

Group Project Deliverable 1

"Project Initiation and Planning Documentation"

Group Project Topic:

Construction Management Information System

Group Name: Tech Phantoms

Team 2

Members:

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Kyle Rumde

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OVERALL PHASE STATUS		
SECTION	ASSIGNEE	STATUS
1. Executive Summary	Faith - Valentine Uzoka	Completed
2. History of the Project	Khaliq Minsariya	Completed
3. Objectives and Scope	Khaliq Minsariya	Completed
a) Produce Context Diagram	Faith - Valentine Uzoka	Completed
4 Current Situation	Srinath Bhaskaran	Completed
5. Solution Recommended	Srinath Bhaskaran	Completed
6. Equipment	Krushnam Badami	Completed
7. Databases and Files Used	Krushnam Badami	Completed
8. Project Feasibility	Artur Komissarov	Completed
9. Costs and Benefits	Varnika Srivastava	Completed
10. Schedules	Varnika Srivastava	Completed
11. Recommendations	Artur Komissarov	Completed

1. Executive Summary

In the current world, technology and information systems are allowing many individuals to complete tasks related to work in an efficient manner, regardless of the level of technical knowledge that the individual possesses.

The **Construction Management Information System (CMIS)** aims to link builders with technology by providing a system that automates many construction management related tasks. In addition to designing a 2D model of the project to be produced, the system will provide an in depth description of the resources required to complete the project in question. These resources include: materials, tools, equipment, and labour hours required. This system will support the decision making for builders and designers by efficiently coordinating project outcomes, along with the organization and management of project related resources. Some of the main competition we might face would come from companies such as AutoCAD, Revit, and SketchUp. All of these companies operate within the architecture and construction modelling industry, where the goal is to leverage technology by creating software programs that provide various workflows and modelling systems for planning construction projects. In total, our project will cost \$310 951.20 to develop, and \$232 000 to operate the system annually.

2. History

(a) Who requested it and when did they request it?

In the official meeting, held at the beginning of the year 2009, that discussed the company's financial status and strategies to address the rising growth in their organizational operations, a couple of key issues were highlighted. The head of the Human Resource Department, Mr. Donald Mcneil, expressed the need of an advanced employee management system that could automate the increasingly complex process of scheduling and assigning builders to construction contracts. The growth in operations has elevated workload and with current procedures the productivity has greatly diminished.

Additionally, the program manager – Mr. Anwen Thomson, pointed out the cost overruns incurred due to inaccurate planning leads to excess materials being purchased or being understaffed which further affects the overall triple constraint of the construction projects.

As a result, The Chief Executive Officer – Mrs. Maizie Hartman decided that to forecast company's growth in operations and the current financial status, the Information Technology Department should implement a construction management information system with the focus on helping them build models of construction projects, and helping them make reliable decisions on the project, subsequently, reducing the overall organizational expenditure.

3. Objectives and Scope

(a) What is this project to accomplish (define the problem to be addressed by the project)?

The company experienced a huge growth in their operations as their customer base increased in the recent years. As they got more and more contracts from various clients, managing the increased workload became extremely difficult and tedious. Moreover, their existing procedures are time-consuming and not so efficient. Consequently, they have had to endure increased costs which has further hampered their overall financial position.

The online construction management system will increase productivity by speeding up the planning and other preliminary processes of construction projects while still rendering accurate results. The system will also introduce simplicity in communicating with customers and gathering their specifications. Resultantly, the system will help overcome this problem of cost overruns in construction projects as well as be the pillar in supporting the growth of their operations.

(b) What is its rationale?

The company's current planning and designing processes for construction work is time-consuming and error-prone because multiple softwares are used for each subtask and several people are involved whereby an occurrence of even the slightest miscommunication can result in inaccurate design specifications and hamper the entire project. The online construction management system provides a centralized solution where all the planning and related vital preliminary processes are done in a quicker, error-free and reliable manner.

In the initial phases where customers are talking to the construction experts to specify what type of building they are looking for, customers often have a difficult time explaining verbally or through drawings what exactly they are looking for. In order to gather precise user specifications and gain their approval, engineers spend lots of hours making 3D models and physical representations of the requested construction work. Plus, after gaining approval, translating the model to blueprints is another time-consuming process. The proposed online system will simplify this issue as users will input their building specifications such as number of floors, bedrooms and bathrooms and the system will automatically generate blueprints based on the user input. This makes it more user-friendly and grants more flexibility in meeting customer requirements.

Furthermore, the system will also handle the scheduling and assigning of builders to specific projects and track progress until it is completed. This ensures competent project management as projects will stay within budget, will be completed in time, and scope will be accurately defined. Altogether, the system will assure stable financial status and help the company run smoothly.

(c) What is involved?

Software requirements:

Operating System: Windows 10, 64-bit

NOS: Microsoft windows server

Database: MySQL

IDE: JAVA Eclipse

GPU Software: Latest Version of Nvidia GeForce Studio Drivers

Hardware Requirements:

CPU: Intel quad-core i5 or higher

GPU: Nvidia GeForce RTX 2000 series or higher

Hard disk: SSD with free space of 15GB

RAM: 8GB at minimum

Servers: 1 of each File Server, Database Server, Web Server, Application Server

Expected Performance Criteria:

Database Query Execution Time: 0.25 seconds maximum

Network Latency: 200ms or below

(d) Produce Vision Document

Online Construction Management System

System Vision Document

Problem Description

Technology is a dynamic entity which keeps evolving over time, and businesses relying on it must adopt the latest technology available in order to operate efficiently. With the growth of the company's operations, the customer base has significantly expanded. This has made managing day-to-day tasks cumbersome as there are now more construction contracts to deal with in a short time frame. The current procedures of using several software tools across departments renders inefficiency as communication and integration of all aspects of one contract has become complicated and more prone to errors. Additionally, the procedures in place require multiple meetings with the client to fully understand their specifications and gain approval of the construction project which is time-consuming and delays the entire project. Plus, it may also cause inconvenience to the customers. With the rise in workload, project management has become complex as well. Assigning engineers and builders, keeping track of resources/materials, and tracking overall progress, all these vital planning processes are done inaccurately which result in cost overruns, hampering the company's overall financial status.

