GROUP PROJECT
ON
BIOMETRIC EMR AUTOMATION

Submitted by

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1. Description

Many individuals die because of inadequate care. Many technologies have been invented and are constantly being developed to protect and prolong human life. In rare situations, a patient may be required to undergo a check-up at a hospital other than his or her primary care facility. They should have access to medical history because they are not trained medical experts, most people are unable to retain the proper names of the medications they take. The protection of patients' medical information is becoming an increasingly pressing concern as more advanced forms of technology are incorporated into traditionally practiced medical procedures. It is becoming more common practice for medical professionals to make changes to and review a patient's record on a tablet PC as electronic medical records become more widespread in the healthcare business. An Electronic Health Record (EHR) can be accessed through the internet and through cloud services, where a person's medical data is stored. Although data can be accessed anywhere by patients and doctors, data privacy has emerged as a top concern for patients.

To preserve the patient's privacy, as mandated by US federal requirements, a secure authentication method must be utilized to access patient information. Biometric access can provide the required security and will be the best solution to protect patient data. Information is vulnerable to exchange, theft, loss, forgery, typos, and duplication. However, biometric identification like a fingerprint or palm recognition is unique to a particular person. Due to this, it is more conducive to:

- Use in emergency treatments
- Accurate and up-to-date information at the point of service
- Highly coordinated and effective care
- Secure patient data sharing among physicians
- Safer prescribing practices
- Eliminate identification fraud at the end of care
- Simplify initial registration procedures.

The managers of patient data are often the treating physicians themselves. During the whole patient registration procedure, the doctor will make room in the cloud or on a server for the patient's information, and they will employ biometric sign-in to validate the patient's identity. Using patient biometric authentication, the patient's information is only accessible to the doctor who has been authorized to see it. When the patient checks out of the hospital or ceases getting treatment, the doctor's access to the patient's medical records will be revoked; at this time, the

patient will also be required to log out of the system. If the patient returns to the hospital after a period, he will be required to check in once again and provide permission for a doctor to see his information.

Establishing a relationship with the patient is the cornerstone of effective therapy. According to the findings of several studies, incorrect identification is one of the key factors that contribute to adverse surgical results and blood transfusion errors, both of which may have negative repercussions for patients. The use of biometrics to identify patients may help eliminate problems such as incorrect patient identification during blood analysis and wrong diagnostic results. The patient's biometric information is collected over the course of the different medical exams that are performed, and this information is then compared to the database that was previously registered for the patient.

Wearable devices, health records, and cloud services all need to have additional security measures implemented in order to protect the sensitive data included inside electronic health records (EHRs). Wearable technology may link to a patient's mobile device or a hospital server via the use of Wi-Fi, Bluetooth, or Near Field Communication (NFC). In order to ensure that only authorized employees can access the devices, biometric authentication will be used. Furthermore, all data transfers will be encrypted. Using the bio-login method, access to the patient's electronic health record or the cloud where the data is kept will be restricted to just the patient and the treating physician. When a doctor requires access to a patient's data, the system may be set up such that the admin has to request biometric identification from the patient. This can be done every time the doctor needs access to the data.

Electronic Health Record: A longitudinal electronic record of patient health information generated by one or more encounters in any care delivery setting. Included in this information are patient demographics, progress notes, problems, medications, vital signs, past medical history, immunizations, laboratory data, and radiology reports. The EHR automates and streamlines the clinician’s workflow. The EHR has the ability to generate a complete record of a clinical patient encounter – as well as supporting other care-related activities directly or indirectly via interface – including evidence-based decision support, quality management, and outcomes reporting.

2. Work Breakdown Structure

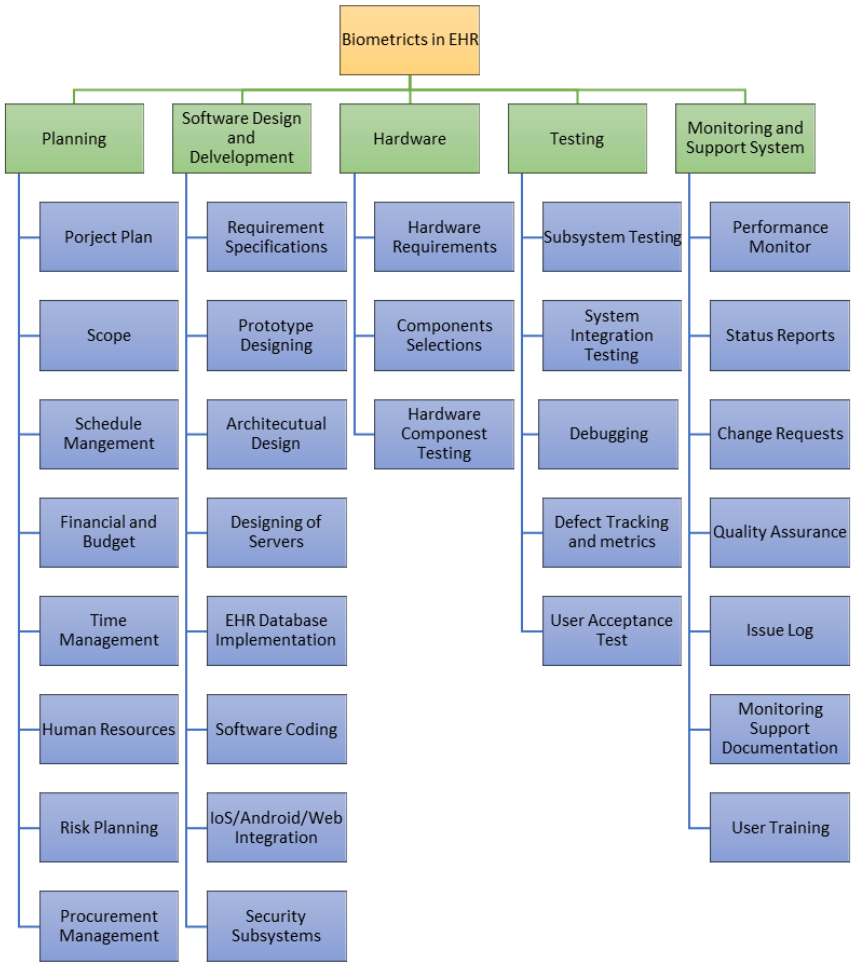


Figure 2- WBS

Work Breakdown Structure
1 Biometric EHR Automation Project
1.1 Planning
1.1.1 Project Plan
1.1.2 Scope
1.1.3 Schedule Management
1.1.4 Financial and Budget
1.1.5 Time Management
1.1.6 Human Resources
1.1.7 Risk Planning
1.1.8 Procurement Management
1.2 Software Design and Development
1.2.1 Requirement Specifications
1.2.2 Prototype Designing
1.2.3 Architectural Design
1.2.4 Design of Servers

1.2.5 EHR Database Implementation
1.2.6 Software Coding
1.2.7 Web/iOS/Android Integration
1.2.8 Security Subsystems
1.3 Hardware
1.3.1 Hardware Specifications
1.3.2 Components Selections
1.3.3 Hardware Component Testing
1.4 Testing
1.4.1 Subsystem Testing
1.4.2 System Integration Testing
1.4.3 Debugging
1.4.4 Defect Tracking and Metrics
1.4.5 User Acceptance Test
1.5 Monitoring and Support System **1.5.1 Performance Monitor**
1.5.2 Status Reports
1.5.3 Change Requests
1.5.4 Quality Assurance
1.5.5 Issue Log
1.5.6 Monitoring Support Documentation
1.5.7 User Training

Table 2- WBS Steps

3. Procurement Management

It is the responsibility of our project manager and the team members to contact the organization's contracting specialist to create the SOW (statement of work), and all the other essential documents that should be run for bidder conferences. Before selecting a bidder, it would be quite easily done to track and monitor all the essential requirements if we had a matrix with the list of necessary items to procure. Also, the list includes the procurement type either COTS/MAJOR/MINOR based on the subject line and the availability/risks that imply to get the necessary item. A purchase order has been initiated which possesses all the information regarding quality, type of supplies, and services we get from them from our selected vendors. All the routine buys that are required for the project include office supplies, infrastructural needs and more. The purchase order includes a set of information regarding the item's specification, product description and the quantity of items that we potentially need. Below is our procurement matrix (attached excel) with the list of items and a brief explanation of the required items we procure.

3.1 Items to procure:

Cloud-based System: Communication and collaboration internally is crucial, and most organizations, specifically healthcare, lack. To avoid the consequences of internal dealings/misconduct within the organization, doctors are relying on a system that could get them diverse information all about the patients which is easily accessible anywhere, anytime. This way doctors would directly connect with their patients, provide extensive information, and could build a predominant relationship.

Physical hosted System: These facilities provide the organizations(healthcare) to get extensive records and can be able to monitor the patients with ease. These servers could have a capacity load and to build these hosting systems there is a need for ensuring bandwidth and certain measures like security, adequate storage and more.

Automated Billing System: Within the organization, there are different units with a specific set of patient information. An enhanced automated billing system could help them trigger complex accounting measures and could minor their busy activities that are internal to the system. An electronic bill would be comparatively easy to access and the ability to generate automated texts to patient's gadgets. For example, a virtual bill is generated and sent to the patient's inbox (could be via email, text).

An Integrated Dashboard application: An integrated dashboard application is something which could pull the patient's information in this scenario, with extreme efficiency and quickly. Most of the store information is sensitive, and the ability to pull the proper information is a major need. Features should include efficiency, quick responses, user-friendly and sensitive information related to patients should be only within the organization (restricted public access).

Digital Record Protection System: Need for an electronic storage medium which could hold all the crucial information related to organizational policies, emergency policies, organizational activity records, and patient records. Security is a major necessity and there's always room for improvement. Looking for a record protection system which could have storage capacity and could preserve all sensitive information.

Procurement matrix:

Please find procurement matrix in the attached excel (additional attachment).

