FACULTY OF COMPUTING
UTM Johor Bahru

SECD2613 – SYSTEM ANALYSIS AND DESIGN

Semester 2 – 2023/2024

Community Garden Management System

Phase Project proposal and planning

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Group members:

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Section: 07

1. Introduction

A community garden is a plot of land where several gardeners contribute to growing vegetables, fruits, or plants either separately or collectively. One of the biggest benefits of a community garden is its sense of--you guessed it-- community. Individuals from the area work together, share tips and stories, and enjoy each other's successes. community gardens promote social interaction, build community cohesion, and provide opportunities for education and skill building, and it also Encourage others to be outdoors and reconnect with nature, allow opportunities for exercise and stress relief Provide educational, and for sure it is Give more people access to healthy produce and more.

2. Background Study

Although Johor is a developed city and uses technology in various fields, the old community gardens remain in their system because; It helps maintain cultural traditions and for those committed to sustainability and personal and family health, since they are often located within neighborhoods and on public property. Gardeners in JB usually use their social media accounts or WhatsApp to know about the community gardens near them and the available plots on them and send requests for assignments for the administrators to use the plots. And the administrators can approve plot request messages from the gardeners. This is clearly not the affection way to communicate with society.

3. Problem Statement

1-knowing of community gardens in Johor that are operating, out of operation, or even operating seasonally. Many gardeners and volunteers face difficulty in knowing the locations of community gardens and accessing their locations through Goul maps.

2-hardest to knowing who runs the community garden, the system, and the information that is important for gardeners before joining a community the garden. The difficulty of knowing the system it is working with, whether it is. the system using plots or planer beds or other, and to know the complete and basic information about the garden in terms of its area, quality, and nature of the soil in terms of whether it is organic or uses fertilizers, or whether it is a garden for growing vegetables, fruits, or other products).

3-Difficulty contacting the landowner or the garden director. To reserve the plots, it is difficult for gardeners to quickly find the garden owner to communicate and choose a plot and its area and location within the garden.)

4- the difficulty of remaining fully informed about both the gardeners and the owner. Without a permanent means of communication between people, it is difficult for them to follow up the work and keep control of all the steps that are. accomplished in the garden such as plowing the soil, sowing the seeds, or periodically cleaning the garden, fighting plant pests in the garden, or even when the date of harvesting the fruits or products comes.

5-The lack of a platform among gardeners to exchange expertise and experiences, share the results and feedback of their work, create and save reports for those who willing to join the later the garden community can get the real benefits from them, easily and smoothly, with the availability of recorded data and reports about the history of the garden in terms of the quality of the soil and the environment surrounding the garden.

6-non-involvement of the volunteers and beginners. The need of volunteers and beginners in this field to learn how to contribute to the community garden and take care of their plots which could be planted with various types of plants so that they will be ready for been a volunteer in the community garden whenever volunteer opportunities open.

7-Poor advertising and promotion of the community garden. The community garden’s lack of advertising weakens its importance and its main goal of being a community place in which most members of society contribute.

4. Proposed Solution

After conducting an interview with many of gardener and admins of garden community in Johor Baharu. We decided to create a mobile application for community garden that would help in managing, improving and sharing the garden community benefits.

What will be provide in the app:

Communication Tools: Allow members to stay connected, share updates, and work together on garden activities through messaging, notifications, and group chats.

Photo Sharing: Allow users to upload and share photos of their garden plots, harvests, projects, and events within the community.

Donation Portal: Include a secure donation platform for individuals and businesses to support the garden financially.

Community Forum: Facilitate discussions, Q&A sessions, and knowledge sharing among members on gardening topics, challenges, and successes.
Sustainability Tracker: Track the garden's environmental impact, water usage, waste reduction efforts, and carbon footprint to promote eco-conscious practices.

Partner Directory: Feature local businesses, organizations, and sponsors that support the garden community with discounts, resources, or collaborative opportunities.

The app for a community garden will enhance communication, increase engagement, streamline organization, foster community building, facilitate knowledge sharing, promote sustainability, and generate financial support.
and it will serve as a centralized platform for community members to stay

connected, share updates, and collaborate on gardening projects. as will the app provide access to resources, educational content, volunteer opportunities, and interactive features, promoting environmental stewardship and fostering a sense of belonging.

Economic feasibility (CBA)

Assumptions	
Discount rate	10%
Sensitivity factor (costs)	1.1
Sensitivity factor (benefits)	0.9
Annual change in production costs	5%
Annual change in benefits	7%

Estimated costs	
Hardware	RM 10000
Software development	RM 10000
Maintenance	RM 3000 per year
Advertising	RM 5000 per year
Salary	RM 35000 per year

Estimated Benefits	
Increase Sales	RM 48000 per year
Savings	RM 24000 per year

Costs	Year 0	Year 1	Year 2	Year 3
Development cost				
Hardware	11000			
Software development	11000			
Total	22000			
Production Cost				
Advertisement		5500	5775	6064
Salary		38500	40425	42446
Maintenance		3300	3465	3638
Annual Production Cost		47300	49665	52148
(Present Value)		43000	41045	39180
Accumulated Costs		65000	106045	145225

Benefits	Year 0	Year 1	Year 2	Year 3
Increase Sales		43200	46224	49460
Saving		21600	23112	24730
Annual inventory costs		64800	69336	74190
(Present Value)		58909	57302	55740
Accumulated benefits		58909	116211	171951
Gain or Loss		(6091)	10166	26726
Profitable Index (PI)	1.34			

5. Objective

1. Enhance Accessibility: Make information about community gardens in JB easily accessible, including locations, plot availability, and management details.

