

**Analyze Customer Complaint in Healthcare  
Using Root Cause Analysis Technique**

By

**SURAINA SULONG**

**11307**

Dissertation report submitted in partial fulfilment of

the requirements for the

**Bachelor of Technology (Hons)**

**(Business Information System)**

May 2011

Universiti Teknologi PETRONAS  
Bandar Seri Iskandar  
31750 Tronoh  
Perak Darul Ridzuan

**CERTIFICATION OF APPROVAL**

**Analyze Customer Complaint in Healthcare  
Using Root Cause Analysis Technique**

by

Suraina Sulong

A project dissertation submitted to the  
Business Information Programme  
Universiti Teknologi PETRONAS  
in partial fulfillment of the requirement for the  
BACHELOR OF TECHNOLOGY (Hons)  
(INFORMATION SYSTEM)

Approved by,



---

(Shakirah Mohd Taib)

**UNIVERSITI TEKNOLOGI PETRONAS**

**TRONOH, PERAK**

**May 2011**

## CERTIFICATION OF ORIGINALITY

This is to certify that I am responsible for the work submitted in this project, that the original work is my own except as specified in the references and acknowledgements, and that the original work contained herein have not been undertaken or done by unspecified sources or persons.



---

SURAINA SULONG

## **ABSTRACT**

This project is to presents an approach for applying Root Cause Analysis (RCA) in improving the healthcare service for the purpose of investigating of need for corrective action, and tracking and trending the services problems. For trending the organization will be able to determine how often a particular error occurs or how often a particular unit or department of the hospital involved. Root Cause Analysis should be performed as soon as possible after the error or variance occurs and should be involved by all parties, to avoid speculation that will dilute the facts. Otherwise the important details may be missed. The development and utility of the proposed methodology presented in this research is illustrated using both a hypothetical example and a real world application.

## TABLE OF CONTENTS

CERTIFICATION OF ORIGINALITY .....	1
ABSTRACT.....	2
TABLE OF CONTENTS.....	3
LIST OF ABBREVIATIONS.....	4
<b>Chapter 1: INTRODUCTION</b>	
1.1 Background.....	1
1.2 Problem statement.....	2
1.3 Objective.....	3
1.4 Scope of Study.....	3
<b>Chapter 2: LITERATURE RIVIEW</b>	
2.1 Introduction.....	4
2.2 Healthcare.....	4
2.3 Customer Complaint.....	5
2.4 Service Improvement.....	6
2.5 Root Cause Analysis.....	7
2.5.1 Definition.....	8
2.5.2 Steps for RCA.....	9
2.5.3 Example of RCA Tools and Technique.....	11
2.6 Existing Work.....	14
2.7 Conclusion.....	17
<b>Chapter 3: METHODOLOGY</b>	
3.1 Gather Information.....	18
3.2 Design Prototype.....	18

3.3 Add Functionality.....	19
3.4 Data Testing.....	19
3.5 Interview.....	19

**Chapter 4: RESULT AND DISCUSSION**

4.1 Data Gathering	
4.1.1 Interview.....	20
4.1.2 Internet Findings.....	20
4.2: System Prototype.....	21
4.2.1 Problem Definitions.....	22
4.2.2 Map Process.....	22
4.2.3 Solution.....	23
4.2.4Investigation team details.....	24

**Chapter 5: CONCLUSION AND RECOMMENDATION.....25**

5.1 Conclusion.....	25
5.2 Recommendation.....	25

**APPENDICES**

Reference.....	26
----------------	----

## LIST OF FIGURES

Figure 1: The figure show the number of Hospitals in Malaysia by sector in 2000 to 2009.....	5
Figure 2 : Example of factor or cause charting.....	9
Figure 3: Example of Root Cause Analysis charting.....	10
Figure 4: Example of steps to use 5 Whys technique.....	12
Figure 5: Steps to solve a problem with a Cause and Effect Diagram.....	13
Figure 6: Cause and Effect diagram or Ishikawa diagram .....	13
Figure 7: Flowchart shows the five steps of FMEA.....	14
Figure 8: Decision tree computed over non-compliant instances of the drug dispensation Process.....	17
Figure 9: Agile methodology to develop the system prototype.....	18
Figure 10: Statistics show the trend of the customer complaint in HUSM in Jan – Dis 2008.....	20
Figure 11: Worksheet of cause mapping template.....	21
Figure 12: Problem definition sheet.....	22
Figure 13: Process incident investigation through map process.....	23
Figure 14 : The sumarization solution table.....	24
Figure 15: Brief details about the investigation team.....	24

## **LIST OF ABBREVIATIONS**

<b>FYP</b>	<b>Final Year Project</b>
<b>ISO</b>	<b>International Organization for Standardization</b>
<b>ED</b>	<b>Emergency Department</b>
<b>ETP</b>	<b>Economic Transformation ProgrammE</b>
<b>EPP</b>	<b>Entry Point Projects</b>
<b>NKEA</b>	<b>National Key Economic Area</b>
<b>HUSM</b>	<b>Hospital Universiti Sains Malaysia</b>
<b>RCA</b>	<b>Root Cause Analysis</b>
<b>FMEA</b>	<b>Failure Mode and Effect Analysis</b>
<b>RCAR</b>	<b>Report Root Cause Analysis</b>

# CHAPTER 1

## INTRODUCTION

### 1.1 Background

A complaint is an expression of dissatisfaction made to an organization, related to its products, or the complaints handling process itself, where a response or resolution is explicitly or implicitly expected (ISO 10002:2004). In healthcare organization patient satisfaction is the most important aspect that show the quality of services provided. Patients normally make complaints when they are not happy with the care they receive.

According to Dr R T Griffey from Department of Emergency Medicine, Brigham and Women's Hospital, patient complaints to the emergency department (ED) have been well studied as indicators of quality. In every working environment complaints are inherent, but in healthcare services, complaints are critical, needing immediate response. This subject is considered a priority and has been well studied in many modern health systems, including the USA, the UK and Australia (Wong, 2007).

Malaysia is one of the world's sanctuaries of health destination. Healthcare in Malaysia is divided into the private and public sectors with adequate coverage of medical needs for the population. The Malaysian government is very much committed to its principles of a universal access to high-quality health care in which the local Ministry of Health offers thru wide varieties of nationwide networks of clinics and hospitals. Furthermore, recently the government had announced robust growth in Malaysia's healthcare sector over the next few years, led by the Economic Transformation Programme (ETP) and Entry Point Projects (EPP). Director for National Key Results Area and National Key Economic Area (NKEA) Dr Chua Hong Teck said the healthcare sector could become a major economic contributor to the country's bottom line, considering the quality of treatment and its low cost. The sector has the potential to grow to RM35.1 billion by 2020, creating more than 180,000 jobs. The total investment requirement for

the healthcare NKEA is RM23.2 billion from 2011 to 2020 (Kaur, 2011). The healthcare industry is growing and become one of the vital industries.

However, in spite of the dedication of the local government of Malaysia to provide the best possible health care, there are still some problems that are unsolved; instead cases that involve the health organization keep increasing and worried. A cross sectional study was carried out to determine the level of customer's satisfaction among private clinic patients in Seremban, Negeri Sembilan. Systematic sampling of patients who receive treatment in the private clinics was done. The data was collected using a structured questionnaire. Overall customer's satisfaction rate was 19.4%. Generally, respondents were satisfied with the interpersonal manners, sensibility and efficacy or outcome of treatment. They were not satisfied with aspects of physical environment, availability, service charges and continuity of care. This study provides useful information to the organization which part they have to improve (A M Haliza, 2003).

The aim of this study is to analyze the complaints recorded at the healthcare organization to come out with the best solution from the analysis.

