

**MCA681: Industry Project**

**AMS Custom Reporting**

by

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Under the Guidance of

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and

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A Project report submitted in partial fulfillment of the requirements for the award of the degree of Master of Computer Applications of CHRIST (Deemed to be University)

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CERTIFICATE

*This is to certify that the report titled* ***AMS Custom Reporting***

*is a bonafide record of work done by* ***Avatansh Awasthi (1947208)***

*of CHRIST (Deemed to be University), Bangalore, in partial fulfillment of the requirements of 6th Semester MCA during the year 2022.*

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**ABSTRACT**

The project titled “AMS Custom Reporting” is an operations project used for providing, managing and maintaining responsiveness through the technical solutions to various clients of the company. This project will be used in the Healthcare sector to provide operational services to various clients.

The clients are already using the solutions provided by the company, these clients are served and being given the services form the company side to help and manage these personalized solutions. But these clients might end up in such a place where they need to have some kind of enhancement or correction or a new feature to be added to the solution altogether. At this point the client registers and requests the company to make the required operational changes to their solutions. These requests are called Service Requests(SR’s). There are many types of service requests that can be made by the clients, and according to their requirements these SR’s are categorized and then assigned to different and respective teams. There is something called Change codes, these are used to determine which bucket/queue the request would fall into so the appropriate team would be handling it. The number in the Change code determines what type of change it is and what solution it might belong to. It will help us to decide which tickets will fall into which buckets and which teams are working on those buckets. When these SR’s are thoroughly classified by the triage teams, the SR’s go the respective backlog of those teams and then taken upon one by one or as a set of related SR’s by the software engineers to be provided solution for in limited time.

This system will be an enhancement addition to the organization as currently there is was existing system to keep a track of the tickets and provide operational solutions for the same but as the technology has evolved so as these systems. This system will not only keep a track of tickets that are being assigned to various teams, but it will also keep track of those tickets which do not have a change code. For this project, the database and current stage of the ticket is already present. We will be using various technologies like - SQL, CCL, etc. The expected result would be to provide the operational support to each and every client in time.

**TABLE OF CONTENTS**

**Acknowledgments** **iii**

**Abstract** **iv**

[**List of Tables**](https://docs.google.com/document/d/15bJ_jRsu0eFw_pUkwwD7B08Gs5whKW_ALm1J2qowRB8/edit#bookmark=id.2et92p0) **vii**

[**List of Figures**](https://docs.google.com/document/d/15bJ_jRsu0eFw_pUkwwD7B08Gs5whKW_ALm1J2qowRB8/edit#bookmark=id.tyjcwt) **viii**

1. Introduction 1

[1.1. Project Description](https://docs.google.com/document/d/15bJ_jRsu0eFw_pUkwwD7B08Gs5whKW_ALm1J2qowRB8/edit#bookmark=id.4d34og8) [1](https://docs.google.com/document/d/15bJ_jRsu0eFw_pUkwwD7B08Gs5whKW_ALm1J2qowRB8/edit#bookmark=id.4d34og8)

[1.2**.** Existing System](https://docs.google.com/document/d/15bJ_jRsu0eFw_pUkwwD7B08Gs5whKW_ALm1J2qowRB8/edit#bookmark=id.2s8eyo1)[2](https://docs.google.com/document/d/15bJ_jRsu0eFw_pUkwwD7B08Gs5whKW_ALm1J2qowRB8/edit#bookmark=id.2s8eyo1)

[1.3. Objectives](https://docs.google.com/document/d/15bJ_jRsu0eFw_pUkwwD7B08Gs5whKW_ALm1J2qowRB8/edit#bookmark=id.3rdcrjn) 3

[1.4. Purpose, Scope, and Applicability](https://docs.google.com/document/d/15bJ_jRsu0eFw_pUkwwD7B08Gs5whKW_ALm1J2qowRB8/edit#bookmark=id.26in1rg) 4

