HIMSys

*HEALTHCARE INFORMATION MANAGEMENT SYSTEM (HIMSYS)*

# PROJECT MANAGEMENT PLAN

Version 3.0

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# 1 INTRODUCTION

This document will provide the detailed requirements of a Healthcare Information Management System (HIMSys) created for healthcare professionals including doctors, hospital workers, pharmacists, researchers and patients. HIMSys will be used to perform real-time drug tracking, centralized data sharing among participants, privacy protection, automatic insurance billing, prescription validation etc. HIMSys will also give patients the functionality to grant remote access of their sensitive health data to other clinics and pharmacies. This document will outline the key stages in the development of the software and allocation of resources and budget.

## 1.1 PURPOSE OF PROJECT MANAGEMENT PLAN

The purpose of project management plan is to provide a summary of project charter along with assumptions and constraints, the scope of the software, associated risks and issues with the project, identify the communication plan, individual roles and responsibilities and a general overview of the budget. In addition, it will provide the necessary resources to complete the software such as software components, schedule for said components, and the resources that will be allocated to complete each component. The intended audience of the *HIMSys* PMP are all the project stakeholders including the project sponsor, senior leadership and the project team.

# 2 EXECUTIVE SUMMARY OF PROJECT CHARTER

*HIMSys* provides all registered patients with an Electronic Health Passport (EHP) that carries all of their healthcare information which are easily accessible via a computer or mobile device. It is used by patients, family doctors, hospital workers, pharmacists and researchers to have access to all of the medical data through the system. The blockchain server will be built on the Amazon Web Services (AWS) and scaled as necessary. The equipment for the project includes a total of 15 rental computers. The project will involve three following teams:

- A Development (DEV) team consisting of 2 Database/Network administrators, 4 Web UI/UX developers, 2 Software Engineers and 1 Blockchain Researchers.
- A Quality Assurance (QA) team consisting of 3 Testers and 1 Quality Engineer.
- A Product Relations (PR) team consisting of 2 Marketing Specialists and 4 outsourced Customer Service Representatives.

Therefore, the project involves 9 employees in DEV team, 4 employees in QA team and 2 employees in the PR team.

## 2.1 ASSUMPTIONS/CONSTRAINTS

A constraint is a predefined limit, choice, condition, and/or option imposed on the project. The software will be created for patients, pharmacists and doctors; therefore constraints must be placed on the software ensuring that it suits their needs.

The following constraints are placed on HIMSys:

- Due to the nature of data of the system it should follow GxP regulatory

requirements as well as the FDA CFR Part 11 for Electronic Records.
- Data Integrity: System should safeguard the data to prevent data loss.
- Data Availability: Server should be available at anytime to accessed by the user.
- Concurrency System Control: System should enhance the shared access to multiple users at the same time and can affect the updates.
- Data Confidentiality: Managing data security and privacy which includes controlled authorized access to data
- Data Accessibility: All of the records and information should be easily accessible via computer or mobile devices.
- The database should record all different changes made.
- The budget for the HIMSys project is set around **$500,000**

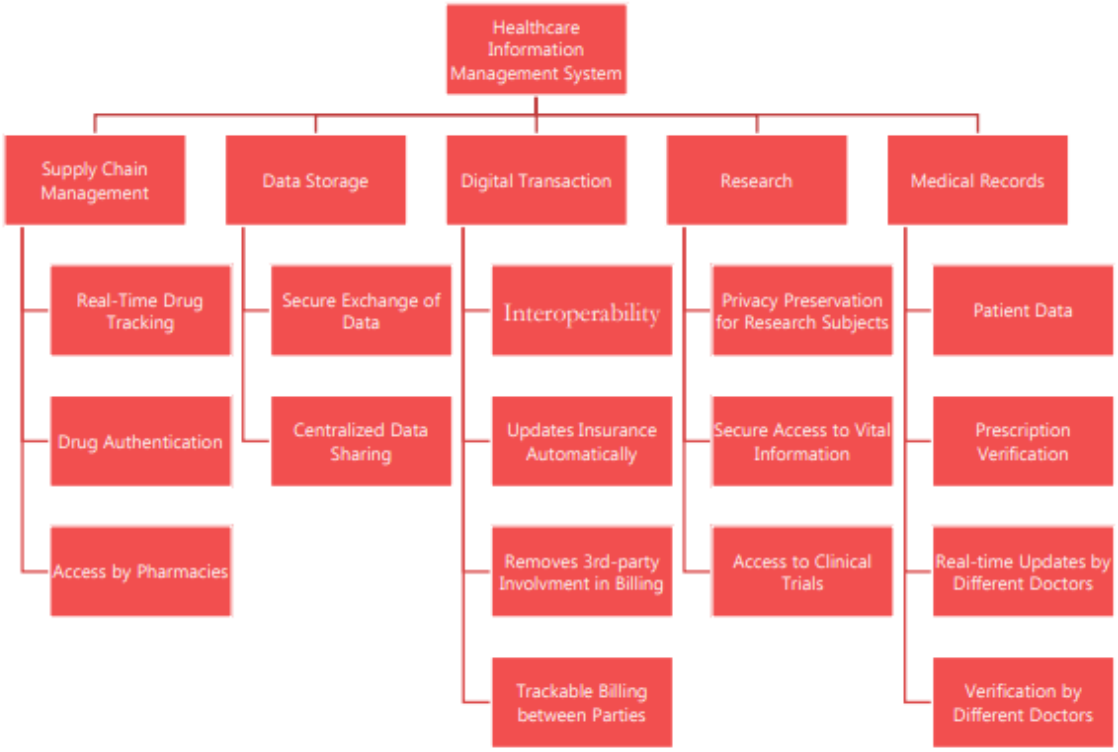
The following assumptions are made for HIMSys:
- Customer Service is managed by an external outsourced team who will have restricted access to the medical data.
- Patients, Pharmacists and Doctors are expected to bring their own hardware (personal computers, mobile phones etc.).
- System Support (CPI/IO/Mem) includes performance tuning tools, security auditing and monitoring suspicions activities.
- Patients have the ability to access all of their medical records and information (e.g. insurance) information whenever they wish.
- Doctors and hospital workers has the ability to view or edit medical information.
- Pharmacists have the ability to view, edit or request prescription information.
- Researchers have the ability to view medical information only with the patient's approval.
- HIMSys has the ability to record all the changes made, submit necessary document, approve researcher’s access to the patient’s data and record information entered by the researcher

