SOUTHERN ILLINOIS UNIVERSITY EDWARDSVILLE
SCHOOL OF BUSINESS

Project Name	Biometric EMR Automation
Date	09/11/2022
Project Manager	Akhil Gurrapu

BUSINESS CASE

BIOMETRIC EMR AUTOMATION

SOUTHERN ILLINOIS UNIVERSITY EDWARDSVILLE
STATE ROUTE 157
EDWARDSVILLE, IL 62026

DATE
09/11/2022

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

1. SCOPE OF WORK

1.1. Project Objective

The Biometric EMR Automation project shall complete on or before 09/30/2023. The project cost shall not exceed $730,000 in total. At the conclusion of this project the agreed deliverables will properly execute on the platforms for which the software components were design to run on.

1.2. Scope description

Successfully create, install, test, and commission an Automated Biometrically Indexed and Accessed Electronic Medical Record System. The customer prefers a system that can filter data to provide a specific patient dashboard based on the accessing user's credentials and defined role. Further the client wants the biometrically captured identity to facilitate the accuracy of billing hospital employee billable labor, as well as equipment and consumable supply charging. The project should take one year or less to complete and stay within the agreed budget.

2. PROJECT CHARTER

The project charter is contained in the Appendix A.

3. BUSINESS CASE ANALYSIS TEAM

Table 1 Business Case Analysis Team

Role	Description	Name/Title
Project Leader	Deliver specifications, scoping, scheduling, resourcing, and costing for the project.	Akhil Gurrapu

4. PROBLEM DEFINITION

4.1. Problem Statement

Since the optimization of Provider to Patient ratios, each healthcare provider has a larger population of patients to attend to. When the number of patients attended

increases for healthcare providers, the amount of information that must be managed by each healthcare team increases significantly. This same dynamic also reduces the healthcare provider's familiarity with each of their patients as well. Coincident with the optimization of the patient ratios, there were also process revisions that reduced the cycle time between patient encounters for the healthcare providers. This places additional stress on the patient care process and outcomes. The company has hired additional support personnel to absorb some of this workload. Unfortunately, these additional personnel have had minimal impact in relieving additional stresses on personnel and process as the point of diminishing return has been reached with actors involved in the execution of the patient care process. The main issues that have arisen are timely access to electronic medical records, focused presentation of relevant sections of electronic medical records, and accuracy of assignment of costing data for consumable supplies and support personnel labor.

1. Timely and focused access to medical records: Emergency room and prompt care facilities need rapid access to electronic medical records that identifies patient data necessary to render care under time and direct patient communication constrained conditions.
2. Each healthcare provider or specialist has different needs to enter, process, or retrieve patient information from the electronic medical records. Focused access will provide detailed information in a patient healthcare data dashboard that summarizes and presents data based on healthcare provider credentials and associated designations from directory access services.
3. Assignment and tracking of costing data and personnel activities for healthcare is critical for both substantiation of healthcare costs as well as healthcare informatics or data analysis. There is a need to associate specific consumable supply costs with healthcare episodes for patients. Further the association of any facility personnel time spent with the patient need to be logged and costed to the aforementioned healthcare episode.

Presently, demographic information is used to match patient health records from one provider to the next. This information includes names, addresses, phone numbers, and dates of birth. However, the chance of a mismatch increases if a patient has changed addresses, changed phone numbers or if their last name has changed as a result of a divorce.

If there is a mismatch, the healthcare system will have to pay for more testing, and the patient may experience delays or receive improper treatment. Patient registration mistakes (64 percent), time constraints when treating patients (60 percent), and duplicate medical records in the system (30 percent) are the main causes of patient

misidentification. With the use of demographic information including first and last names, dates of birth, SSNs, and addresses, healthcare systems have tried to improve patient identification using third-party text-based matching algorithms, but there has been no significant success.

4.2. Potential Solutions

Many individuals die because of inadequate care. Many technologies have been invented and are constantly being developed to protect and prolong human life. Diverse innovative therapies are emerging in the medical profession to tackle various patient conditions. However, every patient's body reacts differently to the therapies. In a previous approach, hospitals used to manage their information in their system and wrote prescriptions to patients. 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 the medical history. A typical individual cannot recall the names of their tablets since they are not medical professionals.

