Declaration of Participation

Professional and Managerial Skills (H1041)

Project Management Group Written Submission

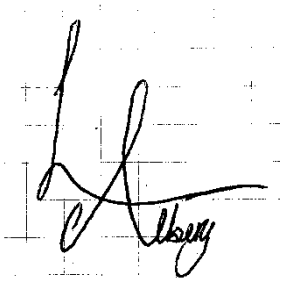
Title: ProstheTech

Word Count: 4,057 (without references)

I, candidate number 266720, hereby declare that I have participated in the project management group report together with candidate number 266720, 262976, 262937, 262903, 267011, and 267339

Candidate Number 266720 has submitted the report on behalf of the group on 14/05/2024.

Signature:



Candidate number 266720

H1041 Documentation of Word Allocation & Group Meetings

Group work allocation documentation

Unless otherwise stated, we will assume that all members participated in the project. If this is not the case, please clearly indicate in the Group Work Allocation Table

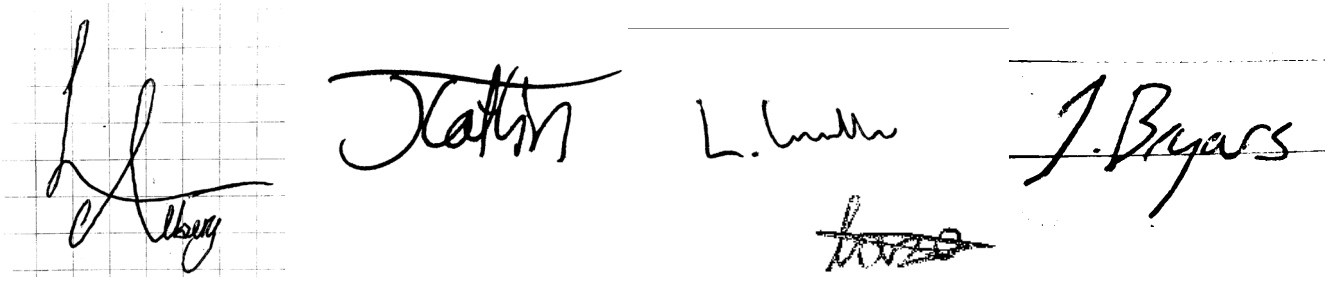
The more details you provide us the better we can allocate fair grade based on quality of work and participation.

If you feel that it is needed, please include the original scripts of the work (unedited) from each group member so we can assess the original work and the work in the final project.

Group Work Allocation Table

Section	**Student(s) allocated to the work** Indicate the student candidate number(s)	**Work completed by student(s)** Indicate the student candidate number(s)
1. Introduction & Project Life Cycle	267011	267011 wrote the section 266720 edited the work
2. Scope Management	266720	266720 wrote the section
3. Time Management	266720	266720 wrote the section and project file
4. Cost Management	266720	266720 wrote and researched this section
5. Quality Management	262903	262903 wrote the section
6. Risk Management	262976	262976 wrote the section
7. Stakeholders	262937	262937 wrote the section
8. Communication Plan	267339	267339 wrote the section
9. References	266720	266720 wrote the section and ensured proper citation. Each candidate provided all references cited in their section.
10. Editing	266720	266720
11. Formatting	266720	266720

Group Member Signatures:
I hereby declare that this statement is a true representation of the events that occurred:



Group meeting documentation.

Group meeting 1:
Date: 13th Feb
Members who attended: 266720, 267011, 262903, 262976, 262937
Summary of meeting:

- Initial ideas discussed.
- Essentially just ideation

Group meeting 2:
Date: 20th Feb
Members who attended: 266720, 267011, 262903, 262976, 262937
Summary of meeting:

- Agreed project.
- 3D printing
- Software ideas
- Possible Exoskeleton?