# 3 SCOPE MANAGEMENT

The scope is limited only to the development and marketing of HIMSys. It does not involve Customer Support as it being outsourced to an external agency.

- Scope includes:
  - Designing and developing the HIMSys User Interface
  - Designing Centralized Database for Prescriptions, Drugs, Research and Medical Records
  - Implementing the Security Protocols and Restrictions
  - System/Integration/Quality Testing
  - Integrating third-party Insurance Companies for billing purposes
  - Deployment of beta software for internal testing
  - Release of the final HIMSys product
- Scope does not include
  - Customer Service and Support

## 3.1 WORK BREAKDOWN STRUCTURE




## 3.2 DEPLOYMENT PLAN

Using CodeDeploy, the source code will be deployed to the blockchain server for running the HIMSys system on the Amazon Web Services (AWS) infrastructure. The version control of the HIMSys will be maintained through GitHub. There will be a beta-version software deployed to a selected few healthcare professionals for internal testing. The QA team will be responsible for running the beta-test trials and they will report the bugs to the DEV team. The DEV team will consult the researchers and work on the reported bugs on their next sprint. It will then be passed on to the Testers for further evaluation. The final version of the HIMSys will be deployed once the system is deemed stable by the DEV and QA teams. During the development phase, the marketing team in PR will be responsible for creating presentations and tutorials on the functionality of HIMSys for potential customers. The team however is not responsible for Customer Support as it is being handled by an outsourced agency.

## 3.3 CHANGE CONTROL MANAGEMENT

- All changes must first be proposed and then reviewed before implementation of the change can proceed.
- All change requests will be submitted to a ticketing system for review. Github issues will serve as the ticketing system for this project. Any change involving significant outages (over half a day during business hours) will need to provide a 48 hour notice period before conducting change.
- Once a change request has been reviewed and approved, a notification in the form of an

email will be sent to all stakeholders of the change implementation will be sent out 48 hours before performing the change. Notification should also confirm

- Infrastructure changes to the databases are implemented in-house by the DEV team. Therefore, there will be no external interference on the development phase.
- A change review board will be established to review the impact of proposed changes to the system consisting of the following roles.
    - Software Engineer
    - BlockChain Researcher
    - Quality Engineer
    - Database Administrator
    - Network Administrator
- If dealing with third-party insurers causes any billing discrepancies, the senior management will look into other options including following industry standards or dealing with major insurers individually.
- In case of major project delays, the management will look into extending employee contracts on a month to month basis.

# 4 SCHEDULE/TIME MANAGEMENT

In HIMSys, we record the project progress weekly. In particular, on Thursdays. As, in weekly base monitoring we may need some rescheduling, so in every other week we do re-evaluations to meet all the necessary preparations for the project success.

If we want to know in which point of the timeline are we located, we use the schedule that we developed. In fact, the schedule is a reference to how ahead/behind the project is.

Obviously, if the project is forward of its scheduled time, we as a team will begin the following available component. In this case, the project manager will revise and update the project schedule. On the other hand, if the project is on the back of the schedule, the project manager will plan possible choices for the task that is behind schedule. In this situation, like the other case, not only he must update the project schedule frame, but also revisions must be sent a week before the expected deadline to all team members.

Undeniably, if the team are not notified the changes in the schedule in a reasonable time, they will not be prepared to adopt for working by the new updated schedule. Hence, the manager must inform the changes ASAP to the team members.

Milestones are the most important element of the project. By accomplishing them, we can be pretty sure that the key components are delivered on time. So, the percentage of the project's success to be delivered on-time will be increased.

If a task is postponed such that it affects the delivery date of a milestone, the project manager will have to re-estimate the critical path and orient the project schedule accordingly. Furthermore, if a milestone has been delayed by more than 2 weeks, the whole project must be re-evaluated. Undeniably, it is a red flag for the project success. So, the project manager must plan for some possible solutions. For instance, adding some members to the team or giving more priority to the key tasks and postponing the non-key components to meet the reasonable accomplishing date of the milestone.

## 4.1 MILESTONES

The table below lists the milestones for this project, along with their estimated completion timeframe.

