Faculty of Computing

CS6003 Advanced Software Engineering

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1.Introduction

The “Home appliances pluming and co” company ask us to develop an online system for their company to provide a friendly service to customer and employees.
The company specializing in repairs and maintenance of domestic appliances.
The company has given some requirement functions. The system should meet these requirements.

The company has allocated £80,000 for the project and the project must be completed within three months from the date started.
Our team has three full time employees including project manager and three-part time employees (part timers only providing 25% of their work time for our project).

1.1 Purposes

The home appliance pluming company does not have online presence so they have asked us to develop an online customer service system for their business.

An online customer service system with specified requirement functions as below

a) To Register New Engineer (Record new engineer details with login password)
b) De-Register engineer (Delete details of a specified engineer with login password)
c) Create a job
d) If new customer, create new customer
e) If Existing customer- update customer
f) Cancel a job should
g) The cancel jobs must be deleted after 12 months.
h) Allocate an Engineer a for job by admin
i) customer can select an engineer
j) An engineer can apply for posted job
k) Completed jobs must be updated and the updated job record must be deleted after 12 moths
l) Customer can give feed about the job
m) weekly report

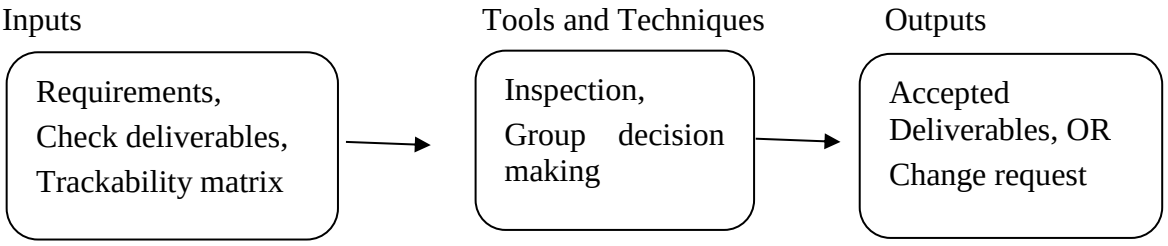
Objectives

Organization objectives

An online customer service system with required functionalities.
The system must be completed in 11 weeks.
Following communication plan
Create a quality product within time, budget, for specified objective
Schedules and milestones to make sure the project as it is

1.2 Scopes

Scope validation process



Organization Name: Home Appliances pluming and co.
Project Title: Home Appliances pluming and co online customer service system
Project Goal: The organisation does not have an online customer service hence we should produce a working online system for their business
Product deliverables: Online customer service system and Final report

A customer service system which includes

a) add /delete engineer with login and password
b) add new customer
c) customer can post a job and select an engineer
d) engineer can apply for job
e) admin can assign job to an engineer
f) customer can rate an engineer's job
g) all jobs must be deleted after 12 months from completed date
h) weekly report

1.3 Definitions, Acronyms, and Abbreviations

Glossary

Term/Acronyms/ Abbreviations	**Meaning/Description**
SQL	Sequential query language
RDBMS	Relational database
PMP	Project Management
Approval Authority	Sponsors, key stakeholder
Reviver	The person who examine the testing documents
WBS	Work breakdown structure
ISO	International standard organization
RBS	Risk breakdown structure
Work breakdown dictionary	Description of work base structure task
Scope Management	The work needs to be completed to accomplish the product
Organization structure	The structure of organization
Function structure	The format of organization structure
Matrix organization structure	The name of the structure which has share power with functional manger

Projectized organization structure	One of the organization structure,
Software Requirements Specification	A document that completely describes all the functions of a proposed system and the constraints under which it must operate. For example, this document.
Stakeholder	Any person with an interest in the project who is not a developer.
User	Reviewer or Author.

2.Project Overview

2.1 Project Summary

Date of issue and status	30th May 2018, completed
Issuing organization	The home appliances pluming and co
Scope	A working product for the above company
Approval Authority	Dr Twan
Estimates	£80000.00
Risk	
Quality control measures	Testing, conform to qc standards
Cost	
Training	Further training if needed
Change procedure and history	No history

2:2 Assumptions and constraints

2.2.1 Assumptions

Part timer assumed weekly 25% of their work time it is 10hours per week.

The organization got all the necessary technology and machines to start the project.

2.2.2 Constraints

1. to register a new engineer – record details of a new engineer (with login password)
2. to de-register an engineer – delete details of a specified engineer (with login password)
3. to create a job – record details of a new job for a specified customer. If a customer is 'new', then the customer's record is also created, otherwise the customer's record is updated (with login password)
4. to cancel a job – update the job's record (the record will be deleted 12 months after the cancellation's date)
5. to allocate an engineer – allocate a selected engineer to the specified job (a system manager assign, or an engineer can apply for, or customer can select);
6. to complete a job – update the specified job (the job's record will be deleted 12 months after the completion's date);

7. to collect customer feedback for the service -- customer can give feedback comments and rank for the engineer's job (with login password)

   Budget £80,000.00
   3 Full time Employees (40 Hrs per week)
   3 Part time Employees (10 Hrs per week)
   11 weeks deadline

   Project manager contribution in project process <=25% and cannot take part in software implementation process.

   Project Manager get paid £30 per hour
   Full time employee one get paid £35 per hour
   Full time employee two get paid £35 per hour
   Full time employee three get paid 25 per hour

   Part time employee one get paid 35 per hour
   Part time employee two get paid 25 per hour
   Part time employee three get paid 25 per hour
   Part timer cannot work more than 25% of their time

2.3 Project Deliverables

A working online customer service system
Scope documents
Objectives documents
System Documents
Schedule and budget reports
Work breakdown structure
Gantt chart schedule
Milestone

2.4 Schedule and Budget Summary

2.4.1 Schedule

The best software ltd are a software development company who has got contract to develop a software for the pluming company

One of the main common task is to schedule the tasks and deliverable also milestones