Therefore, the online construction management system is needed not only to maintain a stable financial position, but it will also support the firm's growth in operations and ensure it runs smoothly.

System Capabilities

The online construction management system will include the following functionality:

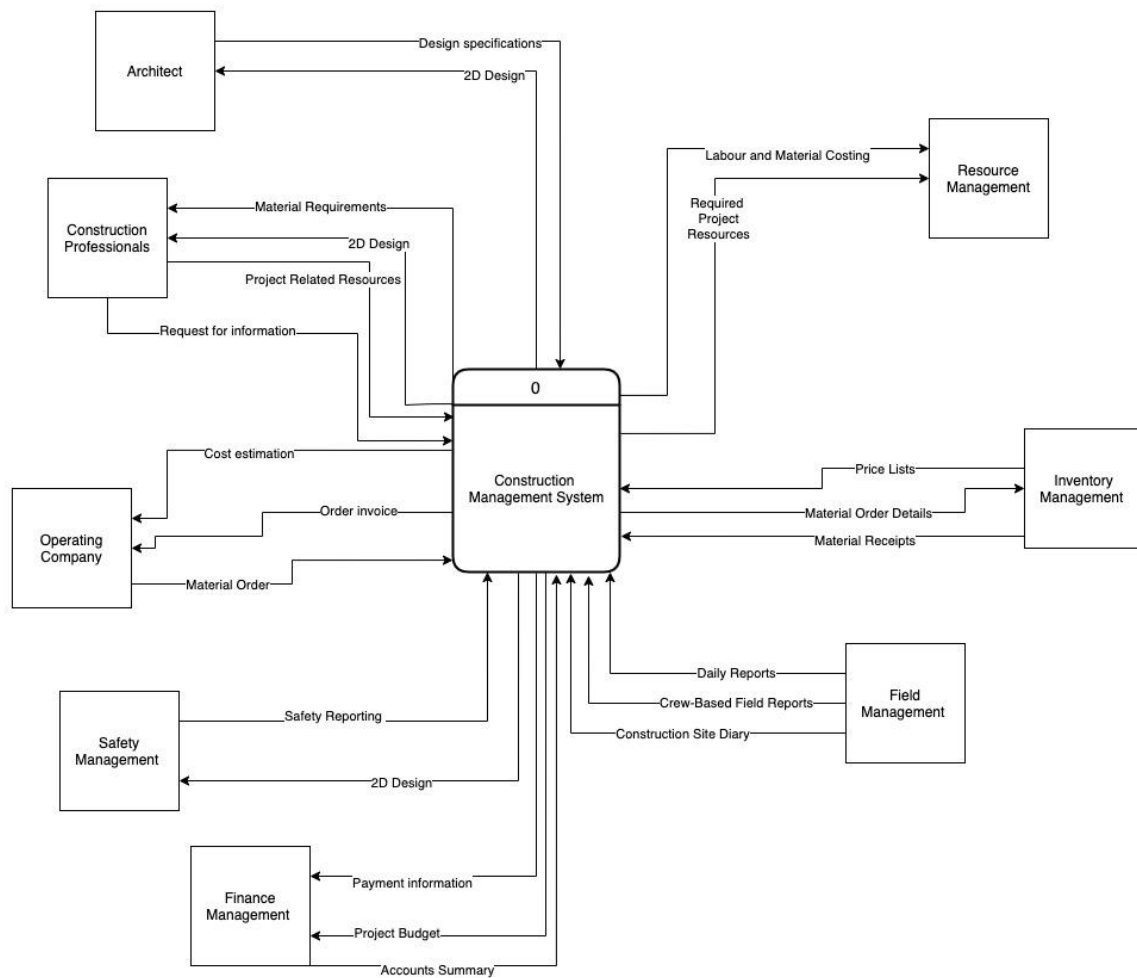
- Generate user-tailored blueprints.
 - Accept user-specifications with simplistic interface (Dropdown menus, etc.).
 - Generate blueprint of given specification with high automation.
 - Support customization of generated blueprints.
 - Recommend best locations to build the chosen blueprint.
- Automate project management activities.
 - Generate schedule automatically based on chosen blueprint.
 - Determine number of builders required and assign tasks to each accordingly.
 - Determine amount of materials required and place order automatically.
- Provide centralized reporting and analytics capability.
 - Generate reports of different time cycles (weekly, monthly, etc.).
 - Conduct analytics throughout the project life cycle and provide charts/visualizations.
- Support financial management and budgeting.
 - Estimate cost of the construction project and generate budget.
 - Keep track of receipts (of materials, payrolls, etc.).

Business Benefits

The primary benefits of the online construction management system will be to reduce total costs, which in turn improves the financial status, and help run the daily operations satisfactorily. The specific benefits include:

- Increased customer satisfaction which promotes customer loyalty.
- Increased efficiency due to the use of a centralized system for construction projects.
- Increased productivity as the system will automate the preliminary planning tasks.
- Advanced security and protection of vital, sensitive business data.
- Ease of data access due to online storage.
- Effective communication and collaboration as all the workflow is conducted through the centralized online system.
- Greater competitive advantage due to faster and reliable business operations that result in high-quality constructions.