| Major Milestones/Deliverables | |
|---|---|
| **Milestone/Deliverable** | **Estimated Completion Timeframe** |
| **PLANNING PHASE** | |
| Implementation Plan | |
| Change Management Plan (including Stakeholder Engagement Strategy and Implementation Evaluation Plan) | One week after the Implementation Plan is approved. |
| Training Plan | One week after the Implementation Plan is approved. |
| Risk Management Plan | One week after the Training Plan is approved |
| Communications Plan | One week after the Risk Management Plan is approved. |
| **DESIGN PHASE** | |
| Technical Architecture and Design (includes HW/SW Infrastructure Design & Deployment and security framework) | Two weeks after the Planning Phase is complete |
| Security , Database System and necessary licences are going to bought chosen | One week after the Communications Plan is approved. |

| | |
|---|---|
| Enterprise Master Patient Index (EMPI) integration design options and recommendations | Three weeks after the Technical Architecture and Design Phase is complete |
| HW/SW Infrastructure Procured & Installed | Two weeks after the EMPI integration is complete |
| Vendor Contract | Two weeks after the HW/SW Procured |
| **CONFIGURE/BUILD PHASE** | |
| Functional HIMSys application/taxonomy | Two weeks after the Design Phase is complete. |
| HIMSys Standard Reports and eForms | One week after the Functional HIMSys Application and Taxonomy |
| System UI | Three weeks after the Design Phase is complete |
| Database Integration | One week after the System UI is complete |
| Security Protocols Integration | Two weeks after the Database Integration |
| Direct Billing for Third Party Insurers | One week after the Security Protocols Integration |
| Support Model | One week after the Database Integration |
| **DEPLOYMENT PHASE** | |
| Functional, System, User Acceptance Test Reports | Two weeks after the Configure/Build Phase |
| Trained Users | One week after the User Acceptance Test Reports. |
| Beta Version Release | As soon as the QA team approves it |

| | |
|---|---|
| Readiness Assessment | Four weeks after the Beta Version Release. QA team approval required. |
| **EVALUATION PHASE (Ongoing activities that will occur in all phases of the Pilot Project)** | |
| Cultural Evaluation Reports (Patient Safety Climate Surveys) | Two weeks after the Implementation Plan. |
| Operational Evaluation Reports (includes User Satisfaction Survey Results) | One week after the Beta Version Release |
| Tactical Evaluation Reports | Three weeks after the Beta Version Release |
| Roll-Out Resource Pack/Toolkit | One week after the Readiness Assessment |

## 4.2 PROJECT SCHEDULE

| | HIMSys Software | Effort Estimate (in days) | Planned Start Date | Planned Finish Date | Resource (DEV,QA,PR) |
|---|---|---|---|---|---|
| | **Project Start/Finish** | | **09/01/19** | **02/10/20** | |
| 1.0 | **Design System** | **30** | **09/01/19** | **10/01/19** | **DEV, QA,PR** |
| 1.1 | Design System UI | 12 | 09/01/19 | 09/13/19 | DEV,PR |
| 1.1.1 | Design System Menu | 7 | 09/01/19 | 09/08/19 | DEV,PR |
| 1.2 | Design Security System | 5 | 09/13/19 | 09/18/19 | DEV,QA |
| 1.3 | Design Database System | 5 | 09/17/19 | 09/22/19 | DEV,QA |
| 1.4 | Design Billing System | 3 | 09/22/19 | 09/25/19 | DEV |
| 1.5 | Design Remote Access | 2 | 09/25/19 | 09/27/19 | DEV |
| 1.5.1 | Design Authentication System | 2 | 09/25/19 | 09/27/19 | DEV,QA |
| 2.0 | **Develop System** | **100** | **10/01/19** | **01/10/20** | **DEV,QA,PR** |
| 2.1 | Develop System UI | 18 | 10/01/19 | 10/19/19 | DEV |
| 2.1.1 | Develop System Menu | 8 | 10/04/19 | 10/12/19 | DEV |

| | | | | | |
|---|---|---|---|---|---|
| 2.2 | Develop Security System | 7 | 10/19/19 | 10/26/19 | DEV,QA |
| 2.3 | Develop Databases | 9 | 10/22/19 | 10/31/19 | DEV,QA |
| 2.4 | Integrate Billing System | 14 | 10/28/19 | 11/11/19 | QA, DEV |
| 2.5 | Develop Remote Access | 6 | 11/08/19 | 11/14/19 | DEV |
| 2.5.1 | Integrate Authentication System | 4 | 11/09/19 | 11/13/19 | QA,DEV |
| 2.6 | Quality Assurance Testing | 12 | 11/14/19 | 11/26/19 | QA |
| 2.7 | Management Reports | 13 | 11/26/19 | 12/10/19 | DEV |
| 2.7.1 | Management UI | 6 | 11/26/19 | 12/03/19 | DEV,PR |
| 2.7.2 | Management Report Functionality | 7 | 12/03/19 | 12/10/19 | DEV,PR |
| 2.8 | Passed Security Validation | 6 | 12/10/19 | 12/16/19 | QA |
| 2.9 | **Beta Version** | **30** | **12/16/19** | **01/16/20** | **QA** |
| 3.0 | **Software Completion** | **160** | | **01/16/20** | |

### 4.2.1 Dependencies

Internal Dependencies:

- The selected team members should be knowledgeable and skilled in their respective roles.
- The team members must be flexible in their work schedule and also should be open to contract renewals.
- The quality of the final version of the software depends on the bugs reported to the QA team and the effort put into rectifying it by the DEV team.
- The final decision on budget flexibility depends on the Project Manager

External Dependencies:

- The third-party billing depends on the cooperation among major insurers to agree upon an industry standard.
- The quality of the final-version of the software depends on the beta-test sample size. The higher the beta testers, the lower the error rate in the final release.
- The adoption rate of the software depends on the price structure and advertising decisions made by the marketing department.