3.2 Make/Buy Analysis

Here, before we decide to create or buy, it is completely entrusted to our project leader, who is responsible for planning, organizing, and directing activities while also ensuring that tasks are performed in line with the milestones plan. Here, before we decide to make or purchase it. It has been decided that it is of the highest necessity for the multidisciplinary team that is taking part in the process to fulfill the important milestone dates on time, and this has been of the utmost importance (Ruben et.al, 2018).

Based on the firm's strategic position, we will be conducting an evaluation to determine the materials required for the project and decision making towards outsourcing. In the matrix below we will be looking at some required considerations and takeaways before deciding. Decision-Making is based on the learnings from past lessons/stakeholder theory where there are decent chances of re-iterating things in future events. Building a matrix could possibly help the team to rely on an action plan whether to make or buy, after reviewing the requirement analysis set.

Looking at the takeaways and overcoming all the possible roadblocks, it would be better to buy the software licenses and additional services that are required for doctors. The doctors(client) need a system which could automate all the processes that are required during emergency situations and to analyze the patient records. An automated billing system should also be produced by the end of the contract. Also, the terms and conditions can be negotiated later between the buyer and the seller.

Description	Considerations	Make	Buy	Takeaways
Materials	Total resources needed	It could be expensive to build certain things in-house. Like a physical hosted system for monitoring patients.	Minimal costs required since we got additional support from vendors.	Decision could impact in the long run. Measure the viable things and confront from risk plan and other necessary actions if needed.

Overall products/services/leases	Total costs that are needed to develop	Costs that incur while we make can be relatively high in most instances. Marketing conditions/price could also affect the project in the long run.	Time is a crucial factor, and we could decide what to buy if the project duration is less and vendor offers a better deal.	Possibilities that we can spend less down the road, if we buy. Note- Decision could impact if the project lasts longer than expected/large complex project.
Required support	Overall support needed including training / evaluation of products.	Though they can be minimal if they have required manpower/resources to build, but still there would be some potential problems, that might arise because of employee expertise/lack of equipment handling experiences.	Provided by the vendor. Very minimal work for the organization.	Can rely on additional support, and purchasing could really benefit the organizations and allows the workers to keep track of other necessary deliverables.

Maintenance needs	Fulfilling all maintenance needs that are necessary for the Biometric authentication	Electronic resource management could really bother the employees, if they are from a different background. Instead, they could do that is essential for the project and leaving the headache to others (additional support).	Since maintenance can be handled by a vendor, all the additional integrations/requirements can be fulfilled based on the contract terms and conditions.	Maintenance could be really crucial during the stages and providing lateral support could really benefit the process and wouldn't be a burden for the organization every now and then.
Objectives fulfillment	Needs/specifications for an item	Role is to check/inquiry during the stages for product fulfillment and checking for utmost perfection.	Can be very minimal load to employees in the organization. Contractors can check for necessities and will act accordingly	Can imply to contractor since all the agreed work/products can be delivered in a timely manner.

Table 3.2- Make/Buy Matrix

3.2.1 Make/Buy Decision

As a result of our considerations, our make or buy analysis, and the takeaways, we decided that it would be best to purchase the collection of systems that the end-user requires. After doing a thorough investigation, we concluded that in order to acquire these systems, we would want further assistance owing to a lack of experience as well as time restrictions. We made the decision to buy the necessary items from a certain vendor rather than investing the hours or effort necessary to produce them in-house.

3.3 Request for Proposal

Along with the information that is needed from the sellers on how the goods and services are going to be offered, how good the quality is, and how will they charge/satisfy their needs, there is other thing that we will be evaluating during the earlier stages is the request for proposal documents. Though these bid documents help solicit the proposals, there are numerous things to be reviewed carefully before we award the contract. The specifications set must be clear, all the price/price negotiations must be determined, the ability to manufacture in a timely manner, and reviewing the seller's previous successful accomplishments is our primary watch.

The essential need comes into picture when the drafting and issuing of the proposals phase has started. There are certain requirements that have to be taken care of when sending out accurate information. After looking at the suppliers past achievements, we decided to purchase multiple items from Supplier X. Along with the medical record system and other essential systems, the requirements/actual specifications/performance and all other vital information for those multiple items we wish to purchase will be included in the procurement statement of work (review section 3.3).

Please find the EHR RFP below

3.3.1 Electronic Health Record Request for proposal

Selection Process for the EHR
Company Name: Healthcare X Organization

Date: 12-12-2022

Re: Request for proposal for Electronic Health Record

Due Date for response: 12-01-2023

To: Appropriate Sellers

From:

Primary Contact Name: Aditya Chilukuri
Address: Garden Street, Washington, IL-62005
Email: pchiluk@siue.edu

Electronic Reponses are accepted
Table of Contents

1. Additional requirements/Desired Fulfillments needed for responding to this RFP

- **Seller Information**
- **Bidder Eligibility**
- **Addressing qualifications**
- **Providing Standards**
- **Recent Milestones**
- **Technical skills**
- **Experience in Industry**

2. Evaluation Metrics and criteria

- **All potential delivery updates**
- **Constant communication**
- **Additional services if required**
- **Close Monitoring**
- **Flexibility to attend meetings with leadership team.**

3. Price Proposal

- **Include all possible offers (can be sent electronically)**
- **Paper copies needed for taxation.**

Figure 3.3.1- RFP for Electronic Medical Record

3.4 Statement of Work

To create the procurement document, the initial document we require is the statement of work.

Current date: 12-12-2022

Project duration: 9 months

Project Manager: Manager X

Client: Client

3.4.1 Project Introduction

Misinterpreted patient identification during blood analysis and incorrect diagnostic conclusions are two examples of the kinds of errors that may be mitigated by using biometrics to verify patient's identities. Patient biometric authentication ensures that only the authorized doctor gets access to sensitive patient data. Hereby we elude that there are such wearable devices, health records, and cloud services that all need to be secured to protect the information contained in the Health Records.

3.4.2 Purpose Statement

Access to electronic medical records in a timely manner and the reliability of cost data assigned to consumable goods and the time spent by support staff are the primary concerns. The firm has brought in additional support staff to help with the increased volume of work. The added staff hasn't helped much in easing the strain on the rest of the team or the processes themselves. To tone in our enthusiasm, we may do a comprehensive evaluation of all the options that could aid the organization's anxieties.

All too often, misidentification is to blame for adverse surgical results and blood transfusion errors. Mistakes in patient identification caused by things like blood analysis may be mitigated by using biometrics. The patient and the doctor will be the only ones with access to the cloud or electronic health record.

3.4.3 Scope of Work

The client requests a user-authenticated, role-based patient dashboard that can be customized for each user. In addition to staying under the set budget, the project timeline should take no more than a year to complete. The customer also requests that their biometric information be used to more precisely charge for medical equipment and supplies, as well as for the billable time of hospital staff. Refer table-3.4.6 for our requirement list and desired objectives that we need for this project.

3.4.4 Tasks & Milestones Breakdown

- Ability to retrieve patient information
- Rapid access to data in case of emergencies
- A system that could match the patient information for identification/treatment purposes.
- A system that could all the patient's previous records with ease

3.4.5 Payment Information

The price that is required to complete the work on time by following all the constraints, this can be by schedule/by deliverables. The client has a total budget of $730,000 for this project, not to be exceeded. Overall spendings should be within the constraints, and the deliverables must be completed within the budget. In the table below, we list the aggregate price for all the estimates.

Deliverable	Price
Cloud-Based System	$190,000
Automated Billing System	$180,000
Physical Hosted System	$130,000
Digital Record Protection System	$120,000
Dashboard Platform	$110,000

Table 3.4.5- Items Price Listing

3.4.6 Requirement List

Compiling a list of all the item details, the scope of the job, and the performance requirements for all the essentials Accurate planning and performance metrics must be shown, and the company expects the sellers to showcase genuineness and meet the criteria that have been set.

ITEM	SCOPE OF WORK	DESCRIPTION	REQUIREMENT/PERFORMANCE STANDARS
Aws cloud-based system	Required a could oriented security platform which can be reliable to information storage/security	A system to handle internal changes, communications, and a flexible path that can store all such diverse patient information.	• Utmost security • Multi-Authentication • Refined platform • User friendly
Automated Billing System	Require an enhanced automated billing system for faster information transfer within the organization	An automated billing system is something that can avoid last moment accounting glitches and financial misinterpretations.	• Fast billing system • Avoid misinterpretations • User friendly • Recursive platform • Needing inbuilt invoice system
Physical Hosted System	Need for a physical system, which can monitor all patient activities.	Potentially useful to monitor patients during complex situations like busy days, employee shortage and other	• Active monitoring • Accurate monitor clips • 24/7 support assistance in case of any emergencies.
Digital Record Protection System	Need an active patient record system which can store/save all the important patient files.	An enhanced data protection system can be essential for industries like healthcare to ensure their customers. Trust can play a crucial role when it comes to data protection and providing such services to our customers is beneficial. Also, such instances can improve an organizational reputation along with some additional perks like mutual relationships.	• Active monitoring • Advanced data storage devices • Secured data sharing • Ability to retrieve data • Secure from data breaches • Wide access within the organization • Alert notifications

Secured System to pull data from dashboards	An active user-friendly dashboard to review patient information.	A system which could be useful to compare/access all the patient information. A dashboard where we see all their records.	• Fast reaction rates • Automated registration forms • User friendly system

Table 3.4.6- Requirement list

3.4.7 Additional Project Requirements

An automatic billing system may be implemented to the accounting department of the organization by choosing and customizing an invoice template, creating regular invoicing periods, and selecting preferred client payment methods. We may delay bringing this up until later stages, which will allow us to avoid the potential effect it will have during the earlier stages of the project.

3.4.8 Project Closure

Project closure will be conducted by following all the disciplinary actions that could prevent the voids in-between. The necessary steps/deliverables that we are targeting are

- Restraining the excessive project costs and making sure that they don't exceed $730,000 which are actually allocated.
- Weekly reports to the project manager without delay.
- Hit the milestones and inform status reports in a timely manner.
- Complete all the tasks on time, exactly twelve months needed.
- Can conduct closure after mutual agreement and upon completion of work.