[1.4.1. Purpose](https://docs.google.com/document/d/15bJ_jRsu0eFw_pUkwwD7B08Gs5whKW_ALm1J2qowRB8/edit#bookmark=id.26in1rg) 4

[1.4.2. Scope](https://docs.google.com/document/d/15bJ_jRsu0eFw_pUkwwD7B08Gs5whKW_ALm1J2qowRB8/edit#bookmark=id.26in1rg) 4

[1.4.3. Applicability](https://docs.google.com/document/d/15bJ_jRsu0eFw_pUkwwD7B08Gs5whKW_ALm1J2qowRB8/edit#bookmark=id.lnxbz9) 5

[1.5. Overview of the Report](https://docs.google.com/document/d/15bJ_jRsu0eFw_pUkwwD7B08Gs5whKW_ALm1J2qowRB8/edit#bookmark=id.lnxbz9) 5

[2. System Analysis and Requirement](https://docs.google.com/document/d/15bJ_jRsu0eFw_pUkwwD7B08Gs5whKW_ALm1J2qowRB8/edit#bookmark=id.35nkun2) 6

[2.1. Problem Definition](https://docs.google.com/document/d/15bJ_jRsu0eFw_pUkwwD7B08Gs5whKW_ALm1J2qowRB8/edit#bookmark=id.35nkun2) 6

[2.2. Requirement Specification](https://docs.google.com/document/d/15bJ_jRsu0eFw_pUkwwD7B08Gs5whKW_ALm1J2qowRB8/edit#bookmark=id.1ksv4uv) 6

[2.2.1. Functional Requirements](https://docs.google.com/document/d/15bJ_jRsu0eFw_pUkwwD7B08Gs5whKW_ALm1J2qowRB8/edit#bookmark=id.1ksv4uv) 6

[2.2.2. Non-Functional Requirements](https://docs.google.com/document/d/15bJ_jRsu0eFw_pUkwwD7B08Gs5whKW_ALm1J2qowRB8/edit#bookmark=id.44sinio) 8

[2.3. System Requirements](https://docs.google.com/document/d/15bJ_jRsu0eFw_pUkwwD7B08Gs5whKW_ALm1J2qowRB8/edit#bookmark=id.z337ya) 8

[2.4.1. User Characteristics](https://docs.google.com/document/d/15bJ_jRsu0eFw_pUkwwD7B08Gs5whKW_ALm1J2qowRB8/edit#bookmark=id.z337ya) 8

[2.4.2. Software and Hardware Requirements](https://docs.google.com/document/d/15bJ_jRsu0eFw_pUkwwD7B08Gs5whKW_ALm1J2qowRB8/edit#bookmark=id.3j2qqm3) 8

[2.4.3. Constraints](https://docs.google.com/document/d/15bJ_jRsu0eFw_pUkwwD7B08Gs5whKW_ALm1J2qowRB8/edit#bookmark=id.1y810tw) 9

[2.4. Conceptual Models](https://docs.google.com/document/d/15bJ_jRsu0eFw_pUkwwD7B08Gs5whKW_ALm1J2qowRB8/edit#bookmark=id.4i7ojhp) [1](https://docs.google.com/document/d/15bJ_jRsu0eFw_pUkwwD7B08Gs5whKW_ALm1J2qowRB8/edit#bookmark=id.4i7ojhp)0

[2.4.1. Data Flow](https://docs.google.com/document/d/15bJ_jRsu0eFw_pUkwwD7B08Gs5whKW_ALm1J2qowRB8/edit#bookmark=id.4i7ojhp) [1](https://docs.google.com/document/d/15bJ_jRsu0eFw_pUkwwD7B08Gs5whKW_ALm1J2qowRB8/edit#bookmark=id.4i7ojhp)0