As new technology is integrated into established medical services, ensuring the security of medical records is becoming an increasingly important issue. As electronic medical records become more prevalent in the health care industry, it is becoming increasingly typical for a health practitioner to modify and examine a patient's record on a tablet PC. 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. 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. Biometric authentication will be the best solution to protect patient data. Information is vulnerable to exchange, theft, loss, forgery, typos, and duplication. However, a 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.

5. PROJECT OVERVIEW

Doctors who treat patients are often the data administrators. The doctor creates space in the cloud or server and uses biometric sign-in to verify the patient's identification throughout the patient registration process. Only the designated doctor has access to the patient's information through patient biometric authentication. The doctor's access to the patient's data will be terminated when the patient leaves the hospital or stops receiving treatment, at which point the patient must log out of the system. The patient must log in again and authorize a doctor to see his information if he visits the hospital again after some time.

The most important part of treatment is figuring out who the patient is. According to numerous studies, misidentification is one of the primary causes of all unfavorable surgical outcomes and blood transfusion mistakes that cause harmful effects on the patients. Using biometrics to identify patients can help reduce issues like misidentification in blood analysis identification and inaccurate diagnosis outcomes. In order to prevent any misidentification, the patient's biometric information is gathered throughout various medical examinations and compared to the previously registered database.

The security of Health Records data is also a primary concern, and they must be secured on three levels - wearable devices, health records, and cloud services. Wi-Fi, Bluetooth, or NFC are used by wearable technology to connect to a patient's mobile device or a hospital server. The devices will use biometric authentication to limit access to only authorized personnel, and these data exchanges will be encrypted. Only the patient and doctor will be able to access the electronic health record or cloud where the data are stored using the bio-login technique. The system can be set up so that whenever a doctor needs access to a patient's data, the admin must require biometric authentication from the patient.

5.1. Cost Benefit Analysis

The following table captures the cost and savings actions associated with the Biometric EMR Automation Project, descriptions of these actions, and the costs or savings associated with them through the first year. At the bottom of the chart is the net savings for the first year of the project.

Table 2 Cost Benefit Analysis

Action	Action Type	Description	First year costs (- indicates anticipated savings)
Purchase Cloud-based software product and licenses	Cost	Initial investment for Biometric EMR Automation Project	$400,000.00
Network infrastructure for additional functionality deployment	Cost	Initial investment for Biometric EMR Automation Project	$220,000.00
Software installation and training	Cost	Cost for IT group to install new software and for the training group to train all employees	$110,000.00
Reduce staff by 2 employees	Savings	An immediate reduction in overhead equal to the annual salary 2 non-physician medical specialists.	-$190,000.00
All medical staff employee time properly allocated for patient billing.	Savings	8 physicians and 68 Nurses / technician time accounting at appropriate billing rates for service classification.	-$440,000.00
All consumable medical supply costs properly allocated and billed to patient accounts	Savings	All materials consumed that are associated with a specific patient will be accurately billed to that patient as opposed to becoming unallocated costs.	-$250,000.00
Reduce employee turnover by 10%	Savings	Savings in cost to out-process exiting employee and recruit, hire, and train new employees is approximately $50,000 in the first year.	-$50,000
Net First Year Savings			**$200,000.00**

Based on the cost benefit analysis above we see that by authorizing the Biometric EMR Automation Project the hospital will save $200,000.00 in the first year alone. This represents a significant improvement in the operating costs, resolves dead weight losses from cost allocation, and is a clear indicator of the benefit this project will have on the company.

5.2. Alternatives Analysis

The following alternative option has been considered to address the business problem. This alternative was not selected for a number of reasons which are also explained below.

Table 3 Alternatives Analysis

No Project (Status Quo)	Reasons For Not Selecting Alternative
Keep the legacy processes in place	• Unnecessary expenditure of funds for increased staffing levels • Continued loss of unallocated supply costs • Time constrained access to critical healthcare information • Lack of automation / data governance

6. PROJECT REQUIREMENTS

6.1. Overview

A patient web portal provides a safe and convenient way for patients to access their medical records online and to communicate with their doctors and other healthcare providers. Patients and staff at a hospital can use an online patient portal to access information about patients, appointments, and medical records. Hospital automation via the portal required well specified project criteria and objectives, and these were provided by the charter. All goals were thoroughly researched. In addition, we were able to set the project on the right track to success by providing crucial information about the project's major deliverables and developing a clear plan for the undertaking. Another standout element was the open presentation of the project's stakeholder registration, which listed the persons involved and their respective duties. While the project's initial needs are laid out in a business case, so are the people who will be engaged in its implementation.

