A

Project-I Report

on

SMART TRIAGE SYSTEM FOR PATIENT ASSIGNMENT AFTER DISASTERS

Submitted in Partial Fulfillment of
the Requirements for the Degree
of

Bachelor of Engineering

in

Computer Engineering

to

Kavayitri Bahinabai Chaudhari
North Maharashtra University, Jalgaon

Submitted by

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DEPARTMENT OF COMPUTER ENGINEERING

CERTIFICATE

This is to certify that the PROJECT-I entitled *Smart Triage System For Patient Assignment After Disasters*, submitted by

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in partial fulfillment of the degree of *Bachelor of Engineering* in *Computer Engineering* has been satisfactorily carried out under my guidance as per the requirement of Kavayitri Bahinabai Chaudhari North Maharashtra University, Jalgaon.

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Abstract

The design and implementation of a system to automate patient handling and assignment to hospitals in mass disasters involving a large number of injured victims over a wireless network. In addition, the previously developed MEDTOC system is modified and enhanced to include location-aware features at the disaster site, as well as quick classification and assignment of patients to nearby hospitals.

The excessive rate of patients arriving at accident and emergency centres is a major problem facing South African hospitals. Patients are prioritized for medical care through a triage process. Manual systems allow for inconsistency and error. It proposes a novel system to automate accident and emergency centre triage and uses this triage score along with an artificial intelligence estimate of patient-doctor time to optimize the queue order. A fuzzy inference system is employed to triage patients and a similar system estimates the time but adapts continuously through fuzzy Q-learning. The optimal queue order is found using a novel procedure based on genetic algorithms. These components are integrated in a simple graphical user interface. Live tests could not be performed but simulations reveal that the average waiting time can be reduced by 48 minutes and priority is given to urgent patients.

Chapter 1

Introduction

The design and implementation of a triage system to automate patient handling and assignment to hospitals in mass disasters involving a large number of injured victims over a wireless network.System includes location-aware features at the disaster site, as well as quick classification and assignment of patients to nearby hospitals.

In section 1.1 background of the machine learning and triage is described. Motivation is described in section 1.2. In section 1.3 problem definition is described. Objective is described in section 1.4.Section 1.5 contains the organization of report.Summary is described in last section.

1.1 Background

In this section background of machine learning and triage is described.

1.1.1 Machine Learning

Machine Learning is a technique that allows computers to learn through programs that generalize behaviors from information or a set of patterns of data. Machine learning algorithms have existed for two decades, but recently, their application has become popular because of growth of power in computing and data storage. It is also important to indicate that there are several models for resolutions of problems in machine learning. Those models can be classified as Geometric, Probabilistic and Logical.Once gotten the final data to be analyzed, three classification algorithms i.e. Naive Bayes Modeling, Logistic Regression and Neural Networks were applied.

- Naive Bayes Modeling:
  For this model the initial probability was defined as 0 and the maximum number of nominal values for each variable was set to 20. The learning node was connected to

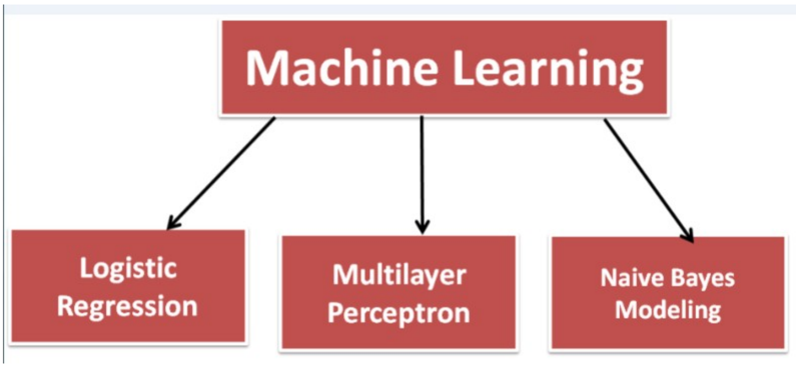

Figure 1.1: Types of Algorithms in Machine Learning

a Naive Bayes prediction node, where the medical criteria of both the test data and the model prediction are observed. The outputs of the prediction node was connected to enter to a scorer node to show the percentage of hits between the model and the medical criterion.

- Logistic Regression:
  The logistic regression model was not executed in the first tests since the learning node had an alert symbol. This alert was because one of the independent variables was too related to the classification level of the triage. After following the advices of Knime documentation i.e. locating a linear mapper and a linear correlator filter node before the input for the learning node, it was possible to complete the tests of this model.

- Multilayer Perceptron: The multilayer perceptron model is generally used when there is no mathematical formula to predict the results based on different input variables.Multilayer Perceptron model has two perceptron neural network models: (1) nodes of type MLP and (2) Multilayer Perceptron of Weka 3.7.

1.1.2 Triage

Triage is derived from the french term trier which means "to select or choose / to choose or to classify", and it refers to a system that quickly evaluates the severity of each patient and indicates the best treatment depending on his/her condition. The most important triage models i.e. (1) Australian Triage Scale, (2) Triage of the Emergency Department of Canada, (3) Manchester triage system, (4) Urgency severity index, and (5) Triage model Andorra. All of these models have five rating levels, starting from immediate care to treatment after several hours, depending on the patient's symptoms.