2. Improve Communication: Enable efficient communication and coordination among gardeners and administrators through messaging, notifications, and group chats.

3. Encourage Collaboration: Foster collaboration and knowledge sharing among gardeners by providing discussion forums, Q&A sessions, and photo sharing features.

4. Engage Volunteers: Provide guidance and opportunities for volunteers and beginners to participate in community gardening activities and learn valuable skills.

5. Promote Sustainability: Monitor and promote sustainable gardening practices to minimize environmental impact and contribute to long-term environmental stewardship.

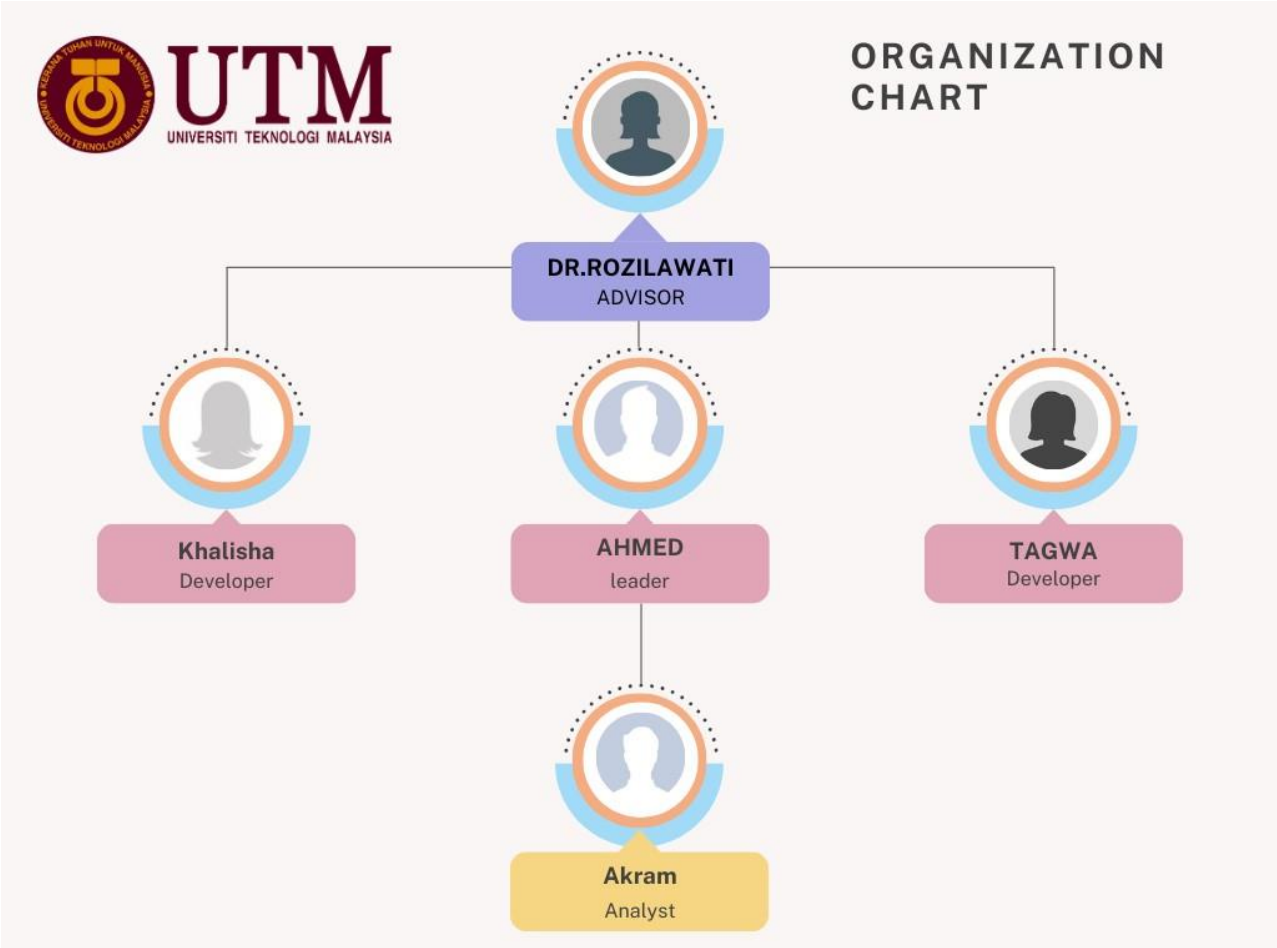
6. Project Scope

This project combines community engagement, environmental stewardship, and practical problem-solving to create a user-friendly and impactful system for managing community gardens in Johor Baharu. With features like plot management, task scheduling, resource sharing, communication hub, education, and community events, the system fosters collaboration, promotes sustainability, and empowers users to make the most of their gardening experience. Through interviews, design, development, testing, and deployment, the project aims to provide a delightful and effective solution for gardeners and administrators alike.