# 5 COST/BUDGET MANAGEMENT

The essential resources for the HIMSys are as follows:

- 15 Employees from DEV, QA and PR teams
- 4 Outsourced Customer Service Employees
- 15 Rental Computers
- Blockchain Network (AWS)

| Type of Expense | Resource | Description | Rate per Hour |
|---|---|---|---|
| **Labour** | Database Administrator | Configures, troubleshoots, database. | $30 |
| | Network Administrator | Configures, maintains network infrastructure. | $25 |
| | Web Developers | Designs web application interface. | $25 |
| | UI/UX Developer | Designs interface, improves user experience. | $25 |
| | Software Engineers | Develops, maintains the system. | $30 |
| | Blockchain Researcher | Provides expert knowledge on blockchain technology. | $25 |
| | Marketing Specialist | Analyzes demographic data of users and market demand. | $20 |
| | Customer Service | Responds to customer inquiries and technical concerns. | $15 |
| **Contingency** | Quality Assurance | Ensure system meets standards, improves system efficiency. | $28 |
| **Equipment** | Computers | Used by the team to design and maintain the system. | $1500 |
| | Blockchain Network | Servers used to host the system. | $1000/month |
| **Total** | | | |

Other miscellaneous resources for HIMSys are as follows:

- Office Rental Space for 5 months (1400 sq. ft)
- Office Supplies/Furniture
- Internet Connection
- Food (Refreshments/Coffee)
- Software Licenses

**Breakdown of the Budget:**

See Appendix D

**Cost Control:**

The project manager is responsible for maintaining and keeping track of HIMSys budget during the weekly meetings. In situations where additional funding is requested by the DEV team, the project manager will review the request and pass it on to upper management including the CFO. If the project costs vary by more than 20% of the expected costs, then an audit may be conducted by a consulting financial firm to determine the cost

discrepancies. If the project is seriously behind schedule, then additional funding may be allocated in order to hire more personnel.

# 6 QUALITY MANAGEMENT

This section will describe the brief outline of the quality plan.

Management of the quality plan will be overseen by the Quality Engineer and the Testers. Deliverables for these two roles would be the Quality Validation Report.

At delivery time, the project team will ensure that no logged critical or high defects are present in the system.

The following tests will be performed on the system and will roughly cover the following test cases:

| ID | Use Cases | Description | Test Case ID | Status |
|---|---|---|---|---|
| 1 | Login to the HIMSys | The patient, doctor and the pharmacist are provided with a welcome page to either login or register into the HIMSys. | TC101<br>TC102<br>TC103 | FAIL<br>FAIL<br>PASS |
| 2 | Display dashboard based on the user type. | Upon successful authentication, display custom dashboards based on the usertype. | TC201<br>TC202 | FAIL<br>PASS |
| 3 | Patient clicks ‘Order New Drugs’ | A registered patient clicks order new drugs and should be able to enter the name of the drugs or the drug ID | TC301<br>TC302<br>TC303<br>TC304 | FAIL<br>FAIL<br>FAIL<br>PENDING |
| 4 | Patient clicks on ‘Track My Drugs’ | After successful order placement, the patient should be able to see the current order status. | TC401<br>TC402 | FAIL<br>PENDING |
| 5 | Pharmacist clicks ‘Display Available Drugs’ | A registered pharmacist should be able to see all current drugs in the inventory based on Drug ID. | TC501<br>TC502 | FAIL<br>PASS |
| 6 | Pharmacist orders drugs | Pharmacist should be able to place new drug orders using just the Drug ID and also be able to choose between a generic drug or branded product. | TC601<br>TC602<br>TC603<br>TC604<br>TC605 | FAIL<br>FAIL<br>FAIL<br>FAIL<br>PENDING |
| 7 | Pharmacist access patients insurance | Pharmacist should only be able to access patient insurance data after the patient gives his consent | TC701<br>TC702 | FAIL<br>PASS |
| 8 | Pharmacist creates | Pharmacist should be able to | TC801 | FAIL |

| | | | | |
|---|---|---|---|---|
| | automatic billing for patient | automatically bill the registered patients insurance directly and also issue invoices. | TC802<br>TC803 | FAIL<br>PENDING |
| 9 | Blockchain Researcher clicks 'Publish Research' | A registered BlockChain Researcher should be able to publish his findings into the HIMSys. | TC901<br>TC902 | FAIL<br>PASS |
| 10 | Doctor clicks 'Access Medical Records' | A registered Doctor should be able to access medical records of his patients only after the patient has given his consent. | TC1001<br>TC1002<br>TC1003 | FAIL<br>FAIL<br>PENDING |
| 11 | Doctor clicks 'Pending Prescription Approval' | Doctor should be able to access pending prescription approvals sent by the pharmacist for only his current patients. | TC1101<br>TC1102<br>TC1103<br>TC1104 | FAIL<br>FAIL<br>FAIL<br>PASS |
| 12 | Doctor clicks 'See Patient History' | Doctor should be able to enter the patient's credentials and see all the history logs for that particular patient. | TC1201<br>TC1202 | FAIL<br>PENDING |
| 13 | Logout from HIMSys | The patient, doctor and the pharmacist should be able to successfully logout and the system should kill their sessions. | TC1301 | PASS |

# 7 HUMAN RESOURCE MANAGEMENT

The human resource management plan is a component of the project management plan, which will describe the delivery stage of this project. The human resource management plans details the roles and responsibilities, tools and techniques and reporting of team members throughout the project.

**Project Manager** - has the overall responsibility from requirements, analysis, design, execution, and closure of the project. It is also the responsibility of the Project Manager to keep track of the process of the project and identify, monitor and respond to risk. In addition, Project Manager will also need to evaluate the project team's performance, and communicate it to all stakeholders. Alongside, there are 3 types of Project Manager along with a description and the staff they oversee.