## **1.2 Problems Statement**

With increasing deployment of people using the hospital services, variety and complexity of treatment need to be done, and sometimes avoidance failures are more likely to occur. These failures may have varying effects on the patient, ranging from no harm to devastating harm. The best way for the customer to express their experience with the services is to make complaint. The hospital will collect the complaint from the customer to analyze it. The complexity and unknown main cause of it happen make complaint very time consuming to solve and delay in giving the feedback than the customer expected, and cause dissatisfaction in the way the hospital handling the complaints.

A study shows that complainant dissatisfaction is a common finding (Sluijs, 2004). Nearly 61% of the patients appeared to be dissatisfied with the complaints handling by the time the complaint file was closed. All but two people said they would never consult the doctor

involved again, while many respondents remained angry and most wanted stern measures to be taken. This problems should be seriously taken to avoid this entire incident from keep repeating.

### **1.3 Objectives**

- 1) To study the problem solving and improvement technique in analysis the complaint data
- 2) To be able to undertake RCA using tools and technique demonstrated to investigate an incident
- 3) To implement the system prototype in order to analyze the complaint

### **1.4 Scope of Study**

This research was being conducted at Hospital Universiti Sains Malaysia between June 2010 and January 2011. HUSM is 747- bed half – governmental and half – private teaching hospital with 3077 medical and management staff and the rest are Houseman Officer from 3132 staff. The total of patient and visitor came to HUSM around 5000 a week. There are 9 specialist clinics provide here and there are 39 department and unit in HUSM. Approximately 30 minutes from HUSM, a general hospital is located. Customer complaint management is under responsibility of Public Relation and Health Education Unit. All of the complaint data will be available at this unit to do research.

## **CHAPTER 2**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

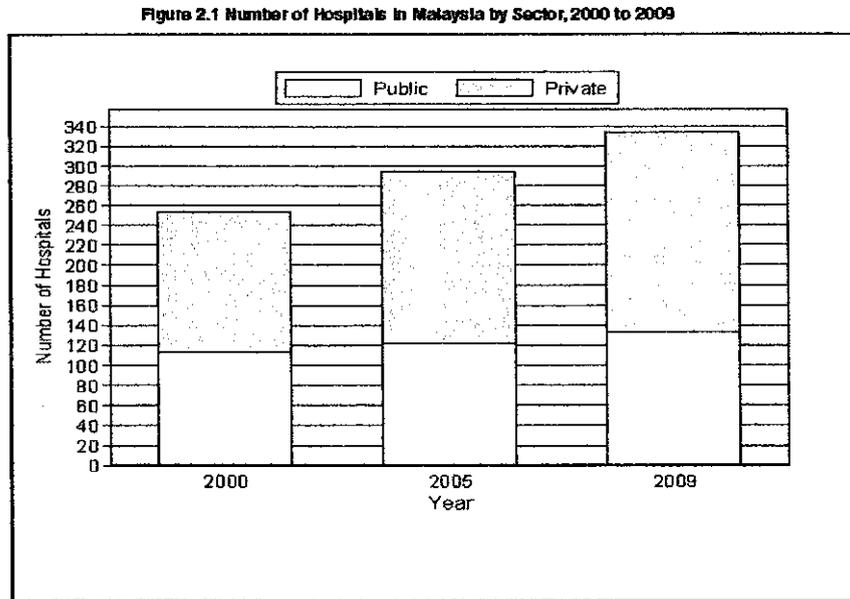
Customer complaint can be defined as an expression of dissatisfaction with a product or service, either orally or in writing, from an internal or external customer. A customer may have a genuine cause for complaint, although some complaints may be made as a result of a misunderstanding or an unreasonable expectation of a product or service. The means a customer complaint is handled will affect the overall level of customer satisfaction and may affect long-term customer loyalty. Plus, it will help the services provider to improve its services. It is important for providers to have clear procedures for dealing rapidly with any customer complaints, to come with a fair conclusion, and to explain the reasons for what may be perceived by the customer as a negative response.

#### **2.2 Healthcare**

Healthcare is an important ingredient in population health. It is the combination of medical technology and the human touch from newborns to the terminally ill. Healthcare is one of the largest industries in 2008 and it provides 14.3 million jobs for wage and salary workers. Ten of 20 the fastest growing occupations are healthcare related. Healthcare will generate 3.2 million new wage and salary jobs between 2008 and 2018, more than any other industry, largely in response to rapid growth in the elderly population (US Bureau of Labor Statistic, 2010).

In Malaysia, for the year 2008-2009 there were a total of 334 hospitals available, which provided acute care services with a density of 0.12 hospitals per 10000 populations (Lim TO, 2011). Out of the 334 hospitals, 133 were public acute hospitals and 201 private acute hospitals, with a density of 0.12 hospitals per 10000 populations. There are 77 hospitals without specialist, 80 single specialty hospitals, 83 tertiary hospitals, and 94 secondary hospitals. Whereas in Australia, which has a 22 million population, has 737 public acute hospitals and 561 private

acute hospitals for the corresponding period (Australian Institute of Health and Welfare, 2010). This number show how important is the healthcare services to the community nowadays.



*Figure 1: The figure show the number of Hospitals in Malaysia by sector in 2000 to 2009*

### 2.3 Customer Complaint

Research has repeatedly shown that health care services is a hazardous enterprise (Baker, 2004), once it makes mistakes the customer will lack of confidence forever. In develop country, such as US, not many have faith in their healthcare providers, and worst only 15% of Americans have a great deal of confidence in healthcare organizations. In this scenario, one single mistake can put the reputation and the financial health of the hospital in destruction (The Economist, 2006). Each year the eight health care commissioners in New Zealand and Australia receive over 10,000 complaints. To date, however, that value remains largely unrealized (Bismarck, 2006).

Fuelled by this realization, the issue of customer problems in health care services seems very serious. All health care organization tried to find the best solution to overcome this matter. Complaints by aggrieved patients have the potential to be an important window on healthcare quality (Marie, 2010). Several studies in the United States have used complaints data to analyze quality problems arising in long-term care and acute care (Stevenson, 2005). The benefits that

the health organization could have by using the customer complaint as a method to improve the healthcare quality are:

- i. A complaint is more on consumer initiated. Complaint is one of the information that come directly from the patient that use the services (Ford, 2006)
- ii. Some incident may require descriptive information about the error occur and some such case – control analyses (using the complaints as cases, and uninjured patients who underwent the same procedures as controls) to illuminate appropriate interventions (Gandhi, 2006)
- iii. Research has shown that customers (patients) who have had problems with a company (hospital) or product (service), but felt that the company (hospital) made honest efforts to correct the problem, become some of the more vocal “evangelists” for the company or product. By resolving the customer’s (patient’s) complaint using quality service, can move a customer (patient) from “dissatisfied” to “completely satisfied” - and you can usually get an increase in loyalty of 50 percentage points (Goodman, 2000).

## **2.4 Services Improvement**

People sometimes confuse process improvement with problem solving. They think that if they find a problem in the process and fix it, they're improving the process. While problem solving may be a first step, it rarely results in an improved process. Problem solving fails to consider how solutions relate to one another, to the process as a whole, or to the outcomes of a process. Process improvement, on the other hand, considers the entire process, maintaining a steady focus on what outcomes the patient receives.

The best-in-business health care organizations design the complaint management processes with input from both patients and staff. They develop a culture that supports teamwork with the patient as part of the team. The complaint management process is designed with commitment from top management, performance goals that are measured and carefully monitored, and a direct link to core processes.