Task Name	Duration	Start	Finish
Home appliances Pluming and co	**63 days**	**Thu 01/02/18**	**Mon 30/04/18**
Home appliance pluming and co online CS system	63 days	Thu 01/02/18	Mon 30/04/18
Initiating	**12 days**	**Thu 01/02/18**	**Fri 16/02/18**
Develop project charter	2 days	Thu 01/02/18	Fri 02/02/18
Identify the objectives	3 days	Mon 05/02/18	Wed 07/02/18
Create project charter	2 days	Thu 08/02/18	Fri 09/02/18
Create high level WBS	2 days	Mon 12/02/18	Tue 13/02/18
Create Scope/cost/resources	3 days	Wed 14/02/18	Fri 16/02/18
First Milestone	0 days		
Requirement/Analysis	**5 days**	**Mon 19/02/18**	**Fri 23/02/18**
Buisness requirements Analysis	3 days	Mon 19/02/18	Wed 21/02/18
Project Resk Analysis	2 days	Wed 21/02/18	Thu 22/02/18
System requirement analysis	2 days	Thu 22/02/18	Fri 23/02/18
Second Milestone	0 days		
Design	**5 days**	**Mon 26/02/18**	**Fri 02/03/18**
Buisness logical design	2 days	Mon 26/02/18	Tue 27/02/18
User Interface Design	2 days	Wed 28/02/18	Thu 01/03/18
Report Design	2 days	Thu 01/03/18	Fri 02/03/18
Third Milestone	0 days		
Development	**20 days**	**Mon 05/03/18**	**Fri 30/03/18**
System process development	5 days	Mon 05/03/18	Fri 09/03/18
system development	15 days	Mon 12/03/18	Fri 30/03/18
Fouth Milestone	0 days		
Testing	**5 days**	**Mon 02/04/18**	**Fri 06/04/18**
Unit Test	2 days	Mon 02/04/18	Tue 03/04/18
Integration test	2 days	Tue 03/04/18	Wed 04/04/18
Acceptance test	2 days	Wed 04/04/18	Thu 05/04/18
System test	2 days	Thu 05/04/18	Fri 06/04/18
Fifth Milestone	0 days		
Deployments	**10 days**	**Mon 09/04/18**	**Fri 20/04/18**
System deployment	10 days	Mon 09/04/18	Fri 20/04/18
Closing	**5 days**	**Mon 23/04/18**	**Fri 27/04/18**
Close Project	**5 days**	**Mon 23/04/18**	**Fri 27/04/18**
Assess Satisfaction	1 day	Mon 23/04/18	Mon 23/04/18
Summarize Project Results and Lessons Learned	1 day	Tue 24/04/18	Tue 24/04/18

Review and Recognize Team Performance	3 days	Wed 25/04/18	Fri 27/04/18
End Milesstone	0 days		
End	1 day	Mon 30/04/18	Mon 30/04/18

2.4.2 Budget Summary

Budget £80,000.00
3 Full time Employees (40 Hrs per week)
3 Part time Employees (10 Hrs per week)
11 weeks deadline

Project manager contribution in project process <=25% and cannot take part in software implementation process.

Project Manager get paid £30 per hour
Full time employee one get paid £35 per hour
Full time employee two get paid £35 per hour
Full time employee three get paid 25 per hour

Part time employee one get paid 35 per hour
Part time employee two get paid 25 per hour
Part time employee three get paid 25 per hour
Part timer cannot work more than 25% of their time

	1	30		
	3	35		
	2	25		
	Full Timer	3		
	Part Timer	3		
	Cost		Week 1 hours	Week 1 Cost
3	Full Timer	GBP 35.00	120	GBP 4,200.00
2	Part Timer	GBP 25.00	20	GBP 500.00
1	Project Manager	GBP 30.00	10	GBP 300.00
				GBP 5,000.00
			Total 11 week cost	GBP 55,000.00