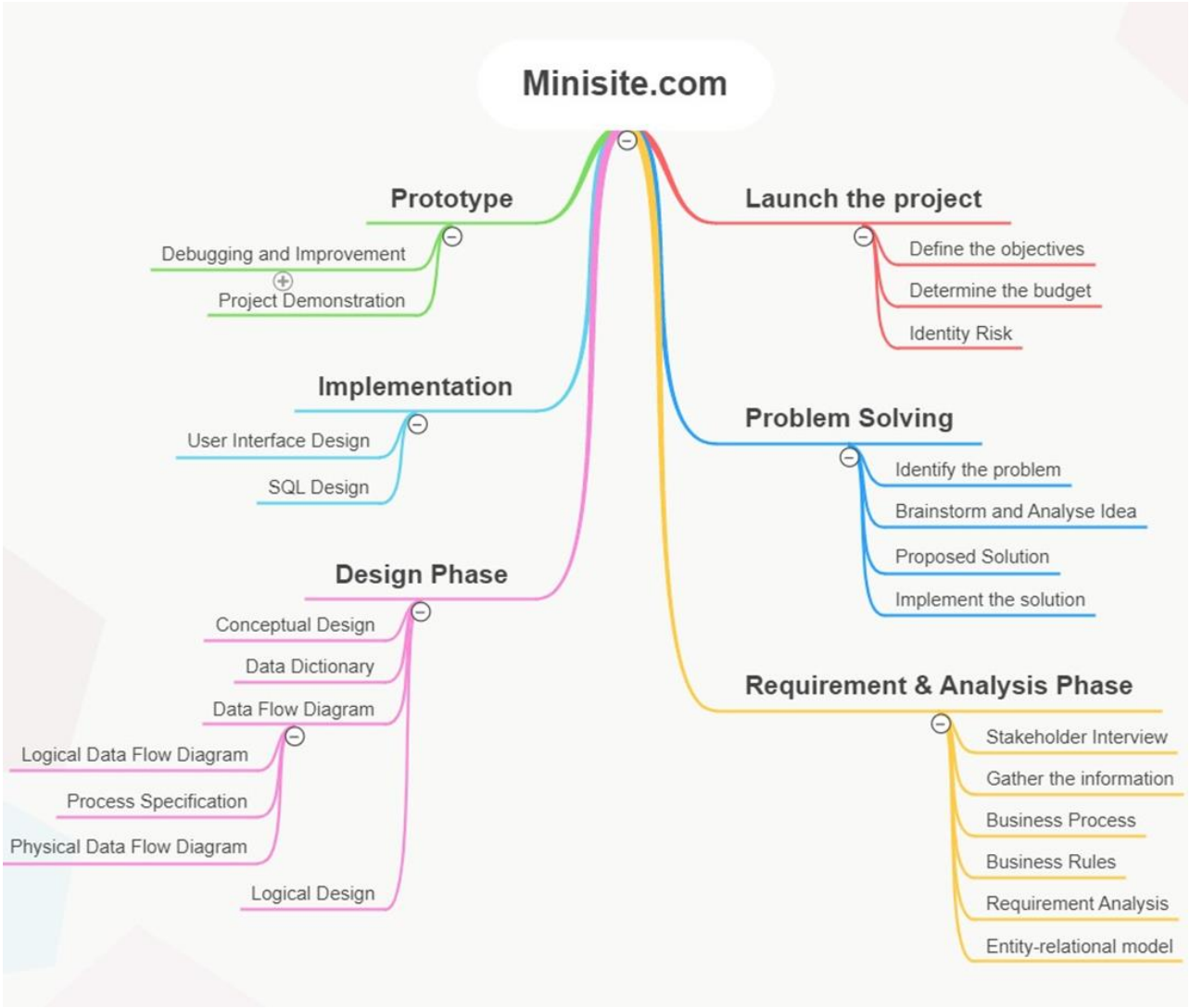
7. Project Planning

Project planning in this context involves a systematic approach to organizing and executing the steps necessary to develop and implement the described system for managing community gardens in Johor Baharu. It encompasses activities such as conducting interviews with stakeholders, designing the system based on their needs and feedback, developing the software, testing its functionality and usability, and finally deploying it for use by gardeners and administrators. The planning process would also involve defining timelines, allocating resources, identifying potential risks, and ensuring alignment with the project's objectives of community engagement, environmental stewardship, and practical problem-solving.