Group meeting 3:
Date: 19th Mar
Members who attended: 266720, 267011, 262903, 262976, 262937
Summary of meeting:

- Scope and Project Timeline discussion
- Allocated Report work
- Allocated Presentation work

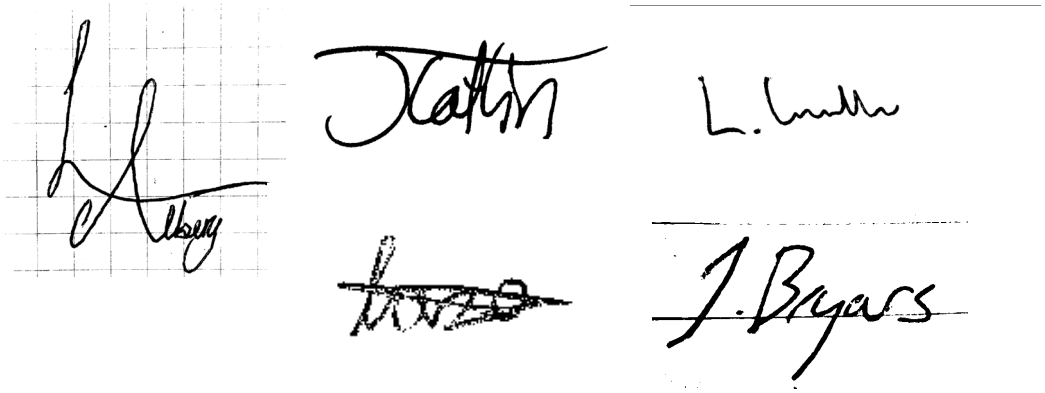
Group meeting 4:
Date: 22nd Apr
Members who attended: 266720, 267011, 262903, 262976, 262937
Summary of meeting:

- Presentation Prep
- Finalising Slides
- Catch up on where everyone is on the report.

Group meeting 5:
Date: 8th May
Members who attended: 266720, 267011, 262903, 262976, 262937
Summary of meeting:

- Last Report catch up.

Group Member Signatures:
I hereby declare that this statement is a true representation of the events that occurred:



ProstheTech

266720, 262976, 262937, 262903, 267011, 267339

Date: Monday 29th April 2024

Abstract

This report outlines the establishment and operations of our company, "Prosthetech," a company focused on producing affordable and rapidly accessible prosthetics. Our company aims to serve veterans of conflicts, particularly those injured in the Ukraine/Russia conflict. We, using 3D printing, plan to customize prosthetics quickly and affordably, with a particular focus on post-conflict Ukraine. The project encompasses designing and sourcing motors, developing software, establishing a postal distribution system, creating instructional materials, collaborating with local organizations, and ensuring quality. Key aspects include addressing regulatory requirements, mitigating risks such as prosthetic malfunction, and engaging with stakeholders such as the UK Government, Red Cross, Doctors without Borders, and the Ukrainian Army. This report also details the project's timeline, labor and outsourcing costs, quality standards, regulatory compliance, risk management strategies, stakeholder engagement matrix, and communication plans.

Contents

1. DECLARATION

This report, written as the prospective company "Prosthetech", is entirely the work of 266720, 262976, 262937, 262903, 267011, and 267339 unless otherwise acknowledged, and performed for the module "Professional and Managerial Skills", and the University of Sussex.

2. INTRODUCTION

Our company is called 'Prosthetech', and we produce quickly made and affordable prosthetics. We were founded in 2024 and are based in Brighton. We are a medium-sized company with 200 employees. We seek to provide fast and affordable prosthetic care to veterans of conflicts to ensure they can live comfortably. Our core values are integrity - to carry out all our work with the greatest responsibility and accountability, creativity - to infuse our work with imagination and innovation, excellence - to deliver the highest quality products and services in all endeavors, and discovery - to explore and bring to light new knowledge, new ideas, and better ways of providing care.