One organization has their patient relations personnel monitor feedback gathered from patients. They select a small number of items that patients complained about most often as target issues. Once these issues are identified, individual patient satisfaction committees are formed that link those issues with mission objectives. The complaint process is monitored to correct root causes of dissatisfaction, and the results for these target issues are reported regularly to the Executive Committee. This is a “best in business” kind of approach.

In order to overcome the problems, this project will use Root Cause Analysis (RCA) to find the cause of the problems, trend and patterns of the problems, which to help the health organization to make accurate future decisions to solve the complaint.

## **2.5 Root Cause Analysis (RCA)**

Root Cause Analysis (RCA) is a process designed for use in investigating and categorizing the root causes of events with safety, health, environmental, quality, reliability and production impacts. The term “event” is used to generically identify occurrences that produce or have the potential to produce these types of consequences (Rooney, 2004). Simply stated, RCA is a tool designed to help identify not only *what* and *how* an event occurred, but also *why* it happened. Only when investigators are able to determine why an event or failure occurred will they be able to specify workable corrective measures that prevent future events of the type observed.

Understanding why an event occurred is the key to developing effective recommendations. Imagine an occurrence during which a pharmacist giving the patient wrong medicine. The typical investigation would probably conclude pharmacist error was the cause. This is an accurate description of what happened and how it happened. However, if the analysts stop here, they have not probed deeply enough to understand the reasons for the mistake. Therefore, they do not know what to do to prevent it from occurring again. In the case of the pharmacist who gives the wrong medicine, we are likely to see recommendations such as retrain the pharmacist on the procedure, remind all pharmacists to be alert when dispense, or emphasize to all personnel that careful attention to the job should be maintained at all times.

Such recommendations do little to prevent future occurrences. Generally, mistakes do not just happen but can be traced to some well-defined causes. In the case of the dispense error, questions might ask, “Was the procedure confusing? Were the medicine clearly labeled? Was the pharmacist familiar with this particular task?” The answers to these and other questions will help determine why the error took place and what the organization can do to prevent recurrence. In the case of the dispense error, example recommendations might include revising the procedure or performing procedure validation to ensure references to medicine match the medicine labels found in the field.

### **2.5.1 Definition**

According to Rooney and Heuvel, RCA can be defined as:

**i. Root causes are underlying causes.**

The investigator’s goal should be to identify specific underlying causes. The more specific the investigator can be about why an event occurred, the easier it will be to arrive at recommendations that will prevent recurrence.

**ii. Root causes are those that can reasonably be identified.**

Occurrence investigations must be cost beneficial. It is not practical to keep valuable manpower occupied indefinitely searching for the root causes of occurrences. Structured RCA helps analysts get the most out of the time they have invested in the investigation.

**iii. Root causes are those over which management has control.**

Analysts should avoid using general cause classifications such as operator error, equipment failure or external factor. Such causes are not specific enough to allow management to make effective changes. Management needs to know exactly why a failure occurred before action can be taken to prevent recurrence. We must also identify a root cause that management can influence. Identifying “severe weather” as the root cause of parts not being delivered on time to customers is not appropriate. Severe weather is not controlled by management.

**iv. Root causes are those for which effective recommendations can be generated.**

Recommendations should directly address the root causes identified during the investigation. If the analysts arrive at vague recommendations such as, “Improve adherence to written policies and procedures,” then they probably have not found a basic and specific enough cause and need to expend more effort in the analysis process.

### **2.5.2 Steps for RCA**

Basically there are four steps processes involve in RCA:

**i. Data collection.**

The first step in the analysis is to gather data. Without complete information and an understanding of the event, the causal factors and root causes associated with the event cannot be identified. The majority of time spent analyzing an event is spent in gathering data.

**ii. Factor or cause charting.**

Factor charting provides a structure for investigators to organize and analyze the information gathered during the investigation and identify gaps and deficiencies in knowledge as the investigation progresses. The factor or cause chart can be in many forms of technique that will be explained in the later chapter. Preparation for the factor or cause chart should begin as soon as investigators start to collect information about the occurrence.

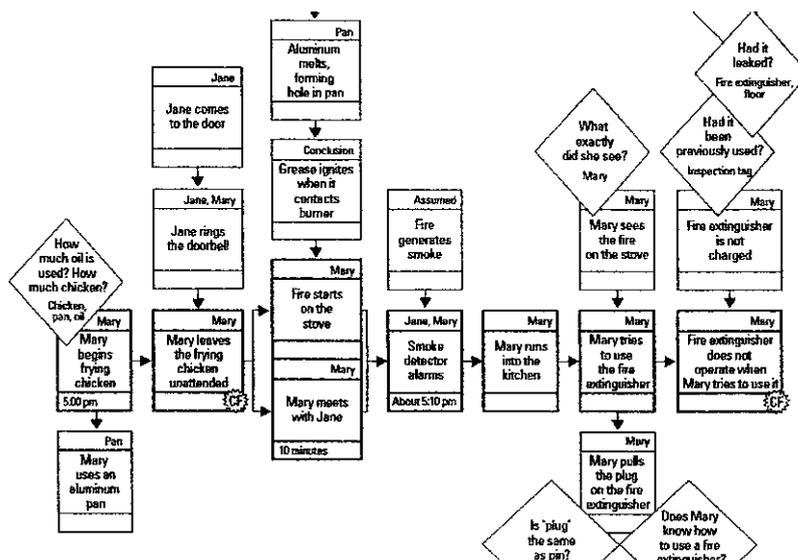


Figure 2 : Example of factor or cause charting.

Data collection continues until the investigators are satisfied with the thoroughness of the chart (and hence are satisfied with the thoroughness of the investigation). When the entire occurrence has been charted out, the investigators are in a good position to identify the major contributors to the incident.

### iii. Root cause identification.

After all the factors have been identified, the investigators begin root cause identification. This step involves the use of a decision diagram called the Root Cause Map to identify the underlying reason or reasons for each factor. The map structures the reasoning process of the investigators by helping them answer questions about why particular causal factors exist or occurred. The identification of root causes helps the investigator determine the reasons the event occurred so the problems surrounding the occurrence can be addressed.

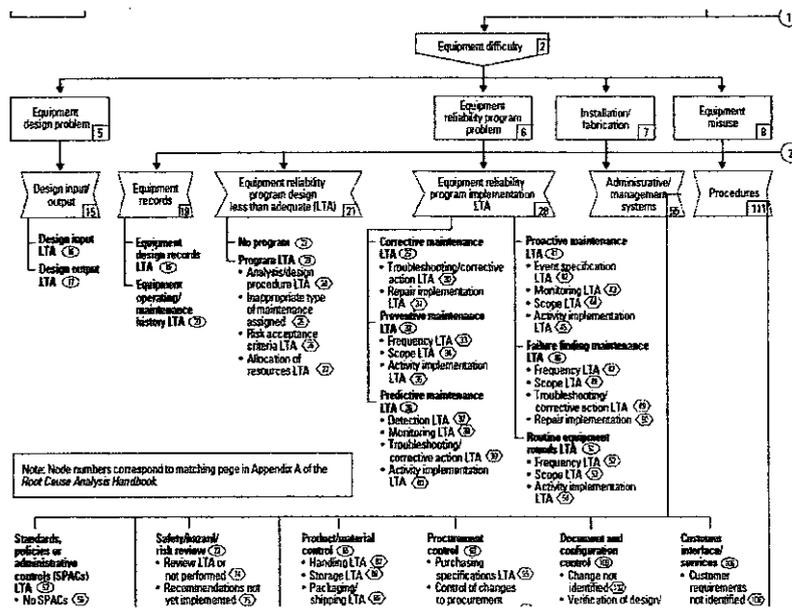


Figure 3: Example of Root Cause Analysis charting

#### iv. Recommendation generation and implementation.

The next step is the generation of recommendations. Following identification of the root causes for a particular factor or cause chart, achievable recommendations for preventing its recurrence are then generated. The root cause analyst is often not responsible for the implementation of recommendations generated by the analysis.