- Usage of Decision Trees in Public Health:
  In the last 30 years, different researches have used statistical techniques in the analysis

and prediction of information. In this aspect, the field of medicine also have used such techniques to predict infections or diseases, to assign treatment priority, to create decision support systems, and so on. Under and over triage The accuracy of triage can be classified and evaluated using the terms under and over triage. An under triaged patient has life-threatening injuries but is assessed as non-critical, which may lead to delayed medical interventions and/or evacuation to hospital . This inaccurate triage decision may delay the patients immediate care, especially when resources are limited or strained .

- Anatomic and physiologic triage:
  Triage used in the pre-hospital setting is mainly based on anatomic or physiologic data, separately or in combination. Guidelines published in 2010 recommend that triage should be based on a combination of physiologic and anatomic parameters, along with the mechanism of injury, comorbidities, and demographics . By only using anatomic triage decisions based on the patients visible injuries, there is a risk of failing to identify severe injuries such as cavity hemorrhage . On the other hand, a trauma patient may display normal physiologic parameters but have visible signs (i.e., soot in the nostrils after exposure to fire) and be at potential risk of developing later complications .

- Pre-hospital triage:
  Triage systems have several structures in common. Most have a walking filter to identify and rapidly discriminate the most severely injured patients and evacuate them from the immediate hazard zone . The use of color codes, generally red, yellow, green, and black, to identify severity levels are common in most triage systems. Tags, a practical device used for triage by ambulance personnel, are attached to each patient and follow this color code . The following paragraphs describe some of the most commonly used pre-hospital triage systems.

- Triage Sieve/Triage Sort:
  Triage Sieve and Triage Sort is a two-step triage model described and used in the Major Incident Medical Management and Support course (MIMMS) . The methodology has been widely advocated in the United Kingdom, parts of Australia, and in several regions in Sweden . The first step, Triage Sieve, is intended to be used at the incident site for primary sorting with a walking filter. This stage represent a very rapid form of triage, entirely conducted according to respiratory rate and capillary refill time or heart rate, in order to classify the patient into triage categories .

- Simple Triage and Rapid Transport:
  Simple Triage and Rapid Transport (START) was developed in the 1980s as one of

the first civilian triage systems used in MCIs . The START model has been described as one of the most commonly used triage systems for handling MCIs in the United States, and is also used in Canada, Saudi-Arabia, parts of Australia and Israel. The system uses a qualitative, fixed-priority method . The triage categorization is based on whether the patient can walk, respiratory rate, perfusion, and mental status. It is designed so that the provider can complete an assessment within 60 seconds , based on strict medical criteria, and thereby identify the patients medical needs.

1.2 Motivation

Public hospital Accident and Emergency Centre queues are notoriously long. Recent years have seen these hospitals formalizing their medical triage systems, whereby patients are sorted before seeing the doctor to prioritize care to those most urgent. The Cape provinces are beginning to standardize their approaches . However, no such standardization exists in the majority of the country. Furthermore, does not make use of technology. The power of modern Computational Intelligence (CI) techniques has aided many industrial and service processes in becoming more automated and uniform . This project proposes a proof-of-concept system that employs a wide variety of such techniques encompassing machine learning, expert systems and optimization to automate the process of medical triage and digitally aid the management of a hospitals.

1.3 Problem Defination

The design and implementation of a system to automate patient handling and assignment to hospitals in mass disasters involving a large number of injured victims over a wireless network. In addition, the triage system is modified and enhanced to include location-aware features at the disaster site, as well as quick classification and assignment of patients to nearby hospitals.It is expected that chaotic mass-disaster situations can be more suitably controlled and stabilized by using the techniques from this project, thus saving more lives.

1.4 Scope

Project will determine the process of determining the priority of patients' treatments based on the severity of their condition. This rations patient treatment efficiently when resources are insufficient for all to be treated immediately. The term comes from the French verb trier, meaning to separate, sift or select. Project may result in determining the order and priority of emergency treatment, the order and priority of emergency transport, or the transport destination for the patient. Project may also be used for patients arriving at the emergency department, or telephoning medical advice systems, among others. This project deals with the concept of triage as it occurs in medical emergencies, including the prehospital setting, disasters, and emergency department treatment.

1.5 Objectives

Project objectives are the specific objectives for which the project works to achieve them within a stipulated time. They should directly address the problem mentioned in the Problem Defnition.

1. Examine Vital signs to calculate triage level.
2. Determine priority of patient by calculating triage level.
3. To find out the nearby hospitals.
4. Assign patient to the hospitals based on priority.

1.6 Organization of Report

This section provides information about the organisation of the report distributed in different chapters, along with the sections discussed in each chapter. Chapter 1 is introduction. It discusses about the background information, problem definition, scope and objectives of the project. Chapter 2 is the system analysis. It discusses about the literature survey of triage system, proposed system, different types of feasibility study, risk analysis, scheduling and effort allocation. Chapter 3 is system requirement specification. It discusses about the different types of requirements, such as functional, non-functional, hardware, software, performance and design requirements. Chapter 4 is system design. It focuses on the architecture of system, data flow and the UML diagrams.

1.7 Summary

In this chapter, introduction of system is described. In the next chapter, system analysis is presented.