3. Project Organisational Structure

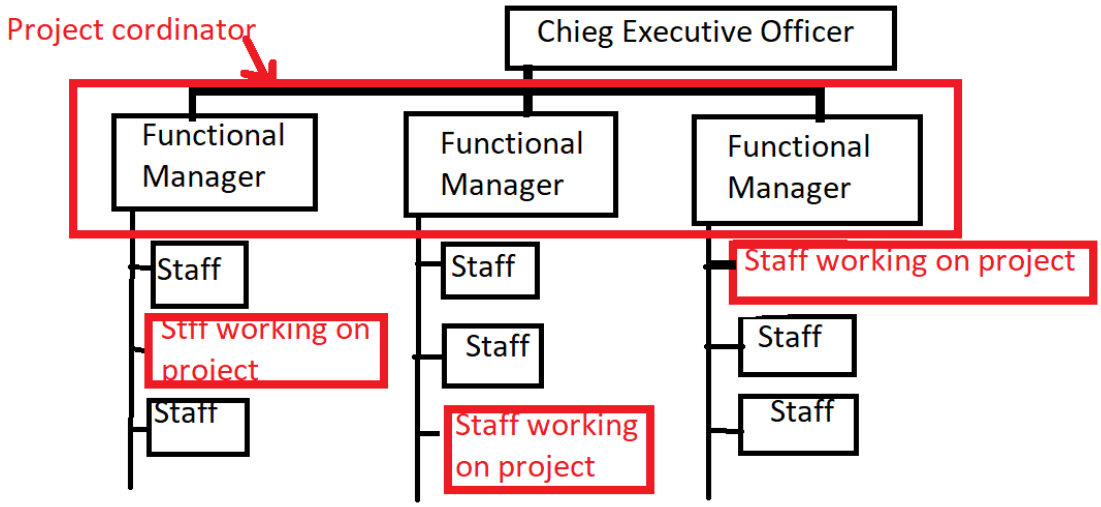
3.1 Description of the Team Structure

3.1.1 Organisational Structure

There are three types of main organization structure such as

Functional

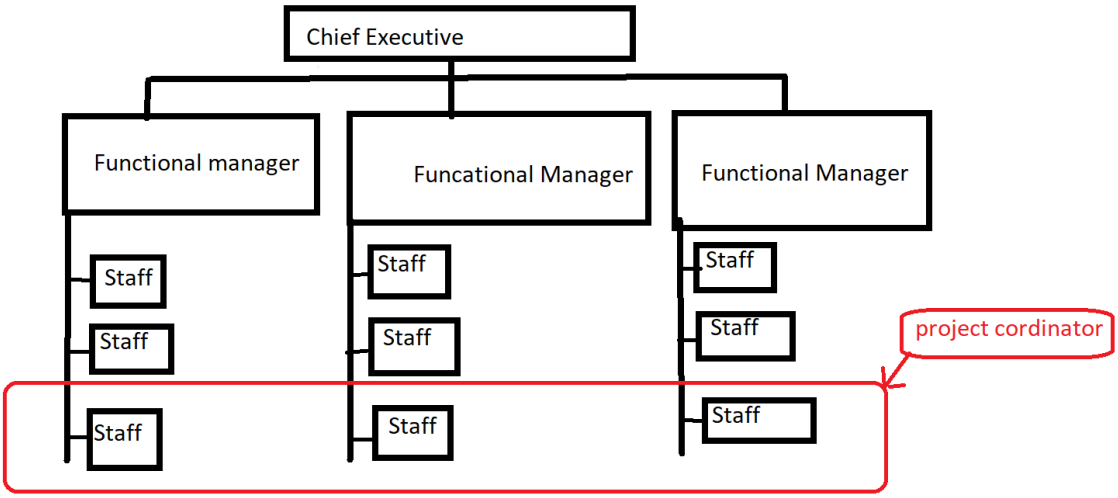
Functional organization structure



In functional organization structure the project team members working in different sectors and there is no project manager but there is a project coordinator who coordinate project work though the project coordinator cannot make decisions and functional manger is decision maker.
The functional manager is responsible for scope budget and management.
Communication among team members must go through functional manager
Since team members working in different sectors they may not take ownership
And cannot dedicate themselves 100% to the project
As Functional structure does not fit to our requirements so we don't select these structure

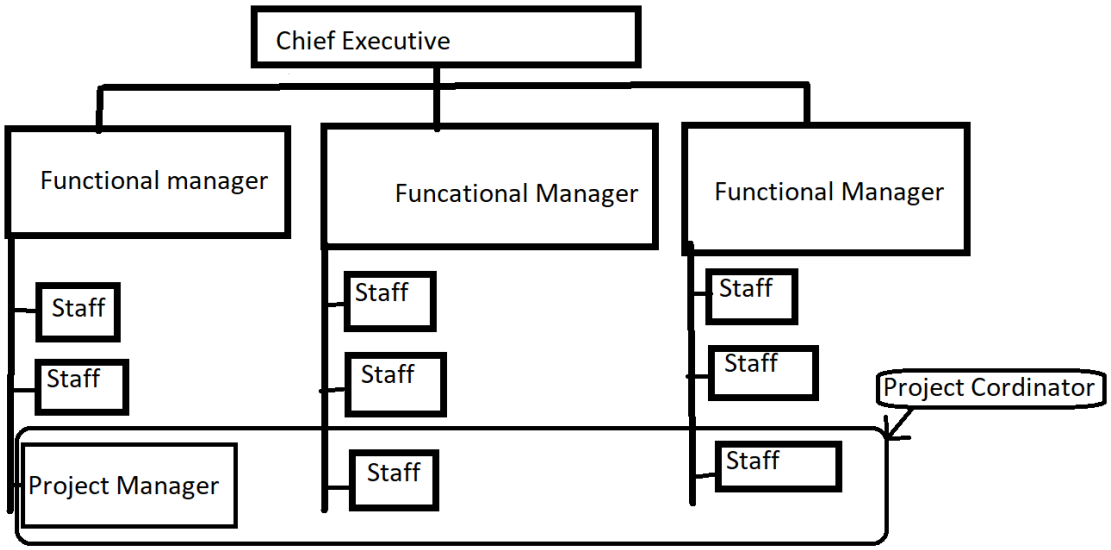
Matrix or Composite

Weak Matrix



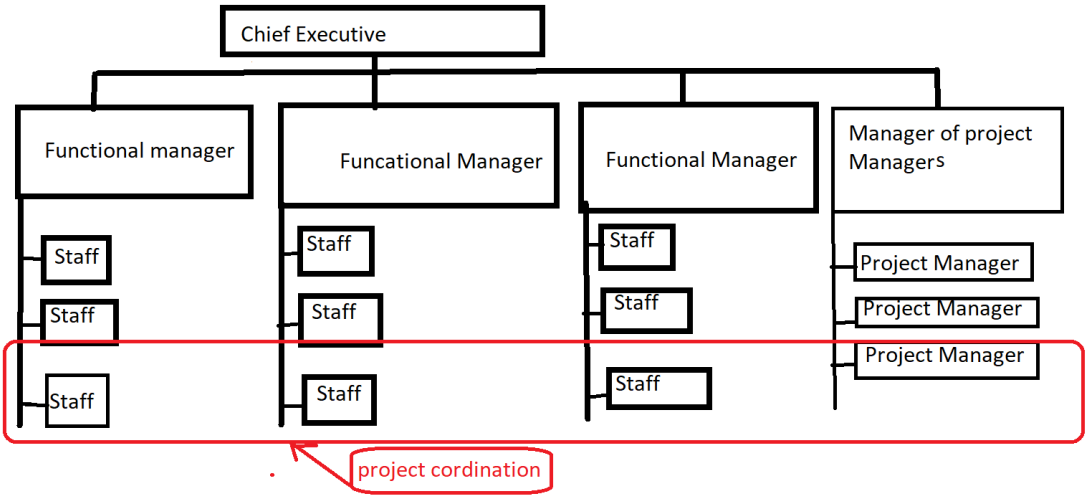
In weak Matrix there is no project manager but there is a project coordinator who coordinate project.
Functional manage is decision maker and project coordinator does not have power to take decision.
Since project manager or project coordinator doesn't have power to make decision the project organization structure does not fit for our project.

Balanced Matrix



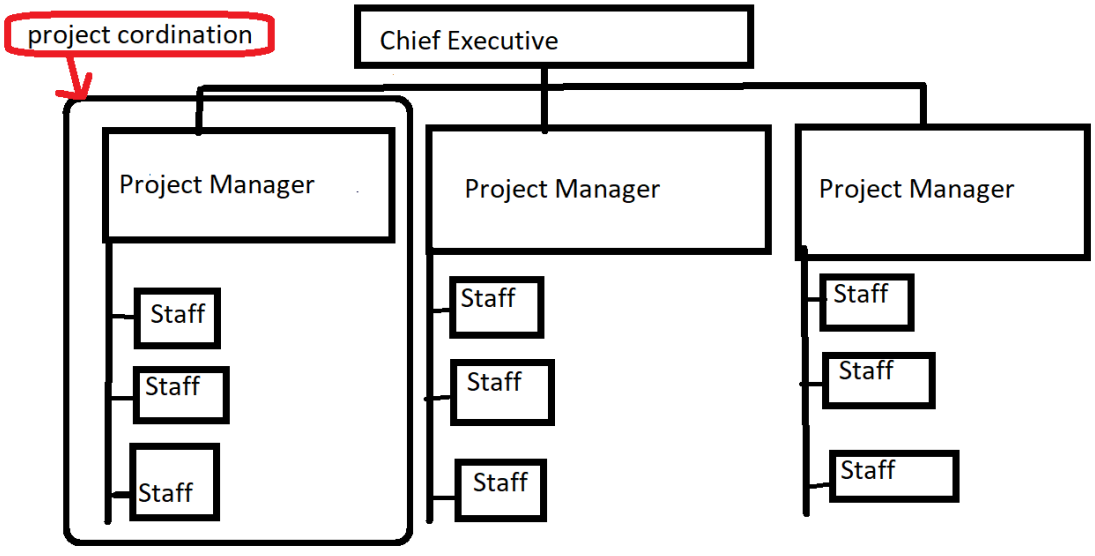
As name suggest project manager and functional manger have power to make decision such as scope, budget, decision is made by project manager but functional manager make decision about staff who does what because of this project manager cannot choose the right people with right skills.
Because of decision making power is balanced between functional manager and project manager we cannot apply this structure to our project.