(e) Produce Context diagram



4. Current Situation

(a) What areas are you addressing?

The main area addressed here is the designing requirement process, project scheduling and project management process.

(b) Why are you addressing these areas?

The construction project takes a large amount of time, which results in a need to monitor and manage the entire process. By implementing a Management Information System, the Project managers can control the process and flow of work orders to remain on track. This system also helps improve communication effectively, which enhances productivity.

(c) What are competitors doing? (provide URLs of some examples you looked at)

Most of our competitors like ECL¹ are focusing on monitoring all aspects of a project. They provide access to multiple team members to work on the same model. All our competitors cut down the paper cost by eliminating the manual documentation and use the system to manage the documentation process. The competitors also provide centralized access to the data such as RFIs, cost control, notices to proceed, and contracts.

(d) Problems with the current approaches (i.e. with what you found when you checked out competing systems on the WWW)

The major issues faced by our competitors are

- 1.) Project delivery time:
 - Some Project Management Systems don't consider factors that could delay the project completion time, such as material Quality problems, materials shipment delays, slow redesign process and so on.
- 2.) The limited file type compatibility:
 - It is difficult to export documents from different file formats to integrate data. It is essential for the system to support files from different softwares for reporting purposes.
- 3.) Synchronization issues: Some of our competitors experience slower synchronization issues as it is based on cloud computing.
- 4.) Design Feature: Competitors like CMiC Platform's UI/UX interfaces are not based on the current technology as it lacks visualization capabilities.

¹ Top 20 Alternatives & Competitors to Procore. Procore Alternatives & Competitors.
<https://www.g2.com/products/procore/competitors/alternatives>.

(e) What will be your competitive advantage?

Our software provides estimated project delivery time and materials requirements based on the design types such that the end-users can make management decisions at ease. The system also allows team members to send and receive information via the system, which reduces the need for other communication channels and avoid conflicts. The system improves performance and ensures effective communication between the teams. The system also offers analytical tools to support project management. External factors like shipment delay are taken into consideration to detect projects overdue. The system also provides pre-developed designs based on the user requirement. The software also supports multiple users to access the system and reduces redundancy in the data by implementing centralized storage.

5. Solution Recommended

(a) How will the thing work? (just a rough overview at this stage to show its feasible)

The user enters the construction project requirements in the Design Requirement Planning interface, and the system will provide various design models. Once a design is selected, the user can get the estimated project cost, the project completion time. The Material required Planning system will manage the materials needed for the project. The system also supports the inventory management system. The project manager can assign tasks to the team members and monitor the status with the project management dashboard. The team members can report the task status through the system. The analysis tools help managers monitor progress on financial targets like the anticipated planned vs. actual cost. The tools also help users identify potential risks, improve the management of projects, minimize costs and project completion time. The users can also track which team is using a particular equipment within the system.

(b) Who will the users be?

- Construction Managers
- builders
- Architects
- Engineer
- Analyst

(c) What will be the main transactions supported (i.e. what kind of interactions with users will the systems support, and what will it provide users?)

Scenario-1

User- Inputs the requirements of the construction project

System - Displays the construction models based on the requirements from an external database

Users: Select their preferred design and request for project estimation and material required

System: Projects the project cost, materials required and estimated project completion time.

Scenario -2

Team leader - Inputs the task of each team and its members

System: Assigns task to the team members

Team members: Reports task completion

System: Updates the tasks status to the team Leader

6. Equipment

(a) What equipment is to be used? (describe very briefly)

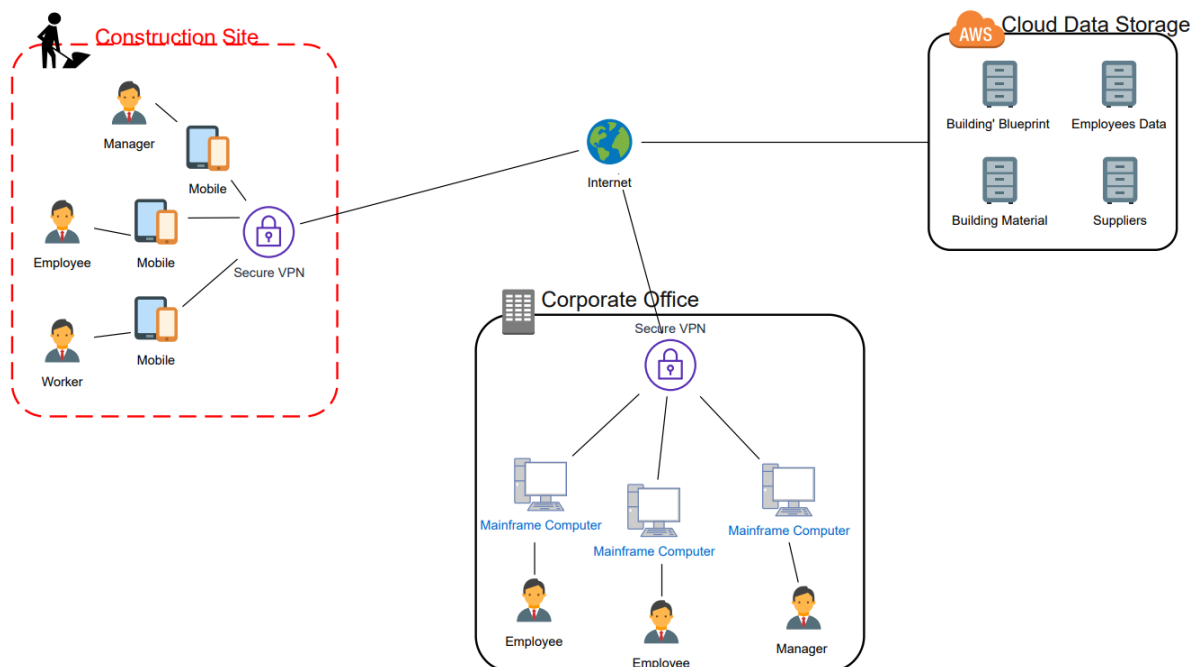
Hardware: Workstations, Mobile device(for remote access), Servers.