[2.4.2. Sequence Diagram](https://docs.google.com/document/d/15bJ_jRsu0eFw_pUkwwD7B08Gs5whKW_ALm1J2qowRB8/edit#bookmark=id.1ci93xb) [1](https://docs.google.com/document/d/15bJ_jRsu0eFw_pUkwwD7B08Gs5whKW_ALm1J2qowRB8/edit#bookmark=id.1ci93xb)2

[2.4.3. Activity Diagram](https://docs.google.com/document/d/15bJ_jRsu0eFw_pUkwwD7B08Gs5whKW_ALm1J2qowRB8/edit#bookmark=id.3whwml4) [1](https://docs.google.com/document/d/15bJ_jRsu0eFw_pUkwwD7B08Gs5whKW_ALm1J2qowRB8/edit#bookmark=id.3whwml4)3

[2.4.4. Entity-Relationship Diagram](https://docs.google.com/document/d/15bJ_jRsu0eFw_pUkwwD7B08Gs5whKW_ALm1J2qowRB8/edit#bookmark=id.2bn6wsx) [1](https://docs.google.com/document/d/15bJ_jRsu0eFw_pUkwwD7B08Gs5whKW_ALm1J2qowRB8/edit#bookmark=id.2bn6wsx)4

[2.4.5. System Flow Diagram](https://docs.google.com/document/d/15bJ_jRsu0eFw_pUkwwD7B08Gs5whKW_ALm1J2qowRB8/edit#bookmark=id.3as4poj) 15

[3. System Design](https://docs.google.com/document/d/15bJ_jRsu0eFw_pUkwwD7B08Gs5whKW_ALm1J2qowRB8/edit#bookmark=id.1pxezwc) [1](https://docs.google.com/document/d/15bJ_jRsu0eFw_pUkwwD7B08Gs5whKW_ALm1J2qowRB8/edit#bookmark=id.1pxezwc)6

3.1. System Architecture 16

3.2. Module Design and Specification 16

[3.3.](https://docs.google.com/document/d/15bJ_jRsu0eFw_pUkwwD7B08Gs5whKW_ALm1J2qowRB8/edit#bookmark=id.1pxezwc) [Database Design](https://docs.google.com/document/d/15bJ_jRsu0eFw_pUkwwD7B08Gs5whKW_ALm1J2qowRB8/edit#bookmark=id.1hmsyys) 1[9](https://docs.google.com/document/d/15bJ_jRsu0eFw_pUkwwD7B08Gs5whKW_ALm1J2qowRB8/edit#bookmark=id.1hmsyys)

3.4[. Interface Design](https://docs.google.com/document/d/15bJ_jRsu0eFw_pUkwwD7B08Gs5whKW_ALm1J2qowRB8/edit#bookmark=id.2grqrue)2[1](https://docs.google.com/document/d/15bJ_jRsu0eFw_pUkwwD7B08Gs5whKW_ALm1J2qowRB8/edit#bookmark=id.2grqrue)

[4. Implementation](https://docs.google.com/document/d/15bJ_jRsu0eFw_pUkwwD7B08Gs5whKW_ALm1J2qowRB8/edit#bookmark=id.37m2jsg) 33

[4.1. Implementation Approaches](https://docs.google.com/document/d/15bJ_jRsu0eFw_pUkwwD7B08Gs5whKW_ALm1J2qowRB8/edit#bookmark=id.37m2jsg) 33

[4.2. Coding Standard](https://docs.google.com/document/d/15bJ_jRsu0eFw_pUkwwD7B08Gs5whKW_ALm1J2qowRB8/edit#bookmark=id.37m2jsg)s 33

[5. Testing](https://docs.google.com/document/d/15bJ_jRsu0eFw_pUkwwD7B08Gs5whKW_ALm1J2qowRB8/edit#bookmark=id.1egqt2p) 37

[5.1. Test](https://docs.google.com/document/d/15bJ_jRsu0eFw_pUkwwD7B08Gs5whKW_ALm1J2qowRB8/edit#bookmark=id.1egqt2p) Plan 37