3.5 Procurement Lead time

Please find the figure below

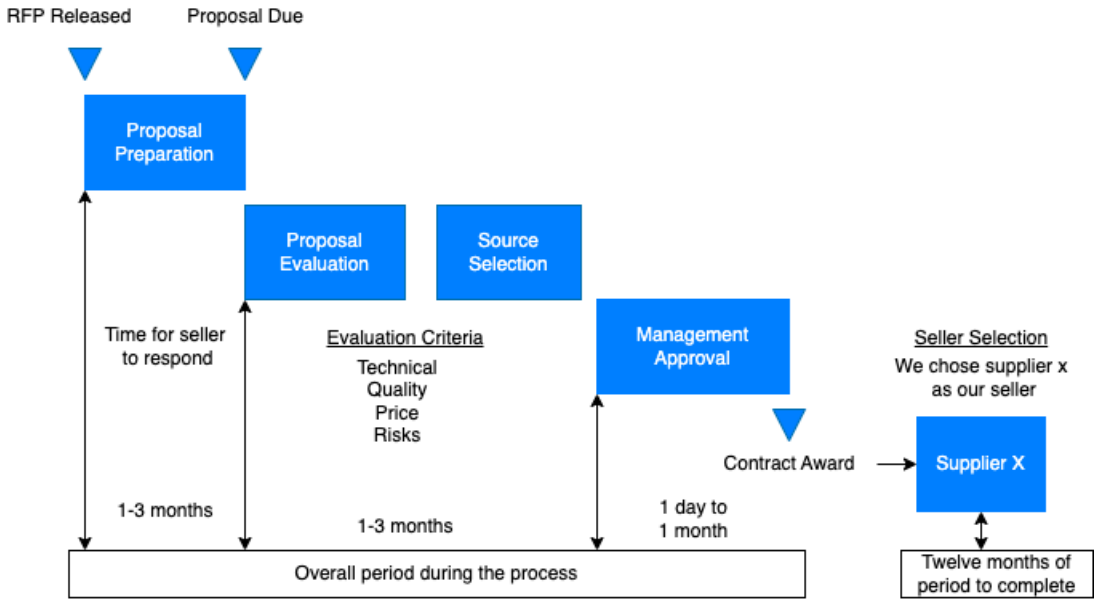


Figure 3.5- Procurement Lead time (Source: Copyright 2022 – David R. Hunter, PMP)

A keen analysis was performed along with the procurement lead times to solicit the process, and thus we decided based on a successful evaluation criteria checklist. After evaluating the proposal documents, and going through the procurement lead times validation stages, we chose Supplier X as our seller for this project.

4. Contract Management

4.1 Selection of Contract Type

Ideally, we choose a contract that fits our needs perfectly. A cost-reimbursement contract is preferable in our situation because we lack the information and minor details that are exactly needed to build the systems, and additionally it provides the contractor with an incentive to minimize production costs. It allows the contractor to factor in savings from more efficient buying or faster project completion into his final payment. The contract lays out the expected expenditure, the contractor's base salary, the mechanism for calculating the incentive bonus, and the minimum and maximum compensation levels. Factors like mutual benefit, multi-functional procurement team, contract risks are included in the organization's terms and conditions/policies (Figure-4).

Expenses are a part of the compensation structure in a cost-plus incentive fee contract. Our main objective is to keep the total cost of the project below the point at which significant adjustments are made and when an additional expenditure is incurred. Under a cost-plus

incentive fee contract, our contractor can be paid an additional incentive fee based on the amount of money or time saved by completing the project early.

There are discrete levels of planning and initiation to be taken care of because of the increased complexity. To overcome these complexities, along with the associated share ratios, an additional incentive is to be provided to the contractor.

Guidelines for Contact Selection	Contractor Evaluation	Cost Price Analysis	Terms/Conditions
Multi-functional Procurement Team	• It is the responsibility of the project manager to make use of multi-functional procurement teams like contracts, legal and finance units for decisions.	• Suggestions for possible rework • Sellers submitting detailed cost estimates beforehand can be reviewed by the multi-functional team	• Frequent communications within the leadership team/primary stakeholders. • Imply to ability/delivering all the necessary information in a timely manner. • Negotiations can be handled (certainly by professionals within)
Calculating mutual benefits	• Estimates are sometimes crucial and weighing the mutual interests and benefits of both the parties is essential	• Ensuring breakdown features and focuses primarily on expensive features	• Both the parties should be agreed upon some internal changes/organizational policies • Incentives are purely based upon the additional savings. Along with the actual costs incurred, 25% of the money from the savings goes to the seller if completed within the budget.
Contract Merits for CPIF	• Can avoid last moment rushes and problems	• Accepting the business	• Agreed upon deliverables

	related to EMR system selection. • Choices can be flexible, since the end user is looking for an automated enhanced system will have all the prime benefits. • Can avoid major changes in requirements, since in CPIF we don't have a suggested solution because of their indefinite scope (just needed a system that fulfills all the requirements).	needs/courtesies. • Conflict of Interest (COI) must be noted. • Annual certifications • Agreed upon tasks/equal priorities to all such crucial activities.	• Ability to handle the internal changes • Ability to provide a reliable system for the end-user • Functioning of these systems should be purely legitimate and frequent communications should be made with the buyer (in case of a tough choice) • EHR (Electronic Health Record) policies should be strictly followed, since end-user safety and trust are utmost priorities.
Detailed specifications	• Before the start of evaluation, there should be detailed specifications set, which can be useful	• Detailed cost estimates • CPIF contract, providing more information	• Keen analysis of project risks before starting the contract process • Make use of SME's and inform the leadership team/primary

	while the contract actual phase has been set.	for comparison and evaluation	stakeholders for every successful completion of a task. This could help the project manager/organization(buyer) to deliver the spontaneity to the end user(doctors).

Table-4. Contract Selection Process

A cost benefit analysis has been made and a net year savings have been calculated. There can be seen that the hospital(end-user) will be around $200,000 (accounted from source document-CMIS-540 project document). This would let the end-user adapt to the system and would allow them to enhance the most out of these systems. All the reliable initial investments made should be legitimate such that there would be no consequences and can flow into smooth transition. This might help us build a decent relationship with the end-user throughout the process.

4.2 Contract Background and Identification

The main objective of this contract is to complete the work order process within the budget in hand i.e., $730,000. End-user's prime requirement/subject line cannot be altered due to certain circumstances that rely on healthcare organizational liabilities/policies. All the necessities are prime deliverables are to be reviewed from requirements list (Table-3.3.6).

Contractor name	Supplier X
Contract number	+1 (618) 618 6180
Current period of performance	Less than a year
Current contract value	$730,000
Contract type	Cost Plus Incentive Fee Contract
Contractor information	Contractors will receive an incentive fee if completed within the budget. Will receive 20% from the actual savings.

Table 4.2 Contract Identification Information

4.3 Contract development Processes

The statement of work regulations (SOW), T&C's, schedules/milestones are strictly followed in this section. Each contract deliverable must have a scheduled date in the contract. Contract Management plan hereby provided includes a detailed set of management plan that sent internally/externally within the organization(buyer/seller).

- Continuous monitoring of seller performance
- Including traditional performance tracking
- Hours spend/Money invested matrix
- Earned value management

4.3.2 Lead Times for Contract deliverables:

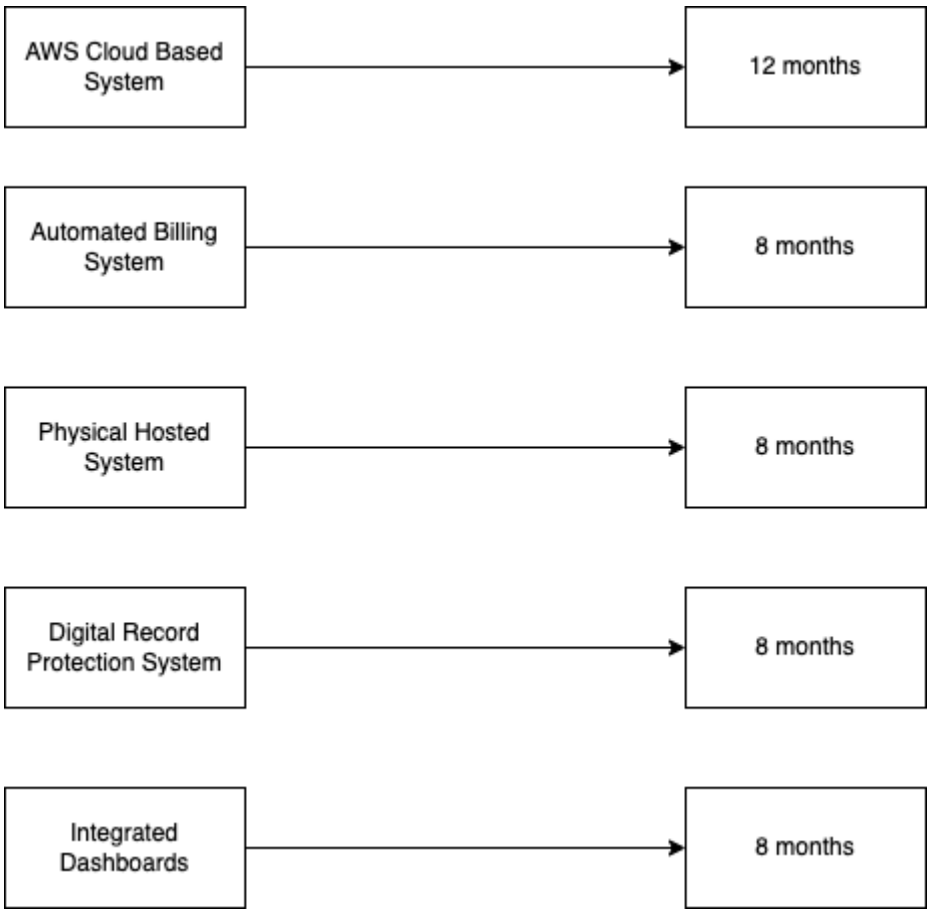


Figure- 4.3.2 Lead Times

4.4 Contract Administration

In our contract administration process, we will be looking into administration process stages for prime deliverables, updates from documentation, planning and design and other deliverables that are addressed below (Refer Figure 4.4, Table 4.4)