Strong Matrix



In strong Matrix the project manager has much more authority and responsibility but not complete authority and responsibility.
The project manager still cannot make all decisions.
Because of this we cannot select this project structure.

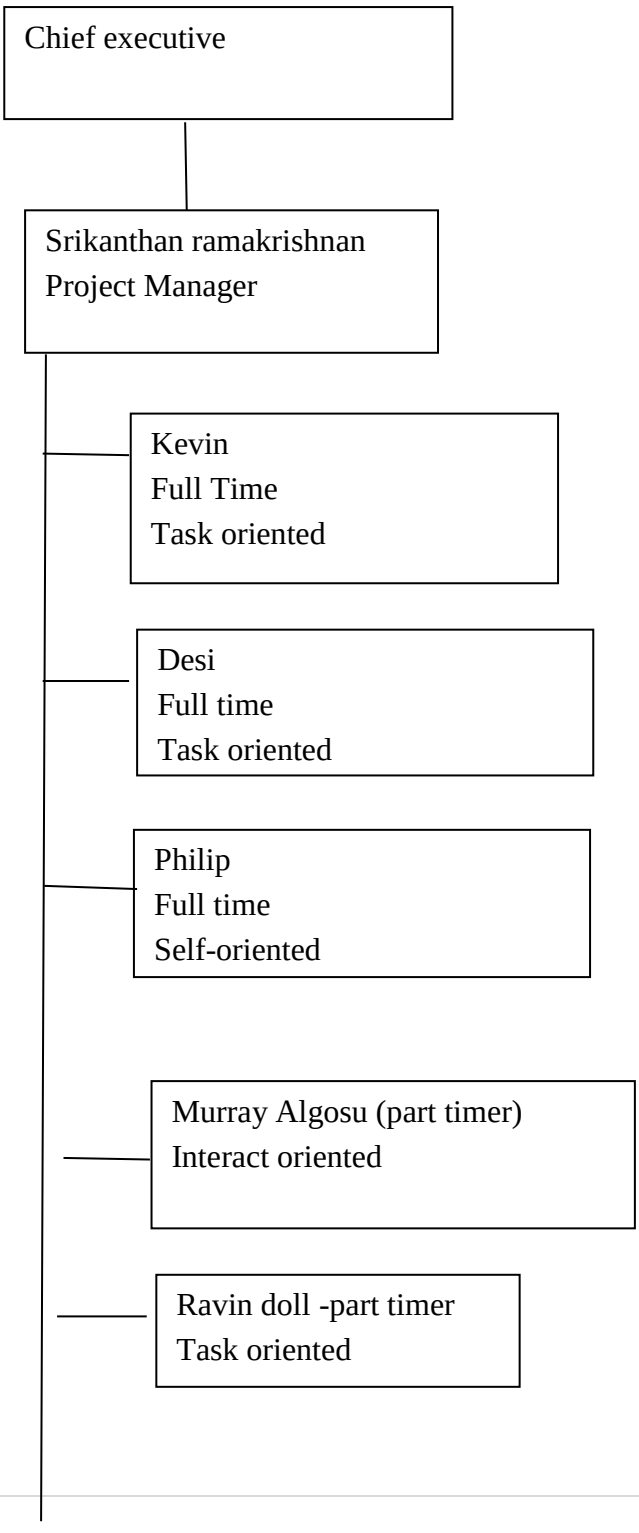
Projectized



We have selected project organization structure because the project manager got necessary power to take decision and changes in the project according requirements.

The team work on one project
Therefore, the staff take ownership of their work
Project manager can apply his management and leadership skills in order to make sure the project is going as planned.

3.1.2 Our project organization structure (Projectized Organization structure)



3.2 Identification of the Team Members responsibilities for software process

Srikanthan Ramakrishnan
Project manager
Responsibilities

Organizing kick off meetings
Clients and management meetings
Project milestone

Mark Philip -Full time employee
Process Scope (As per ISO 12207-2008). SW Implementation processes.
Background: Previous experience as a senior software engineer in a leading company.
Skills: .net APIs, asp net/asp net .mvc, sql database, PMP qualified
Responsible for software implementation process and activities.

Desi bulla – Full time
Process scope (as per ISO 12207-2008) software implementation process
Background: sql server database design expert including and sql server report services.
Responsible for software implementation process activities.

Kevin Tony -full time
Process scope (as per ISO 12207-2008) Software implementation process,
Background and skills -experience as asp.net c# developer and vast knowledge in relational database design and adobe photoshop.
Responsibilities as per ISO 12207-2008
Software requirement Analysis process
Software architecture design process
Software detailed Design process
Software construction process
Software integration process
Software qualification testing process
Software requirement process
Software implementation process

Ravin doll (part time) -End to End Testing Lead
Process scope (as per iso 12207-2008) software support process
Background: ISQTB certified, vast experience in software and hardware testing.
Responsible for end to end testing core functionality and hardware and this will be done addition to unit testing.

Different milestone reached by different developer so a part time employee cannot carry out all test in in working hours and days so we need another full-time employee as he/she can test as long as it is completed.

Responsibilities as per ISO 12207-2008:

Software documentation management
Software quality assurance process
Software verification process
Software validation process
Software review process
Software audit process
Software problem resolution process.

Murray algosu (part time) testing
Process scope (as per iso 12207-2008) software process support
Background -ISQTB certified, vast experience in software testing (MANUAL)
Responsibilities : testing

Responsibilities as per ISO 12207-2008:

Software documentation management
Software quality assurance process
Software verification process
Software validation process
Software review process
Software audit process
Software problem resolution process.