7.1 Human recourses

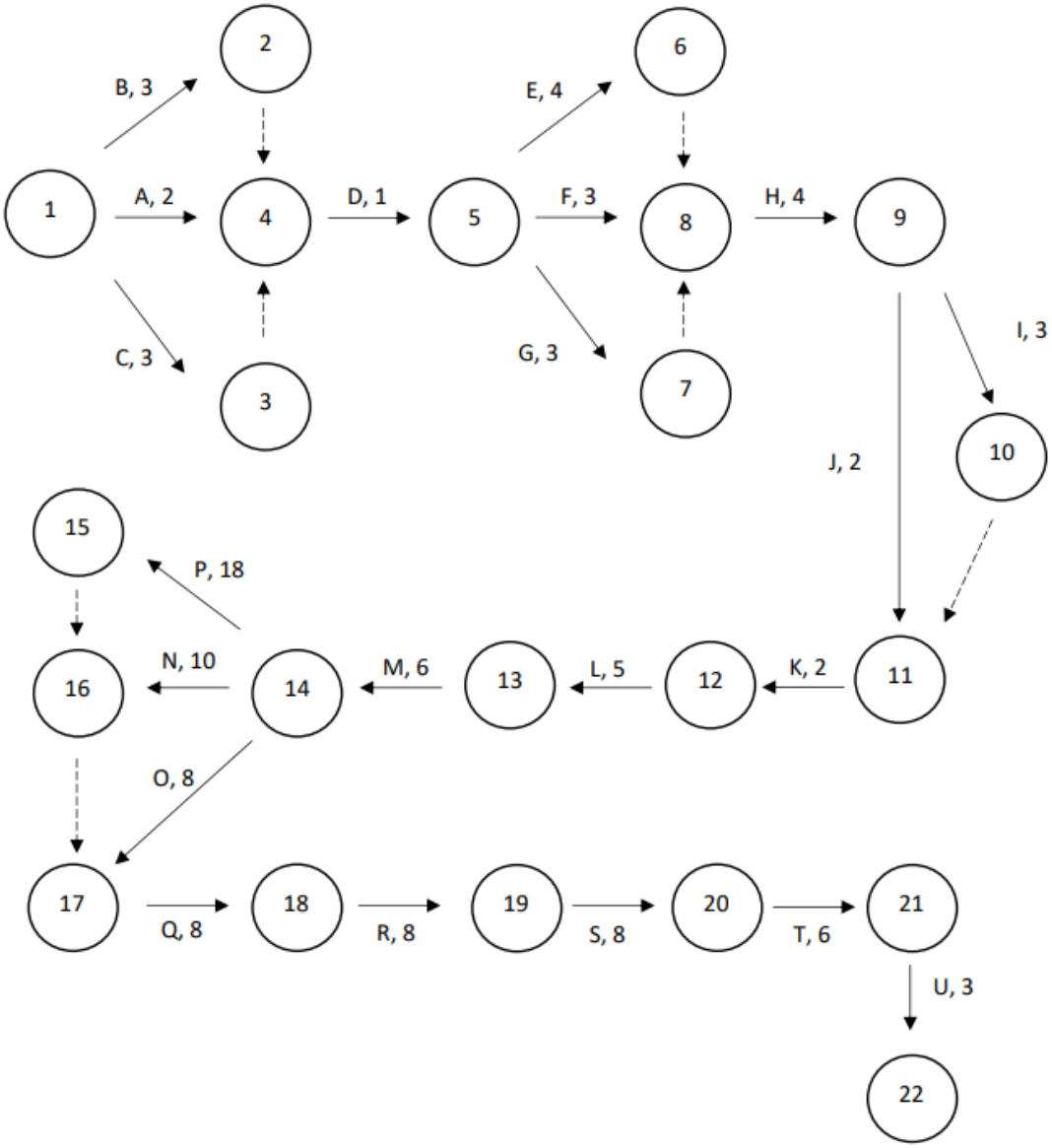


7.2 Work Breakdown Structure (WBS)



7.3 Pert Chart

Activity		Predecessor	Duration
A	Define the objectives	None	2
B	Determine the budget	None	3
C	Identity Risk	None	3
D	Identify the problem	A	1
E	Brainstorm and Analyze idea	D	4
F	Proposed solution	D	3
G	Implement the solution	D	3
H	Stakeholder interview	G	4
I	Gather the information	H	3
J	Business process	H	2
K	Business rules	J	2
L	Requirement Analysis	K	5
M	Entity-relational model	L	6
N	Conceptual Design	M	10
O	Data Dictionary	M	8
P	Data Flow Diagram	M	18
Q	Logical Design	O,P	8
R	User Interface Design	Q	8
S	SQL Design	R	8
T	Debugging and improvement	S	6
U	Project Demonstration	T	3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K, 2
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P, 18
Q, 8
R, 8
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T, 6
U, 3

Note: All durations are in days

Path 1: A – D – F – H – I – K – L – M – N – Q – R – S – T – U Length: 2 + 1 + 3 + 4 + 3 + 2 + 5 + 6 + 10 + 8 + 8 + 8 + 6 + 3 = 69

Path 2: A – D – F – H – I – K – L – M – P – Q – R – S – T – U Length: 2 + 1 + 3 + 4 + 3 + 2 + 5 + 6 + 18 + 8 + 8 + 8 + 6 + 3 = 77

Path 3: A – D – F – H – I – K – L – M – O – Q – R – S – T – U Length: 2 + 1 + 3 + 4 + 3 + 2 + 5 + 6 + 8 + 8 + 8 + 8 + 6 + 3 = 67

Path 4: A – D – F – H – J – K – L – M – N – Q – R – S – T – U Length: 2 + 1 + 3 + 4 + 2 + 2 + 5 + 6 + 10 + 8 + 8 + 8 + 6 + 3 = 68

Path 5: A – D – F – H – J – K – L – M – P – Q – R – S – T – U Length: 2 + 1 + 3 + 4 + 2 + 2 + 5 + 6 + 18 + 8 + 8 + 8 + 6 + 3 = 76

Path 6: A – D – F – H – J – K – L – M – O – Q – R – S – T – U Length: 2 + 1 + 3 + 4 + 2 + 2 + 5 + 6 + 8 + 8 + 8 + 8 + 6 + 3 = 66