(b) How much of it is already installed?

The office has minimal internet connectivity, printer and a computer

(c) What else is needed?

A cloud service provider as infrastructure as a service and a VPN service.



7. Databases and Files

(a) What databases or files will be used?

- Building's Blueprint
- Building Material Information and their associated Costs
- Inventory
- Current Projects
- Employees data.

(b) What databases will be created?

- Building's Blueprint Database shared with other architects and builders
- Material Information Database consisting all the information and cost per unit.
- Suppliers Database
- Inventory Database to keep track of current items on hand.
- Current Projects - the list of current ongoing projects.
- Employee Database.

(c) What will they be available for?

All the databases will be integrated with the Construction Management Information System and will be used by the software for calculating required material and their cost. It will also be used to assign work orders to the team which can be scheduled and monitored by the manager.

8. Project Feasibility

(a) Organizational and cultural feasibility

There's a notable stress on the AS-IS process in initializing, executing, and maintaining construction projects can present multiple challenges and unwanted errors. As stated, more work is padded between software in use for a project endeavour in construction and may result in deviations in detail which could lead into project delays or even project failure. It's also noted that project partners tend to assume different roles among the duration of a construction project (<https://core.ac.uk/download/pdf/194567605.pdf>, page 2). It's typical that introducing new technologies into organizations may bring among the employees the fear of losing jobs, however, this is not the case with the presented CMIS in deliverable 1, as it aims to unify many pivotal milestones of a construction project within one software. There could be a reasonable amount of reluctance that might come from the organizations and employee's side for revamping their structure and using our information system. However the problem is resolved as our information system offers a full demo session of the systems functions and displays the ease a user gets by using our system.

Our CMIS aims to complete the same tasks in a shorter time, as well as eliminating errors as all phases of a construction project are considered and implemented in a centralized manner. Errors in communications are sought to be addressed with our CMIS.

Such innovations are therefore deemed feasible according to the organization's interest as well as it's organizational culture for a unified centralized process.

(b) Economic feasibility (details in section 10)

To determine economic feasibility, a cost/benefit analysis has been performed in regards to ongoing costs, initial cost, ongoing benefits, all of these dollar values with the discount value applied with our proposed CMIS. Section 10 illustrates that the 5 year ROI is approximately 152%, as well as a payback period of 13 months (1 year, 31 days). Given that only the first 5 years have been considered and that the cumulative NPV demonstrates an upward slope of benefits, and the payback period is early, **it's clear that the project is economically feasible to proceed to deliverable 2.**

(c) Technological feasibility

The organization has already seen former projects involving the use of BIM software and could be reused for the new project initiative suggested in deliverable 1. The only challenge is to develop the CMIS itself.

New databases and software will be needed to house the Construction Management Information System as well as the new BIM software to be in compliance with other use cases of the CMIS, such as completion of the construction proposed as well as meeting project goals such as funding, resource allocation for the construction site, and milestones. Therefore, it is essential that the planning phases are integrated and aligned with the construction phase in our CMIS, **which may require relational databases. Hardware requirements to support the CMIS product itself are reasonable and shall not pose a problem in technology feasibility. The technology required for CMIS is therefore feasible to proceed into deliverable 2.**

(d) Resource feasibility

Creating an in-house BIM software, even though having previous knowledge on BIM as suggested from the company history, will require a reasonable amount of funding to produce an effective BIM software into the CMIS. It's been noted though that the fruits of labour in BIM have shown to be very effective throughout the industry as noted in *BIM implementations - Global Strategies* where “*BIM usage is accelerating powerfully, driven by major private and government owners who want to institutionalize its benefits of faster, more certain project delivery and more reliable quality and cost*”. **It is therefore feasible, as BIM is proving to be a powerful solution for construction companies in the industry with ample resources available to successfully develop the CMIS proposed in deliverable 1.**

(e) Schedule feasibility (details in section 11)

Upon review of the GANTT chart constructed at section 11 of the report, it clearly shows each task derived by a work breakdown structure and is deemed feasible to proceed into deliverable 2.

9. Costs and benefits

(a) List benefits (estimates of tangible and intangible benefits)

Estimated Annual Benefit of CMIS	
Tangible Benefits	Amount
Ensuring Quicker Processing and Turnabout	\$50,000
Reducing Error Rates	\$60,000
Office Space Reduction	\$87,600
Consistent Estimation Accuracy	\$84,000
Designing overly complex incentive schemes	\$60,000
Reduced Paperwork Cost	\$80,000
Budget Management	\$50,000
Total Annual Benefit for CMIS	\$471,600

Intangible Benefits of CMIS
Efficient communication between the construction employees and departments
Enhanced Customer Experience
All the management for the construction project can be executed smoothly
Accurate and faster access to data for timely decisions
Facilitates Strategic Planning

(b) List costs (development cost, operating cost)

Total Estimated One Time Cost for Development	
Expense Category	Amount
Salaries/Wages for Project	\$100,951.20
Equipment and Installation	\$80,000
Licenses	\$20,000
User Training	\$30,000
Facilities	\$20,000
Utilities	\$20,000
Miscellaneous	\$35,000
Contingency	\$5,000
Total Estimated One Time Development Cost	\$310951.20