Employee table

Employee name	Working pattern
Murray Algosu- Part timer	2 days a week
	5 hours in a day
Ravin Doll - Part timer	2 days in a week 5 hours per day
Srikanthan Ramakrishnan	2 hours a day
	5 days a week
Mark Philp -full time	5 days in week 40 hours
Desi bulla -full time	5 days in a week 40 hours
Kevin-full time	5 days in week 40 hours

4. Software quality management

4.1 Present the project risk management

Project Risk Management

We can categorize Risk as negative and positive risks

Known Risk

Identified and Analysed

Planned Risk Response

Unknown Risk

Cannot be identified

Have a management reserve

Risk Appetite

the organization willing to take risk benefit

Risk threshold

Below the threshold the organization can accept the impact

Above the threshold the organization cannot accept the impact

Risk Tolerance

Organization can withstand by a risk

Risk can categorize as

Technical, quality or performance risk

technical changes

changes to industrial standards.

Project Management Risk

Inadequate time and resource allocation

Ineffective project plan

Poor cost estimation

Organizational Risk

Inconsistent Management

Inadequate funding

External Risk

Union Risk

Security risk

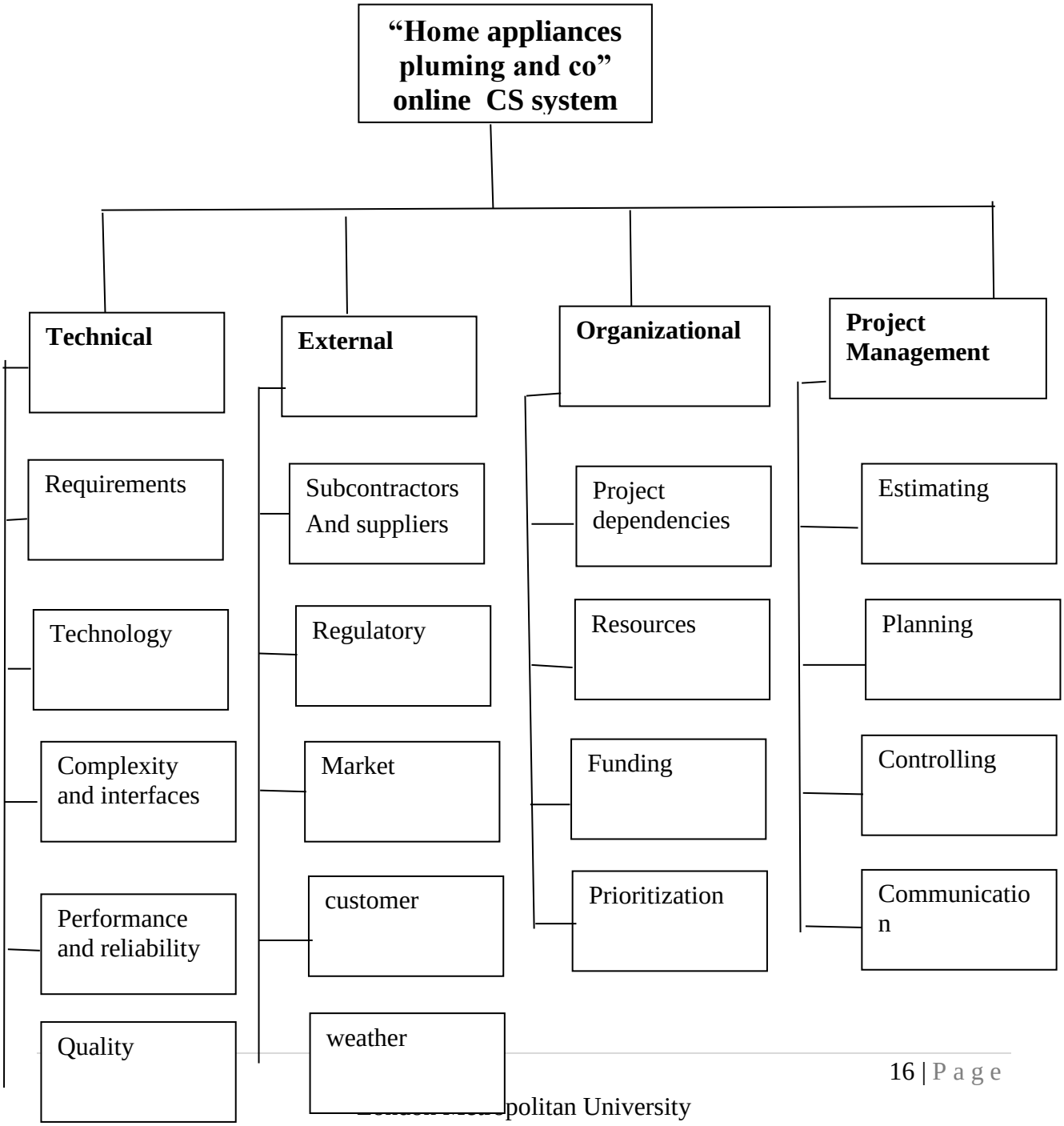
Risk Glossary

Risk- the incident which can make impact of the project

Probability-chances to occur

Impact-impact on the project it makes

Risk Breakdown structure



Risk Management techniques and tools used

Analytical techniques

- Using stakeholder risk profile analysis
- Strategic risk sheet

Expert Judgement

- Senior Management
- Project stakeholder
- Project Managers
- Subject Matter Expert
- Professional technical association
- Industry group

Meetings

- Project Managers
- Selected Team Members
- Key Stakeholders

Identified Risk inputs

Risk Management Plan

- Roles and responsibilities,
- vision for risk management activities

Cost Management Plan

Schedule Management Plan

- Time and Schedule objectives

Quality Management Plan

- Quality policy

Human Resource Management Plan

Scope Baseline

- Project Assumption

Activity cost estimates

- Quantitative assessment of cost of each activity

Activity Duration

The time allowed for each activity or for whole project

Stakeholder Register

To identify key stallholder

Project Documents

All project related documents,

Quality Checklist

Risk Information gathering Techniques

Brainstorming

Delphi Technique

Interviewing

Root Cause Analysis

SWOT analysis

Project Risk Register

Id	Risk	Consequence		Likelihood		Rating Level of Risk
1	Funding	Major	Insignificant	Rare	Rare	Extreme
2	scope	Major	Insignificant	Rare	Rare	high
3	Loss of team members	Major	Minor	unlikely	unlikely	high
4	Organization resource	Major	insignificant	rare	rare	low
5	Stakeholder	Major	insignificant	rare	unlikely	extreme
6	weather	Minor	Minor	unlikely	rare	low
7	External resource	Major	Major	rare	rare	low