Path 7: A – D – G – H – I – K – L – M – N – Q – R – S – T –

U Length: 2 + 1 + 3 + 4 + 3 + 2 + 5 + 6 + 10 + 8 + 8 + 8 + 6 + 3 = 69

Path 8: A – D – G – H – I – K – L – M – P – Q – R – S – T – U Length: 2 + 1 + 3 + 4 + 3 + 2 + 5 + 6 + 18 + 8 + 8 + 8 + 6 + 3 = 77

Path 9: A – D – G – H – I – K – L – M – O – Q – R – S – T – U Length: 2 + 1 + 3 + 4 + 3 + 2 + 5 + 6 + 8 + 8 + 8 + 8 + 6 + 3 = 67

Path 10: A – D – G – H – J – K – L – M – N – Q – R – S – T – U Length: 2 + 1 + 3 + 4 + 2 + 2 + 5 + 6 + 10 + 8 + 8 + 8 + 6 + 3 = 68

Path 11: A – D – G – H – J – K – L – M – P – Q – R – S – T – U Length: 2 + 1 + 3 + 4 + 2 + 2 + 5 + 6 + 18 + 8 + 8 + 8 + 6 + 3 = 76

Path 12: A – D – G – H – J – K – L – M – O – Q – R – S – T – U Length: 2 + 1 + 3 + 4 + 2 + 2 + 5 + 6 + 8 + 8 + 8 + 8 + 6 + 3 = 66

Path 13: A – D – E – H – I – K – L – M – N – Q – R – S – T – U Length: 2 + 1 + 4 + 4 + 3 + 2 + 5 + 6 + 10 + 8 + 8 + 8 + 6 + 3 = 70

Path 14: A – D – E – H – I – K – L – M – P – Q – R – S – T – U Length: 2 + 1 + 4 + 4 + 3 + 2 + 5 + 6 + 18 + 8 + 8 + 8 + 6 + 3 = 78

Path 15: A – D – E – H – I – K – L – M – O – Q – R – S – T – U Length: 2 + 1 + 4 + 4 + 3 + 2 + 5 + 6 + 8 + 8 + 8 + 8 + 6 + 3 = 68

Path 16: A – D – E – H – J – K – L – M – N – Q – R – S – T – U Length: 2 + 1 + 4 + 4 + 2 + 2 + 5 + 6 + 10 + 8 + 8 + 8 + 6 + 3 = 69

Path 17: A – D – E – H – J – K – L – M – P – Q – R – S – T – U Length: 2 + 1 + 4 + 4 + 2 + 2 + 5 + 6 + 18 + 8 + 8 + 8 + 6 + 3 = 77

Path 18: A – D – E – H – J – K – L – M – O – Q – R – S – T – U Length: 2 + 1 + 4 + 4 + 2 + 2 + 5 + 6 + 8 + 8 + 8 + 8 + 6 + 3 = 67

Path 19: B – D – F – H – I – K – L – M – N – Q – R – S – T – U Length: 3 + 1 + 3 + 4 + 3 + 2 + 5 + 6 + 10 + 8 + 8 + 8 + 6 + 3 = 70

Path 20: B – D – F – H – I – K – L – M – P – Q – R – S – T – U Length: 2 + 1 + 3 + 4 + 3 + 2 + 5 + 6 + 18 + 8 + 8 + 8 + 6 + 3 = 78

Path 21: B – D – F – H – I – K – L – M – O – Q – R – S – T – U Length: 2 + 1 + 3 + 4 + 3 + 2 + 5 + 6 + 8 + 8 + 8 + 8 + 6 + 3 = 68

Path 22: B – D – F – H – J – K – L – M – N – Q – R – S – T – U Length: 2 + 1 + 3 + 4 + 2 + 2 + 5 + 6 + 10 + 8 + 8 + 8 + 6 + 3 = 69

Path 23: B – D – F – H – J – K – L – M – P – Q – R – S – T – U Length: 2 + 1 + 3 + 4 + 2 + 2 + 5 + 6 + 18 + 8 + 8 + 8 + 6 + 3 = 77

Path 24: B – D – F – H – J – K – L – M – O – Q – R – S – T – U Length: 2 + 1 + 3 + 4 + 2 + 2 + 5 + 6 + 8 + 8 + 8 + 8 + 6 + 3 = 67

Path 25: B – D – G – H – I – K – L – M – N – Q – R – S – T – U Length: 2 + 1 + 3 + 4 + 3 + 2 + 5 + 6 + 10 + 8 + 8 + 8 + 6 + 3 = 70

Path 26: B – D – G – H – I – K – L – M – P – Q – R – S – T – U Length: 2 + 1 + 3 + 4 + 3 + 2 + 5 + 6 + 18 + 8 + 8 + 8 + 6 + 3 = 78

Path 27: B – D – G – H – I – K – L – M – O – Q – R – S – T – U Length: 2 + 1 + 3 + 4 + 3 + 2 + 5 + 6 + 8 + 8 + 8 + 8 + 6 + 3 = 68

Path 28: B – D – G – H – J – K – L – M – N – Q – R – S – T – U Length: 2 + 1 + 3 + 4 + 2 + 2 + 5 + 6 + 10 + 8 + 8 + 8 + 6 + 3 = 69