6.2. Project Boundaries:

Table 4 Project Boundaries

Included	Excluded
Planning and Design	In App messaging
Research Electronic Health Record (EHR)	Push Notifications
Application style design	Compatibility with Android
Preliminary Design	Cloud infrastructure services
Budgeting	Kerberos support
Research and interviews	
Managing patient data	
Application architecture design	
Web Portal for the system	
Perform inspections	
Coordinating programmer work	

Addressing Application Draw Backs	
Working Software Application	
Progress Reports	
Team management	
Select subcontractors (programmer)	
Manage Subcontractors	
User interface for billing	

6.3. Project Deliverables:

Table 5 Project Deliverables

Key Project DELIVERABLES	
Name	Description
Automation project Charter	Setting up a ceremony to officially launch the project.
Automated Application	Creation of a program that can gather data and provide user feedback.
Biometric capabilities - Hardware	Hardware used for biometric scanning
Required Automation Documentation	According to the needs, both practical and aesthetic
Application documentation	Proving the worth of the whole undertaking.
Quick Start Guide	Instructions on how to use the computer program
Automated Billing System	Initiating the hospital's infrastructure for an automated billing application

6.4. Product Acceptance Criteria:

A flawless Automated Application Installed into EHR hospital systems that will include:

- Accurate biometric patient identification
- Easy and accessible patient records
- Feasible in accessing Insurance details
- Inbuilt Invoice system
- Significant Cost Reduction (day to day usage)
- Limited resources (reduction in paper and pen usage)
- Greater number of patients could be treated
- Increase in safety and security

6.5. Project Constraints:

Table 6 Project Constraints

Constraints (Time, Budget, and Technical)
Constraint Description
For this project to be completed successfully, twelve months are needed.
Complete the project without going above the $730,000 allocated.
Cancellation of a project is possible if insufficient effort is put into developing the code for the application.
Weekly status reports to the project manager.

6.6. Project Assumptions

Table 7 Project Assumptions

Assumptions
Description
The installation of the app increases all available resources, increasing the number of people who can be helped in a given period of time.
This new automated application feature has the potential to significantly increase the hospital's income.
There was no compromise of patient information or billing systems.

6.7. Risk Management

- The primary goal of incorporating risk assessment into a project is to provide a review of all possible dangers and risks that might crop up as the project progresses. Some of these threats may be less impactful than others, while others may be rather dangerous. One way to make sense of these threats is via a method called risk assessment:
- Prepare a comprehensive report outlining every potential risk that the project or the steering committee might face in regard to the intended endeavor.
- Now that we know what risks are at play, we can recognize the effects they might have on the project.
- When both risks and their consequences, or the possible threats, have been assessed, the next step is to implement a risk mitigation strategy, which entails outlining remedies and providing preventative action.

- In the end, a risk register is used to document any problems and offer a report on the procedure's results.

Table 8 Risk Management

Ranking	Potential Risk	Mitigation Strategy
1	Budget overrun on costs	For this reason, it is essential to maintain a vigilant watch on the company's finances throughout the duration of the project.
2	Software and User Interface failures	In order to carry out the Program, specialized desktop and portable computers will need to be obtained.
3	Available human resources to perform work.	Recruit a larger pool of qualified individuals who are capable of managing the necessary web-based automation system.
4	Client Sponsor	Before beginning the project, get confirmation from a legitimate sponsor.
5	Missed deadline for delivering project components.	If the customers decide to cancel or forego payment, you must complete the project according to the Gantt chart plan.
6	Power failures	Additional power generators and UPS systems are required for these kinds of failures.
7	Not being able to deliver the intended scope of supply.	Extending the length of the impact and review stages might help rectify any discrepancies.
8	Competitors recruiting resources away from the project.	Do your best to prevent such problems by signing binding liability agreements with any new vendors.
9	External crisis such as COVID-19	Be sure you have enough money stashed away to cover the project's costs in case you lose your main source of funding.
10	Subcontractors might break their contract in the middle of the project.	Before employing someone, make sure the contract is rock solid, or add

		a large sum in case a member tries to cancel it.

6.8. Plan of Change:

Many variables affect who has final say over the project and what gets done. Similarly, in the EHR project's development and research, factors that could alter the project's management include:

- Allocating Resources According to Skill Sets.
- Improperly timed project planning.
- Time Management Strategy Alterations.
- Inconsistencies in Workload.
- Problems with the Gear.
- Stop Manufacturing.