5.2. Test Cases 37

[5.3. Testing Approaches](https://docs.google.com/document/d/15bJ_jRsu0eFw_pUkwwD7B08Gs5whKW_ALm1J2qowRB8/edit#bookmark=id.2dlolyb) 39

[6. Conclusion](https://docs.google.com/document/d/15bJ_jRsu0eFw_pUkwwD7B08Gs5whKW_ALm1J2qowRB8/edit#bookmark=id.1rvwp1q) 42

[6.1. Design and Implementation Issues](https://docs.google.com/document/d/15bJ_jRsu0eFw_pUkwwD7B08Gs5whKW_ALm1J2qowRB8/edit#bookmark=id.4bvk7pj) 43

[6.2. Advantages and Limitations](https://docs.google.com/document/d/15bJ_jRsu0eFw_pUkwwD7B08Gs5whKW_ALm1J2qowRB8/edit#bookmark=id.4bvk7pj) 43

6.2.[1.](https://docs.google.com/document/d/15bJ_jRsu0eFw_pUkwwD7B08Gs5whKW_ALm1J2qowRB8/edit#bookmark=id.4i7ojhp) Advantages 43

6.2.[2.](https://docs.google.com/document/d/15bJ_jRsu0eFw_pUkwwD7B08Gs5whKW_ALm1J2qowRB8/edit#bookmark=id.1ci93xb) Limitations 44

[6.3. Future Enhancement](https://docs.google.com/document/d/15bJ_jRsu0eFw_pUkwwD7B08Gs5whKW_ALm1J2qowRB8/edit#bookmark=id.4bvk7pj) 45

[References](https://docs.google.com/document/d/15bJ_jRsu0eFw_pUkwwD7B08Gs5whKW_ALm1J2qowRB8/edit#bookmark=id.2r0uhxc) 46

**LIST OF TABLES**

|  |  |  |
| --- | --- | --- |
| **TABLE NO.** | **TITLE** | **PAGE NO.** |
| 3.1. | Table 1 |  |
| 3.2. | Table 2 |  |
| 3.3. | Table 3 |  |
| 3.4. | Table 4 |  |
| 3.5. | … |  |
| 5.1. | Table n |  |

**LIST OF FIGURES**

| **FIGURE NO.** | **TITLE** | **PAGE NO.** |
| --- | --- | --- |
| 2.1. | Figure 1 |  |
| 2.2. | Figure 2 |  |
| 2.3. | Figure 3 |  |
| 2.4. | Figure 4 |  |
| 2.5. | … |  |
| 2.6. | Figure n |  |

**1. INTRODUCTION**

Healthcare IT domain is a fast and upcoming industry with the rise is healthcare infrastructure, the need for IT solutions to manage them is also increasing. There are over 10,000 applications related to healthcare of which around 40% are designed for healthcare professionals, which includes remote monitoring and healthcare management applications.

Companies in this industry design and publish software for use by health care providers, including hospitals, pharmacy and medical practices. There are many vast areas in healthcare where the new technologies are leading. The adoption of health IT software will allow for more effective cost control and better medication management.

Cerner Healthcare Solutions Pvt. Ltd. is the leading U.S. supplier of healthcare information technology solutions that optimize clinical and financial outcomes. Cerner Healthcare Solutions Pvt. Ltd solutions are currently licensed by approximately 9,300 facilities around the world, including more than 2,650 hospitals, 3,750 physician practices, 40,000 physicians, 500 ambulatory facilities, 800 home health facilities, 40 employer sites, and 1,600 retail pharmacies with such many solutions being present in the market.

The healthcare IT market is growing at a tremendous rate. The adoption of health IT software will allow for more effective cost control and better patient care, as well as improvements in employee productivity. Cerner Healthcare Solutions Pvt. Ltd is the leading U.S. supplier of healthcare information technology solutions that optimize clinical and financial outcomes.