Chapter 2

System Analysis

System analysis is the process of gathering and interpreting facts, diagnosing problems and using the facts to improve the system. System analysis chapter will shows overall system analysis of the concept, description of the system, meaning of the system. System analysis is the study of sets of interacting entities, including computer systems analysis. In any mass-disaster situation such as a building collapse, earthquake, or flash floods, it is expected that many agencies would rush to aid the victims. Given the possible large number of victims, the situation can quickly become unmanageable, and chaos can reduce the chances to save lives. In addition, chaos can limit the ability of area hospitals to identify and treat the most critically injured victims in a timely manner. The current procedure of dealing with disasters includes setting up triage rooms at the disaster site and nearby hospitals. Patients are tagged according to their condition, and the critically injured patients are immediately transferred to nearby hospitals. The main purpose behind the development of proposed system is to overcome the drawbacks of existing system.

In the Section 2.1 literature survey is described. Existing techniques of classification is described in Section 2.2. In Section 2.3 feasibility study of proposed system is described. Risk analysis is described in Section 2.4. In Section 2.5 project scheduling is described. Effort allocation table is described in Section 2.6. In the last section summary is presented.

2.1 Literature Survey

Udaya B Kapu and Raghu B Korrapati in [**?**] has 2015 proposed system a neural network is used to foretell which of the patients seen in an emergency room need to be admitted, transferred to a specialty care or discharged. A multilayer feedforward network model maps input datasets to a corresponding output. The complexity of multilayer feedforward can be altered by changing the number of layers and the number of nodes in each layer. It has been shown that the multilayered neural network can estimate virtually any function to any desired accuracy with the given hidden nodes and enough data. Feedforward describes how the neural network processes the pattern and remembers the patterns. Backpropagation describes how this type of neural network is trained. constantly training the network with the most recent data is time consuming.

H.A. Chong and K. B. Gan in [?] has proposed system in 2016 acquires vital signs, syndrome and chief complaint from patient. The acquired data will be analyzed using triage decision making algorithm and triage level of a patient will be reported instantly. All information and patient records will be stored in database for future reference. Finally, an automated triage system has been designedand developed to assists assistant medical officer to perform triage assessment in Emergency Room. This system can provide specific triage output compared to the one done by assistant medical officer. Cloud service is recommended so that the database can be shared and used in other hospitals.

Byron Graham et al., in [?] has proposed system in 2018 in which drawing on logistic regression, we identify several factors related to hospital admissions including hospital site, age, arrival mode, triage category, care group, previous admission in the past month, and previous admission in the past year. This study highlights the potential utility of three common machine learning algorithms in predicting patient admissions. Practical implementation of the models developed in this study in decision support tools would provide a snapshot of predicted admissions from the emergency department at a given time, allowing for advance resource planning and the avoidance bottlenecks in patient flow, as well as comparison of predicted and actual admission rates. However, the optimization is very time consuming, and the accuracy of the algorithm is similar to that of Feature Mine.

Above all systems assigns patient on arrival at hospital which causes overcrowding in certain hospital resulting in risk to patient's life. Available medical equipment and resources of certain hospital may not be sufficient to tackle the patients condition.

2.2 Proposed System

System provides a mechanism to integrate the patient data collected on site using vital motes and send it to hospitals using the cellular network. vital signs of patients are captured based on questions answered on chatboard and transmit them wirelessly .A web portal is designed to let the authorized users obtain vital statistics about the overall disaster management scenario. The designed a clientserver application manages the processing of patients at a disaster site. In the hospital, the received data are decompressed and segregated to be displayed to the physicians using machine learning algorithm.In system a disaster management algorithm is implemented at the client (disaster) side that finds the nearest hospitals and automates the process of patient data flow to the hospitals.In addition, algorithm at the server (hospital) side that assigns patients to nearby hospitals based on several factors including the distance, trauma rank and available capacity of the hospital. The GPS location of both i.e disaster site and hospital will be calculated .Assigned hospital will be informed to send ambulance at the disaster site.

2.3 Feasibility Study

Feasibility studies aim to objectively and rationally uncover the strengths and weaknesses of the existing business or proposed venture, opportunities and threats as presented by the environment, the resources required to carry through, and ultimately the prospects for success. In its simplest term, the two criteria to judge feasibility are cost required and value to be attained. The entire feasibility of the project is comprehended by economical feasibility, operational feasibility and technical feasibility. Feasibility has applied to code clone detection using hybrid approach pertains to the following areas:

1. Economical Feasibility
2. Operational Feasibility
3. Technical Feasibility

2.3.1 Economic Feasibility

Economical feasibility refers to whether the project can be developed at an affordable price. Talking from any organization's point of view, the economical feasibility refers that the organization should be able to finance the project. Moreover, the returns from the project has also to be considered. To decide whether a project is economically feasible, various factors are considered as:

1. Cost benefit analysis
2. Maintenance costs

The proposed system is computer based and it does not require any additional hardware components, hence there is no cost of hardware involved. Considering, the software part required for the project, the project is to be developed in python and python is open source therefore there is no need to required cost for software. It requires average computing capabilities, which are very basic requirements hence it doesn't include additional economic overheads, which renders the system economically feasible.

2.3.2 Operational Feasibility

Operational feasibility of the project describes the ease with which even the naive user can operate the developed system. The developed system should be as easy and user friendly to operate and should be self-comprehensive.To determine the operational feasibility of the system, the awareness level of the users should take into consideration. This system is operational feasible since the users are familiar with the technologies and hence there is no need to gear up the personnel to use system.Also the system is very friendly to use. The Proposed system provide classification using minimum time. Performance of the proposed system is enhanced by lift method. To determine the operational feasibility of the system, the awareness level of the users should take into consideration. This system is operational feasible since the users are familiar with the technologies and hence there is no need to gear up the personnel to use system. Also the system is very friendly to use.