Additional change management improvements might be made in the following areas:

- Establishing what threats, the business could face is the first step.
- When examining the risk management process, it is important to have a holistic view that incorporates both quantitative and qualitative analysis.
- Past scenarios based on actual occurrences should be included into the risk management strategy. It's useful for drawing connections between the outcomes of previous situations and the likelihood of an event occurring in the present.
- To avoid any such confusion and to establish additional preventative measures, a more in-depth examination of risk severity and the feasible actions might be brought forward.
- It's important to give careful consideration to the evaluation, too.
- The project sponsor, the project manager, and the CBC will have the last say over whether or not any modifications are made to the project.
- Include potential timetable situations with a detailed reference to their inclusion.

6.9. General Schedule

1. Project Planning
2. Project Development
3. Project Execution
4. Project Validation
5. Project Closeout

6.10. Approval Requirements

Possible proposed changes in the scope will have to be assessed to analyze its effect regarding project schedule, cost and resources. Any deviations from this scope must be approved by the Project Manager and reflected in a new version of the project plan. The owners of the project

must provide their approval for any alterations to the project's scope that necessitate adding personnel or increasing the budget. The Project Manager and the Project Owners must sign off on any budget adjustments before they may be implemented. Risk management requires the approval of the general manager of our project and it is necessary to communicate the information regarding this topic to the complete team of the project so that everyone who is working on it is perfectly informed on how to deal with risks that might arise during the development of the project.

6.11. Major Project Milestones

The following are the major project milestones identified at this time. As the project planning moves forward and the schedule is developed, the milestones and their target completion dates will be modified, adjusted, and finalized as necessary to establish the baseline schedule.

Table 9 Project Milestones

Milestones/Deliverables	Target Date
Project Origination	09/12/2022
Planning & Data Collection	10/06/2022
Core Development Complete	03/16/2023
Integration & Productization	05/11/2023
Commercial Product Available	09/11/2023

7. WORK BREAKDOWN STRUCTURE

The below Work Breakdown Structure is divided into 5 main task groups.