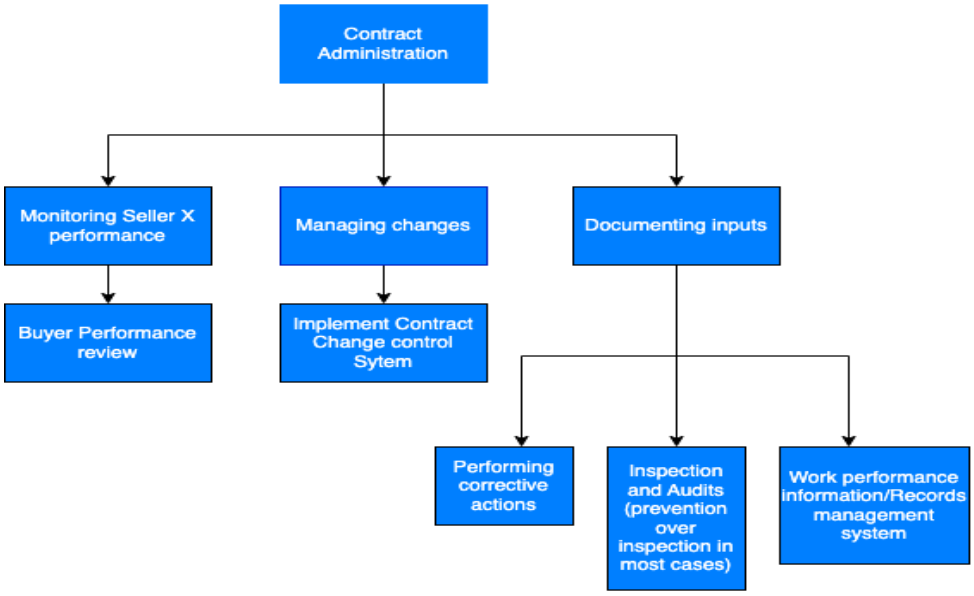


Figure 4.4 - Contract Administration Process Steps (Source: Copyright 2022 – David R. Hunter, PMP)

Documenting the tasks/necessities that we need to monitor and look for any changes throughout the process steps. Our prime goal is to associate/monitor all the activities to keep the project on track and handle any potential troubles caused within and outside the process stages.

Documenting Inputs	Monitoring Seller Performance	Managing Changes
Reviewing information records in early stages of the contract. Includes: • Automated records list • Checklists of most recent • Application Documentation	Performance Review • Early progress reports review (reviewing the latest documents and updated lessons on system delivery and patient data for monitoring abilities in earlier stages)	Ability to manage all the changes based to the seller's baseline • Project outcomes and their changes if needed (review the progress of end-user's primary need first). Changes could impact the outcome if

	• Continuous monitoring	not monitored at an appropriate stage. • Activity logs/issue logs updates
Thorough analysis must be done initially and integration steps to be evaluated if necessary • Project boundaries review • Deliverable updated documentation review in the initial stages of the contract.	Balancing all the subcontractor's deliverable performance. • Asking for working software applications update. • Subsequent interaction (Administration department would allow one of our core members to interact with seller to track/monitor) • Develop relationship (mutual understanding)	Claims administration should be taken care of. • Updated procurement management plan • Corrective actions
Document important list for end-user satisfaction, which is done internally. • Managing patient data is our key (initial performance recheck and review) • Constant evaluation by our expert	Reasonable measures to review the seller agreements • Review seller responses/agreements document (Action updated required) • Review integrated change control process if required (in case of change requests)	Changes in cost baseline if necessary • Changes that took place with costs/costs associated with procurement process and sellers (Seller X).

Ensuring the marketplace conditions and relying on buying organizations code of ethics. • Buyer's review (check for any missed lessons learned), as we need to document those to the lessons learned repository). In our case it is important to do so, because end-users' expectations are high, and we are not ready to accept any misinterpretations.	Document and review the detailed information of the physical and financial performance • Includes refinement of procurement plans and schedules if necessary	Approved change requests • Payment system (Updated project management plan) after sustainable changes that occurred.

Figure 4.4 Contract Administration Process

4.5 Contract Closure

We focus most of our attention in the contract closure section on finding all the activities that have been completed according to the desired quality, which is something that we look for in the quality section, and then we move on to the capabilities that are likely to be unaffected by the risk management process.

Our checklist includes:

- Upon seller delivery (timely updates, following deadlines)
- Product/System verification
- Performance capabilities
- Updated documents (information related to deliverables/accomplished milestones)
- No additional constructive changes determine the project completion
- Documented lessons (include add-ons, and any specific system’s performance details).

5. Quality Management Plan

5.1 Purpose

A Quality Management Plan ensures that a quality product is delivered to the client in accordance with the contract information/requirements and procurement items of the Biometric EMR automation project that fulfills the client's requirements. This plan ensures the quality of the whole system and steps to ensure it with the testing process. The quality process is illustrated with a simple flowchart to understand the workflow. The purpose of the plan is to establish the deliverables, roles and responsibilities to produce an effective quality management plan. The plan also included the major deliverables with the acceptance standards/criteria throughout the project.

5.2 Revision History

Revision Date	Author(s)	System / Version	Approved by	Memo/Notes
11/20/2021	xxxxxx	0.1	yyyyyyy	
12/01/2021	******	0.2	xxxxxxx	
12/08/2021	xxxxxxx	0.3	yyyyyyy	

Table 5.1- Revision History

5.3 Quality Procedures, guidelines, and related policies:

Quality related policies, procedures and guidelines help us to set quality standards and ensure that those set standards are achieved. They also make sure that the quality is maintained and if there is any way or need to improve the quality. The following are some of the quality related policies, procedures and guidelines that will be applied to achieve the quality objectives

Stringent security standards: The stringent security standards of the project ensure that the safety and security quality objective is achieved by guaranteeing that the system can keep the digital medical records safe and secure.

Multiple levels of testing: Testing is done throughout the process to all the deliverables to make sure that they satisfy the quality standards and the medical records kept can be accessed anytime by the right people with ease accurately.

- Continuous process development: We believe in continuous process development as the world is everchanging and the process has to be changed accordingly to accommodate the new trends. It ensures that the system is relevant to that point of time and it is usable.
- Client satisfaction: This quality policy ensures that the quality is as per the client’s requirement and need. It makes certain that the client is satisfied. Client satisfaction plays a vital role in the success of the project.

- Compliance: Compliance to the industries rules and regulations assures that the system is reliable and legitimate to use. It also helps in contract management and document procedures.
- Sourcing: The quality of the end product depends on the quality of inputs put into the process of production. Hence it is important to make sure that the sourcing of the requirements is done correctly from sources that are trustworthy and reliable.

5.4 Quality Policy Statement

Our project is committed to providing a system that our clients can use to migrate, store and access their digital medical records which is protected with biometric access technology for safety and security purposes.

We aim to solve the problems arising from the lack of availability of medical data which is needed to make vital decisions by the clients and the medical professionals. The project stives to provide an affordable, efficient and effective system through continuous process improvements.

In order to achieve this aim it is our policy to maintain an effective Quality Management System based on the requirements of the ISO 9000 Standards & Guidelines and incorporating parts of other globally recognized systems.

We are committed to continuously reviewing and improving the quality system to ensure its success in helping achieve our objectives, which are themselves reviewed to ensure consistency with the policy.

5.5 Quality Objectives

The quality objectives for this project are:

Reliability: The customers should be able to trust the product to store and use their medical data when necessary. So it is important to make sure that the system is free of bugs at every step of the process. To ensure that the system is free of faults we have quality checks.

Accuracy: Our product is used to store and access medical data which is a vital part of health care services. The medical data is then used to make important decisions related to the health and treatment of the clients. Hence it is important to make sure that all the medical records are accurate and up to date.

Timeliness: Medical records should be available at any time to the clients and the health care providers in an instance as they may be used in emergencies. A good quality system should ensure that the medical records are available with no delay.

Accessibility: The clients and medical professionals should be able to access the medical records without any issues whenever necessary. The system will be designed in a way to ensure smooth accessibility of medical records.

Safety and Security: As medical records are sensitive information; they should be protected with the necessary security systems. We ensure secure data sharing, data storage and

accessibility to only the authorized people such as the clients, medical professionals and the people authorized by the clients themselves.

Usability: Not everyone is knowledgeable when it comes to technical knowledge, so our system will be designed in such a way that anyone will be able to use it. The dashboard through which the medical records are accessed will be simple and easy to understand and use to the end user.

5.6 Resources

A wide range of resources are required by the project management to meet the Biometric EMR automation project quality objectives. These resources need to be sourced in such a way that it suits the project quality management system.

The resources that are needed to meet the quality objectives are as follows:

- Human Resources:

Personnel are needed to test the quality standards of the system to make sure that the project is adhering to the set quality objectives. The personnel then make decisions on whether the system needs to be improved further or is all set according to the standards.

- Tools:

Tools such as software tools and hardware tools are necessary to test the project for its efficiency. These may be test management tools, functional testing tools and performance testing tools.

- Prototype or Actual system:

We need to test the prototype or actual system to make sure that it is functional and according to the quality standards set for the project. With the help of testing tools, we can ensure that the system is achieving the set objectives and is fully functional.

- Sample client pool:

A sample pool of clients or customers is necessary to test and check if the system is fulfilling their needs and requirements. This is needed to make sure we have a perspective of the customers who will be the end users of the product.

- Quality Management System:

A quality management system with set standards and regulations is required so that we benchmark the final goal for the quality objectives. This will be used to maintain the quality throughout the project.