2.3.3 Technical Feasibility

Technical feasibility of a project, is performing a check whether the development of project is possible with the available technological resources. The technical feasibility is a very important aspect to be considered before the official commencement of the project by the organization. The technical feasibility is checked by pondering over the functional requirements of the user. To determine whether the proposed system is technically feasible, the technical issues involved behind the system should taken into consideration. Proposed system uses python technology. Python is an open source technology, it is available for free of cost and conve- niently. As far as platform for the project is concerned, it is decided to perform the project on the window OS. Therefore, the project has to be done on any Windows OS and also on Ubuntu . Thus, it becomes quite sure the project is technically feasible.

2.4 Risk Analysis

Project risk analysis is the identification and quantification of the likelihood and impact of events that may damage the project. Risk analysis is an opportunity to help solve problems and to enhance communications within the project for a more effective team effort. Risk analysis has applied to code clone detection using hybrid approach pertains to the following areas:

1. Technical Risks

2. Business Risks

3. Project Risks

2.4.1 Technical Risks

Technical risk is the risk that some feature of the correct system can not be implemented due to a technical reason. Technical risk is exposure to loss arising from activities such as design and engineering, manufacturing, technological processes and test procedures. To determine whether the proposed system has technical risk or not, the technical issues involved behind the system should taken into consideration. proposed system uses python technology. As python is an open source technology, it dose not have any technical risk. Thus, no technical risk associated with project.

2.4.2 Business Risks

The term business risk refers to the possibility of inadequate profit or even loss due to uncertainties e.g., changes in tastes, preferences of consumers, strikes, increased competition, change in government policy, obsolesce etc. Business risks implies uncertainty in profits or danger of loss and the events that could pose a risk due to some unforeseen events in future, which causes business to fail.Some of the risks can be

- Unfamiliar to the programming language, e.g. Advanced Java
- Unfamiliar to concept of project.
- Unfamiliar to software tools.
- Considerably resulting in schedule overruns.

There are numerous techniques proposed to classification in software system. The pro- posed system use a lift method for identify classification rules which is able to required less time for classification. Therefore there is no business risk associated with project.

2.4.3 Project Risks

Project risk is defined as an uncertain event or condition that, if it occurs, has a positive or negative effect on a projects objectives. Threaten the project plan, that is, if project risks become real, it is likely that project schedule will slip and that costs will increase. Project risks identify potential budgetary, schedule, personnel (stafing and organization), resource,

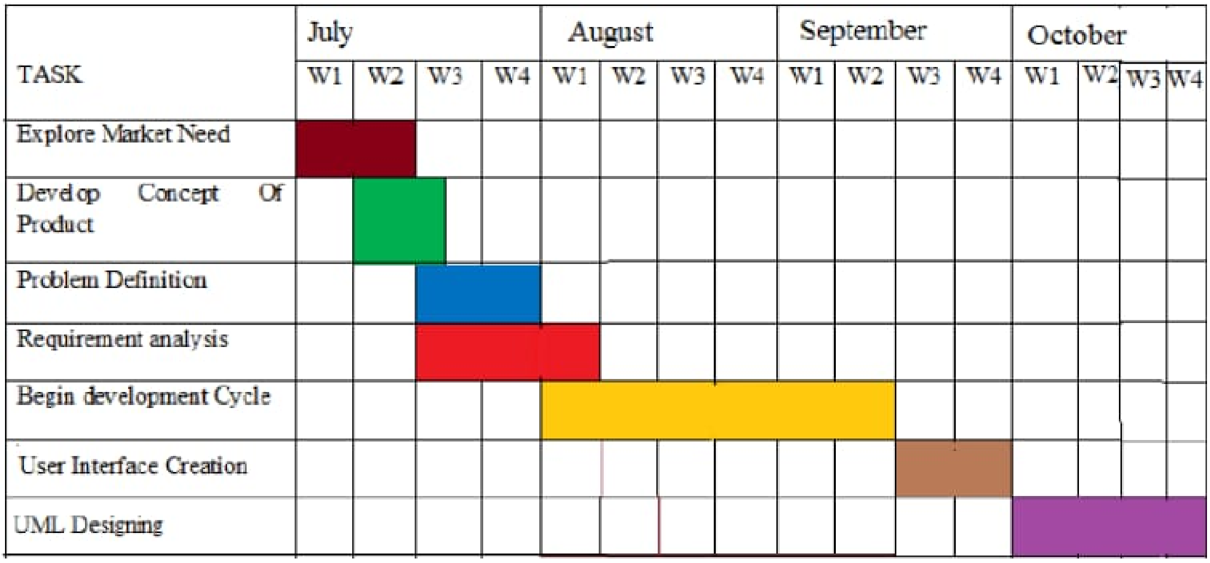

Figure 2.1: Gantt Chart

customer, and requirement problems and their impact on a software project. As per as the project is concerned, the task in project is completed under estimated sched- ule and project is completed before deadline. Therefore there is no project risk associated with project.