Population health is one of the primary factor that decides nations development and wealth, so need of electronic health information management at hospital level is very crucial since paper based healthcare information management always leads to one or more medical errors in turn patient critical situations. Cerner had managed to maintain world largest Electronic Health Record System(EHRS), this system contain all the information that is required for the management of successful Health IT sector.

Cerner provides many IT solutions to various clients according to their specific needs. These solutions need to be managed and operated vigorously. The project titled “AMS Custom Reporting” is carried out at Cerner Healthcare Solutions Pvt. Limited” Bengaluru, and is aimed to do the same, i.e. provide the operational services and help to all the IT solutions provided by the company.

**1.1. PROJECT DESCRIPTION**

Improving the quality of life is one of the main benefits of integrating innovations into medicine. Health Information technology (HIT) is the application of information processing involving both computer hardware and software that deals with the storage, retrieval, sharing, and use of healthcare information, data, and knowledge for communication and decision making. HIT, technology represents computers and communications attributes that can be networked to build systems for moving health information.

Let's have a brief glimpse of the background of information technology in medicine. Worldwide use of computer technology in medicine began in the early 1950s with the rise of computers. Health informatics also called Health Information Systems is a discipline at the intersection of information science, computer science, and health care. It concerns the resources, devices, and methods required for optimizing the acquisition, storage, retrieval, and use of information in health and biomedicine.

Health IT is one of the important fields which is responsible for the care of the patients held by the physicians. Effective and efficient workflows in health IT can be beneficial for both the physicians and patients, where these can save their time as well as make the physician's role easy. There are different companies following different approaches, Cerner is one of the companies which has made significant efforts to increase the quality of care, reduce waste, and lower costs by developing efficient, effective solutions which are either used in multistate health systems and other one-doc practices.

Cerner recommended solution is an electronic restorative record with elements that are meant to figure crosswise over numerous facilities and divisions. It streamlines the work method brace oneself for clinicians onto one desktop stage, with an in-depth type of clinical and authoritative capacities. This could be a family of system solutions for a good assortment of health care suppliers.

Cerner deals with various kinds of client requests known as Service Request (SR). AMS Custom Reporting deals with these SR’s which are based on the reporting side of the requests and targets to accomplish the work that is desired by various clients in a timely manner. We use different tools and techniques to track down the status of the tickets and work so that there is no margin for error and confusion so that the solution and the changes can be delivered in the stipulated time.

**1.2. EXISTING SYSTEM**

In the past, there was no proper medium from which the engineers were able to track their work. The challenge encountered by the earlier systems was variation in the information retrieval and display format by the engineers and conflict happening to the assigned tickets. Some tried to keep a track of their work on excel and other mediums but the access will be restricted to them and a few other colleagues. Chances of being wrong are also there as no one else is there to validate the records.

Development of the desired system to overcome this drawback began nearly a few years ago. Yet no system can support the entire process. The existing systems have certain traits in common. First, they maintain the data related to tickets on their local device. Second, sometimes conflict may happen, multiple people will be working on the same ticket. Third, more prone to errors as there is no one to cross-verify all the records. Finally, lots of manual work is to be done to report or keep a track of everything.

An effective system was needed to be introduced so that they can surpass all the challenges mentioned above. In the current system, if a ticket is being assigned to an engineer or associate, then they will need to check their emails or any other collaborative software for the notification. During scrum meetings, it becomes very hard to keep a track of priority-based tickets or the tickets which are being pending for too long. The proposed system will not only save time and effort, but it will also help us to keep a track of everything in one place.

Some of the common issues encountered in the Existing System:

* Execution time: The time taken for the execution of a report is high apart from that it would require some supporting tools that involve load ahead times.
* Human errors: Manual errors made by humans while maintaining a record is always high. Also, errors can be caused by factors like negligence, untested modules, or no proper test case.
* Regression: Every engineer rolls out different versions of the report, each version will build some confusion.
* Repetitive tasks: When the code is updated or enhanced the testing team needs to run the workflows again.
* Conflict of work: Sometimes two or more engineers would be working on the same thing because of no central portal, which will lead to a conflict of work.