Supporting Details for salaries/Wages for the project	
Team Members	Salary/Wage for Project
Project Manager (120 days @ \$371.92/day)	\$44,630.40
Senior Systems Analyst (40 days @ \$496/day)	\$19,840
Systems Analyst (30 days @ \$329.2/day)	\$9,876
Database Analyst (20 days @ \$272.08/day)	\$5,441.60
Programmer Analyst (60 days @ \$301.44/day)	\$18,086.40
Testing Analyst (10 days @ \$307.68/day)	\$3,076.80
Total Salaries and Wages	\$100,951.20

Total Estimated Annual Cost for Operating	
Recurring Expense	Amount
Connectivity	\$45,000
Equipment Maintenance	\$40,000
Database Maintenance	\$10,000
Programming	\$60,000
Help Desk	\$25,000
Amortization of Equipment	\$45,000
Site Recovery	\$2000
Contingency	\$5,000
Total Estimated Annual Operating Cost	\$232,000

(c) Comparison of costs versus benefits (cost-benefit analysis, NPV, BEP, ROI)

Cost/Benefit	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Value of Benefits		4,71,600	5,89,500	7,54,560	9,80,928	13,73,299	
Discount Factor (10%)	1	0.9091	0.8264	0.7513	0.6830	0.6209	
Present Value of Benefits		4,28,732	4,87,163	5,66,901	6,69,974	8,52,681	30,05,451
Development Costs	-3,10,951						-3,10,951
Ongoing Costs		-2,32,000	-2,32,000	-2,32,000	-2,32,000	-2,32,000	
Discount Factor	1	0.9091	0.8264	0.7513	0.6830	0.6209	
Present Value of Costs		-2,10,911	-1,91,725	-1,74,302	-1,58,456	-1,44,049	-8,79,442
IV of Net of Benefits & Costs	-3,10,951	2,17,820	2,95,438	3,92,599	5,11,518	7,08,633	
Cummulative NPV	-3,10,951	-93,131	2,02,307	5,94,906	11,06,424	18,15,057	
Payback Period	1 year +93131/ (93131+202307) = 1 + 0.315 or 1 year 31 days						
5 Year ROI	152.48%						

10. Schedules

(a) Task list (effort, size and schedule estimates; Work Breakdown Structure)²

Task List for Construction Management Information System			
Task Name	Duration in Days	Start Date	End Date
1.0 Project Planning Phase			2/9/2021
1.1 Defining the Problem	8	1/19/2021	1/26/2021
1.1.1 Meet the Users	1		
1.1.2 Determine Project Scope	1		
1.1.3 Write Statement of Need	1		
1.1.4 Develop System Vision Document	2		
1.1.5 Develop Context Diagram	2		
1.1.6 Determine Competitive Advantage	1		
1.2 Create the Project Schedule	5	1/27/2021	1/31/2021
1.2.1 Develop the Task List	1		
1.2.2 Construct Work Breakdown Schedule	2		
1.2.3 Estimate Resources to be Used	<1		
1.2.4 Develop PERT & Gantt Chart	2		
1.3 Verify Project Feasibility	4	2/1/2021	2/4/2021
1.3.1 Evaluate Organizational & Culture feasibility	1		
1.3.2 Identify tangible costs	<1		
1.3.3 Identify intangible costs and benefits	<1		
1.3.4 Identify Development & Operating Cost	<1		
1.3.5 Calculate NPV, ROI & Payback	1		
1.3.6 Evaluate Economic Feasibility	<1		
1.3.7 Assess Technological Feasibility	1		
1.3.8 Evaluate Resource Feasibility	<1		
1.3.9 Assess Schedule Feasibility	1		
1.4 Staff the Project	1	2/5/2021	2/6/2021
1.4.1 Develop Project Resource Plan	1		
1.4.2 Identify Technology sector Staff Members	<1		
1.4.3 Meet with users, identify & request user staff	<1		
1.4.4 Organize Project Team	<1		
1.4.5 Conduct Team – Building Exercises	<1		
1.5 Launch the Project	3	2/7/2021	2/9/2021
1.5.1 Prepare Presentation Material	1		
1.5.2 Make Executive Summary	<1		
1.5.3 Create Content Summary	1		
1.5.4 Assign Content Parts	<1		
1.5.5 Conduct Official Project Presentation Meeting	1		
2.0 Project Requirement Determination			3/9/2021
2.1 Gather Information	2	2/10/2021	2/11/2021
2.2 Define information System Goals	1	2/12/2021	2/12/2021
2.3 Identify Requirements using techniques	2	2/13/2021	2/14/2021

² Can be viewed in the excel sheet as well

2.4 Identify functional Requirements	1	2/15/2021	2/15/2021
2.5 Create Activity Diagram	5	2/16/2021	2/20/2021
2.6 Create Event Table	5	2/21/2021	2/25/2021
2.7 Identify Use Case Specifications	3	2/26/2021	2/28/2021
2.8 Develop Use Case Diagram	5	3/1/2021	3/5/2021
2.9 Construct Conceptual Model	4	3/6/2021	3/9/2021
3.0 Detailed Design Documentation			4/6/2021
3.1 Create Interaction Diagrams	3	3/10/2021	3/12/2021
3.2 Develop Design Class Diagram	4	3/13/2021	3/16/2021
3.3 Design Program Structure	8	3/17/2021	3/24/2021
3.3.1 Design Application Architecture			
3.3.2 Design the user interface			
3.3.3 Design the system interface			
3.3.4 Design and integrate the database			
3.3.5 Prototype for design Detail			
3.3.6 Design and integrate system controls			
3.4 State System Complexity	4	3/25/2021	3/28/2021
3.4.1 Identify layers and Partitions			
3.4.2 Create Package Diagram			
3.4.3 Create Component Diagram			
3.4.4 Construct Deployment Diagram			
4.0 Implementation and System Prototype			4/6/2021
4.1 Construct Software components	5	3/29/2021	4/2/2021
4.2 Construct Database	2	4/3/2021	4/4/2021
4.3 Verify and Test	2	4/5/2021	4/6/2021
4.4 Present Functional Prototype of IS	<1		4/6/2021