However, if the recommendations are not implemented, the effort expended in performing the analysis is wasted. In addition, the events that triggered the analysis should be expected to recur. Organizations need to ensure that recommendations are tracked to completion.

### 2.5.3 Example of RCA tools and techniques

There are several of tools and technique that available for RCA, such as:

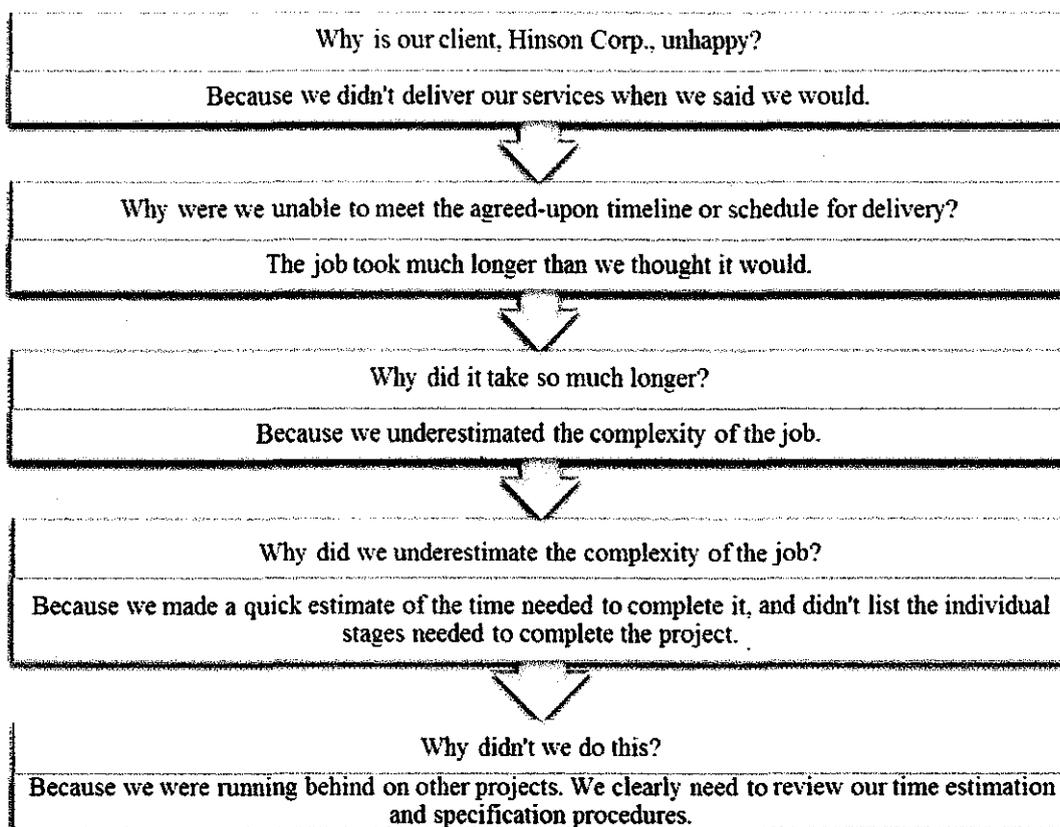
#### i. 5 Whys - Quickly Getting to the Root of a Problem

5 Whys is a simple problem-solving technique that helps the organization to get to the root of a problem quickly. Invented in the 1930's by Toyota Founder Kiichiro Toyoda's father Sakichi and made popular in the 1970s by the Toyota Production System. The 5 Whys strategy involves

looking at any problem and asking: "Why?" and "What caused this problem?" Very often, the answer to the first "why" will prompt another "why" and the answer to the second "why" will prompt another and so on; hence the name the 5 Whys strategy.

By using the 5 Whys it helps the organization to quickly determine the root cause of a problem and it is simple, and easy to learn and apply. The 5 Whys technique is simple techniques that can help the organization quickly get to the root of a problem. But that is all it is, and the more complex things get, the more likely it is to lead the organization down a false trail. If the technique does not quickly give the answer that's obviously right, then the need to use more sophisticated problem solving technique such as Root Cause Analysis or Cause and Effect Analysis.

Chart below shows example of real case study that uses the 5 Whys technique is Hinson Corp, the following steps to get to the cause of the problem:

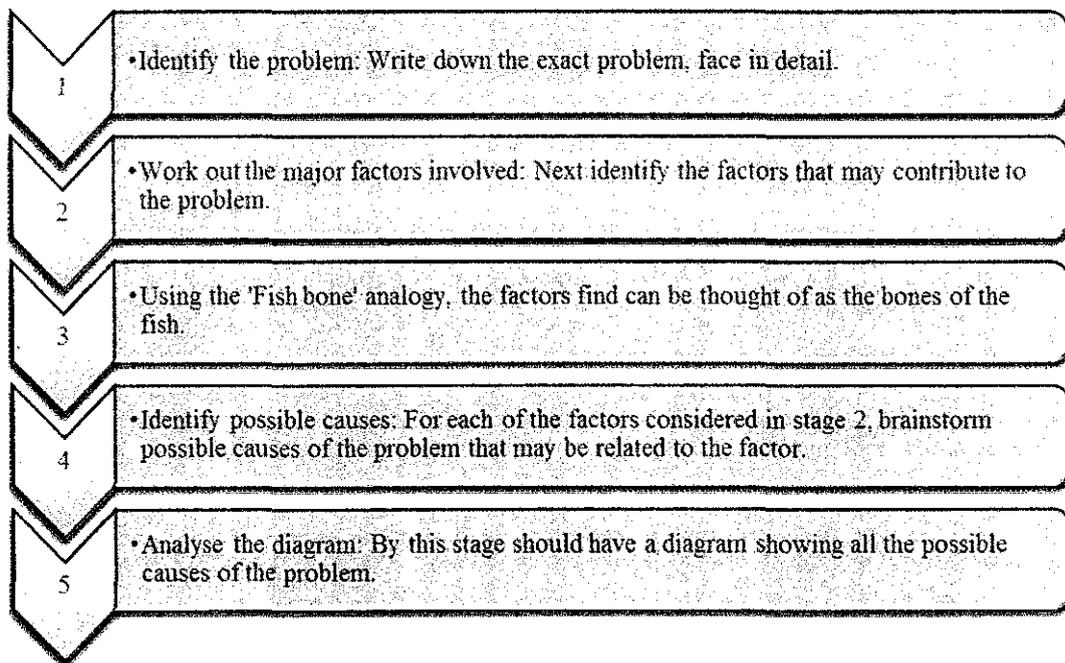


*Figure 4: Example of steps to use 5 Whys technique*

## ii. Cause and Effect Diagram

Cause and Effect Diagrams assist the organization to go through causes of a problem thoroughly. Their major benefit is that this technique pushes to consider all possible causes of the problem, rather than just the ones that are most obvious. The approach combines brainstorming with use of a type of concept map.