**1.3. OBJECTIVES**

* The main aim of the project is to streamline the ticket-related tasks and track the records or tickets assigned to engineers.
* Maintain the right information about the tickets available to all engineers and managers so that they can prioritize their work accordingly.
* Aims at increasing the efficiency, effectiveness, and reliability of the ticket’s information.
* Deals with solving and providing a personalized solution to the client in timely manner.
* The process to be seamless and error/confusion free so that it doesn’t affect the workflow.
* Moreover, informing the engineer’s about the necessary step or information to be taken on a particular ticket.

**1.4. PURPOSE, SCOPE, AND APPLICABILITY**

1.4.1. PURPOSE

When we look at the existing system, it is completely dealt with manual power. Manual power is nothing, but a predefined set of plans generated to check the enhancements performed on the tickets or to run through the workflows. The main aim of the project is to improve the efficiency and obtain the expected result with a minimum number of steps and in required time.

Engineers and Managers should know which engineer is working on which ticket, its progress, and the necessary step to be taken to complete or close the ticket. Tickets without change codes should be updated when an automated mail will be sent to the engineer’s and TSA’s email.

All the above-mentioned things should be regulated via a portal that will be accessible by all the employees so that no conflict of work can take place. This will help everyone to remain focused, work efficiently, and be well informed.

Hence, the purpose of the project is to have easy approach to solve and provide operational services to the clients of the company while overcoming the lapses of existing system which took more efforts and time due to the tools and techniques followed.

1.4.2. SCOPE

* The project aims to ease the records related to ticket information.
* Enable every assignee or engineer to go through all the records related to the ticket they will be working on.
* Display all previous activities done on a ticket by a previous engineer.
* Aims at introducing automation in ticket-related operations to ease the engineer’s workflow.
* Eliminates the time consumption in performing repetitive tasks.

1.4.3. APPLICABILITY

* Focus on what really matters: The main advantage of improvising the operational process is to help engineers/managers to focus on what really matters, that is while is observing the tickets progress and providing the right process and code at the right time.
* Client Support: Automating the workflows could be beneficial for the end-users who can understand the flow and use it accordingly based on their requirements.
* Smart Hospitals: The backbone of these facilities will improve the hospital’s way of dealing with its patients. Better and smart tracking facilities could lead to smart hospitals.
* Overall IT Solution Satisfaction: If we are able to achieve all that is mentioned we are indirectly satisfying the client base with the IT solutions that are provided by the company.

**1.5. OVERVIEW OF THE REPORT**

The report provides an idea about the impact of patient information analysis in health care followed by applying them to the solution-oriented software. The flow includes the requirements to set up the software for easing all the processes related to hospital-like registration, discharge-related, pharmacy-related, specimen-related, insurance, or billing-related processes carried out by the medical staff. Storing, retrieval, and visualization of the patient record, focusing on the right information and tracking necessary details of the patient to provide better healthcare. This helps in maintaining all the tickets which further helps the clients to run their organization smoothly.

**2. SYSTEM ANALYSIS AND REQUIREMENT**

The section explains the characteristics of the users who use the software followed by the basic requirements to run the software. The purpose of the system requirements analysis is to structure the system independently of any implementation environment. This phase can determine system behavior and limitations. The system requirements analysis activity represents the second major development phase of the overall process.

**2.1. PROBLEM DEFINITION**

To develop the system which enables ticket owners to create a new ticket for an assignee and further manager assigns that ticket to an engineer. Clients are also associated with the ticket. In case of any doubt like the requirement is not clear or engineers need a few more examples related to the ticket, an engineer can reach out to clients for the same. All the information will be saved and tracked through this dashboard related to that particular ticket. An engineer may work on 1 or more tickets simultaneously by prioritizing the work.