- Finance:

To procure and gather all the resources mentioned above and to run the project effectively so that the project objectives are met we need financing for it. The amount of finance will

determine the extent of the project and its effectiveness. This also plays a vital role in establishing the quality objectives.

5.7 Product Quality

The definition of quality differs from customer to customer and from project to project. In this case the customer may define quality by the degree to which the biometric EHR automation helps improve the electronic health record system. The main aspects that will define quality in this project are the integrity, safety and ease of accessibility of the electronic health records. The quality of deliverables is more important as the resultant output of the project depends on them. Without a good quality of deliverables, the resultant system may unproductively result in the failure of the project.

The customer will know quality when their expectations are met and when they are satisfied. When the customer sees that the electronic health records are integrated at one place with the required safety and security measures in place along with the ease of accessibility and a smooth transition among all these with the help of an efficient software and hardware system, they will get to see the quality among all these components individually and as a whole system

5.8 Quality process Flowchart:

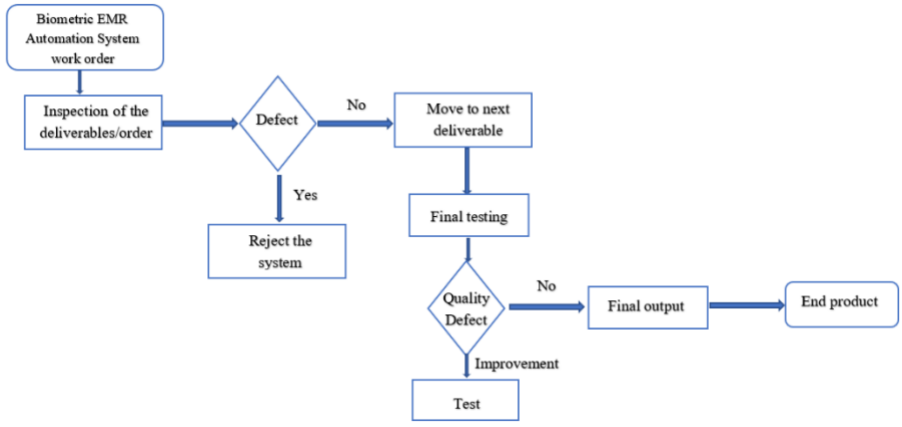


Figure 5.8 Quality process Flowchart

5.8 Project Requirements and Standards

The overall project requirements and standards are to be effective and efficient in the storage of medical records digitally which can be accessed through biometric of the client which provides security. Hence, the project quality requirements are as follows: -

- The data migration should be effortless
- Medical data stored should be secured
- Accuracy of data when accessed
- Dashboard should be easy to use
- Data should be accessible to the client and medical professionals when necessary

5.8.1 Deliverables & Acceptance standards/Criteria:

The following are the deliverable quality requirements and standards for the project

- AWS Cloud based system
- Automated Billing System
- Physical Hosted System
- Digital Record Protection System
- Dashboard Platform

All the deliverables of the project will go under *quality review* as all the elements should satisfy the quality standards for the end product to be of the utmost quality. The following are the deliverables and processes that will go under quality review: -

AWS Cloud based system: The AWS cloud-based system should be able to maintain data security and privacy. The data migration should be error free and smooth. The interface capability should be good between the equipment and the cloud system.

Automated billing system: The automated billing system should provide real time and accurate financial data. It should also be compatible with other ecosystems.

Digital record protection system: The protection system should go under quality review so that its efficiency can be tested as to how secure the digital medical records can be kept. Any system that has flaws in the security should be rejected as medical records are highly sensitive data.

Dashboard Platform: The quality review of the dashboard platform will make sure that the dashboard is user friendly. The clients and medical professionals will access the medical records through the dashboard platform; hence it is important to make sure that the dashboard is appealing and user friendly with effective design.

5.9 Required steps to ensure that Quality of this product:

Quality assurance activities are those activities that allow us to ensure that the project, product development and associated processes are correctly carried out as per the standards. Quality Assurance Activities not only assure the existence of clear and achievable standards but also evaluate the compliance of the products to the established standards.

The steps that I would take to ensure that quality is built into the product are as follows:

- ✓ Develop specifications for the product
- ✓ Audit the sources to ensure quality inputs
- ✓ Ensure effective communication between all departments of the project for better product development
- ✓ Testing the product or prototype
- ✓ Inspect and monitor throughout production
- ✓ Support continuous improvement.

5.10 Ensuring the adequate testing:

Adequate can be defined as being sufficient for a specific need or requirement. In this instance we can say that adequate testing is done when the set standards or requirements for the product

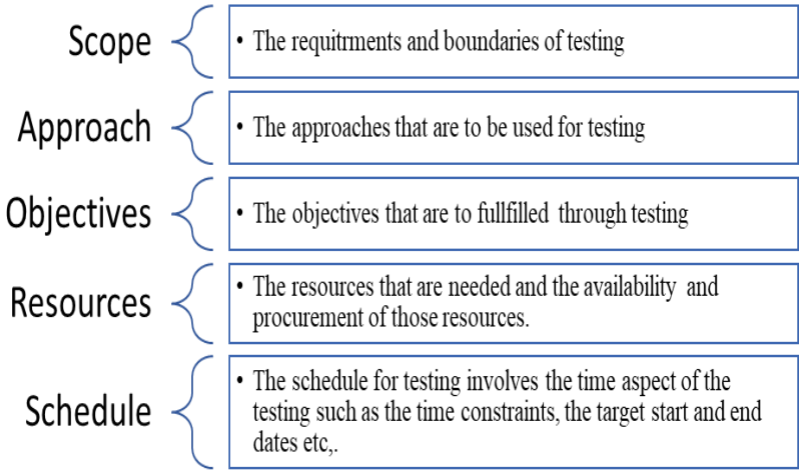
is achieved. The standards or requirements should be clear and strict, with no uncertainty or ambiguity.

To ensure that adequate testing is done the testing process should be planned and carried out effectively. The following steps will make the testing process adequate: -

- Project scoping and requirements.
- Establishing quality benchmarks.
- Develop testing plan.
- Test the product.
- Quality assurance processing and testing.
- User acceptance testing.
- Validating from system as per quality standards.
- Continuous improvement through continuous testing.

5.11 Test Plan:

The test team will be working from an effective test plan that was designed to ensure that the testing process is effective. That test plan will describe the following aspects of testing;



The test team will understand their responsibilities clearly as the test plan will contain all the necessary elements required for successful testing. The test plan will contain: -

- Test items
- Features to be tested
- Features not to be tested
- Approach
- Test pass or fail criteria
- Test deliverables
- Test environment
- Who should test what
- Estimates for cost and effort
- Schedule
- Assumptions and dependencies
- Approvals

Hence, if all the aspects of the test plan are defined clearly there will be no confusion for the test team with their responsibilities.

5.12 Project Monitoring and control:

Project Monitoring and Control
• **What audits and reviews are required and when they will be held?**
External audit: An external audit will be conducted by a third party that is usually not associated with the project to make sure that the auditing is done without any influence. Internal audit: Internal audits will be held to make sure that there are no discrepancies in the system. It is usually held by a trained professional related to the project. IRS (Internal Revenue service) audit: Internal revenue service audits are held to make sure the tax regulations are followed. Information system audit for biometric system : An audit of information for the biometric system is done to make sure that the data in the biometric system is accurate. **Reviews** Ensure the fingerprint quality assessment. Track and identify the physical hosted system to get clear for monitoring the patient's information. Track and monitor the physical hosted system to correct the error in the patient information. Verify that deliveries are complete and that standards are followed according to the rules and regulations. Maintain an audit trail for all signed documents.
▪ **How will you report and resolve variances from acceptance criteria?**
When it is established that the result is not according to the acceptance criteria, the appropriate department will be informed about it, so that a solution can be found to eliminate the variances from the set criteria. It is vital for the project success that the deviations from the set standards are corrected within time so that resources can be saved. The following are some brief steps to explain this process: • Checking for any deviations from set criteria • If any variances are found report to responsible department • Make changes to resolve the variances • Check if variances are resolved
▪ **What will you measure to determine if the project is out of Scope?**

In order to make sure that the project is within its scope it is important to check if the project's main objectives are met. If the project's main objectives and goals are met it means that the project is not out of scope.
▪ **What will you measure to determine if the project is within budget?**
Calculate the actual cost at each stage of the project and compare it with the estimated cost that provides the variances in cost.
▪ **What will you measure to determine if the project is within schedule?**
We will measure the duration of the project and progress on procuring the necessary items. The project progress shows the project is within the schedule. It is necessary to measure the time taken at every step of the project to make sure that the overall project is on schedule. We need a set time schedule for all the steps of the project so that we can compare the set time schedule with the actual time schedule to make sure the project is within schedule.

Table: 5.12 Project Monitoring and Control

5.13 Project Quality Plan Approval:

Project Name: BIOMETRIC EMR AUTOMATION

Project duration: 9 months

Project Head: Quality Manager X

Client: Client X

The Quality plan of the Biometric EMR Automation is reviewed and approved the acceptance. If further changes are required that will coordinated with the following designated staff/members and approved by their signatures.

Name	Role	Responsibility	Signature	Date	Comments
<xxxxxxxx>	Project Manager	Verify and ensure the Quality standards and product delivery.			
<yyyyyyyy>	Team leader	Coordinating with team, Developing the Quality processes			
<******>**	Test head	Guide and monitor the inspection/testing process			

Table 5.13- Quality plan

Log Quality Plan Audit log:

Review Date	Role in audit	Reviewed Activity	Audit standard	Audit Duration	Signature	Issue(s)	Comments/ Resolutions
<xxxxxxxx>	Project Manager						
<yyyyyyyy>	Team leader						
<******>**	Test head						

Table-5.13 Quality Log

6. Stakeholder Management:

6.1 Stakeholder Analysis Register:

A project-related document called a project stakeholder register contains all the details about the project's stakeholders which includes people, organizations, and groups that are interested in the work, the project, and its outcomes are listed in this document.