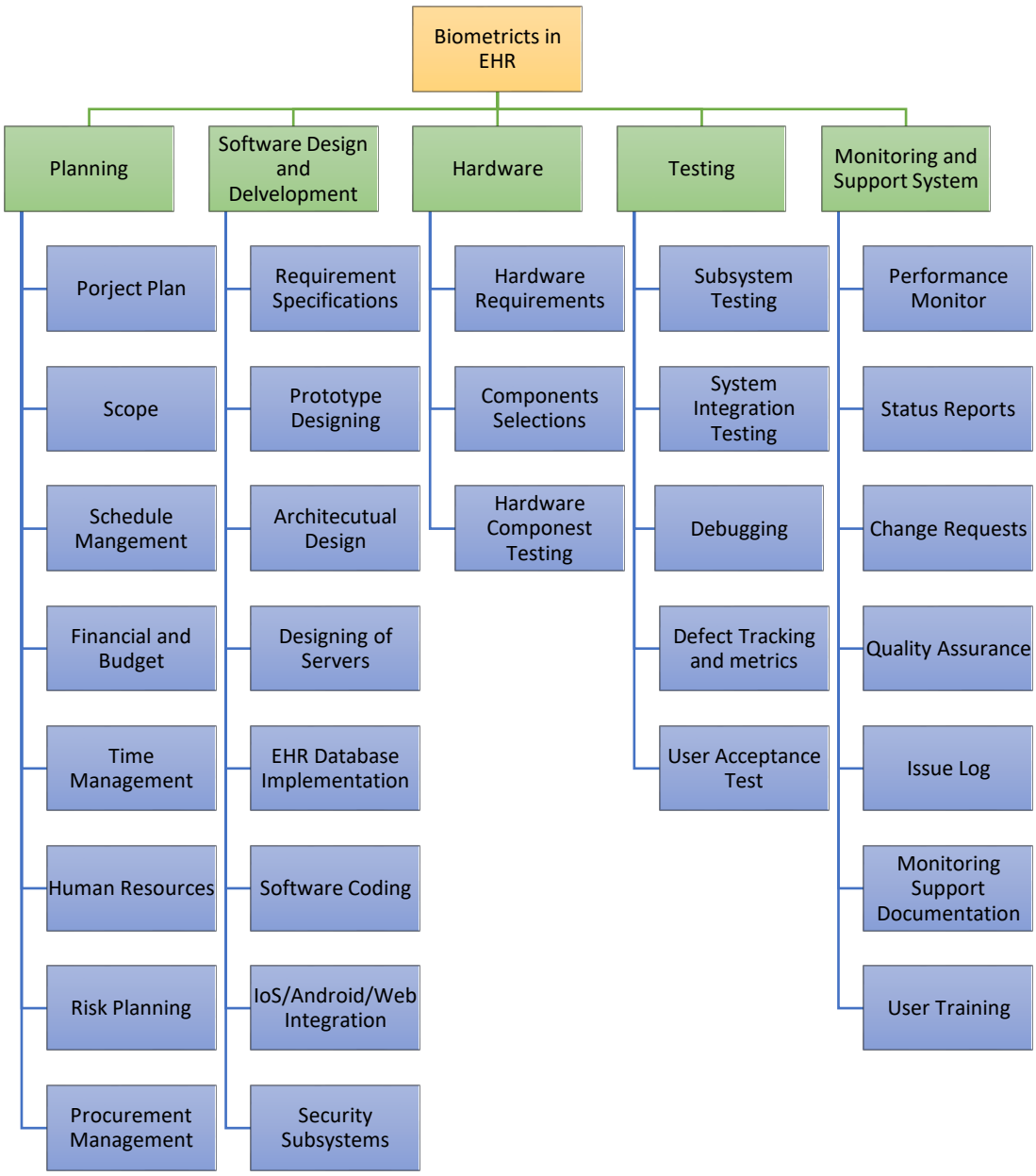


Figure 1 Work Breakdown Structure

Table 10 Work Breakdown Structure

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

8. COMMUNICATION PLAN

The information flow is depicted using the communications strategy. The communication plan will specify who, what, how, and when the information will be delivered in more detail. The major stakeholders, relevant information, important sources, means of distribution, roles and due dates for the information flow are all covered in this section.

8.1. STAKEHOLDERS

The stakeholders involved in this project are hospital owners, Project Manager, Technical Lead, Architect/Design Engineer, QA Analyst, IT System Admin, Hardware Engineer, Security Administrator, Lead Database Engineer, city inspector, and the loan officer.

8.2. INFORMATIONAL REQUIREMENTS, SOURCES AND DISSEMINATION STRATEGIES

Table 11 Biometric EMR Automation Communication Plan

INFORMATI ON	KEY STAKEHOLDERS	FREQUENCY & TIMING	DISSEMINATION METHOD	INFORMATION PROVIDER
Initial Consultation	Hospital owners, Production Engineer	Beginning of project	Meeting, Email	Project Manager
Design Consultation	Hospital owners, Architect& Design Engineer	After initial consultation	Meeting, Email, Hardcopy	Design Engineer
Preliminary Design Review (PDR)	Hospital owners, Sr production Engineer, Operator.	After initial design complete	Meeting, Email, Hardcopy	Project Manager /Design Engineer

Design Plan	Hospital owners, Human Resource Officer, Sr production engineer, Computer Numerical Control head, Operator.	Bi-weekly until design is complete	Email	Design Engineer
Critical Design Review (CDR)	Hospital owners, Technical Lead, Architect Engineer, project manager, QA Analyst.	After final design plan is complete	Meeting, Email, Hardcopy	Project Manager/Design Engineer
Project Status Report	Hospital owners, Project Manager, General Manager	Weekly	Email	General Contractor
Sub-contractor Status Report	Project Manager, Deputy General Manager, Quality control head, Subcontractor	Weekly	Email	Sub-contractors
Supplier Performance Review	Hospital owners, QC, DGM, Project Manager.	Weekly	Email	General Contractor
Work Breakdown Structure (WBS)	General Manager, Project Manager.	Anytime	Online Cloud	Project Manager

9. RESPONSIBILITY MATRIX

See APPENDIX B – RESPONSIBILITY MATRIX

10. BUDGET

The total budget for the Biometric EMR Automation project is $730,000. Each of the main categories of work has been assigned a budget from the cost estimation performed by the team. In the current supply chain environment for labor and materials, extraordinary fiscal discipline will be required to keep the project on budget. Additional budgetary funding will require CFO approval.