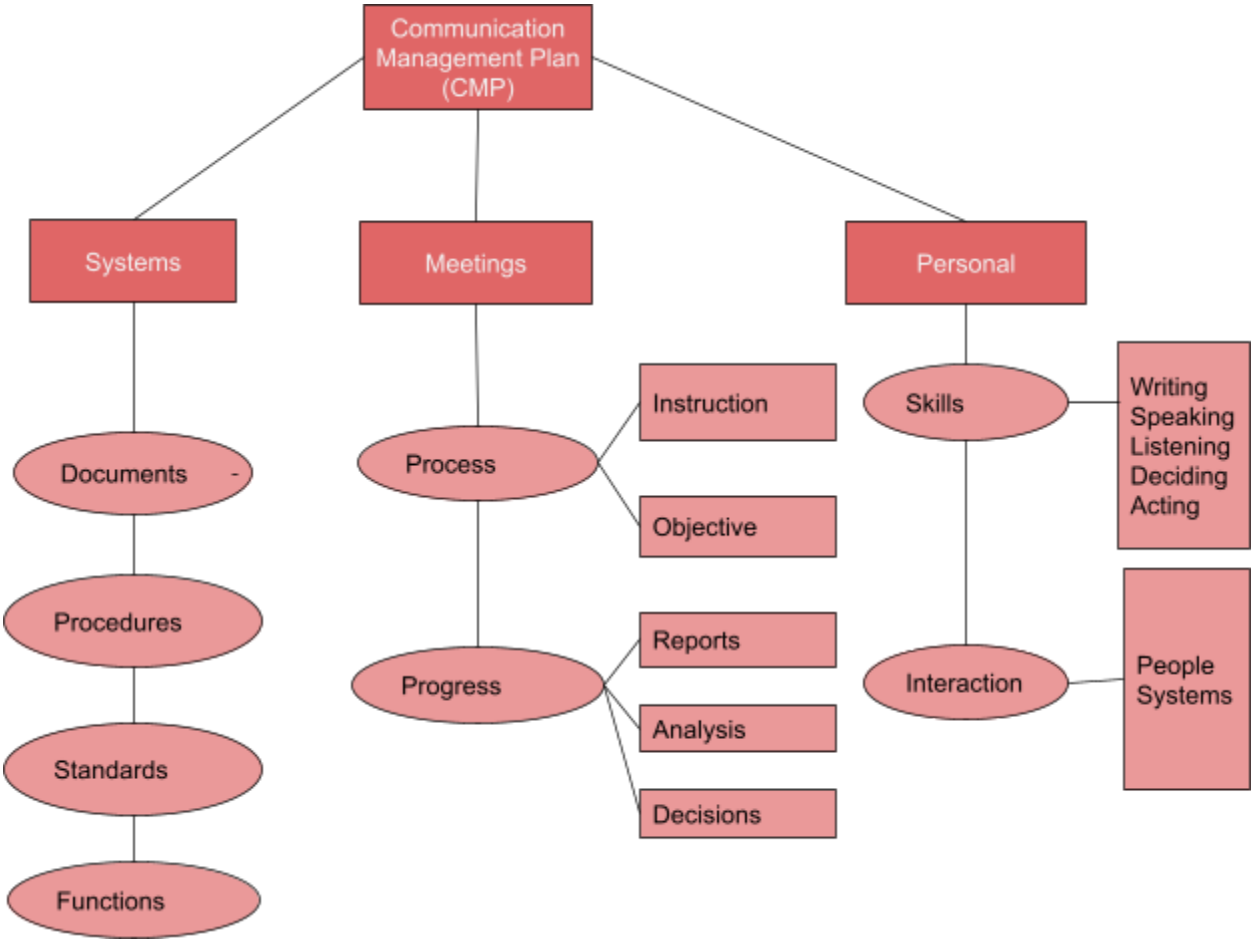
- **Design Project Manager** - Responsible for the overall design and requirements of the healthcare information system. The Design Project Manager ensures that the design interface is at the users' standard. The staff they are overseeing are:
    - *Web Developer* - Responsible for coding, layout and designing the web application interface.Web Developers takes into consideration of user experience.
    - *UI/UX Developers* - Responsible for designing interface and improve user experience. The UI/UX Developers will work closely with the Operations Manager to ensure the user experience has met.

- **Implementation Project Manager** - Responsible for the overall development, and maintaining and configuring the system. The Implementation Project Manager ensures the system is up to standards and has implemented all the necessary requirements. The staff they are overseeing are:
    - *Software Engineer* - Responsible for developing and maintaining the system
    - *Database Administrator* - Responsible for configuring, troubleshooting and maintaining the database.
    - *Network Administrator* - Responsible for configuring and maintaining the network infrastructure.
    - *Blockchain Network* - Responsible for providing central access to patient data, research data, and supply chain management. The system also completes transactions without the involvement of a 3rd party.
- **Quality Project Manager** - Responsible for analyzing and improving organizational processes, and work to improve quality, productivity and efficiency. They are to share their findings to Design and Implementation Project Manager, if necessary changes are needed to be done. The staff they are overseeing are:
    - *Blockchain Researcher* - Responsible for providing expert knowledge on blockchain technology.
    - *Marketing Specialist* - Responsible for analyzing and demographic data of users and market demand.
    - *Customer Service* - Responsible for responding to customer's inquiries and technical needs or assistance.

All project managers will work effectively together to ensure the project is delivered within scope, budget and on schedule.

# 8 COMMUNICATIONS MANAGEMENT

We will use the Communication Management Plan (CMP) to maintain an information distribution lifeline among members of the project. The CMP will be handled by the Project Manager and will take a proactive role in ensuring that effective communication is maintained between teams throughout the project.




The Project Manager will also be responsible for managing all proposed and approved changes to the CMP while making sure that the budget constraints are met. Whenever possible, HIMSys will follow all the standardized formats and templates for the CMP. HIMSys will also maintain the chain of confidentiality whenever it comes to sensitive documentation.