Impact: High, Medium, Low

State of Change Readiness: Unaware, Resistant, Neutral, Supportive, Leading.

Group Name	**Group Members**	**Description of Group & Key Attributes**	**Impact on the Project**	**Current State**
Project Team Members	▪ Project Manager ▪ Design Engineer ▪ Embedded Engineer ▪ Hardware Support Engineer ▪ Software Development Engineer ▪ Database Admin ▪ Backend Engineer ▪ Security Administrator ▪ Disaster Recovery Analyst ▪ Training Manager	The team members are responsible for executing the project tasks and producing the deliverables scheduled, members may or may not participate throughout the project's lifecycle.	High	Leading

	▪ Subject Matter Experts			
Administrative Staff	▪ Front Office Staff ▪ Implementation Manager ▪ Registration Staff Lead ▪ Laboratory Staff Lead ▪ Billing Staff Lead ▪ Workflow Redesign Lead ▪ Super-User/Training Lead	Support medical professionals and maintain accurate sensitive and private records relevant to high-risk patients. Maintain databases, accounting records, and other financial data, including payroll coding and budget creation.	Medium	Supportive
Medical Department	▪ Doctors ▪ Clinicians ▪ Physicians ▪ Nurse Lead ▪ Medical Assistant Lead ▪ Laboratory Staff Lead ▪ Pharmacy Director ▪ Director of Nursing	Medical Professionals who take an active part in the Project, right from helping in creating the health records to providing prompt and efficient medical care.	High	Leading
EHR Vendor	▪ EHR Builder ▪ Consultants ▪ Marketing agents	The organization that supplies the project with EHR services and	High	Leading

		technology is compensated for its work. Additionally, secure patient information and data by adhering to all Federal government regulations.		
Board and Executive Leadership	▪ Sponsors ▪ Board Members ▪ Investors	The individuals who serve as the governing body of the project and oversee all the project managerial positions and operations. And the ones who invest in the project and support the project financially	High	Supportive
Health IT and other Organizations	▪ Health Information Technology (Health-IT) Vendors ▪ Insurance Specialists ▪ Financial Insurances ▪ Local Health Information Organization (HIO) ▪ Patient Safety Organizations (PSOs) ▪ Office of National Coordinator (ONC) for Health IT ▪ Regulatory Agencies	The domain of information technology that deals with designing, developing, creating, utilizing, and maintaining information systems for the healthcare sector. And all the organizations related to healthcare rules and regulations.	Medium	Neutral
Patients/End Users	▪ Patients ▪ Record Users ▪ Patients Family	The health record users and their well-wishers	Medium	Neutral

Table 6.1 Stakeholder Analysis Register

6.2 Stakeholders Identification:

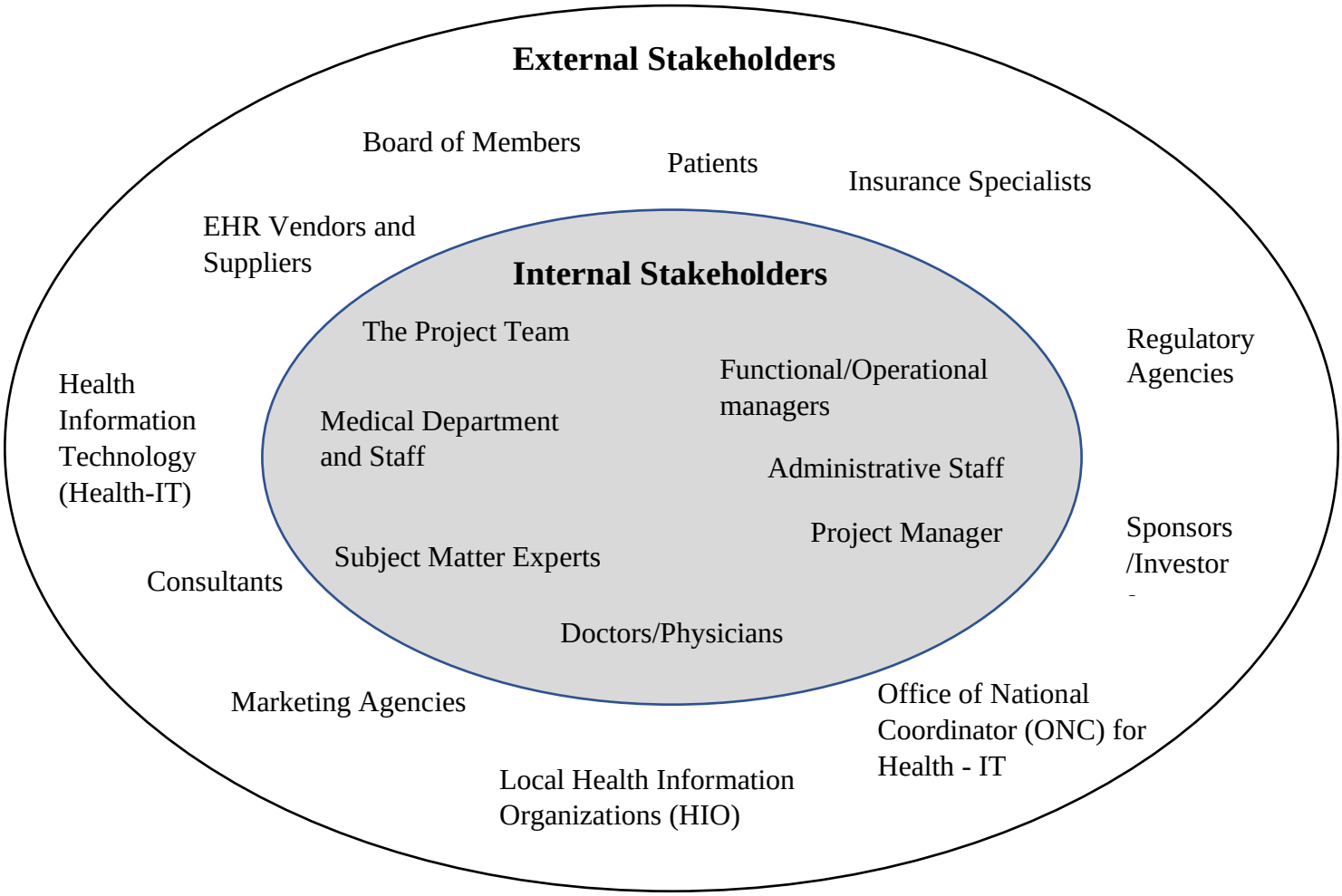


Figure- 6.2 Stakeholder Identification

6.3 Power Classification

In this Section, Stakeholders are categorized based on their power and degree of interest in the project's outcomes.

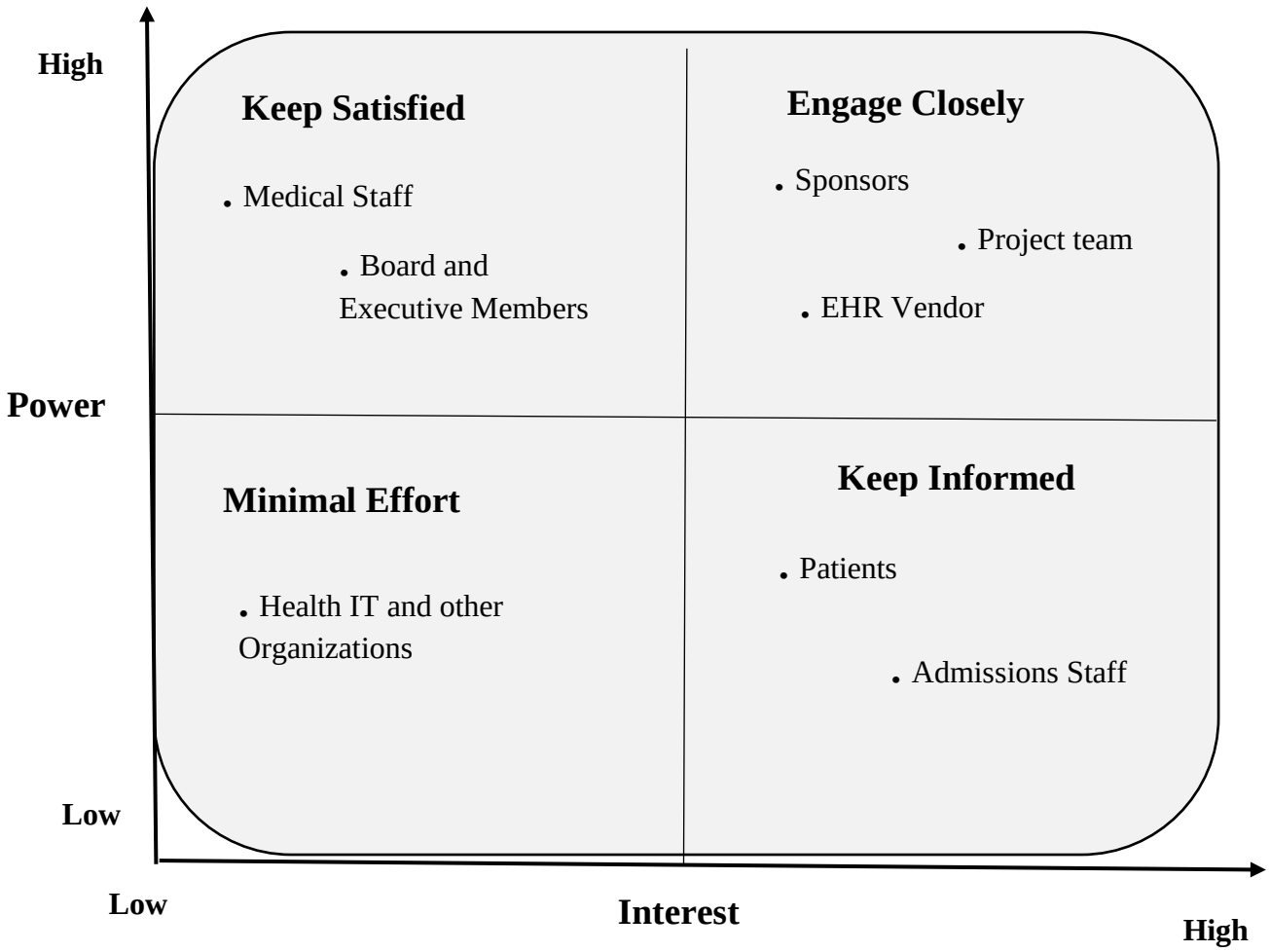


Figure- 6.3 Power Classification

6.4 Stakeholder Participation Matrix:

The Stakeholder Participation Matrix is used to guide planning and arrange the plan in a concise and organized manner. Its goal is to organize the interaction with stakeholders during an evaluation process.