Table 12 Categorical Budget

Planning	$100,000
Software Design & Development	$250,000
Hardware	$180,000
Testing	$90,000
Monitoring & System Support	$110,000
Total Budget	**$730,000**

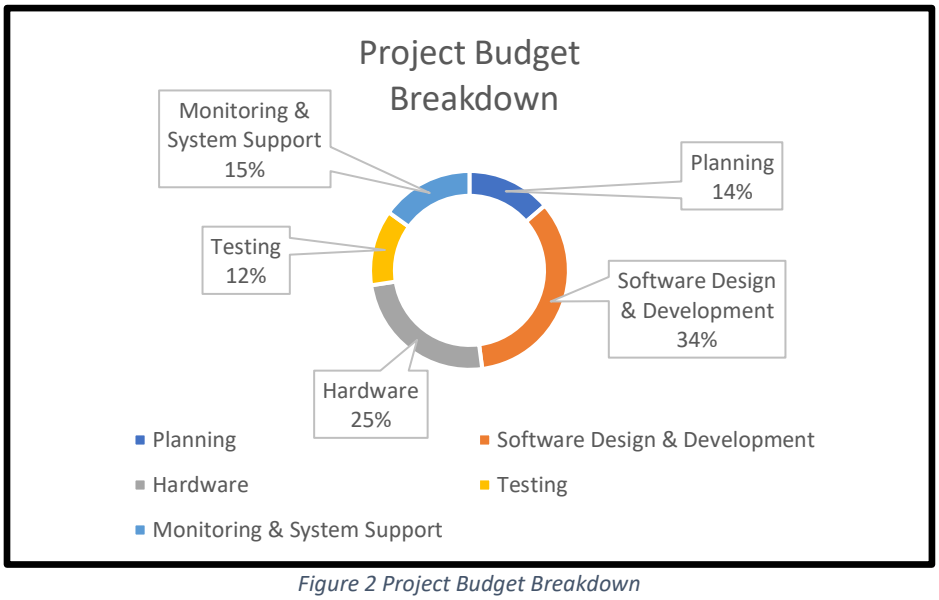
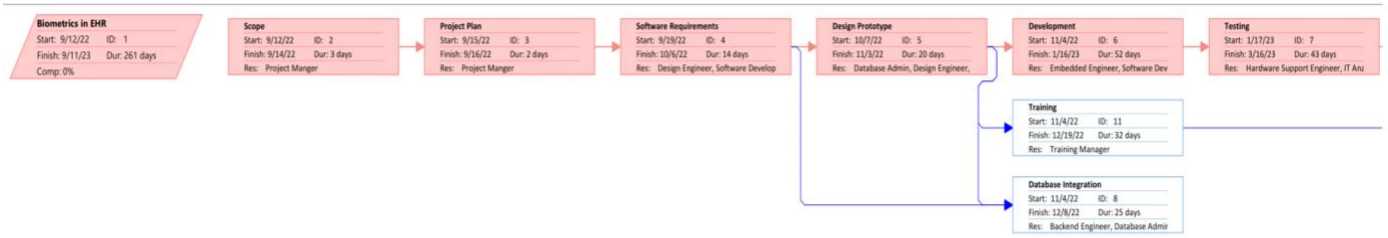
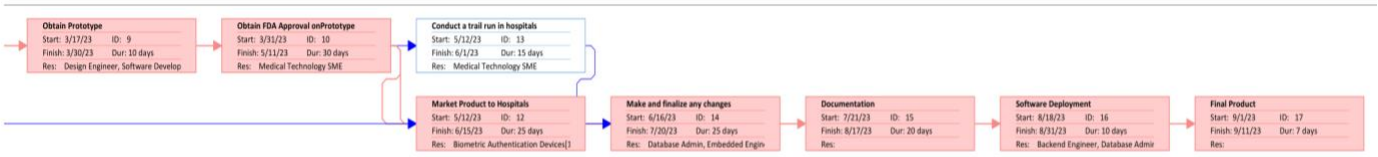