Therefore, if a CMP requires a secure channel for communication, the Project Manager will make sure that all the stakeholders as well as appropriate employees have the necessary access to receive project communications.

Some of the roles in the CMP include:

**Project Sponsor:** This individual has authorized the project and is responsible for funding it. Therefore belongs to the executive team and is not involved in day to day operations.

**Program Manager:** This individual oversees the project at the portfolio level and is

responsible for overall program costs and profitability.

**Key Stakeholders:** This individual comes from the executive management team as the Project Manager is responsible in keeping them updated.

**Customer:** The individual who will be accepting the final deliverable of the project. They will be informed on the project status and schedule on a regular basis.

**Project Manager:** This individual manages that day to day resources and provides a report on the project metrics to the executive team.

**Project Team:** Includes all the individuals who have a role in the project development on a day to day basis. They are also responsible for completing the scheduled work on provided time and budget. They interact with the Project Manager on a week by week basis and provide details on the project progress, delays and other budget issues.

**Project Team Directory:**

| Role | Name | Title | Department | Email | Phone |
|---|---|---|---|---|---|
| Project Sponsor | Jessica Simmons | CTO | IT | j.simmons@himsys.com | 4164383222 |
| Program Manager | Anthony Brown | PMO Manager | PMO | a.brown@himsys.com | 4163739423 |
| Project Manager | John Goodman | Project Manager | PMO | j.goodman@himsys.com | 4163739283 |
| Project Stakeholder | Stakeholder Directory | SD | SD | Stakeholder Directory (SD) | SD |
| Customer | SickKids | Manager | IT | b.candy@sickkids.com | 4168493332 |
| Project Team | Project Directory | PD | PD | Project Directory (PD) | PD |

## 8.1 COMMUNICATION MATRIX

| Communication Type | Objective | Medium | Frequency | Owner | Deliverable |
|---|---|---|---|---|---|
| Kickoff Meeting | Review Project Objectives and other management approaches | Face to Face | Once | Project Manager | Agenda |
| Project Team Meeting | Review the current status of the project | Face to Face Conference Call | Weekly | Project Manager | Project Schedule |

| | | | | | |
|---|---|---|---|---|---|
| Technical Design Meeting | Develop technical design solutions | Face to Face | On Demand | Program Manager | Technical Issues |
| Monthly Project Status Meeting | Report on the current status of the project to management | Face to Face Conference Call | Monthly | Program Manager | Project Progress |
| Project Status Reports | Report on the progress, cost and issues of the project | Email | Monthly | Project Manager | Project Progress |

# 9 RISK MANAGEMENT

There are 2 types of risk management, reactive and proactive. Reactive is when a project team manages risks when they occur. Putting out fires when they happen instead of preventing fires from happening. Proactive is anticipating the risk before they happen, using formal risk analysis to plan for a variety of potential fires.

It is almost uniformly agreed upon that proactive risk management is much more appropriate for any project especially so for software projects. When we plan for a risk, it is much easier to fix it as we already planned a fix. Since we have an overall understanding of the variety of risks and the threat we pose, we know how many problems can be solved given the project deadline and resources. Not just that, but if we plan for a certain amount of risks and implement good leadership skills to mitigate them, it is possible for the project to be finished under budget. None of these benefits are possible under reactive risk management since the team is fixing the problems as they arise, unsure of how many more problems there will be and how long it takes to fix them, let alone how.

In an ideal world, our software project team would use exclusively proactive risk management. However, like in the corporate world, the situation is never ideal. The software development team had to do significant learning with a software framework they are unfamiliar with. Not only this, but the management team had no experience with developing a software solution in this niche. So, the software team did not have the knowledge of what the technical errors would be and how to fix them. They are resolving development errors as they arise which although is not ideal, is sufficient given our projects limited scope.

If we want to accomplish a comprehensive risk management, we have to follow three fundamental step requirements as;

- Risk Assessment: it describes all process or method where we;
  - Identify hazards and risk factors that have the potential to cause harm (hazard identification).
  - Analyze and evaluate the risk associated with that hazard (risk analysis, and risk evaluation).

Risk assessment was done when making Risk table and Risk Mitigation Monitoring Management (RMMM) table. Each risk needs to be documented and submitted for project managers. the Risk Management log (Risk Register), which contains risk information has been shown on 9.1.

- Risk Threshold: it is defined as a project management tool to measure the degree of uncertainty and the level of impact which a stakeholder/organization and consequently the project managers may have handle. It determines a certain value that they will accept a certain risk or not. to control it, it must be monitored across each phase. If the risk passed the threshold, then a review/re-evaluation proceeded by all project managers.

- Risk Control: when the project risk approved by all project managers the risk handling solution shall be proceeded via on of the following:
  -Accept/Mitigate: Develop RMMM

  -Reject: Not recommended for non-partial ones

  -Share: handle it to the third parties e.g. insurance or external professionals

Since, we have a team doing testing and testing methodology, then it is inappropriate to use reactive risk management. Hence, the testers will be as intimately attuned to the development algorithms, design patterns, and the overall framework. The project team recognizes the importance of risk management. Accordingly, a Risk Management Plan and Risk Register (Risk Log) will be developed and maintained throughout the pilot, identifying, monitoring and mitigating risks proactively as the pilot projects progress. Testing is being done simultaneously with development by the Quality Assurance team.

Our software team did manage to implement proactive risk management on the overall software project goals and the umbrella activities. Our risk management was designed to abide by the seven principles of proactive risk management.