Identifying and analysis Risks

Risk Type	Possible Risk/opportunities
Funding	Delay in completion of project or abandon the project
Scope	Direct effect in project deadline, Market opportunity missing, Increment in budget Key stakeholder not satisfaction
Loss of team members	Delay in project task/ Opportunity-hiring new employee with expert skills
Organization resource	Delay in project work
stakeholder	Project abandon if key stake holder does not like to carry on. Even development team members need proper working condition
Weather	Transport to work place, damage to work place, internet or telephone services unavailable to communicate
External Resources	Sub-contractors- Suppliers delay in necessary resource will delay the project Law -relating law changes effect requirement changes

Qualitative risk analysis and Risk response

Avoid=illuminate the threat

Mitigate=identity the ways to reduce the impact of the risk

Accept =nothing will be done.

Transfer=Make another party for the responsible for the risk

ID	RISK	PROBALITIY	Triger	Risk Strategy	response
1	Change in deadline	Low	Fail to meet agreed schedule/marketing opportunity	mitigate	Revisit scheduling/ team meetings, revise documents
2	Change in requirements	High	Competitors or new comers with new features or new technology needs	Mitigate	Keep update with market trends and technology
3	Reduction in budget	Low	Organization loosing turn over	Mitigate	Features which are mostly needed to be done and other features to be considered
4	Increase in budget	low	Ask to use new technology	accept	More training for team members
5	Implement new technology	moderate	Competitors with new technology products	Mitigate	More training for team members
6	Key staff leaving	low	Late coming, not properly attending meetings and schedules	mitigate	Discuss and try to find out his/her expectations
7	Team member leaving	moderate	Late coming, don't take ownership, poor relationship among team members	Exploit	Discuss and try to find out their views
8	Miscommunication	Moderate	Blaming each other as each member says they sent or	Mitigate	Make sure communication planning and

			passed the message to specific team member but they refused		management followed properly
9	Government new law	moderate	Pressure groups and other organization pushing government to implement more regulations	accept	Follow the law requirements and regulations are requested

4.2 Software quality management strategies

Functional and non-functional testing to be a carried out to make sure we are producing right product.

AS PER ISO 9001 QUALITY STANDARD

Testing

	Unit test	**Integration test**	**System**	**Acceptance test**
Why	Ensure code is developed correctly	Make sure the ties between components works correctly	Make sure the whole system work well as whole .	Make sure customer and end users expectations are met
Who	Philp, desi, Kevin	Philp, desi, Kevin	Philp, desi, Kevin	Philp, desi, Kevin
How	Automated, unit testing	Automated, soap ul, rest client	Automated, web driver, exploratory testing	Automated cucumber
When	After completion of each coding of their own	Once others component completed	Once all components completed	

Integration testing approach -top down approach in order to avoid waiting for another component.

Quality Control

Testing carried out in order to make sure the expected result is met

Before the release, the developing team make sure the developed product corresponds to the requirements and specification.

Quality assurance

Make sure the product compliance to ISO standard requirements.

Throughout the process the team including stakeholder setting up adequate process and introducing the standard of the quality to prevent the errors and flaws in product.

5. Work Breakdown Structure (WBS)

5.1 WBS

A WBS is a breakdown of a project onto a smaller component to the team to organise the work to carried out to accomplish the project objectives to deliverables stages