Type of Participation

Stage in Lifecycle

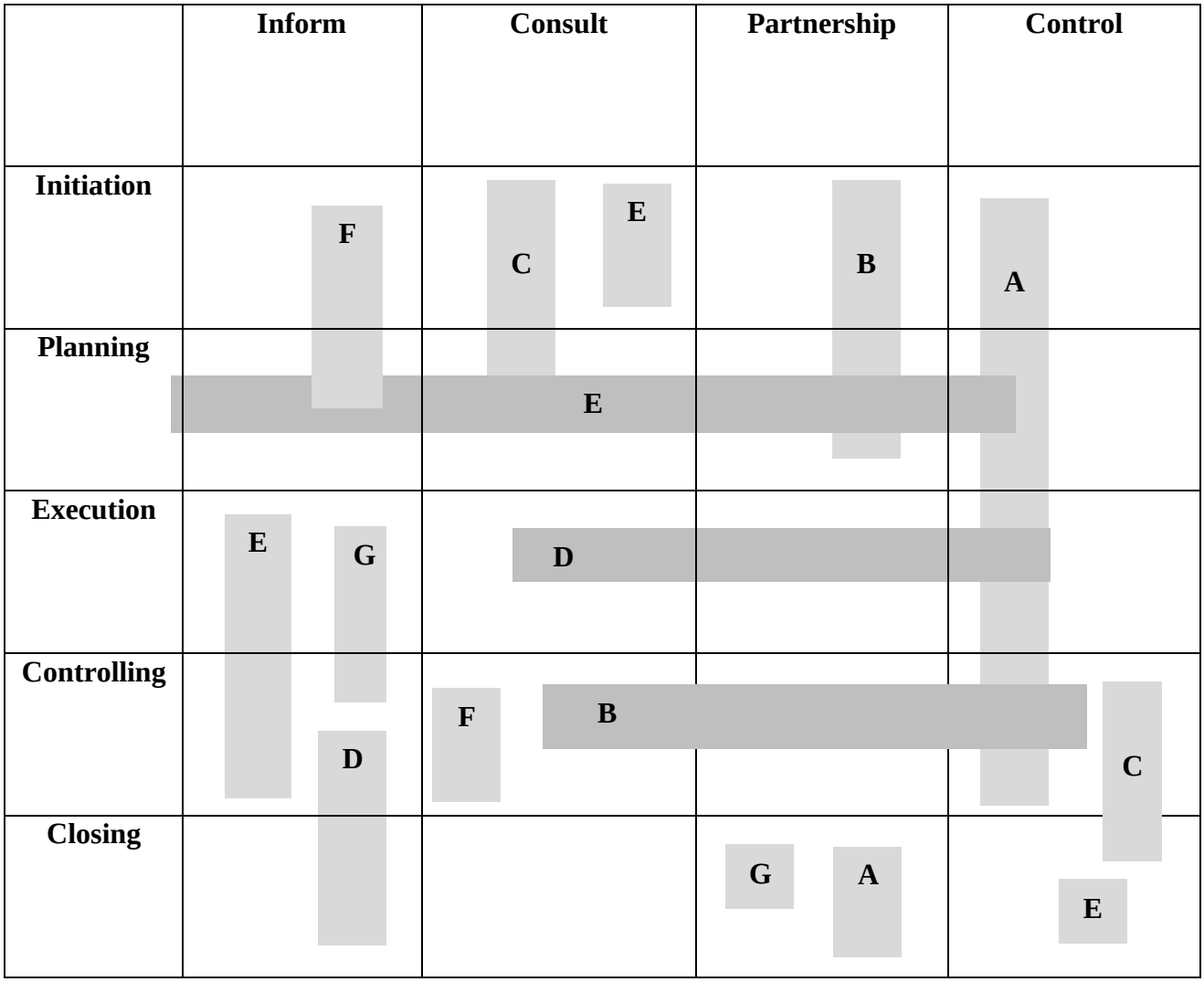


Table 6.4 Stakeholder Participation Matrix

Stakeholders	Participation
Project Team Members	A
Administrative Staff	B
Medical Department	C
EHR Vendor	D
Board and Executive Leadership	E
Health IT and other Organizations	F
Patients	G

6.5 Stakeholder Engagement Assessment Matrix

The stakeholders were assigned a "C" for their current degree of engagement and a "D" for their desired level.

U - Unaware - This group is unaware of the project.

R - Resistant - aware of the project and unwilling to accept any potential modifications or effects it may have

N – Neutral – aware of the project, but neither supportive nor resistant

S – Supportive – aware of the project, as well as any prospective modifications and effects, and is supportive

L - Leading - conscious of the initiative and actively working to guarantee its success

Stakeholder	Unaware	Resistant	Neutral	Supportive	Leading
Project Team Members					**C**
Administrative Staff			**C**		**D**
Medical Department					**D**
EHR Vendor			**C**	**D**	
Board and Executive Leadership				**C**	**D**
Health IT and other Organizations		**C**		**D**	
Patients	**C**			**D**	

Table 6.5 Stakeholder Engagement Assessment Matrix

6.6 Communication Plan

Using a communication plan, you may accomplish short-term and long-term goals. Additionally, it is important to keep or strengthen connections with the key stakeholders, who have the power to affect an organization's performance.

COMMUNICATION PLAN					
No	**Stakeholder**	**Reason Consultation/Communication**	**Likely Stance on Project**	**Method of Communication**	**Owner**
1	Project Team Members	To manage the project right from handling the technical aspects to hardware requirements.	Leading	Weekly Reports through emails, Teams, and Direct meetings.	Project Manager
2	Administrative Staff	For Maintaining and Managing the EHR software and maintaining records.	Supportive	Daily reports and weekly meetings.	Administrative Lead
3	Medical Department	For providing high-quality health care and to creating checking patients' health records	Supportive	Email and monthly reports and status updates.	Doctor
4	EHR Vendor	For the EHR Software Designing the Development.	Leading	Daily updates and Emails with weekly direct meetings.	Supplier
5	Board and Executive Leadership	For allocating funds and permissions to run the project.	Supportive	Emails and weekly reports on the status of the project.	Board Members
6	Health IT and other Organizations	To gain their approval to access and maintain patients' health records	Neutral	Emails and direct meetings.	Organization Directors
7	Patients	For their Health information and to enter data in their personal health records	Neutral	Email, customer calls and direct meetings.	Patient

Table 6.6 Communication Matrix

6.7 Stakeholder Decision Responsibility Matrix

During a project, confusion regarding who needs to be involved in decisions can be a major source of conflict. By designating authority and responsibility for the main elements of the project, the Decision/Responsibility Matrix makes an effort to prevent this issue.

E – Responsibility for driving this task to completion.

A – Authority to make decisions.

C – Must be consulted prior to decisions.

I – Must be informed after decisions.

		Major Project Activities						
Stakeholder Names		Project Planning and Scope	Prototype Designing	Software Development	Hardware Selection and Testing	Database Integration	System Integration and Testing	Monitoring and Support
	Project Team Members	**A**		**E**	**E**	**A**	**E**	
	Administrative Staff						**C**	**A**
	Medical Department					**C**	**I**	**A**
	EHR Vendor		**I**	**E**	**E**	**E**	**I**	
	Board and Executive Leadership	**C**	**I**				**A**	
	Health IT and other Organizations	**C**					**A**	
	Patients						**I**	

Table 6.7 Stakeholder Decision-Responsibility Matrix

6.8 Stakeholder Salience Model

The use of the Salience Model will be helpful in managing the stakeholder effectively. It gives you a more thorough analysis and understanding of your stakeholders.