By this way, we can still respond to the risks related to deadlines, documentation, and overall functionality without getting lost in the weeds of the technical risks. This sticks to the principal of maintaining a global perspective and taking a forward-looking view. During the initial planning and throughout the development process all QA and DEV team members were encouraged to voice potential risks. All of these risks were considered and planned for which abides by the principles of encouraging open communication, integration, and an emphasis on a continuous process. Each of these team members involved in every step of the process, risk related or not, so our risk management process also follows the principles of developing a shared product vision and encouraging teamwork.

Risk Identifications using the outline from Software Engineering: *A Practitioner's Approach, 8/e*:

- Product size: risks associated with the overall size of the software to be built or modified.
- Business impact: risks associated with constraints imposed by management or the marketplace.
- Customer characteristics: risks associated with the sophistication of the customer and the developer's ability to communicate with the customer in a timely manner.
- Process definition: risks associated with the degree to which the software process has been defined and is followed by the development organization.
- Development environment: risks associated with the availability and quality of the tools to be used to build the product.
- Technology to be built: risks associated with the complexity of the system to be

built and the "newness" of the technology that is packaged by the system.

- Staff size and experience: risks associated with the overall technical and project experience of the software engineers who will do the work.

## 9.1 RISK LOG

| Risk Title | Full Name | Manager | Department | Trigger Date | Description | Comments |
|---|---|---|---|---|---|---|
| **Being impractical by linking external D.Bs** | John Goodman | Project Manager | PMO | 09/17/19 | Due to the different venders/ versions of D.Bs for banks, Insurance linkage may have problems | Research about the most reliable D.B |
| **Upgrade potential scop being limited** | John Goodman | Project Manager | PMO | 09/19/19 | Connect the billing system to banks that have certain licences | Buy comprehensive licences have guaranteed support that matches by all banks |
| **unforseen bugs** | Anthony Brown | Program Manager | PMO | 09/27/19 | uncover any internal working system defects | -Well unit test -White Box Testing |
| **Unforseen limitation of HIMSys framework** | John Goodman | Project Manager | PMO | 09/15/19 | adding some new insurance may have asising problems | Consider all framework facilities further support in planning phase |
| **Security penetration** | John Goodman | Project Manager | PMO | 09/23/19 | using stolen ID card | Having additional D.B that can check for this issue |

# 10 ISSUE MANAGEMENT

Issues appear in the form of any problem that poses gap in functionality from the intended requirements.

The following category of issues can be defined:

- Coding Issues - issues due to the implementation of the system
- Stakeholder Issues - issues due to misinterpretation/failures to meet of stakeholder expectations
- Performance Issues - issues that refer to the performance of the system. This may be due to an architectural issue (hardware, network or software)

Issues that are found should be logged and stored using Github Issues on the project code repository. Issues will be periodically discussed during the daily meetings with the associated parties required for resolution.

## 10.1 ISSUE LOG

| Issue Number | Issue Title | Status |
|---|---|---|
| HS-013 | See patient history - not listing correct history | Opened |
| HS-012 | Pending prescription approval - displaying incorrect status | Closed |
| HS-011 | Access medical records - giving only stubbed response | Ready for Testing |
| HS-010 | Publish Research - data not recorded | Closed |
| HS-009 | Billing system giving a stubbed response | Opened |
| HS-008 | Insurance data not appearing correctly | Closed |
| HS-007 | Display available drugs - Drug ID search gives a stubbed response | Ready for Testing |
| HS-006 | Display available drugs - page not found error | Closed |
| HS-005 | Track my drugs - missing order status field | Opened |
| HS-004 | Order new drugs - entered drug data is not saved into the blockchain | Coding |
| HS-003 | Dashboard - “missing data” error message | Closed |
| HS-002 | Login not working | Closed |
| HS-001 | Periodic database connection issues | Open |

# 11 PROCUREMENT MANAGEMENT

The Procurement Management Plan (PMP) will be used to manage procurement throughout the project and will be updated as necessary. The PMP will also describe the conditions under which the items will be procured. The following procurement items and/or services have been determined to be necessary for project completion and success. The following list of items/services, justification, and timeline are pending Project Management Office (PMO) review:

| Item/Service | Justification | Needed by |
|---|---|---|
| Service A: Blockchain Network | Needed for hosting the database/server; Need to decide between AWS and Microsoft Azure; we do not host our own server | September 28, 2019 |
| Item A: Rental Computers | Needed by the DEV Team to develop the HIMSys; we do not buy the equipment | September 02, 2019 |
| Service B: Software Licenses | Needed by the DEV and QA Teams to develop and test HIMSys; we only license products on a yearly basis | September 05, 2019 |
| Service C: Customer Service Agency | Needed to help potential customers with the product support necessary; we do not offer customer service and have decided to outsource it during the Kickoff meeting | December 26, 2019 |
| Item B: Office Supplies/ Furniture | Needed for day to day operations by the DEV, QA and PR teams; we do not make our own furniture | September 01, 2019 |
| Item C: Internet Connection | Needed for day to day operations to maintain and publish code to the Blockchain Server; we do not have the budget or infrastructure for this item. | September 01, 2019 |
| Item D: Office Space | Needed for day to day operations to develop HIMSys; WeWork is bankrupt and we need our own space. | September 01, 2019 |

The following individuals are those authorized to approve necessary purchases of procurement items and/or services for the project team:

- Project Manager: John Goodman
- Program Manager: Anthony Brown

All the items for the above mentioned procurement will be obtained using firm-fixed contracts. The Project Manager and the Teams will work together to determine the exact item type, quantity and delivery dates.