Work Breakdown Structure for Construction Management Information System			
Task Name	Number of Resources	Dependencies	Task Assigned to
1.0 Project Planning Phase		-	
1.1 Defining the Problem		-	
1.1.1 Meet the Users	6	1.1.1	Artur, Faith – Valentine, Khaliq, Krushnam, Srinath, Varnika
1.1.2 Determine Project Scope	6	1.1.2	Artur, Faith – Valentine, Khaliq, Krushnam, Srinath, Varnika
1.1.3 Write Statement of Need	2	1.1.2,1.1.3	Faith Valentine, Khaliq
1.1.4 Develop System Vision Document	1	1.1.4	Khaliq Minsariya
1.1.5 Develop Context Diagram	1	1.1.4	Faith – Valentine Uzoka
1.1.6 Determine Competitive Advantage	1		Srinath Bhaskaran
1.2 Create the Project Schedule		1.1.2,1.1.3	
1.2.1 Develop the Task List	1	1.2.1	Varnika Srivastava
1.2.2 Construct Work Breakdown Schedule	1	1.2.2	Varnika Srivastava
1.2.3 Estimate Resources to be Used	1	1.2.3	Krushnam Badami
1.2.4 Develop PERT & Gantt Chart	1		Varnika Srivastava
1.3 Verify Project Feasibility		1.1.2	
1.3.1 Evaluate Organizational & Culture feasibility	1	1.1.2	Artur Komissarov
1.3.2 Identify tangible costs	1	1.1.2	Varnika Srivastava
1.3.3 Identify intangible costs and benefits	1	1.1.2	Varnika Srivastava
1.3.4 Identify Development & Operating Cost	1	1.3.2,1.3.3, 1.3.4	Varnika Srivastava
1.3.5 Calculate NPV, ROI & Payback	1	1.3.5	Varnika Srivastava
1.3.6 Evaluate Economic Feasibility	1	1.1.2	Artur Komissarov
1.3.7 Assess Technological Feasibility	1	1.1.2	Artur Komissarov
1.3.8 Evaluate Resource Feasibility	1	1.2.4	Artur Komissarov
1.3.9 Assess Schedule Feasibility	1		Artur Komissarov
1.4 Staff the Project		1.2.4	
1.4.1 Develop Project Resource Plan	1	1.4.1	Krushnam Badami
1.4.2 Identify Technology sector Staff Members	1	1.4.2	Krushnam Badami
1.4.3 Meet with users, identify & request user staff	1	1.4.4	Krushnam Badami
1.4.4 Organize Project Team	1	1.4.4	Varnika Srivastava
1.4.5 Conduct Team – Building Exercises	1		Varnika Srivastava
1.5 Launch the Project		1.3.9	
1.5.1 Prepare Presentation Material	1	1.5.1/1.3.9	Kyle Rumde
1.5.2 Make Executive Summary	1	1.5.2/1.3.9	Kyle Rumde
1.5.3 Create Content Summary	1	1.5.3/1.3.9	Kyle Rumde
1.5.4 Assign Content Parts	1	1.5.4/1.3.9	Varnika Srivastava
1.5.5 Conduct Official Project Presentation Meeting	7		Artur, Faith – Valentine, Khaliq, Krushnam, Kyle, Srinath, Varnika
2.0 Project Requirement Determination		1.5.5	
2.1 Gather Information	3	2.1	Artur, Krushnam, Kyle
2.2 Define information System Goals	4	2.1	Faith – Valentine, Khaliq, Srinath, Varnika
2.3 Identify Requirements using techniques	7	2.2	Artur, Faith – Valentine, Khaliq, Krushnam, Kyle, Srinath, Varnika

2.4 Identify functional Requirements	7	2.3	Artur, Faith – Valentine, Khaliq, Krushnam, Kyle, Srinath, Varnika
2.5 Create Activity Diagram	7	2.4	Artur, Faith – Valentine, Khaliq, Krushnam, Kyle, Srinath, Varnika
2.6 Create Event Table	2	2.5	Faith – Valentine, Kyle
2.7 Identify Use Case Specifications	5	2.6	Artur, Faith – Valentine, Khaliq, Krushnam, Srinath, Varnika
2.8 Develop Use Case Diagram	5	2.7	Artur, Faith – Valentine, Khaliq, Krushnam, Srinath, Varnika
2.9 Construct Conceptual Model	2	2.8	Faith – Valentine, Kyle
3.0 Detailed Design Documentation			
3.1 Create Interaction Diagrams	3		Krushnam, Srinath, Varnika
3.2 Develop Design Class Diagram	4		Artur, Faith – Valentine, Khaliq, Kyle
3.3 Design Program Structure	7		Artur, Faith – Valentine, Khaliq, Krushnam, Kyle, Srinath, Varnika
3.3.1 Design Application Architecture			
3.3.2 Design the user interface			
3.3.3 Design the system interface			
3.3.4 Design and integrate the database			
3.3.5 Prototype for design Detail			
3.3.6 Design and integrate system controls			
3.4 State System Complexity	7		Artur, Faith – Valentine, Khaliq, Krushnam, Kyle, Srinath, Varnika
3.4.1 Identify layers and Partitions			
3.4.2 Create Package Diagram			
3.4.3 Create Component Diagram			
3.4.4 Construct Deployment Diagram			
4.0 Implementation and System Prototype			
4.1 Construct Software components	5		Artur, Faith – Valentine, Khaliq, Krushnam, Srinath
4.2 Construct Database	2		Kyle, Varnika
4.3 Verify and Test	7		Artur, Faith – Valentine, Khaliq, Krushnam, Kyle, Srinath, Varnika
4.4 Present Functional Prototype of IS	7		Artur, Faith – Valentine, Khaliq, Krushnam, Kyle, Srinath, Varnika