Project planning

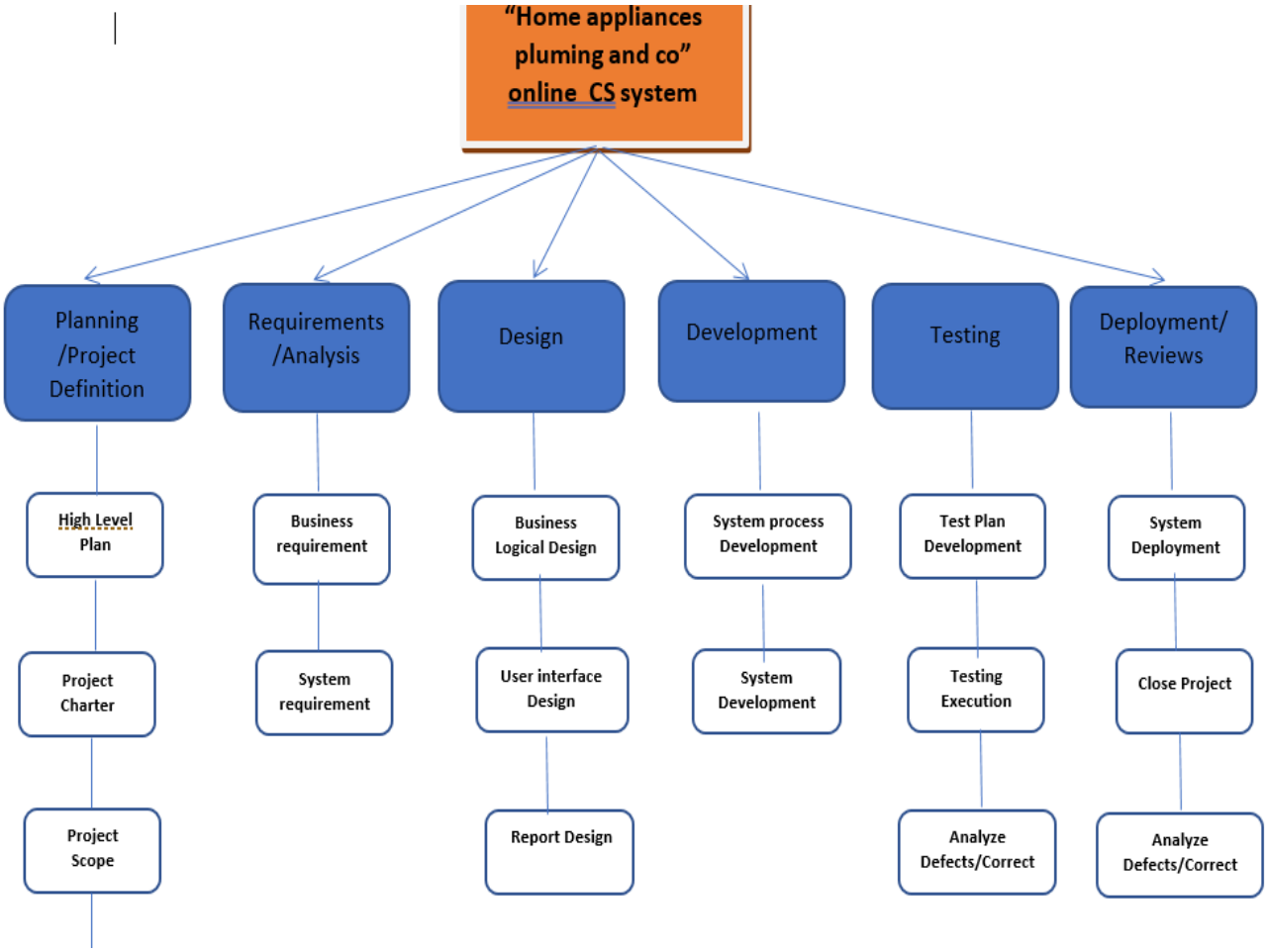
Requirements analysis

System Design

System Development

Testing

Deployment /Reviews



5.2 Rationale for this WBS

The WBS goals to identify all the project tasks that need to be completed and organised with smaller sub task contribution to complete the high-level project tasks. Once a WBS is identified also completed, project milestones (Key Deliverables) can be identified.

Each task in the WBS should be estimated including Resources As a high-level project tasks are

Project planning

Initiating

Develop project charter

Identify the objectives

Create project charter

Create high level WBS

Create Scope/cost/resources

Requirements analysis

Problem statement:

The home appliance pluming company does not have online presence so they have asked us to develop an online customer service system for their business.

They are expecting a system with following requirements

a) add /delete engineer with login and password
b) add new customer
c) customer can post a job and select an engineer
d) engineer can apply for job
e) admin can assign job to an engineer
f) customer can rate an engineer's job
g) all jobs must be deleted after 12 months from completed date
h) weekly report

Back ground information

The home appliance pluming company specializing in repairs and the maintenance of domestic appliances (such as heating and plumbing etc) they do not have any online customer service system for their customers

Environment and system models

The system mainly an internet system on window or main frame with excellent

server to maintain data with securely with following options

a) add /delete engineer with login and password
b) add new customer
c) customer can post a job and select an engineer
d) engineer can apply for job
e) admin can assign job to an engineer
f) customer can rate an engineer's job
g) all jobs must be deleted after 12 months from completed date
h) weekly report

Functional requirements

1. to register a new engineer – record details of a new engineer (with login password)
2. to de-register an engineer – delete details of a specified engineer (with login password)
3. to create a job – record details of a new job for a specified customer. If a customer is 'new', then the customer's record is also created, otherwise the customer's record is updated (with login password)
4. to cancel a job – update the job's record (the record will be deleted 12 months after the cancellation's date)
5. to allocate an engineer – allocate a selected engineer to the specified job (a system manager assign, or an engineer can apply for, or customer can select)
6. to complete a job – update the specified job (the job's record will be deleted 12 months after the completion's date)
7. to collect customer feedback for the service -- customer can give feedback comments and rank for the engineer's job (with login password)