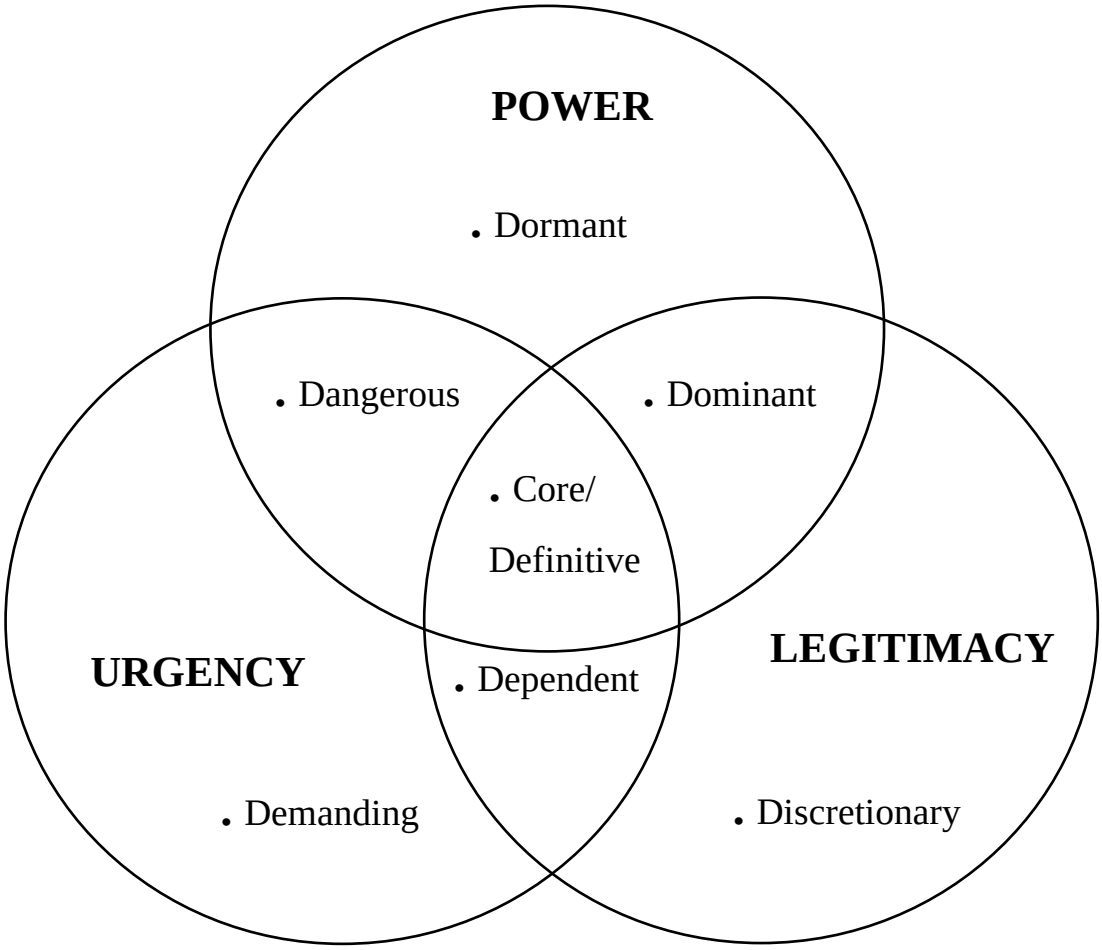


Figure- 6.8 Salience Model

Dormant Stakeholder: High power, low legitimacy, and low urgency are attributes of these stakeholders. You will carefully control them because they have significant power and might have an effect on your project.

Discretionary Stakeholder: The legitimacy will be high for these Stakeholders with low legitimacy and urgency. You will comply with their demands despite their lack of strength and urgency because of their legitimacy.

Demanding Stakeholder: High urgency, low legitimacy, and low power are attributes of these stakeholders. If their demands are not met, they frequently speak up and can influence other stakeholders. They are interested in being noticed. They will be carefully managed.

Dependent Stakeholder: The urgency and legitimacy of these parties are strong, but their power is weak. You won't give these stakeholders as much consideration because they have limited influence.

Dominant Stakeholder: Although they are highly legitimate and powerful, these stakeholders lack urgency. You will closely handle these stakeholders because they have a legitimate investment in your project. Their rank is lower than the core group because the urgency is minimal.

Dangerous Stakeholder: These stakeholders are exposed because they lack legitimacy while yet possessing high power and urgency. They might act violently and cause problems for your project. You'll handle them carefully.

Core/Definitive Stakeholder: These Stakeholders have to manage closely as they have high Power, Legitimacy and Urgency.

Stakeholder Names	**Salience Attributes**
Project Team Members	Core/Definitive Stakeholder
Administrative Staff	Demanding Stakeholder
Medical Department	Dominant Stakeholder
EHR Vendor	Dormant Stakeholder
Board and Executive Leadership	Dangerous Stakeholder
Health IT and other Organizations	Dependent Stakeholder
Patients	Discretionary Stakeholder

Table 6.8 Stakeholder Names - Salience Attributes

7. RISK MANAGEMENT

7.1 Risk Response Planning

7.2 RISK MANAGEMENT STRUCTURE AND PROCEDURES

This section describes the risk management process and provides an overview of the risk management approach.

RISK ID	RISK CATEGORY	CAUSE	DESCRIPTION EVENT	EFFECT	PROXIMITY	RISK RESPONCE CATEGEORIES	RISK RESPONCE STRATEGIES	RISK STATUS	RISK IMPACT

1	Over budget	Due to the increase in the patients lists.	increase in the servers	Increase in data storage	During project development	Accept	Talk to the project manager and to increase the project budget	Active	
2	Extra time taken to complete project	Negligence of employees and project manager	Delay in the project	cost increase, litigation, abonnement	During project development	Mitigate	Decrease in employee's salary	Active	
3	Increase in patients	List of patients may increase due to the more disease	Increase in the employees to decrease time in the project	salaries for employees and time	Before or after the project	Accept	Maintaining the budget to pay the employees if they are hired	Inactive	
4	increase in patients will increase healthcare providers	Due to more diseases	Increase the knowledge on decreasing the diseases	infrastructure for the employees	After the project	Accept	Don't know until the risk has occurred and maintain space for the providers	Inactive	
5	Data loss	Due to hackers or data breach	Security breach	It will affect the security and data of patients and safety issues	After or during the project	Avoid	More security and data should be privately	Active	

6	Storage problems	Increase in data	servers increase	Information is late to the patients, increase in storage	After the project	Share	Share because of the data iss being shared to the other cloud services	Active	
7	safety of data	Corruption, thief	Maintain high security	Cost and data loss	During the project	Share	Share with the AWS cloud and maintain high security	Active	
8	time taken to open the patients' records	Internet connection	Best internet connection	Time of patients and the doctors	After the project	Mitigate	Reduce it by occuring and make sure you have the best internet in that location	Active	
9	malware installation failure	Opening suspicious emails and applications and websites	Don't open until you know what you are doing	This causes the loss of data and risk to the patients	Before and after the project	Avoid	Keep antivirus protections which gives information before opening.	Active	
10	system failure	Software or hardware problem	Maintenace should be done frequently	System to freeze, Reboot	After the project	Mitigate	By cooling down the system by keeping the cooling system for the computers	Inactive	
11	Data centers	Natural disasters	locations that doesn't happen	Data loss and increase in cost for	During project development	Avoid	By avoiding the locations that natural disasters occur	Inactive	

	safety			recovering data					
12	Patients' satisfaction	Less knowledge about the disease and the technology	Hiring experienced doctors	Decrease in the patients using these biometrics	During the project	Avoid	by gaining knowledge about the technology and the disease	Active	
13	Partnership with different hospitals	Misinformation of the patients	specific information should be mentioned	Invalid information causes the retake of the patients tests and reports	During the project	Avoid	By making staff how to maintain the patients' records	Active	
14	Proper training to doctors and staff	invalid information of the patient's disease and blood group	Knowledge about the patient's information	Information in the reports online should be	After the project	Mitigate	Firing the employees and giving proper training to staff	Inactive	
15	Yearly reports to W.H.O on time	reports should be maintained for the patients	reports should be taken from the hospitals	Testing and the information should be taken newly every time for the patients without records	After the project	Share	share information so the patients change location the doctors can know about the patient	Active	

16	Proper medication	loss of data and invalid information	Knowledge to doctors	It will effect the patients' health worse or death	During the project	Avoid	Avoid by doing the proper medication and knowing the patient's disease and medication.	Active	
17	Delay in project	Not hiring the skilled project manager	hiring experienced PM	It will take more cost, time and may close the project	Before the project	Mitigate	By firing the project manager and hiring a better PM and who knows about the project	Active	
18	Knowledge to Stakeholders	Without mentioning what's going on with the project	Proper information sharing.	Delay in project, stopping the funds to the project	Before the project	Avoid	Making sure the information about the project has been shared always with the higher officials.	Active	
19	Making duplicate reports for safety	Due to Datac enters damage, Data loss	protection, and location of datacenters	It effects the loss of the data and leaking of the data, effects the govt	After the proj ect	Avoid	Making the duplicate will avoid from the data loss and storing the information securely for future	Active	
20	Negligence of Aws cloud architect	Without monitoring there will be security	Skilled AWS architect	Without a skilled person we might get lost in data the website	After the proj ect	Mitigate	Hiring a new experienced architect and making sure each and every time to monitor.	Active	

		breach		and system running slow					
21	week internet connection	Time to test patients, and to pull out patients information	Proper internet connection	It effects the patients wait time and the doctor's time	After the project	Accept	Change it to a good internet connection in your location	Active	
22	Damage in biometric scanners	Too much use of machine, or outdated	Update the machine	Without the biometrics there will be no information about the patients that will cause the hospitals closure.	After the project	Avoid	By ordering more scanners for the future and and maintaining stock	Inactive	
23	Health records website	Website developer should be more precise	Update the website	It causes them to much trouble to understand the website and take much time to open the records	After the project	Transfer	website development company should take care about this website update or proper information should be on the website	Active	
24	Increased	Too much	limited hours	Too much work will	Before the	Accept		Active	

	work load	wor k on emp loye es		affect the project and may cause mistake in the project	projec t		Depends on contingency budget		
25	Audit trails	Not maint aining qualit y of EHR	giving it to outside party	It will affect the annual audit quality and feedbac k	After the proj ect	Transfer	Hiring a third party and doing the annual audit and feedback quality of EHR documents.	Active	
26	Patien t portals	Not comm unicat ing g with patien ts weekl y o not impro ving the patien t health condit ions	Weekly reports	It will be affecte d to patients ' health and maintai n the physicia n– patient relations hip may be disconn ected	After the proj ect	Avoid	Marinating close relationship with the patients and conducting weekly reports about the patients	Active	
27	Preve nt Staff over sight	Forgot to logout of the syste m	Automat ic logout	Unaut horize d individ uals to view patient - specifi c data.	After the project	Avoi d	Avoid it by giving the login time and if not in use it should automatic logout	Active	

28	Implement security safeguard	Only doctors should deal with the patient's information	Specific persons only	Everyone can effect and change the patient's information if they have access	After the project	Avoid	You must restrict this data to a need-to-know-only basis	Active	
29	Data encryption	Blind spots	Secure everything	Blind spots will pose threat to IT healthcare and the hackers hide and execute	During the project	Mitigate	Change these blind spots from never happening again and making more secure	Active	
30	Copy and paste	Duplicate the patient's information	Dtabreach	This allows users to easily duplicate the records and change the patient's information	After the project	Avoid	This cannot be happening because it will cause the allergies to the patients or the death	Active	

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