Figure 2 Project Budget Breakdown

11. NETWORK DIAGRAM

Task Name	Predecessors	Duration	Start	Finish
Biometrics in EHR		**261 days**	**Mon 9/12/22**	**Mon 9/11/23**
Scope		3 days	Mon 9/12/22	Wed 9/14/22
Project Plan	2	2 days	Thu 9/15/22	Fri 9/16/22
Software Requirements	3	14 days	Mon 9/19/22	Thu 10/6/22
Design Prototype	4	20 days	Fri 10/7/22	Thu 11/3/22
Development	5	52 days	Fri 11/4/22	Mon 1/16/23
Testing	6	43 days	Tue 1/17/23	Thu 3/16/23
Database Integration	4,5	25 days	Fri 11/4/22	Thu 12/8/22
Obtain Prototype	7	10 days	Fri 3/17/23	Thu 3/30/23
Obtain FDA Approval on Prototype	9	30 days	Fri 3/31/23	Thu 5/11/23
Training	5	32 days	Fri 11/4/22	Mon 12/19/22
Market Product to Hospitals	10,11	25 days	Fri 5/12/23	Thu 6/15/23
Conduct a trail run in hospitals	10	15 days	Fri 5/12/23	Thu 6/1/23
Make and finalize any changes	12,13,10	25 days	Fri 6/16/23	Thu 7/20/23
Documentation	14	20 days	Fri 7/21/23	Thu 8/17/23
Software Deployment	15	10 days	Fri 8/18/23	Thu 8/31/23
Final Product	16	7 days	Fri 9/1/23	Mon 9/11/23





12. RESOURCES PLAN

Resource Name	Type	Max. Units	Std. Rate
IT Analyst	Work	300%	$90.00/hr
Design Engineer	Work	200%	$100.00/hr
Embedded Engineer	Work	100%	$90.00/hr
Hardware Support Engineer	Work	200%	$80.00/hr
Medical Technology SME	Work	100%	$80.00/hr
Software Development Engineer	Work	300%	$120.00/hr
Database Admin	Work	100%	$110.00/hr

Backend Engineer	Work	100%	$110.00/hr
Security Administrator	Work	200%	$120.00/hr
Disaster Recovery Analyst	Work	100%	$90.00/hr
Training Manager	Work	100%	$80.00/hr
Biometric Authentication Devices	Material		$220,000.00
Project Manger	Work	100%	$120.00/hr

13. APPROVALS

The signatures of the people below indicate an understanding in the purpose and content of this document by those signing it. By signing this document, you indicate that you approve of the proposed project outlined in this business case and that the next steps may be taken to create a formal project in accordance with the details outlined herein.

Approver Name	Title	Signature	Date
Momot, M.	President and COO		
Gurrapu, A.	Executive VP		

14. APPENDIX A – PROJECT CHARTER

Project Title: Biometric EMR Automation

Project **Sponsor**: Date Prepared: **Sep. 11, 2022**

Project Manager: Project Customer:

Project Justification:

The purpose of this project is to utilize biometric technology to automate and store a person's Electronic Health Record (EHR). The success of this project will increase medical personal's access to a patient's medical records in cases of emergency and increase security of patient information.

Project Description

A person's medical information is kept in an Electronic Health Record (EHR), which is accessible online and through cloud services. Although data may be accessed by patients and doctors from anywhere, data privacy has emerged as a top issue for patients. Biometric authentication will be the best solution to protect patient data as the information is vulnerable to exchange, theft, loss, forgery, typos, and duplication. Integration of biometric technology and Cloud Servers to preserve the patient's privacy, as mandated by US federal requirements, a secure authentication method must be utilized to access patient information. During any emergency, when patients lack any kind of physical identity, biometrics can still be used to recognize the patient and retrieve their Electronic Health Records to perform better treatment. Patients essentially act as their own ID.

High-Level Requirements:

The requirement of this project is to utilize biometric technology to access and store a person's EHR. This needs to be completed in no longer than 1 year and cost no more than $730,000.

High-Level Risks:

The high level risk includes going over budget and schedule due software and user interface failures.

Project Objectives	Success Criteria	Person Approving

Scope:

Use in Emergency treatment	Consistent one scan access to patient data	Hospital board of directors Project Manager Hardware designer Software engineer Quality Control officer
Safer prescribing practices and elimination of prescription farad	Secure network, with timeout properties.	Hospital board of directors Project Manager Hardware designer Software engineer Quality Control officer
Secure patient data sharing among medical staff	Firewalls the abide by HIPPA guidelines	Regulatory analyst Quality control officer
Simplified registration process	Easy to use registration portal	Hospital board of directors
Management of Healthcare Liability	Decrease liability	Hospital board of directors Regulatory analyst

Time:

1 year	Project should take no longer than a year	Project Manager, Hospital Board of Directors

Cost:

$730,000.00	Cost no more than $730,000.00	Project Manager, Hospital Board of Directors

Other:

Use hospital tablets that are already in use.		