Path 29: B – D – G – H – J – K – L – M – P – Q – R – S – T – U

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Path 31: B – D – E – H – I – K – L – M – N – Q – R – S – T – U Length: 2 + 1 + 4 + 4 + 3 + 2 + 5 + 6 + 10 + 8 + 8 + 8 + 6 + 3 = 71

Path 32: B – D – E – H – I – K – L – M – P – Q – R – S – T – U

Length: 2 + 1 + 4 + 4 + 3 + 2 + 5 + 6 + 18 + 8 + 8 + 8 + 6 + 3 = 79

Path 33: B – D – E – H – I – K – L – M – O – Q – R – S – T – U Length: 2 + 1 + 4 + 4 + 3 + 2 + 5 + 6 + 8 + 8 + 8 + 8 + 6 + 3 = 69

Path 34: B – D – E – H – J – K – L – M – N – Q – R – S – T – U Length: 2 + 1 + 4 + 4 + 2 + 2 + 5 + 6 + 10 + 8 + 8 + 8 + 6 + 3 = 70

Path 35: B – D – E – H – J – K – L – M – P – Q – R – S – T – U Length: 2 + 1 + 4 + 4 + 2 + 2 + 5 + 6 + 18 + 8 + 8 + 8 + 6 + 3 = 78

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Path 37: C – D – F – H – I – K – L – M – N – Q – R – S – T – U Length: 3 + 1 + 3 + 4 + 3 + 2 + 5 + 6 + 10 + 8 + 8 + 8 + 6 + 3 = 70

Path 38: C – D – F – H – I – K – L – M – P – Q – R – S – T – U Length: 2 + 1 + 3 + 4 + 3 + 2 + 5 + 6 + 18 + 8 + 8 + 8 + 6 + 3 = 78

Path 39: C – D – F – H – I – K – L – M – O – Q – R – S – T – U

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Path 40: C – D – F – H – J – K – L – M – N – Q – R – S – T – U Length: 2 + 1 + 3 + 4 + 2 + 2 + 5 + 6 + 10 + 8 + 8 + 8 + 6 + 3 = 69

Path 41: C – D – F – H – J – K – L – M – P – Q – R – S – T – U Length: 2 + 1 + 3 + 4 + 2 + 2 + 5 + 6 + 18 + 8 + 8 + 8 + 6 + 3 = 77

Path 42: C – D – F – H – J – K – L – M – O – Q – R – S – T – U Length: 2 + 1 + 3 + 4 + 2 + 2 + 5 + 6 + 8 + 8 + 8 + 8 + 6 + 3 = 67

Path 43: C – D – G – H – I – K – L – M – N – Q – R – S – T – U Length: 2 + 1 + 3 + 4 + 3 + 2 + 5 + 6 + 10 + 8 + 8 + 8 + 6 + 3 = 70

Path 44: C – D – G – H – I – K – L – M – P – Q – R – S – T – U Length: 2 + 1 + 3 + 4 + 3 + 2 + 5 + 6 + 18 + 8 + 8 + 8 + 6 + 3 = 78

Path 45: C – D – G – H – I – K – L – M – O – Q – R – S – T – U Length: 2 + 1 + 3 + 4 + 3 + 2 + 5 + 6 + 8 + 8 + 8 + 8 + 6 + 3 = 68

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Path 47: C – D – G – H – J – K – L – M – P – Q – R – S – T – U Length: 2 + 1 + 3 + 4 + 2 + 2 + 5 + 6 + 18 + 8 + 8 + 8 + 6 + 3 = 77

Path 48: C – D – G – H – J – K – L – M – O – Q – R – S – T – U Length: 2 + 1 + 3 + 4 + 2 + 2 + 5 + 6 + 8 + 8 + 8 + 8 + 6 + 3 = 67

Path 49: C – D – E – H – I – K – L – M – N – Q – R – S – T – U Length: 2 + 1 + 4 + 4 + 3 + 2 + 5 + 6 + 10 + 8 + 8 + 8 + 6 + 3 = 71

Path 50: C – D – E – H – I – K – L – M – P – Q – R – S – T – U

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Path 51: C – D – E – H – I – K – L – M – O – Q – R – S – T – U Length: 2 + 1 + 4 + 4 + 3 + 2 + 5 + 6 + 8 + 8 + 8 + 8 + 6 + 3 = 69

Path 52: C – D – E – H – J – K – L – M – N – Q – R – S – T – U Length: 2 + 1 + 4 + 4 + 2 + 2 + 5 + 6 + 10 + 8 + 8 + 8 + 6 + 3 = 70