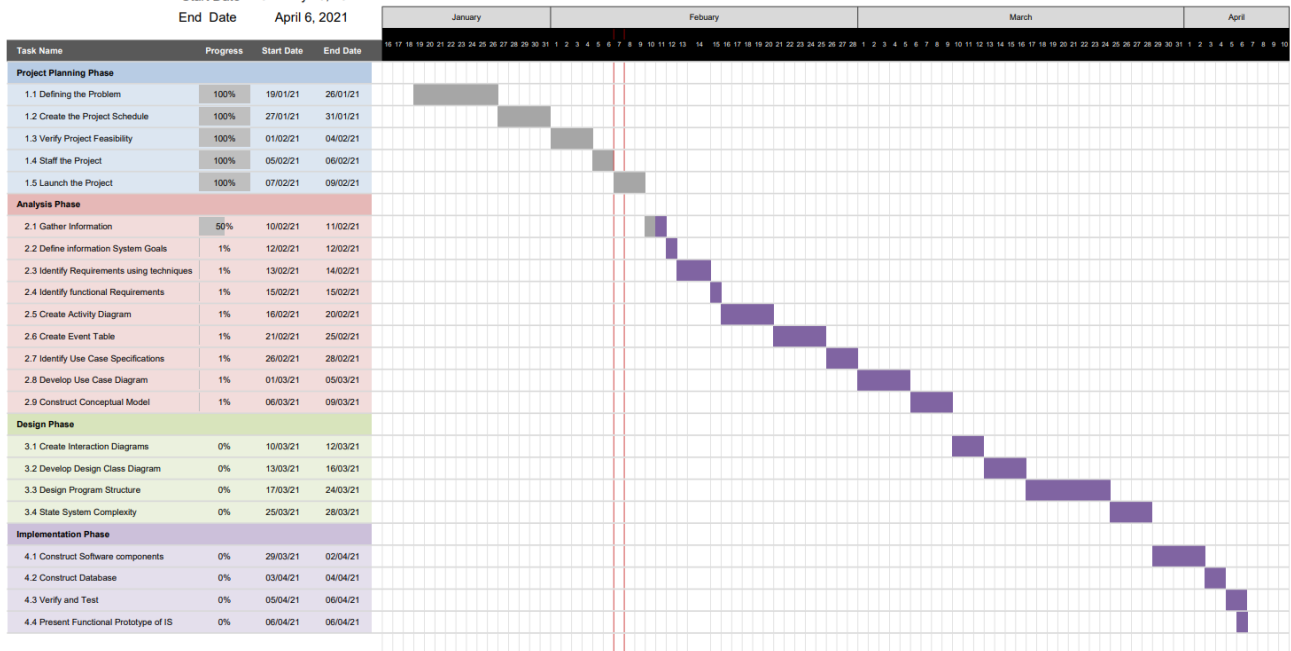
(b) Gantt chart; PERT Chart³

GANTT Chart for CMIS

Construction Management Information System

Group Name: Tech Phantoms

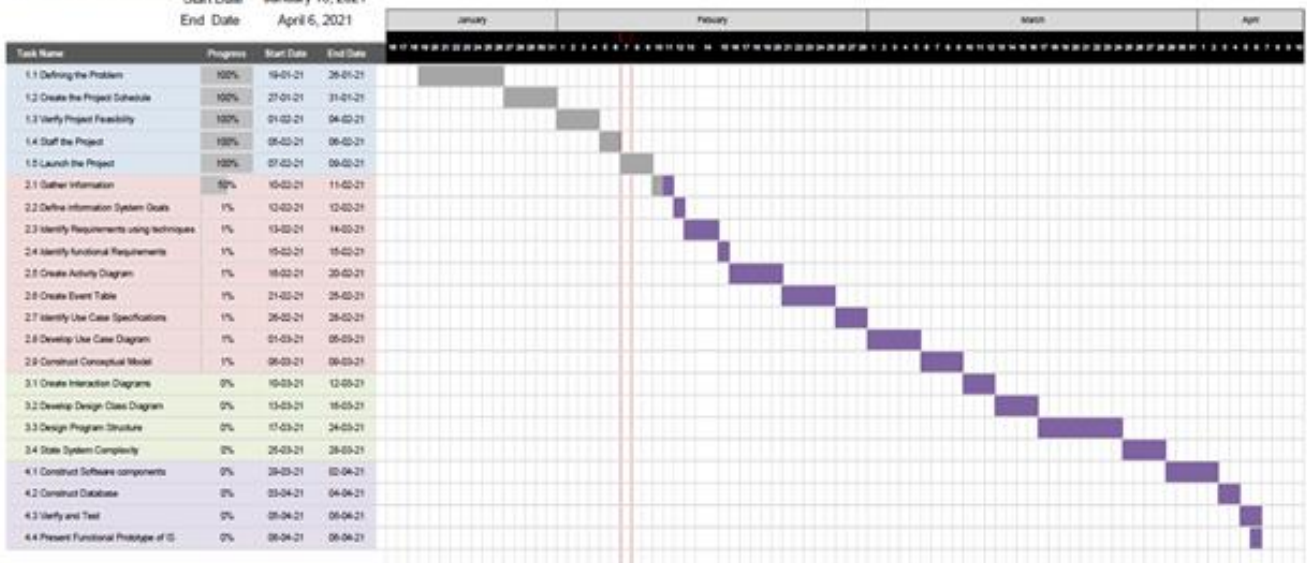
Start Date January 16, 2021
End Date April 6, 2021