**Decision Criteria:** The decision to award vendors with contracts on procurements will depend on the following criteria:

- Can the vendor deliver the items on time
- Quality and Cost
- Cost of out-sourcing vs in-sourcing
- Past Performance

**Performance Metrics for Procurement Items:**

| Vendor | Product | On Time Delivery | Development Costs | Development Time | Proj Manager Approval |
|---|---|---|---|---|---|
| Amazon AWS | Blockchain | Yes | $1100/month | Available | YES |
| Microsoft Azure | Blockchain | Yes | $1300/month | Available | NO |
| Dell | Computers | Yes | $1400/unit | 1 week | YES |
| HP | Computers | No | $1600/unit | 2 days | NO |
| JetBrains | Software Lic | Yes | $250/unit | Available | YES |
| Microsoft Visual Studio | Software Lic | Yes | $300/unit | Available | NO |
| Alorica | Customer Ser | Yes | $3/call | 4 weeks | YES |
| Sykes | Customer Ser | No | $2/call | 2 weeks | NO |
| Rogers | Internet | Yes | $120/month | Available | YES |
| Bell | Internet | Yes | $160/month | Available | NO |

# 12 COMPLIANCE RELATED PLANNING

Compliance is a term that describes conforming to a standard rule, law or requirement. It ensures that the project are executed within the overall objectives of the company. The compliance plan is assessed to ensure that personnel are aware of the non-compliance incidents. The approaches used are to ensure that every resources and tasks are assigned to respective individuals to achieve good governance. It also helps minimize risks and other problems that may be encountered during the project's lifecycle. The compliance related processes the project must adhere to are the following:

- Maintaining
- Troubleshooting
- Configuring

**The Compliance Planning**

The compliance plan consists of documents made up of internal policies, government regulations and obligations.

**Maintaining**

The maintaining process involves the team to design and verify the level of conformity to internal or external requirements. The maintaining process is based on a specific compliance document. This will allow compliance levels to be documented with evidence to recommend corrective actions in order to prevent future non-compliance incidents.

**Troubleshooting**

Troubleshooting involves the team's challenge in achieving regulatory and standards compliance requirements. Troubleshooting will allow the team to subsequently respond to unexpected events, update risk management plans, re-scope the project, and problem-solving as needed. This will help with productivity and efficiency and ensures that the project gets done within its timeline.

**Configuring**

After design stage has been put in place by the team, the next phase involves configuring the project. Configuring enables the team to define the level of compliance for each final product or deliverable, such as functional and physical specifications. By capturing evidence will demonstrate the level of compliance on details of observations. Any changes must be monitored and assessed to determine its impact on project configuration.

# APPENDIX A: PROJECT MANAGEMENT PLAN APPROVAL

The undersigned acknowledge they have reviewed the **HIM Sys Project Management Plan** and agree with the approach it presents. Changes to this **Project Management Plan** will be coordinated with and approved by the undersigned or their designated representatives.

| | | | |
|---|---|---|---|
| Signature: | | Date: | 12/15/2019 |
| Print Name: | John Goodman | | |
| Role: | Project Manager | | |

| | | | |
|---|---|---|---|
| Signature: | | Date: | 12/15/2019 |
| Print Name: | Anthony Brown | | |
| Role: | Program Manager | | |

| | | | |
|---|---|---|---|
| Signature: | | Date: | 12/15/2019 |
| Print Name: | Jessica Simmons | | |
| Role: | Project Sponsor | | |

| | | | |
|---|---|---|---|
| Signature: | | Date: | 12/15/2019 |
| Print Name: | Martha Hinnings | | |
| Role: | Project Stakeholder | | |

# APPENDIX B: REFERENCES

The following table summarizes the documents referenced in this document.

| Document Name and Version | Description | Location |
|---|---|---|
| CFR - Code of Federal Regulations Title 21 | FDA Regulatory Requirements for Record Keeping | https://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfcfr/CFRSearch.cfm?CFRPart=11 |

# APPENDIX C: KEY TERMS

The following table provides definitions for terms relevant to this document.

| Term | Definition |
|---|---|
| Amazon Web Services (AWS) | A vendor offering blockchain storage solutions |
| Blockchain | A secured ledger used to store information |
| CodeDeploy | An application used to deploy source code |
| Communication Management Plan (CMP) | maintains an information distribution lifeline among members of the project. |
| GitHub | An online software repository service used to store application codes |
| Electronic Health Passport (EHP) | A repository that carries users healthcare information |
| Healthcare Information Management System (HIMSys) | The application under development |
| FDA CFR Part 11 | Regulatory Requirements for Record Keeping |
| Microsoft Azure | A vendor offering blockchain storage solutions |
| Procurement Management Plan (PMP) | Manage procurement throughout the project and will be updated as necessary. |
| User Interface (UI) | The interface that a user will interact with |

# APPENDIX D: SUMMARY OF SPENDING

The original budget was set at **$500,000**. The real spending has amounted to **$492,350**

Below is the breakdown:

| Item | Cost | Breakdown |
|---|---|---|
| Rental Computers | $112,500 | (15 Computers x 5 months x $1500/month) |
| Software Licenses | $3750 | (15 Computers x $250/computer) |
| Blockchain Networks | $5500 | (5 months x $1100 /month) |
| Customer Agency | $1500 | ($3/call x 500 calls) |
| Office Supply/ Furniture | $7500 | (15 desks x $500/desk) |
| Internet Connection | $600 | ($120/month x 5 months) |
| Office Space | $17500 | (5 months x $3500 /month) |
| Food / Refreshments | $2250 | (5 months x $450 /month) |
| Employee Salary | $330,000 | 15 employees x ($27.50/hour x 800 hours)<br><br>where $27.50 is the average hourly rate among all the employees |
| Utilities (Hydro/Water) | $1250 | (5 months x $250/month) |
| Marketing | $10000 | (5 months x $2000/month) |
| **Total Cost** | **$492,350** | |