2.5 Project Scheduling

This section specifies the project scheduling of the project. Software project scheduling is an activity that distributes estimated effort across the planed project duration by allocating the effort to specific software engineering task. In this phase we are identifying all major software engineering activities and the product function to which they are applying. As we have selected the linear sequential model for developing our project we divide the work according to the phases of this model. As we are four partners working on this project and having two months,we schedule the project. If the project has been developed according to the schedule, the project schedule defines the task and milestones that must be tracked and controlled as the project proceed. A Gantt chart helps in scheduling the activities of a project, but it does not help in identifying them. One can begin with the activities identified in the work breakdown structure, as we did for the compiler example. During the scheduling activity, and also during implementation of the project, new activities may be identified that were not envisioned during the initial planning. The manager must then go back and revise the breakdown structure and the schedules to deal with these activities .The fig shows the gantt chart of our project, we required 12 weeks to complete our project work, the timeline chart shows the work done in each week and the time required for the same.

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Project Planning	25%	25%	25%	25%
Requirement Gathering	20%	20%	30%	30%
Design	30%	30%	20%	20%

Table 2.1: Effort Allocation

2.6 Effort Allocation

Each of software project estimation techniques leads o estimate of work units requires completing software development. The characteristics of each project dictate the distribution of efforts. There are four members in this project and there are four phases such as Requirement Gathering, Project planning, Design and Coding, Testing. So below shows effort of each member in this project.

2.7 Summary

In this chapter System analysis is described. In the next chapter System Requirement are described.

Chapter 3

System Requirement Specification

Software Requirements Specifications is the official statement of what is required of the system developers. It includes both user requirements and a detailed specification of the system requirements. Requirement analysis is done in order to understand the problem the software system is to solve.

In Section 3.1, Hardware requirements of the system are described. Software Requirements are described in Section 3.2. In Section 3.3, Functional Requirements of system are described. Non functional Requirements are described in Section 3.4. In Section 3.5 Performance Requirements are described. Finally summary is presented in last section.

3.1 Hardware Requirements

Hardware requirements give the physical component required for the proposed system. The hardware requirement includes a system with following configurations:

1. Processor : Pentium IV or above
2. Display Type : VGA and higher.
3. RAM : 512MB or above
4. Storage Memory : 1GB or above

3.2 Software Requirements

The Software Requirements Specification is produced at the culmination of the analysis task. The function and performance allocated to software as part of system engineering are refined by establishing a complete information description, a detailed functional description, a representation of system behavior, an indication of performance requirements and design constraints, appropriate validation criteria, and other information pertinent to requirements. The various software requirements of the system are summarized here:

1. Operating system : Windows 7/8, Ubuntu.
2. System Type : 64-bit/32-bit operating system.
3. Front end : Java

3.3 Functional Requirement

In software engineering, a functional requirement defines a function of a software system or its component. A function is described as a set of inputs, the behavior, and outputs. Functional requirements may be calculations, technical details, data manipulation and processing and other specific functionality that define what a system is supposed to accomplish. The functional requirements of the proposed system are:

1. The system should be able to examine Vital signs to calculate triage level.
2. The system should be able to determine priority of patient by calculating triage level.
3. The system should be able to find out the nearby hospitals.
4. The system should be able assign patient to the hospitals based on priority.

3.4 Non Functional Requirement

A non-functional requirement is a requirement that specifies criteria that can be used to judge the operation of a system, rather than specific behaviors. This should be contrasted with functional requirements that define specific behavior or functions. The plan for implementing functional requirements is detailed in the system design. The plan for implementing non functional requirements is detailed in the system architecture. The non functional requirements are:

1. The system should be able to take a input dataset.
2. Warnings and error messages should be provided to user throughout the system.
3. Fast response time.
4. Easy enhancement.
5. Execution qualities, such as usability.

6. User interface - The system is designed in such a way that instructions are given clearly to navigate through the System.

3.5 Performance Requirements

The performance requirements of the proposed system are:

1. The system should take the minimum possible time for the operation to perform.

2. The system should be robust.

3.6 Summary

In this chapter, system requirement is described. In the next chapter, system design is presented.

Chapter 4

System Design

System Design chapter provides graphical structure of the project by using various UML diagrams. System design provides the understanding and procedural details necessary for implementing the system recommended in the system study. Design is a meaningful engineering representation of something that is to be built. It can be traced to a customers requirements and at the same time assessed for quality against a set of predefined criteria for good design. In the software engineering context, design focuses on four major areas of concern are data, architecture, interfaces and components.

In Section 4.1 architecture of proposed system is described. Data ow diagrams are described in Section 4.2. In Section 4.3 all UML diagrams of the project are described. Finally summary is presented in last section.

4.1 System Architecture

A system architecture or systems architecture is the conceptual model that defines the structure, behavior, and more views of a system. The figure 4.1 shows the working of Smart Triage System in systematic manner.System architecture consist of authorised user disaster site will send patient data at server.Triage level will be calculated and patients will be assigned to nearby hospitals.Assigned data will be send back to user.