We decided to start this company due to the number of people injured from the Ukraine/Russia conflict and had an idea that we could use 3D printing for prosthetics to help veteran amputees acclimate to regular life faster and more affordably than with conventional prosthetics. As the prosthetics would be 3D printed, we could set up in conflict counties quickly as all we would need are 3D printers. We would customize the prosthetic to fit the customer by taking their measurements and entering them into our own software that would adjust the 3D file to fit the measurements of the customer. We could also 3D scan the customer's remaining limb and 3D print a more accurate prosthetic for the customer, if applicable.

Our project will have four stages: starting, preparing and organizing, carrying out work, and closing. The starting stage will take 3 days, which is to come up with the project objective. The second stage (preparing and organizing) will take 2 months. During this time, we will find out what type of stakeholders would be interested and establish team roles and responsibilities. The third stage (carrying out work) will take 1 year. We will develop a suitable motor, develop the website, create a prototype of the arm, find suppliers, create instructions, and find appropriate postal services. The final stage (closing) will take 2 weeks. During this time, we will ensure delivery of motors, evaluate project success, and document lessons learned.

3. PROJECT SCOPE

3.1. Objective

The primary objective of the project is to provide affordable, accessible, and functional prosthetic arms to individuals in post-conflict Ukraine. This means ensuring that the prosthetic arms are customisable, easy to assemble, and use locally available materials whenever possible. The project aims to empower individuals with limb differences to regain independence and improve their quality of life.

3.2. Approach

3.2.1. Design and Development

Collaborate with prosthetists, engineers, and software engineers to create 3D print software to generate 3D printable prosthetic arm designs that are lightweight, durable, and adaptable to different user needs. These designs should be optimized for easy assembly and customization.

3.2.2. Motor Distribution

Partner with suppliers to source affordable and reliable motors for prosthetic arms. Develop a postal distribution system for sending these motors to individuals in post-conflict Ukraine.

3.2.3. Community Engagement

Establish partnerships with local organizations, healthcare providers, and community leaders in post-conflict countries to identify individuals in need of prosthetic arms and provide support throughout the assembly and fitting process.

3.2.4. Training and Support

Develop instructions, including manuals and videos, to guide users through the assembly and

fitting of the prosthetic arms and usage of the app or website. Provide training sessions and ongoing support to ensure users can effectively utilise and maintain their prosthetic arms.

3.2.5. Quality Assurance

Implement quality control measures to ensure the safety, functionality, reliability and durability of the prosthetic arms. This involves testing prototypes, gathering user feedback, and making continuous improvements to the design and manufacturing process.

3.2.6. Sustainability

Explore user or 'self' manufacturing and assembly of prosthetic arms, a bit like IKEA furniture, in post-conflict countries, leveraging 3D printing technology and local expertise. Create partnerships with locals and local hospitals to promote sustainability and self-reliance within the communities served.

3.2.7. Monitoring and Evaluation

Monitor mechanisms to assess the project, including tracking the number of prosthetic arms distributed, user satisfaction, and improvements in quality of life. Use this data to expand and optimise the project for broader distribution, considering local data for specific areas.

3.3. Scope Definition

3.3.1. Requirements

- Design and sourcing of affordable and reliable motors suitable for prosthetic arms.
- Design and development of software for generation of 3D prints.
- Development of a postal distribution system for sending motors to post-conflict Ukraine.
- Creation of instructional materials for motor assembly and integration into prosthetic arms.
- Collaboration with local organizations for recipient identification and support.
- Quality control measures to ensure safety and functionality of motors.

3.3.2. Included in the Project

- Design and sourcing of motors meeting prosthetic arm specifications.
- Development of packaging and shipping logistics for motor distribution.
- Creation of instructional materials for motor assembly and integration.
- Collaboration with local organizations for recipient identification and support.
- Quality control measures for motor safety and functionality.