System Design

Business logical design

User Interface Design

Report Design

System Development

System process development

system development

Testing

Unit Test

Integration test

Acceptance test

System test

Deployment /Maintenance

System deployment

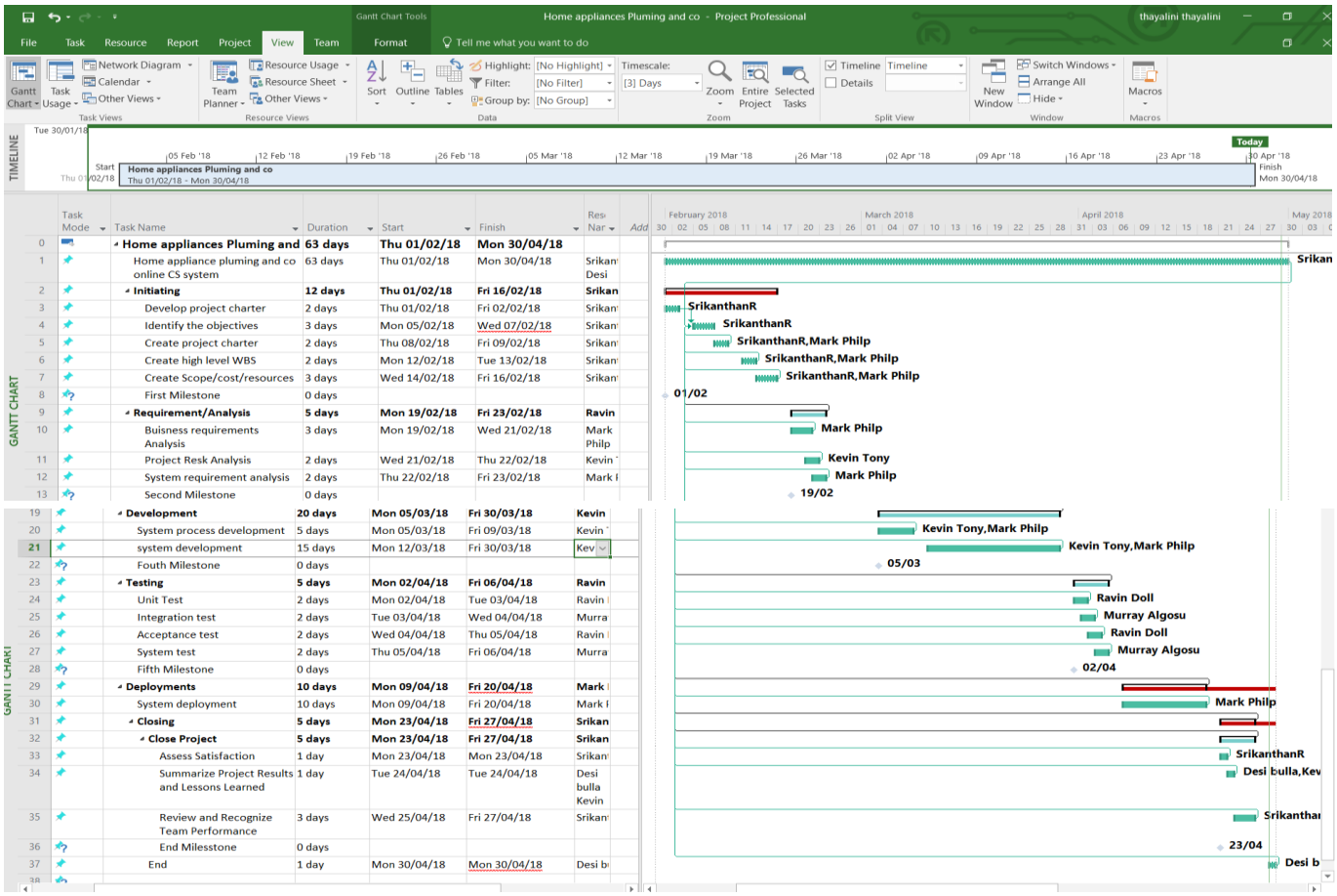
Close Project

Assess Satisfaction

Summarize Project Results and Lessons Learned

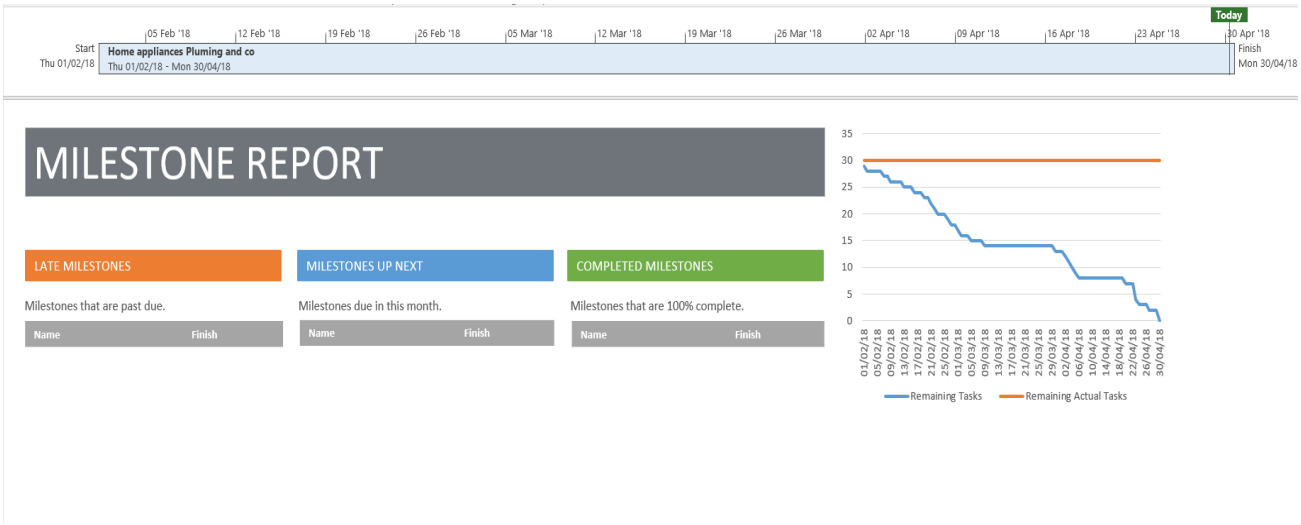
Review and Recognize Team Performance

5.3 Gantt Chart



5.4 Milestones

Task Name
Initiating
Develop project charter
Identify the objectives
Create project charter
Create high level WBS
Create Scope/cost/resources
First Milestone
Requirement/Analysis
Business requirements Analysis
Project Risk Analysis
System requirement analysis
Second Milestone
Design
Business logical design
User Interface Design
Report Design
Third Milestone
Development
System process development
system development
Fourth Milestone
Testing
Unit Test
Integration test
Acceptance test
System test
Fifth Milestone
Deployments
System deployment
Closing
Close Project
Assess Satisfaction
Summarize Project Results and Lessons Learned
Review and Recognize Team Performance
End Milestone
End



5.5 Rationale for the Milestones

The Milestones being defined and achieved based on the development life cycles and the project plan. milestone is a task of zero duration that shows an important achievement in a project. The milestones should represent a clear sequence of events that incrementally build up until your project is complete.

Task Name
Initiating
Develop project charter
Identify the objectives
Create project charter
Create high level WBS
Create Scope/cost/resources
First Milestone
Requirement/Analysis
Business requirements Analysis
Project Risk Analysis
System requirement analysis
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Third Milestone
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System process development
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Integration test
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System test

Fifth Milestone
Deployments
System deployment
Closing
Close Project
Assess Satisfaction
Summarize Project Results and Lessons Learned
Review and Recognize Team Performance
End Milestone
End

6.Conclusions

In order to manage the project, I have prepared necessary documents and course materials, and followed the steps as explained in the lecture notes to complete each task to satisfy assignment requirements.

The knowledge and skills I have gained after completion of this assignment gave me a confident to address project management issues and steps to follow to successfully complete a project.

This assignment gave me a vast knowledge in project management and how to organize and complete the task in projects.
Specially organizing people, task, analysing risks, budget planning, scheduling work and what steps to take to produce a quality product

7.References

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Appendix

1. PROJECT CHARTER

Project Title: “Home appliances pluming and co” online customer service system
Project start date: 01 February 2018
Projects finish date: 30 April 2018
Project manager: Srikanthan Ramakrishnan

PROJECT OBJECTIVES

1. **Induction**
   1.1 Purposes
   1.2 Scopes
   1.3 Definitions, Acronyms, and Abbreviations
2. **Project Overview**
   2.1 Project Summary
   2.2 Assumptions and Constraints
   2.2.1 Assumptions
   2.2.2 Constraints
   2.3 Project Deliverables
   2.4 Schedule and Budget Summary
   2.4.1 Schedule
   2.4.2 Budget Summary
3. **Project Organisational Structure**
   3.1 Description of the Team Structure
   3.1.1 Organisational Structure
   3.1.2 Our project organization structure (Projectized Organization structure)
   3.2 Identification of the Team Members responsibilities for software process
4. **Software quality management**
   4.1 Present the project risk management
   4.2 Software quality management strategies
5. **Work Breakdown Structure (WBS)**
   5.1 WBS
   5.2 Rationale for this WBS
   5.3 Gantt Chart
   5.3 Milestones
   5.3 Rationale for the Milestones
5. **Conclusions**
6. **References**

A. Appendices
   A.1 Project Charter

ROLES AND RESPONSIBILITES:

Name	Role	Responsibilities
Srikanthan Ramakrishnan	Project Manager	
Murray Algosu	Team member	Testing
Ravin Doll	Team member	Test lead

Mark Philp	Team member	Developer
Desi bulla	Team member	
Kevin Tony	Team member	Software Engineer

Network Diagram