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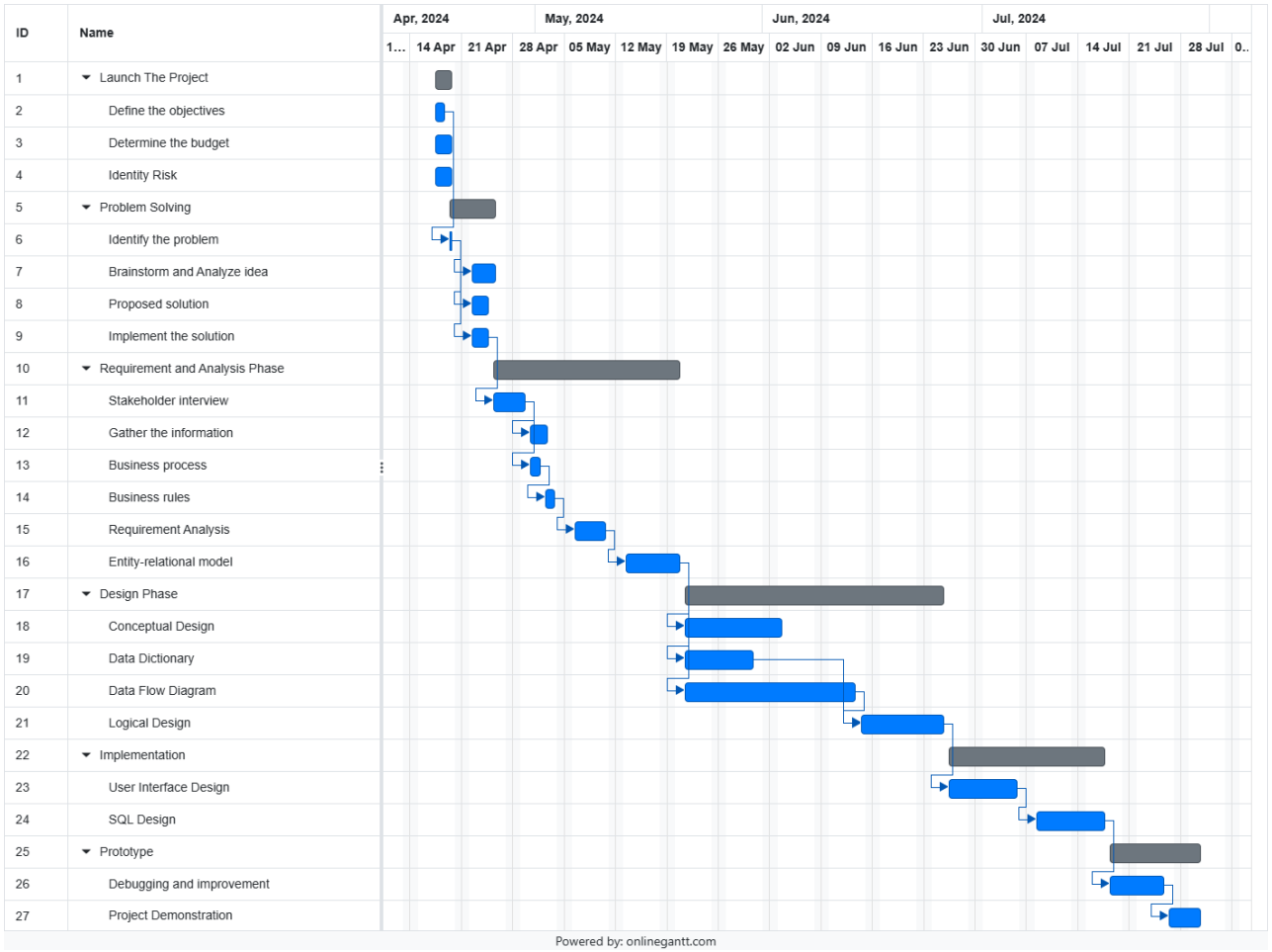
Path 54: C – D – E – H – J – K – L – M – O – Q – R – S – T – U Length: 2 + 1 + 4 + 4 + 2 + 2 + 5 + 6 + 8 + 8 + 8 + 8 + 6 + 3 = 68

Since the critical path is the longest path through the network diagram, Path 32 and Path 50 are the critical path for this Project.

7.4 Gant Chart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1 Launch The Project
2 Define the objectives
3 Determine the budget
4 Identity Risk
5 Problem Solving
6 Identify the problem
7 Brainstorm and Analyze idea
8 Proposed solution
9 Implement the solution
10 Requirement and Analysis Phase
11 Stakeholder interview
12 Gather the information
13 Business process
14 Business rules
15 Requirement Analysis
16 Entity-relational model
17 Design Phase
18 Conceptual Design
19 Data Dictionary
20 Data Flow Diagram
21 Logical Design
22 Implementation
23 User Interface Design
24 SQL Design
25 Prototype
26 Debugging and improvement
27 Project Demonstration
Powered by: onlinegantt.com

8. Benefits and Summary of Proposed System

The Community Garden Management System represents a paradigm shift in the management and operation of community gardens in JB. By leveraging technology to overcome communication barriers and streamline processes, the app revolutionizes the way community gardens are managed and experienced.

Through its centralized platform, the app facilitates community building by providing tools for communication, collaboration, and knowledge sharing. Gardeners, volunteers, and administrators can easily connect, share updates, and work together on gardening projects, leading to stronger social ties and increased participation in community gardening activities.

Furthermore, the app promotes sustainability by encouraging environmentally friendly practices and providing resources for users to track their ecological impact. Features like the sustainability tracker and educational content empower users to make informed decisions about their gardening practices and contribute to a healthier ecosystem within their community.

In addition to its social and environmental benefits, the app offers economic opportunities through its donation portal and partner directory. By facilitating financial support from individuals, businesses, and organizations, the app ensures the long-term viability and growth of community gardens in JB.

Overall, the Community Garden Management System is not only technically feasible but also operationally and economically viable. It represents a significant step towards creating inclusive, sustainable, and thriving green spaces that enrich the lives of residents and strengthen the fabric of the community in Johor Baharu.