The dashboard must pass all the test cases which are carried out in a real-life scenario when performing the ticket assignment process and the initial assessment. Necessary validations must be performed while storing the data in the database. Test cases should cover all the valid situations as well as the negative scenarios.

**2.2. REQUIREMENT SPECIFICATION**

2.2.1. FUNCTIONAL REQUIREMENTS

Functions available in the system are grouped under -

1. **Authentication**
   1. Credentials: Users can access this dashboard using their organization credentials using Lightweight Directory Access Protocol (LDAP).
   2. Rule check: Employees have certain permissions and rules to follow.
2. **Ticket Details**
   1. Ticket Information: Information related to ticket like - ticket number, requirement, client details, ticket priority, description of activity/operation done on the ticket, and so on.
   2. Kanban Status: Ticket is in which phase - Scoping, Coding, Revision, Non-prod validation, and so on.
   3. Activity: Which user is performing which activity on the ticket. All operations on the ticket will be stored here.
   4. Setting the Closing Date: An engineer must set the closing date, which means till which date he or she would be able to complete the assigned task.
   5. Workflows: The engineer should submit the workflow of the work he/she has done, so the client won’t be facing any problems when trying out the required code.
3. **Change Code Tracker**

Tickets without change code: Engineers must update the tickets assigned to them according to the change required. After doing this, he/she must update the change code of the ticket which will let others know that some change has been done on a particular ticket. Change on a ticket can be an addition or a manipulation.

1. **Search Existing Records**

Existing Record: If an engineer wants to look at a particular ticket for help or maybe for consulting, he/she can do it by entering the ticket number on the search bar. All the necessary information related to that ticket will be displayed on the screen.

2.2.2. NON-FUNCTIONAL REQUIREMENTS

* Validation: All the processes must be validated strictly against the permissible authority.
* Security: Dashboard will be only available within an intranet that is within an organization.
* The flexible architecture will be highly desirable for future modifications of the software.
* Ease of maintenance and adaptability due to the use of the referenceable module
* The modules should be well documented with a proper description for ease of maintenance and upgrading of the system in the future.

**2.3. SYSTEM REQUIREMENTS**

2.3.1. USER CHARACTERISTICS

There are mainly three types of users participating in the network at any given point in time. The users who are responsible for creating a new ticket for the assignee. The manager will assign that ticket to an engineer. An engineer who will code according to the requirement for the tickets. Clients are also associated with the ticket. In case of any doubt like the requirement is not clear or engineers need a few more examples related to the ticket, an engineer can reach out to clients for the same.

2.3.2. SOFTWARE AND HARDWARE REQUIREMENTS

**I. Software Requirements**

* Programming Language – HTML, PHP, CSS, JS, Bootstrap
* Version – 7.2
* Database – MySQL
* IDE – Visual Studio
* Operating System – Windows 10
* Version Controlling System – Git
* Code documentation – Jiraa

**II. Hardware Requirements**

* Desktop - Cloud Machine
* Processor - Intel®Xeon®ProcessorE5540 (8M Cache, 2.53 GHz, 5.86 GT/s Intel® QPI)
* Main Memory - 4.0 GB

2.3.3. CONSTRAINTS

To use the dashboard, adequate application knowledge and organizational personnel are required who should be familiar with integrating different aspects of various clinical processes and the workflow of those processes. Knowledge of these processes and working Employees should be authorized to perform the necessary actions using this dashboard.

* The web browser is required. Chrome version 48 or higher, Firefox 34 or higher, or IE9 or higher.
* Active internet connection.
* Requirements from the client-side.
* Knowing the basic operations of US Healthcare
* A code should satisfy all the criteria as per the client requirement and coding standards.

Some of the constraints are as follows:

* Design Constraints

1. Standard Compliance
2. The system is designed to handle invalid inputs to ensure reliability
   1. Ensuring network portability

* Hardware Limitations

1. Pentium Processor
2. Memory should not be less than 2 GB of memory.