Cause and Effect Diagrams are also known as Fishbone Diagrams because a completed diagram can look like the skeleton of a fish; and as Ishikawa Diagrams, after Professor Kaoru Ishikawa, a pioneer of quality management, who devised them in the 1960s. The steps to solve a problem with a Cause and Effect Diagram are:



*Figure 5: Steps to solve a problem with a Cause and Effect Diagram.*

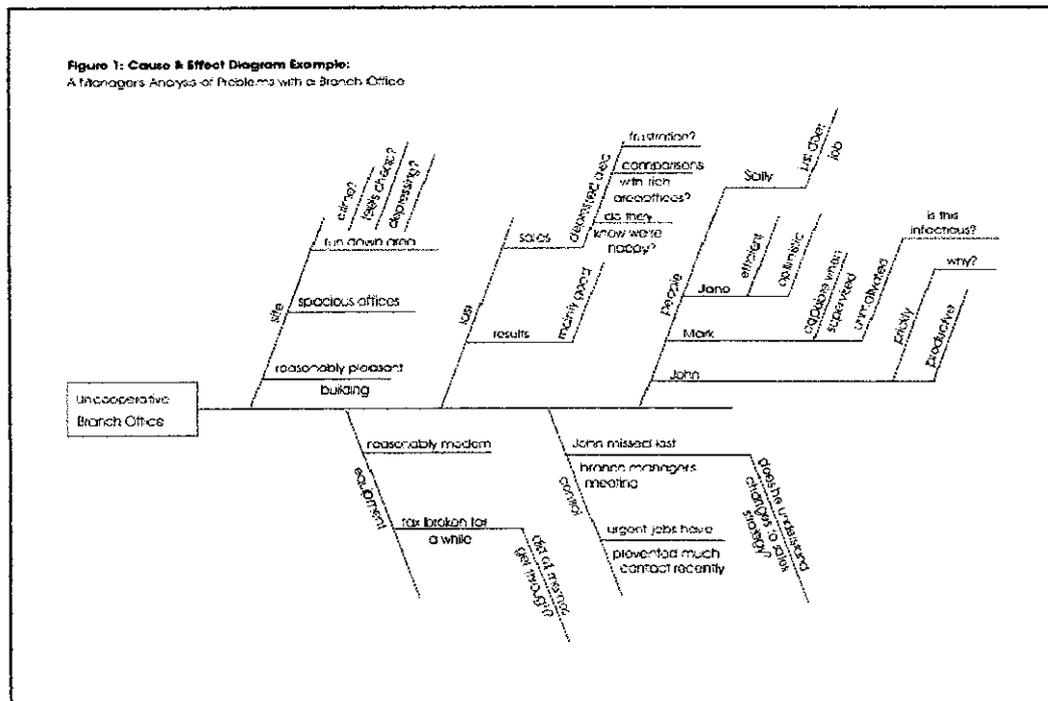


Figure 6: Cause and Effect diagram or Ishikawa diagram

### iii. Failure Mode and Effect Analysis (FMEA)

Failure mode and effect analysis (FMEA) is a qualitative method used to proactively detect risks to the problems in a particular process and correct potential errors before adverse events occur (Linkin DR, Sausman C, Santos L, et al, 2005). This analytic method is derived from the FMEA process used by the engineering community.

FMEA is used by the U.S. military and the National Aeronautics and Space Administration to prospectively identify potential failures and hazards and to help reduce failures that could occur in their practice (Esmail R, Cummings C, Dersch D, et al, 2005). This concept is being use in health care systems as indicated in the Joint Commission on Accreditation of Healthcare Organization standards, which state that health care institutions should have “an ongoing, proactive program for identifying risks to patient safety and reducing medical/healthcare errors is defined and implemented.”

The important core concepts of FMEA approach includes the construction of a multidisciplinary team, a diagramming process, the identification of failure mode and causes,

and the prioritization of potential risks, decision making, implementation of actions, and measures of outcome.

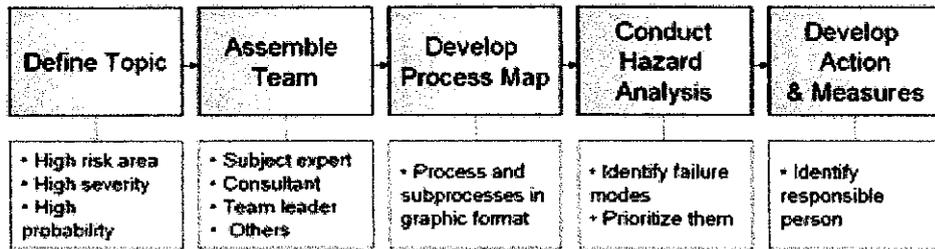


Figure 7: Flowchart shows the five steps of FMEA

## 2.6 Existing Work

Some research based on these issues has largely done using different data mining approach. For example;

- i. **Quality Improvement in Healthcare: The Six P's of Root-Cause Analysis** (Jayaram, Patrick, 2008)

This model is an adaptation of the approach to root-cause analysis described in the widely used London Protocol for the investigation and analysis of clinical incidents. The six Ps represent the six perspectives needed to answer the question, "Why did this event happen?" They are as follows:

- i. **Patient:** What are the patient-related factors that may have contributed to the event? The goal is not to blame the patient but rather to identify risk factors that may predispose similar future patients to the same outcome.
- ii. **Personnel:** What are the personnel or staff-related factors that may have contributed to the event? It is important to think beyond "bad apples" or blame in order to consider the mechanisms by which good people can create less than optimal results.
- iii. **Policies:** Are there written policies for this type of event? Were the policies followed? If not, why not?

- iv. **Procedures:** Are there standard procedures that should be used in handling this type of clinical scenario? Were there deviations from this standard approach in this case? If so, why?
- v. **Place:** Were there workplace environmental factors that may have contributed to this event? Is there an appropriate degree of staffing for the clinical volume?
- vi. **Politics:** What broader institutional or outside factors may have played a role in the event? Think about recent events, both within and outside of the institution.

As noted by Drs. Jayaram and Triplett, lapses and barriers to high-quality care are unfortunately common in healthcare settings. It is through the approaches that they described as well as the systematic application of tools such as the six Ps that front-line clinicians can begin to improve the care we provide in all mental healthcare settings.

**ii. Descriptions of verbal communication errors between staff. An analysis of 84 root cause analysis-reports from Danish hospitals (Rabol and Andersen, 2010)**

Unexplored factor for Poor teamwork and communication between healthcare staff that correlated to patient safety incidents, leads the organization to use Root cause analyses (RCA) human factors thinking to analyze the systems behind severe patient safety incidents. The objective of study is to review RCA reports (RCAR) for characteristics of verbal communication errors between hospital staff in an organizational perspective.

Two independent raters analyzed 84 RCARs, conducted in six Danish hospitals between 2004 and 2006, for descriptions and characteristics of verbal communication errors such as handover errors and error during teamwork. Result found that more than half of the RCARs described erroneous verbal communication between staff members as root causes of or contributing factors of severe patient safety incidents. The RCARs rich descriptions of the incidents revealed the organizational factors and needs related to these errors.

**iii. Analyzing Compliance of Service-Based Business Processes for Root-Cause Analysis**

## and Prediction (Rodríguez, Silveira, et al, 2010)

Automatically monitoring and enforcing compliance of service-based business processes with laws, regulations, standards, contracts, or policies is a hot issue in both industry and research. A little attention however been paid to the problem of understanding non-compliance and improving business practices to prevent non-compliance in the future, a task that typically still requires human interpretation and intervention.

Building upon work on automated detection of non-compliant situations, a technique for the root-cause analysis of encountered problems and for the prediction of likely compliance states of running processes that leverages (i) on event-based service infrastructures, in order to collect execution evidence, and (ii) on the concept of key compliance indicator, in order to focus the analysis on the right data.

