gives detailed information about the problem like unit master, user master, department master, location master, nature master, subnature master, etc. These masters give different information to the problem solver.



**RESULT:** Final Solution of the problem is provided by the problem solving team in which the complaint lodged by the customer is solved by giving proper solution.

**CONCLUSION:** The 8D method used in the organization and presented in this research is an excellent tool for preventing defects from recurring. 8D methodology is a structured approach of problem solving for quality problems. Models can be used to solve problems in business operations, customer complaints, etc. This model raises the level of quality thus reducing the cost of defects.

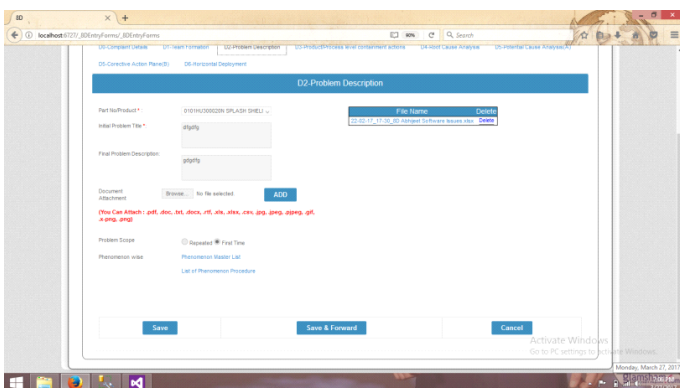
At the end permanent solution is provided to the customer and this information is stored in database. If the same problem is registered by another customer it does not have to go through whole 8D process. The solution is directly provided to the customer thereby saving time and money. This process is very efficient and reliable.



The 'D1 - Team Formation' form includes a table for 'Team Champion' and 'Team Member'. The 'Team Champion' table has columns for Name, Department, and Issue Date. The 'Team Member' table has columns for Name, Department, Designation, Contact No, and Delete.

Name	Department	Issue Date
Balasarath B. Bhaskar	Information Technology	22/02/17

Team Member	Department	Designation	Contact No	Delete
Balasarath B. Bhaskar	Information	Administrator	9579075448	Delete



The 'D2 - Problem Description' form contains fields for Part No/Description, Initial Problem Title, Final Problem Description, and Document Attachment. It also includes a 'Problem Scope' section with a 'Requested First Time' checkbox and a 'Permissions List' section with a 'List of Permissions Procedure' link.

**REFERENCES:**

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2. Wikipedia. (2012, August 25). *Eight Disciplines Problem Solving*. Retrieved September 29, 2012, from [http://en.wikipedia.org/wiki/Eight\\_Disciplines\\_Problem\\_Solving](http://en.wikipedia.org/wiki/Eight_Disciplines_Problem_Solving)