9. System Documentation

System Documentation details procedures related to the Community Garden Management System. Advisable is the correct use of this system, managing community garden data. Horticulture ought to familiarize itself with operations manual if planning to effectively use the system.

Community Garden Management System possesses countless functions. Garden inventory is one and allotment tracking another. Moreover, the system manages member contact and sets task scheduling. It is key in maintaining environmental best practices.

We can clarify functions by dissecting the system. Garden inventory is about gauging quantities of different plants. It keeps track too of leased garden plots. It also manages the waitlist for unassigned plots. This all makes up to one part of the system.

Another role involves watching over member contact management. This feature has the job of storing details of all registered members. Contact info is logged as well down to all communication records. All of these ensure convenience in member communication and management.

The task scheduling feature aids in organizing activities. Activities are related to cultivation. Maintenance and composting are managed effectively. The function helps manage tasks effectively.

Both members of the Community Garden Management System value environmental stewardship. This includes irrigation practices. We also mention waste management and recycling directives. All these practices aim for sustainable gardening methods.

Reliability of this system hinges on the commitment of its users. It is crucial to periodically update and verify system data. Outdated or incorrect data can undermine the functionality of the system. Fostering a culture of meticulous data maintenance is important.

Documentation aims to guide you through the system features. Features have been designed to make garden management easy. They also encourage sustainability. Read and adhere to these guidelines. This way, you can enhance the usability of the Community Garden Management System.

10. System Overview

- **Purpose**: Central aim of the system is both simple and profound. It aims to enhance, streamline community garden administration. This is specifically applicable to gardens in Johor Bharu.

- **Users**: Primary users of this system are diverse. They range from everyday gardeners to management personnel. Insight is needed here. Volunteers are noteworthy users as well.

- **Scope**: The system offers comprehensive capabilities. This is impressive in scope. Aspects like plot management are covered. This is key for efficient use of space. More things to consider: It aids in scheduling tasks. This ensures time use is proficient. It encourages resource sharing. This significantly enhances communal work. Last point: The system encourages communication between users. This is important to note.

2. Features and Functionality

Plot Management:

- Function: Lets users see, book, manage plots.

- User Interaction: Reveals how to reserve a plot. It is through the system.

Task Scheduling:

- Function: Assists users. Helps in crafting and overseeing assignments. Also lends a hand in controlling get-togethers.

- User Interaction: Steps on inserting a duty into the calendar. The user is taught to add to the list. The manner of adding a social gathering is then clarified.

Resource Sharing:

- Task: Allows for the share of resources. We're talking about tools, seeds.

- User Engagement: We have a method for adding and asking for resources. Our method is split neatly into two steps. First, we must list resources. Second, ask for those that are needed.

Communication Hub:

- Function: It's a central platform. It offers messages and updates.

- User Interaction: It's a way. It sends messages. It posts updates.

Educational Events:

- Function: Overseeing educational workshops. Public assemblies as well.

- User Interaction: The registration process will be discussed for the event. Steps to set up such an occasion will be discussed. The organization will be outlined.

3. Architecture and Technology

- **System Architecture**: The high-level architecture is worthy of outline. Contemplate frontend. Also pay attention to the backend. Don't forget databases. Worth highlighting are integrations.

- **Technology Stack**: Pivotal is providing detail on technologies used. Programming languages and frameworks are engrossed in this. Databases, of course, are a part of it.

4. User Guide

- **Accessing the System**: Directions are available. They unfold, revealing steps to log. Furthermore, they aid in moving through the preliminary interface.

- **Using Features**: Detailed guides are available. These guides show ways to use each feature. Features are outlined. They’re outlined within the Features and Functionality section.

5. Administrator Guide

- **Managing Users**: Instructions exist on how to add or remove users. Also available is a guide on managing roles.

- **System Settings**: A guide exists on configuring system settings. Instructions on adjusting

parameters are also included.

6. Technical Documentation

- API Documentation:

Enumerates APIs. Elucidates their functions. These APIs are for system integration.

-Database Schema:

Offers schema. It's a detailed one. It's about the database structure.

- Error Handling:

Provides documentation about common errors. There are also troubleshooting steps.

7. Testing and Quality Assurance

- **Test Plans**: Strategies meticulously utilized in testing the system have been outlined.

- **Test Cases**: There are examples that map out test cases. Each case corresponds to unique functionality.

- **Quality Metrics**: We make use of criteria. Criteria used to measure system performance are employed. Also, system usability is evaluated.

8. Deployment Guide

- **Installation**: Steps for the system's installation exist. This installation could occur on servers. Or it could happen on cloud platforms. Steps will involve detailing processes. Also, they might touch on necessary prerequisites.

- **Configuration**: There are needed steps in achieving a functional system. Omitting a step, it's not an option.

- **Maintenance**: Tasks that are regular in nature exist for maintenance. The updates for a system are never left out.

9. Maintenance and Support

- **Support Channels**: How users can obtain help and support is conveyed in data.

- **System updates exist**: The method of their implementation adheres to a detailed protocol. It's crucial for users. They should understand these sequences.

- **Feedback Loop**: There exists a system. Users can use it to give their feedback. The management of this feedback is explained in a process.

GitHub link: https://github.com/Ahmedabdelhadi1/groub-7