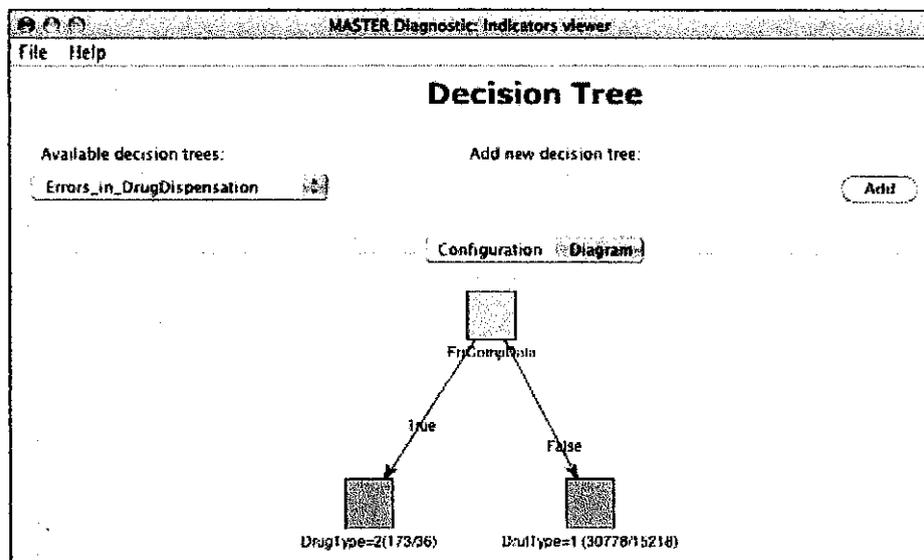


Figure 8: Decision tree computed over non-compliant instances of the drug dispensation process

## 2.7 Conclusion

Progressive hospital may see Root Cause Analysis as a strategic tool that will help them increase their success and provide them with the edge that they need. By using RCA, leading healthcare organization are increasing their competence by focusing directly on improvement of

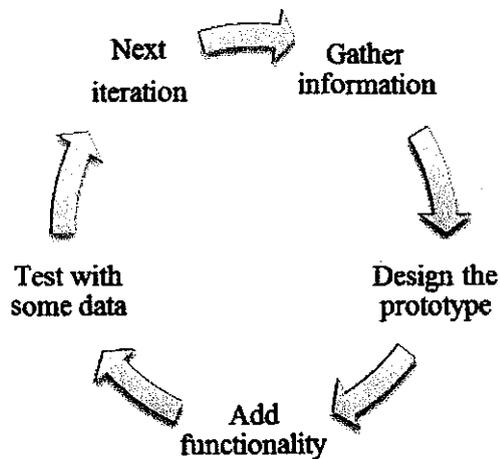
the customer problems and then using that knowledge to quickly tailor their operation changing needs for the customers and services areas.

In conclusion, Root Cause Analysis, Root cause analysis helps identify what, how and why something happened, thus preventing recurrence. Root causes are underlying, are reasonably identifiable, can be controlled by management and allow for generation of recommendations. The process involves data collection; cause charting, root cause identification and recommendation generation and implementation

## CHAPTER 3

### METHODOLOGY

The methodology that will be used in this project is agile methodology. Agile Methodology is an incremental, repetitious means of managing projects; particularly in the field of software development (<http://www.agile-methodology.com>). These iterations, or sprints, give project managers many opportunities to evaluate and change the project during its lifecycle as well as keeping the end user informed and involved in development. The development process can be done in many stages and the freedom agile gives to change is very important. New changes can be implemented at very little cost because of the frequency of new increments that are produced.



*Figure 9: Agile methodology to develop the system prototype*

#### 3.1 Gather information

This is the first step the project initiated. For the first step all related information and data requirement will be gathered.

#### 3.2 Design prototype

In this phase the system prototype will be design based on the data requirement and previous existing work on the RCA system.

### **3.3 Add functionality**

Some functionality will be add in this phase, to ensure the system run smoothly and the system could analyze the complaint easily and come out with accurate outcome

### **3.4 Data Testing**

After some functionality added, to the prototype will be tested with some data gathered. The next iteration will keep repeating until the prototype complete and the objective is achieved

### **3.5 Interviews**

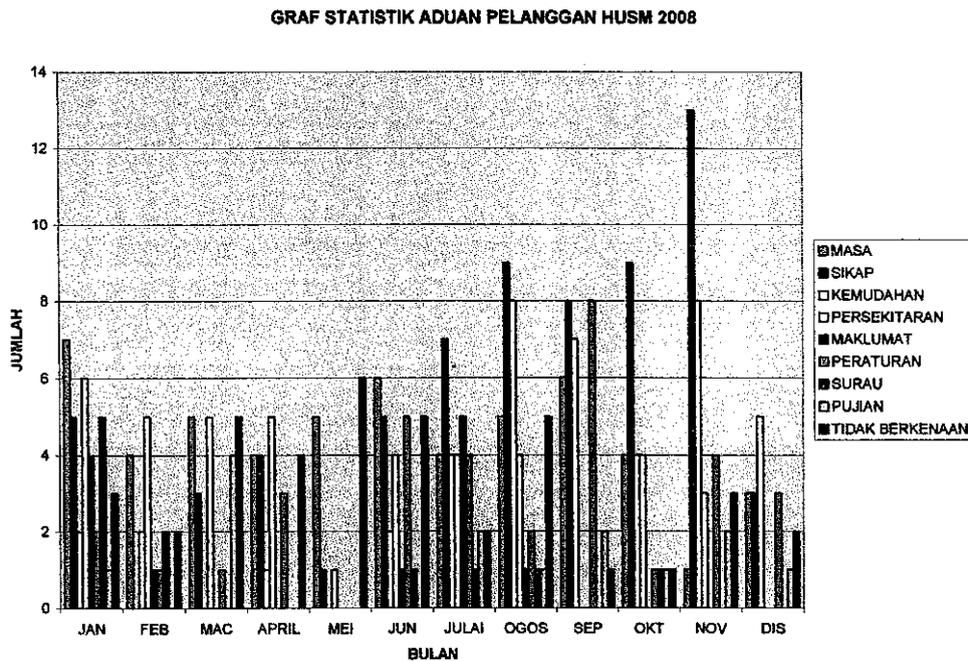
Interviews were carried out with the Head department of Public Relation at HUSM, En Wan Ahmad Azahar and assist by his assistant. A summary of the project purpose and plan was sent to the head department then he recognizes the importance of the project paper and put trusting and positive relationships to give some information about the complaint. The questions asked is mainly about the complaint that always occur, how the hospital solve it, how long does it take to solve and the effect to the organization and the customer after the complaint solve.

## CHAPTER 4 RESULT AND DISCUSSION

### 4.1 Data gathering

In completion of this project data gathered through the methodology above are:

#### 4.1.1 Interview



*Figure 10: Statistics show the trend of the customer complaint in HUSM in Jan – Dis 2008*

By doing interview some of complaint gain verbally form the hospital, the hospital could not give the letter of the complaint because the complaint is highly private to the hospital. The statistic about trend of the customer complains of the hospital also provided by the hospital.

#### 4.1.2 Internet findings

Some if the information about the RCA also gains from the internet findings. Some of the findings said that the different worksheet in the Excel template make it extremely easy to

organize the entire investigation. Each work sheet contains specific information related to the incident.

### Worksheets within the Cause Mapping Template

The different worksheets in the Excel Cause Mapping template make it extremely easy to organize the entire investigation. Each worksheet contains specific information related to the incident. Here are some examples of the worksheets within the Cause Mapping template.

**Problem Outline**  
In the Cause Mapping method a problem is defined in an outline format with the impact to the goals quantified in the red boxes.

**Cause Map (basic)**  
The cause-and-effect analysis for any incident can begin with just a few "Why" questions. This basic Cause Map provides a simple way for people to get started.