Summary Milestone Schedule

Milestones/Deliverables	Target Date
Project Origination	09/12/2022
Planning & Data Collection	10/06/2022
Core Development Complete	03/16/2023
Integration & Productization	05/11/2023
Commercial Product Available	09/11/2023

Estimated Budget

$730,000.00

Stakeholders	Role
Customer	Hospital Board of Directors
Hardware engineer	

Software Designer	Design a biometric software that is compatible with the existing computer systems
Quality Control Officer	Internal source to ensure the device is working up to all parameters.
Regulatory analyst	External source to ensure the device meets all regulatory parameters.

Project Manager Authority Level

Staffing Decisions:

The project manager has the authority to higher any subcontractors that are needed to complete the work on time. The project manager can also let any subcontractor, who are not fulfilling their obligations, go.

Budget Management:

The project manager is authorized to distribute funds and resources as longs as it fits within the budget. Funds may be reallocated within the budget but additional funds must be authorized by the customer.

Technical Decisions

The project manager is authorized to make decisions regarding the type and use of equipment used for the project. Changes to the software and hardware design need to be approved by the software and hardware engineers. Any large change to the overall design and scope of the device must be approved by the Hospital Board of Directors.

Conflict Resolution:

The project manager is authorized to make decisions to reduce conflicts between the project status and the customer.

15. APPENDIX B – RESPONSIBILITY MATRIX

WBS Activities	Project Office/ Project manager	Hospital board of directors	Hardware engineer	Software Designer	Quality Control Officer	Regularity Analyst
Planning	R A	C I				
Software design and Development	C	C		R A I	C	
Hardware	C		R A I		C	
Testing	C				R A	R A I
Monitoring and Support	C	C		I	R	A
	(R= Responsible A= Accountable C=Consult I=inform)					

Table 13 shows the Responsibility Assignment Matrix

WBS Activities	Project Office/ Project manager	Hospital board of directors	Hardware engineer	Software Designer	Quality Control Officer	Regularity Analyst
Project Plan	R A	C I				
Scope	*R A*	C I				
Schedule Management	R A	C I	I	I	I	I
Time Management	R A	C I				
Human Resources	R A	C I				
Risk Planning	R A					
Procurement Management	R A	C I				
	(R= Responsible A= Accountable C=Consult I=inform)					

Table 14 Responsibility Assignment Matrix for section 1.1 of the WBS

WBS Activities	Project Office/ Project manager	Hospital board of directors	Hardware engineer	Software Designer	Quality Control Officer	Regularity Analyst
Requirement Specifications	C I	C I	C I	R A	C I	
Prototype Designing	*C I*	C I		*R A*		
Architectural Design	I	I	I	R A		
Design Servers	I	I		R A		
EHR Database Implementation	I	I		R A		
Software Coding				R A		
Web/iOS/ android integration				R A		
Security Subsystems	C I	C I		R A		
	(R= Responsible A= Accountable C=Consult I=inform)					

Table 15 Responsibility Assignment Matrix for section 1.2 of the WBS

WBS Activities	Project Office/ Project manager	Hospital board of directors	Hardware engineer	Software Designer	Quality Control Officer	Regularity Analyst
Hardware Specifications	C I	C I	R A			
Components Selection	*C I*	C I	R A			
Hardware Component testing	I	I	R A		C I	
	(R= Responsible A= Accountable C=Consult I=inform)					

Table 16 Responsibility Assignment Matrix for section 1.3 of the WBS

WBS Activities	Project Office/ Project manager	Hospital board of directors	Hardware engineer	Software Designer	Quality Control Officer	Regularity Analyst
Subsystem testing					R A	
System integration testing				C I	R A	
Debugging				C I	R A	
Defect Tracking and Metrics				C I	R A	
User acceptance test	CI	C I			R A	
	(R= Responsible A= Accountable C=Consult I=inform)					

Table 17 Responsibility Assignment Matrix for section 1.4 of the WBS

WBS Activities	**Project Office/ Project manager**	**Hospital board of directors**	**Hardware engineer**	**Software Designer**	**Quality Control Officer**	**Regularity Analyst**
Performance Monitor	C	I			R	A
Status Reports	C	I			R	A
Change Requests	C	I			R	A
Quality Assurance	C	I			R A	
Issue Log	C	I			R A	
Monitoring Support Documentation	C	I			R A	
User Training	C	C			R A	
	(R= Responsible A= Accountable C=Consult I=inform)					

Table 18 Responsibility Assignment Matrix for section 1.5 of the WBS