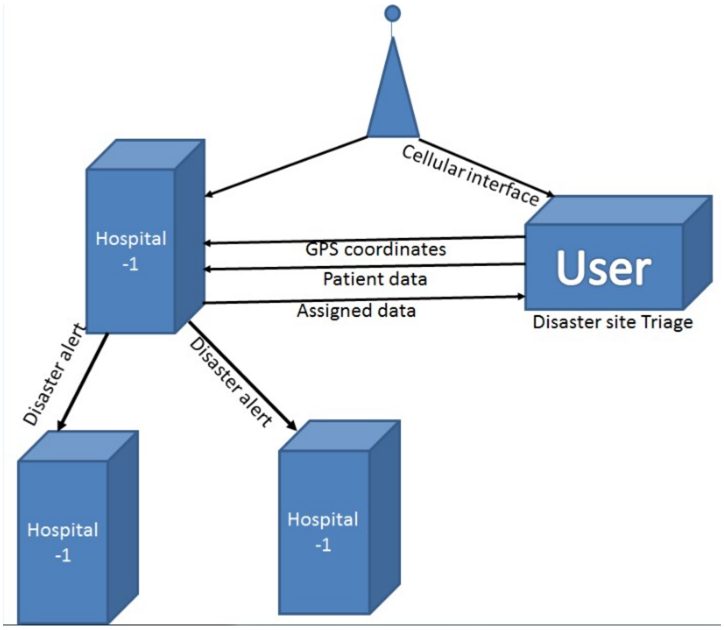

Figure 4.1: System Architecture

4.2 Data Flow Diagrams

As information moves through software, it is modified by a series of transformations.Data Flow Diagram(DFD) is a graphical representation that depicts information flow and the transforms that are applied as data move from input to output. The basic form of a data flow diagram, also known as a data flow graph or a bubble chart. The data flow diagram may be used to represent a system or software at any level of abstraction. In fact, DFDs may be partitioned into levels that represent increasing information flow and functional detail. Therefore, the DFD provides a mechanism for functional modeling as well as information flow modeling.

A level 0 DFD, also called a fundamental system model or a context model. The DFD level 0 shows the abstract of the whole system.

Figure 4.2: DFD Level 0

The Figure shows the level 1 DFD. The DFD level 1 shows some internal structure of the system also identifies data stores that are used by the major processes.

4.3 UML Diagrams

This section illustrates the various UML diagrams of the project. The Unified Modeling Language(UML) is a standard visual modeling language intended to be used for modeling business and similar processes, analysis, design, and implementation of software-based systems.UML is a common language for business analysts, software architects and developers used to describe, specify, design, and document existing or new business processes, structure and behavior of artifacts of software systems. UML is a standard modeling language, not a software development process

4.3.1 Use Case Diagram

Actors are user and system.The use case diagram of proposed system shows the basic functionality such as enter vital sign,calculate triage level,establish connection to server,transfer data to server,retrive patient information,search nearby hospitals,calculate priority.

4.3.2 Class Diagram

Figure 4.5: Class Diagram Figure above shows the Class Diagram of proposed system shows the attributes and the operations of the All the classes are described with their attributes and operations that are performed within respective classes.

4.3.3 Sequence Diagram

Figure above shows the sequence diagram for enter vital sign use case and calculate triage level use case. Actors are user and system.Database is a object.The sequence diagram of proposed system shows the flow of system.