**Process Maps**  
The work process(es) related to the particular issue can also be captured within the same Excel Cause Mapping file. Connecting the problem analysis back to specific breakdowns within work process is a fundamental aspect of the ThinkReliability approach.

**Diagrams**  
Any type of diagram or sketch can be added to the Excel Cause Mapping file either by drawing it, using the outstanding drawing tools within Excel, or simply pasting it electronically.

**Include Photos**  
Photographs can be easily organized on a single worksheet inside the template. Excel already has the capability to compress larger files, edit photos and create thumbnails.

**Timeline**  
The Date, Time and Description columns for the sequence of events are already organized in the template.

**Cause Map (detailed)**  
As more information is collected it's added to the basic Cause Map to create a more detailed Cause Map. Both maps are accurate they're just at different levels of detail. This is just like zooming-in and zooming-out on a map of your town. This visual dialogue improves the way people communicate detail.

**Visual Detail**  
The cause boxes (white) link back to the effects on the overall goals (red boxes). Evidence that supports a particular cause is placed beneath that cause in an evidence box (magenta). Possible solutions, proposed by individuals, are placed in a box (green) above the cause that it controls. The best solutions are selected from the possible ones.

Figure 11: Worksheet of cause mapping template

## 4.2 System Prototype

The system prototype will be develop using Microsoft Excel, using Macro the run the function that will be embedded in the prototype. Microsoft Excel is use to design the template for the user to fill up the problems, and cause analysis. The chart sheet will be link to Microsoft Visio, which will assist the user to create the chart.

### 4.2.1 Problem definition

2	This form is a tool for finding causes of process problems and developing actions for eliminating		Date:
3			
4	Incident Date:	RCA Initiated by:	
5	Investigator:		
6	1. Define the problem:	Describe the incident. What was defect, how many, how often, etc.	
7			
8	What:	Problems:	
9	When:	Date:	
10	Where:	Location:	
11	How:	Task being performed:	
12			
13	Impact:	Patient Safety:	
14		Employee Safety:	
15		Organization:	
16		Patient Services:	
17		Compliance:	
18			
19	DMAIC Checklist (not all required, depending on problem)		Date completed
20		1. Define the problem	
21	D	2. Map Process (if required)	
22	M	3. Gather data	
23		4. Cause/Effect Analysis (Seeking Root Cause)	
24	A	5. Verifying root cause with data	
25		6. Solutions & Prevention steps development (including cost/benefit)	
26	I	7. Pilot of implementation	
27		8. Implementation	
28	C	9. Control/Monitoring Plan (including Process Metrics)	
29		10. Lessons Learned	
30			

Figure 12: Problem definition sheet

In the first sheet the user need to define the complaint that received from the customer, with the date the complaint received, the location the customer complaint about, and the task the customer complaint on. The user also needs to fill in a brief description the impact of the complaint to the patient and employee, plus the impact on the organization and the patient services and last for the compliance row if have.

### 4.2.2 Map Process

In the process of the incident investigation, the user needs to drill down all the possible cause and fill it in the chart, in order to brainstorm about the cause of the complaint. From the sheet the customer need to define the root cause and state the case in the next sheet to find the possible solutions. In the mapping process, charting technique will be used. By using this technique the incident flow and the cause form the incident could be traced easily.

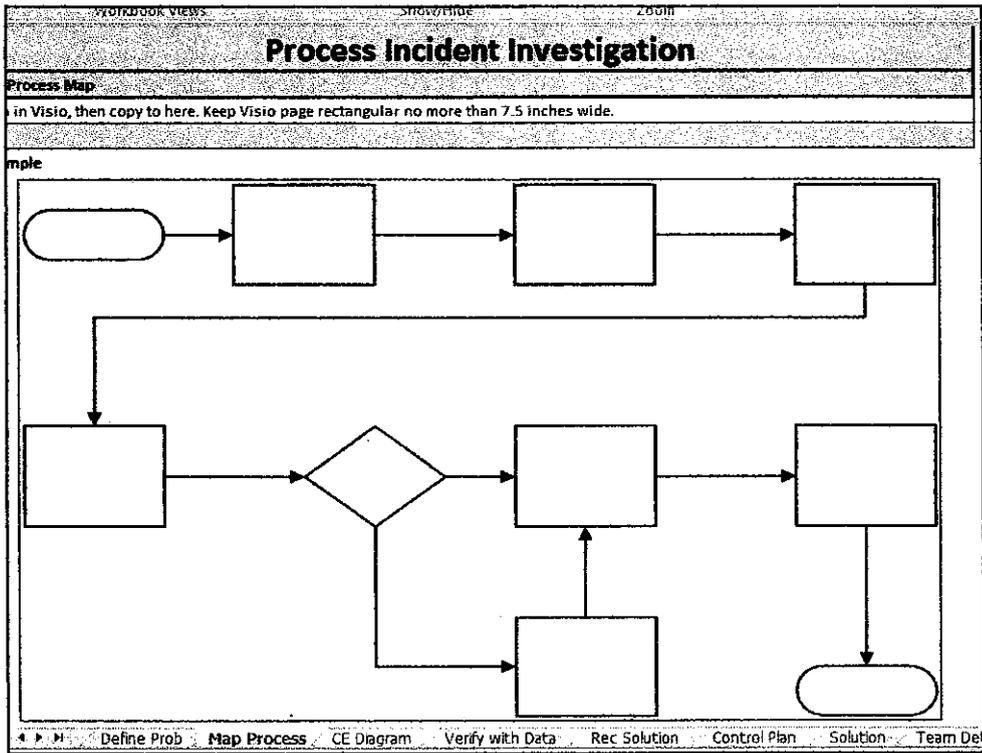


Figure 13: Process incident investigation through map process

### 4.2.3 Solution

Finally, the user need to csummarized of the previous findings, into the solution sheet. This sheet would be convenience reference to the organization to produce a complete report from the complaint and the flow incident occur.

Solutions						
Corrective Actions to be taken from this incident that are Causally Related						
No.	Action Item	Cause	Assign	Due Date	Status	Completed
1	Flag frequently confused medications	Similar looking bottles	Pharmacy			
2	Check of prescription before it leaves the pharmacy	Prescription filled incorrectly	Pharmacy			
		Pharmacist incorrectly measures dose				
3	Type prescriptions	Prescription illegible	Physicians			
4	Make out prescription for brand & generic name, include what it is for	Similar sounding names	Physicians			
5	Check of medication before it is given to patient	Nurse gives wrong medication to patient	Nursing staff			
		Nurse gives wrong dose to patient				
6	Tell patient what medication is for, including brand and generic name	Doctor did not explain medication to patient	Physicians			
7	Check patient identity before giving medication	Medication given to wrong patient	Nursing staff			
8	Have only one dose stored in any location	Different dosages in same location	Pharmacy			
9	Use only abbreviations from list	Use of incorrect abbreviations	Physicians			
10	Overcheck of dose	Dosage mis-calculated	Pharmacy			

Figure 14 : The summarization solution table

#### 4.2.4 Investigation team details

Clipboard		Font			Alignment				
	A	B	C	D	E	F	G	H	I
1	<b>Root Cause Investigation Team:</b>								
2	<b>Role</b>	<b>Name</b>			<b>Business Phone</b>		<b>Cell Phone</b>		
3	Process Owner:								
4	Team Leader:								
5	OE Support:								
6	Team member:								
7	Team member:								
8	Team member:								
9	Team member:								
10	Team member:								
11	Team member:								
12	Team member:								
13									

Figure 15: Brief details about the investigation team

In the last sheet the user need to define brief description about the investigation team, in order for the organization to make reference for the future work.