Construction Management Information System

Group Name: Tech Phantoms

Start Date January 16, 2021
End Date April 6, 2021

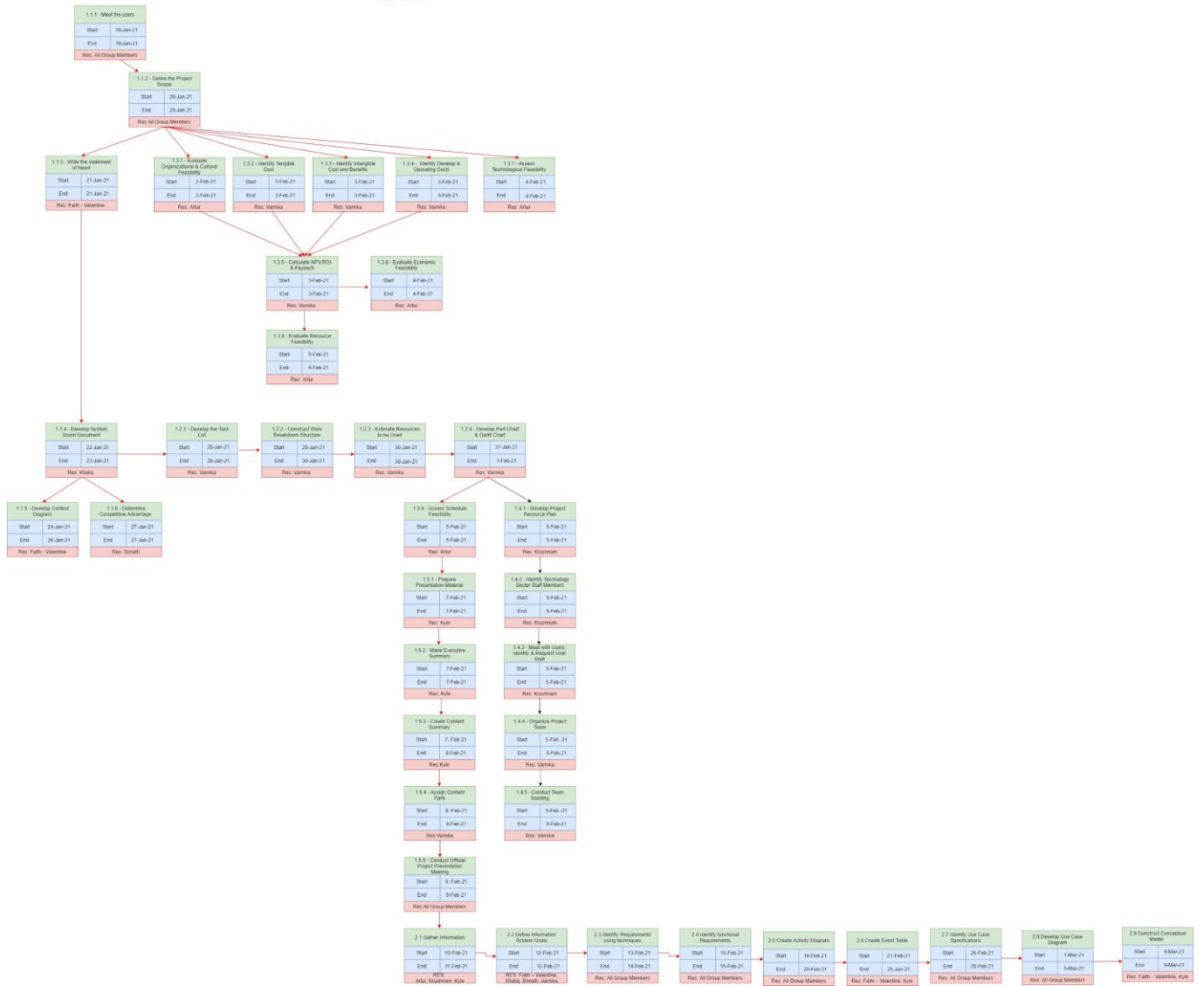


(The above image shows excludes the phase titles)

³ Please refer to the Excel sheet to get a full overview of the Gantt and PERT Chart

PERT Chart of CMIS

PERT CHART



11. Recommendations

The project has already been deemed feasible and is ready for review by our client. Our team's immense enthusiasm and determination to work on this project has been seen consistently in the deliverable 1. We look forward to getting our project proposal approved by you and moving towards beginning deliverable 2.

Participation Marks⁴

- 1. Artur Komissarov - 10**
- 2. Faith-Valentine Uzoka - 10**
- 3. Khaliq Minsariya - 10**
- 4. Krushnam Badami - 10**
- 5. Kyle Rumde - 9.3**
- 6. Srinath Bhaskaran - 10**
- 7. Varnika Srivastava - 10**

(Note: The marks mentioned above are a average of the total marks given by each participant)

⁴ Please view the excel sheet for further details

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