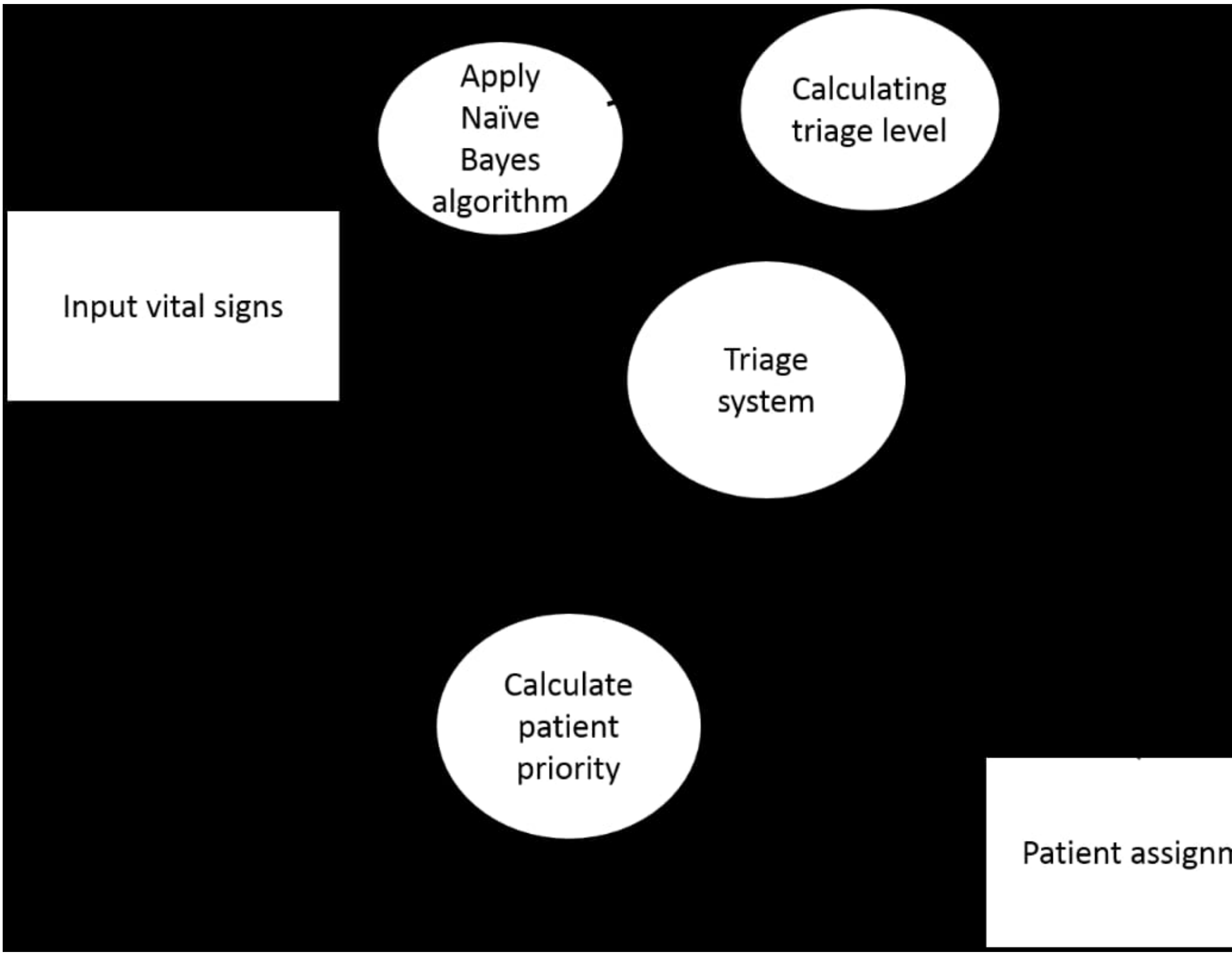

Figure 4.3: DFD Level 1

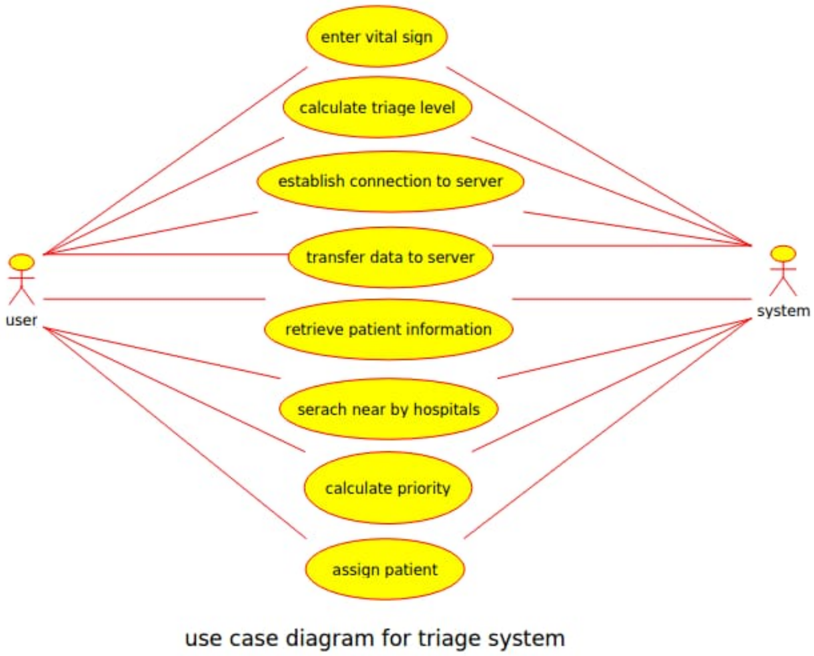

Figure 4.4: Usecase Diagram

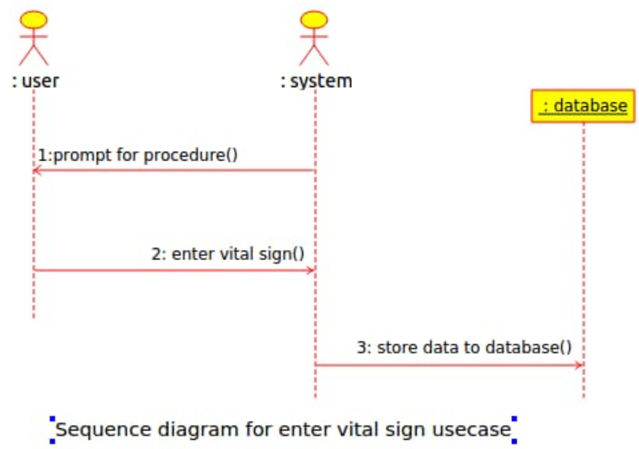

Figure 4.5: sequence Diagram 1

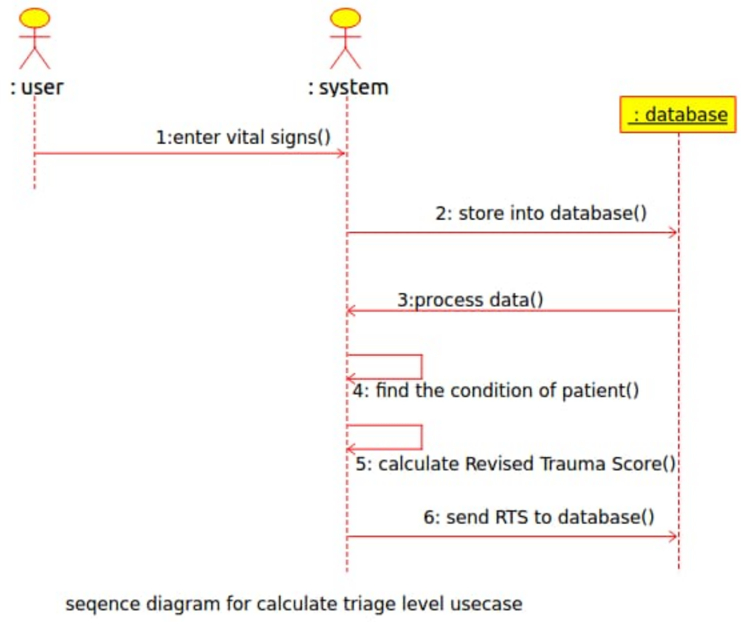

Figure 4.6: sequence Diagram 2

4.3.4 State Diagram

Figure 4.7: State Chart Diagram Figure shows the statechart diagram of proposed system. State chart diagram include various state such as

A Final state represents the last or "final" state of the enclosing composite state. There may be more than one final state at any level signifying that the composite state can end in different ways or conditions. When a final state is reached and there are no other enclosing states it means that the entire state machine has completed its transitions and no more transitions can occur. For the system, display of clusters is last state. It identifies different keywords in clusters and displays them as the output.