## **CHAPTER 5**

### **CONCLUSIONS AND RECOMMENDATION**

#### **5.1 Conclusion**

This project highlights the way of analyzing the customer complaint for the healthcare organization, to improve the quality services and get the complaint solve in a short time by satisfying the customer and to avoid the problems from repeating again. The design prototype will be develop used is to minimize the error and improved the outcome result.

#### **5.2 Recommendations**

Recommendation for this project is to add another technique that could easily help the user to analysis the complaint. For example is by adding the category of complaint, and the level of severity of the complaint.

The documentation of brief explanations of the complaint should be a built function in the system, so the analyzing time can be reduced, and the possible solution could be trace easily. Moreover by categorizing the type of the complaint, could help the investigator to analyze more precise. By adding more features in the prototype system, hope that the system will be one of the important Decision Support System for the healthcare organization.

## REFERENCES

- [1] <http://www.bsigroup.com/en/Assessment-and-certification-services/management-systems/Standards-and-Schemes/ISO-10002/>
- [2] Anderson K, Allan D, Finucane P. A 30-month study of patient complaints at a major Australian hospital. *J Qual Clin Pract* 2001;21:109e11
- [3] Taylor DMD, Wolfe RS, Cameron PA. Analysis of complaints lodged by patients attending Victorian hospitals, 1997e2001. *Med J Aust* 2004;181:31e5.
- [4] Taylor DMD, Wolfe R, Cameron PA. Complaints from emergency department patients largely result from treatment and communication problems. *Emerg Med* 2002;14:43e9.
- [5] Wong LL, Ooi SBS, Goh LG. Patients' complaints in a hospital emergency department in Singapore. *Singap Med J* 2007;48:990e5
- [6] Sluijs EM, Friele RD, Hanssen JE: *De WKCZ-klachtbehandeling in ziekenhuizen: verwachtingen en ervaringen van cliënten [Complaints handling in hospitals; patients' expectations and experiences]*. Den Haag: ZonMw; 2004.
- [7] . Baker G, Norton P, Flintoft V. The Canadian Adverse Events Study: the incidence of adverse events among hospital patients in Canada. *CMAJ* 2004;170.
- [8] Marie M Bismark, David M Studdert, *New Zealand Medical Journal*, Realising the research power of complaints data, 14 May 2010, Vol 123 No 1314; ISSN 1175 8716
- [9] Bismark M, Brennan T, Paterson R, Studdert D. Relationship between adverse events and quality of care complaints in New Zealand: a descriptive analysis of complainants and noncomplainants. *Quality & Safety in Healthcare* 2006;15:17-22
- [10] Stevenson D. Nursing home consumer complaints and their potential role in assessing quality of care. *Medical Care* 2005;43:102-11.
- [11] Ford D. Patient safety: the patient's role. *World Hospitals and Health Services* 2006;42:45-
- [12] . Gandhi TK, Kachalia A, Thomas EJ, et al. Missed and Delayed Diagnoses in the Ambulatory Setting: A Study of Closed Malpractice Claims. *Annals of Internal Medicine* 2006;145:488- 96
- [13] G.K Gupta, *Introduction to Data Mining with Case Studies*, Prentice Hall of India, New Delhi, 2006

[14] Pang – Ning Tan, Micheal Steinbach, Vipin Kumar, *Introduction to Data Mining*, Pearson Education, 2006

[15] Robert P. Trueblood, John N. Lovett, Jr, *Data Mining ad Satatistical Analysis Using SQL*, APress, United State of America

[16] Judith Rosta, Andreas Gerber, Excessive working hours and health complaints among hospital physicians: a study based on a national sample of hospital physicians in Germany, German medical science GMS ejournal (2007), Volume: 5, Publisher: German Medical Science GMS Publishing House, Pages: Doc09

[17] The geography of hospital admission in a national health service with patient choice, Health Economics, Volume: 19, Issue: 9, Pages: 1029-1047, 2010

[18] Roland D Friele, Emmy M Sluijs, Johan Legemaate, , Complaints handling in hospitals: an empirical study of discrepancies between patients' expectations and their experiences, *BMC Health Services Research* 2008, 8:199doi:10.1186/1472-6963-8-199

[19] Wong L L, Ooi S B S, Goh L G, Singapore Med J 2007; 48 (11) : 990Patients' complaints in a hospital emergency department in Singapore

[20] [http://www.metricstream.com/whitepapers/html/complaints\\_management\\_healthcare.htm](http://www.metricstream.com/whitepapers/html/complaints_management_healthcare.htm), Effective Complaints Management in Healthcare, A Practice for Improved Customer Satisfaction

[21] BMJ Qual Saf 2011;20:268-274 doi:10.1136/bmjqs.2010.040238,Error management, Descriptions of verbal communication errors between staff. An analysis of 84 root cause analysis-reports from Danish hospitals, Louise Isager Rabøl1, Mette Lehmann Andersen2, Doris Østergaard3,4, Brian Bjørn2, Beth Lilja2, Torben Mogensen5,6

[22] Quality Improvement in Healthcare: The Six Ps of Root-Cause Analysis, GEETHA JAYARAM, M.D., M.B.A.Baltimore, Md.Am J Psychiatry 166:3, March 2009

[23] Presentation 4 . Kajian Terhadap Komplian Pesakit Di Farmasi Pesakit Luar Hospital Taiping Ng Chew Beng B Pharm (Hons) , Zawawi b. Musa B Pharm (Hons) Hospital Taiping

[24] Esmail R, Cummings C, Dersch D, et al . Using healthcare failure mode and effect analysis tool to review the process of ordering and administrating potassium chloride and potassium phosphate. *Healthc Q* 2005; 8( spec no.): 73– 8

[25] Linkin DR, Sausman C, Santos L, et al . Applicability of healthcare failure mode and effects analysis to healthcare epidemiology: evaluation of the sterilization and use of surgical instruments. *Clin Infect Dis* 2005;

[26] DeRosier J, Stalhandske E, Bagian JP, Nudell T . Using health care failure mode and effect analysis: the VA National Center for Patient Safety's prospective risk analysis system. *Jt Comm J Qual Improv* 2002; 28: 248– 267

[27] Stalhandske E, DeRosier J, Patail B, Gosbee J . How to make the most of failure mode and effect analysis. Biomed Instrum Technol 2003

[28] [http://www.mindtools.com/pages/article/newTMC\\_03.htm](http://www.mindtools.com/pages/article/newTMC_03.htm), Cause and Effect Analysis, Identifying the likely causes of problems

[29] Kaur, S. (2011, March 16). *Article : Robust growth in healthcare under ETP*. Retrieved September 13, 2011, from The New Straits Times Press (Malaysia) Berhad: [www.nst.com.my](http://www.nst.com.my)

[30] A M Haliza, A. M. (2003). A study to determine the level of customers satisfaction among private clinic in Negeri Sembilan. *Jurnal Kesihatan Masyarakat*, 7.

[31] Lim TO, S. S. (2011). *NATIONAL HEALTHCARE ESTABLISHMENTS & WORKFORCE STATISTICS 2008-2009*. Kuala Lumpur: The National Healthcare Statistics Initiative (NHSI).

[32] Australian Institute of Health and Welfare 2010. Australian hospital statistics 2008-09. Health Services Series no. 17. Cat. No. HSE 84. Canberra: AIHW

[33] John Goodman, Jeff Manzal and Eden Segal, Creating a Customer Relationship Feedback System that has Maximum Bottom Line Impact, *Customer Relationship Management*, March/April 2000 pp 289-296

[34] Lim TO, S. S. (2011). *NATIONAL HEALTHCARE ESTABLISHMENTS & WORKFORCE STATISTICS 2008-2009*. Kuala Lumpur: The National Healthcare Statistics Initiative (NHSI).