4.3.5 Activity Diagram

Activity diagram shows the basic activities between two immediate states of state chart diagram. Activity diagram shows the ow from activity to activity.

Figure shows the Activity diagram of system. If a state is satisfied it transits to next state. It also consists of forking and joining as shown in the figure.Above figure shows activities like take vital signs,patient priority,if priority is 1 activity is requires critical room, ,if priority is 2 activity is differ attention for 2 or 3 hours,,if priority is 3 activity is differ attention for 24 or 48 hours,then next activity is send data and finally assign hospital.

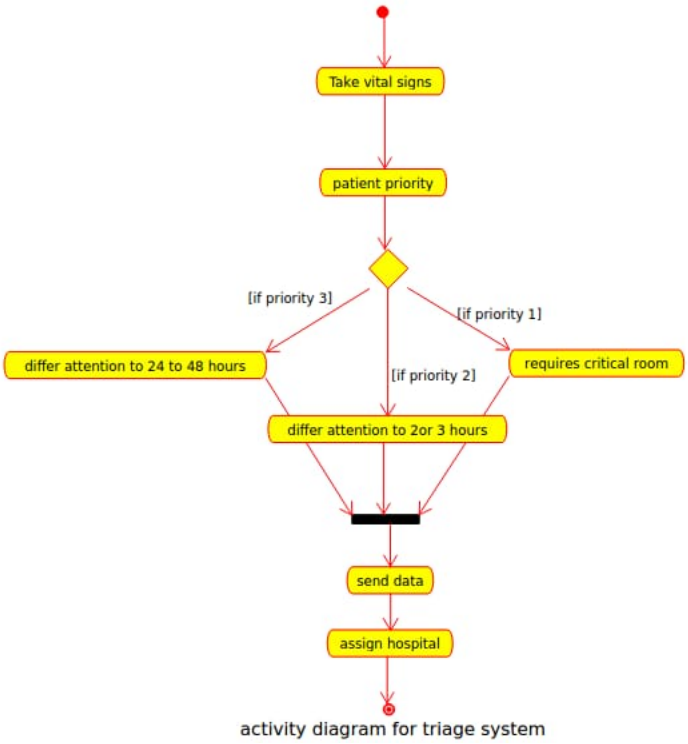

Figure 4.7: Activity Diagram

4.3.6 Component diagram

Figure shows the component diagram of system.The components are triage.exe,dataset,priority classifier,naive bayes classification,client data,server data.

Proposed system component diagram shows dependency of modules which are use in system such as suspicious detection depend

4.3.7 Deployment diagram

A deployment diagram shows the configuration of run-time processing nodes and the components that live on them. Deployment diagrams address the static deployment view of an architecture. They are related to component diagrams in that a node typically encloses one or more components.

Figure 4.10: Deployment Diagram Figure shows the deployment diagram of proposed system ,Deployment diagram in- clude the physical component of the system such as internet and different servers. By using private connection we can deploy it to different servers.

4.4 Summary

In this section UML diagrams are explained which are necessary for understanding the flow of system.

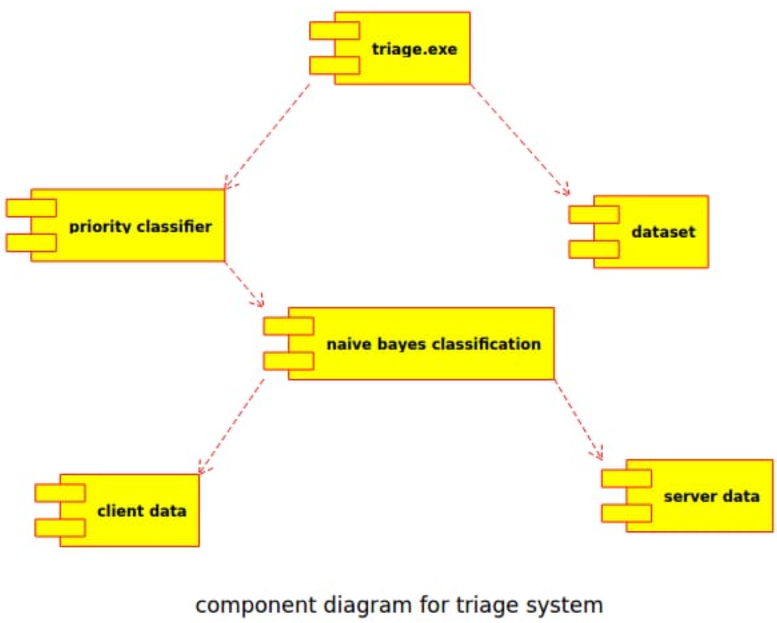

Figure 4.8: Component Diagram