3.3.3. Not Included in the Project

- 3D printing of the arms
- Construction of motors
- Distribution of complete prosthetic arms.
- Medical consultations or fittings.
- Long-term maintenance or support beyond motor integration.
- Development of unrelated technologies or products.
- Modifications to arms

3.4. Detailed Product Description

The project sources, packages, and distributes affordable, reliable motors tailored for generative designed and self printed 3D printable prosthetic arms. Recipients receive detailed assembly instructions, along with support from local hospitals. Quality control measures guarantee motor safety and functionality, enhancing prosthetic arm effectiveness and reliability.

3.5. Work breakdown structure

3.5.1. Project Initiation

a. Define Project Objectives
b. Identify Stakeholders
c. Establish Project Team

3.5.2. Design and Sourcing

a. Research Motor Requirements
i. Identify required torque, size, weight, and power specifications.
ii. Consult with prosthetists and engineers for specific motor needs.
b. Source Potential Motor Suppliers
i. Research motor suppliers that meet requirements.
ii. Contact potential suppliers for product catalogues, pricing, and technical specifications.
c. Evaluate and Select Motor Supplier(s)
i. Review supplier proposals and compare motor specifications, pricing, and delivery options.
ii. Assess supplier reliability and track record.
iii. Conduct negotiations and select suppliers based on evaluation criteria.
d. Negotiate Contracts and Agreements
i. Negotiate terms and conditions, including pricing, delivery schedules, and warranties.
ii. Create contracts or agreements with selected motor suppliers.
iii. Ensure legal review and approval of contracts before finalisation.

3.5.3. App/Web Development

a. Planning and Research

i. Define app objectives, target audience, and key features.

ii. Conduct market research to identify trends and user preferences.

iii. Determine technical requirements and platforms for development.

b. UI/UX Design and Prototyping

i. Create wireframes and prototypes to visualize app layout and user flow.

ii. Design intuitive and visually appealing user interfaces.

iii. Focus on optimizing user experience through usability testing.

c. Development and Integration

i. Develop frontend components using appropriate technologies.

ii. Build backend infrastructure to support app functionality.

iii. Integrate frontend and backend components to create a fully functional app.

d. Testing and Quality Assurance

i. Conduct thorough testing to identify and fix bugs.

ii. Ensure compatibility across devices and platforms.

iii. Optimize performance and usability through testing iterations.

e. Deployment and Distribution

i. Prepare app for submission to relevant app stores (e.g., App Store, Google Play Store).

ii. Compile necessary documentation and app metadata for submission.

iii. Conduct beta testing and address any issues before public release.

f. Maintenance and Support

i. Monitor app performance and user feedback for ongoing improvements.

ii. Release regular updates to address bugs and enhance functionality.

iii. Provide user support and troubleshooting assistance as needed.

3.5.4. Motor Development

a. Prototype Motor Development

i. Develop initial motor prototypes from design specifications.

b. Testing and Iteration

i. Gather feedback from testing and identify areas for improvement.

ii. Iterate on motor design to address any issues or deficiencies.

iii. Conduct additional testing to validate improvements and ensure functionality.

c. Finalize Motor Design

i. Use feedback and improvements into the final motor design.

ii. Ensure final design meets all requirements and specifications.

iii. Prepare design documentation and specifications for mass production.

3.5.5. Postal Distribution System

a. Design Packaging for Motors

i. Develop packaging materials that protect motors during transit and storage.

ii. Consider factors such as size, weight, and fragility of motors when designing packaging.

b. Develop Shipping Logistics

i. Establish procedures for packaging and labelling motors for shipment.

ii. Determine shipping methods, routes, and carriers based on destination locations.

c. Establish Partnerships with Postal Services

i. Identify and reach out to postal services or shipping companies operating in post-conflict regions.

ii. Negotiate agreements or partnerships to facilitate motor distribution through postal channels.

d. Test Shipping Procedures

i. Start trial shipments to verify the effectiveness of packaging and shipping logistics.

ii. Identify and address any issues or challenges encountered during test shipments.

iii. Refine shipping procedures based on test results for efficiency and reliability.

3.5.6. Instructions

a. Create Assembly Manuals

b. Produce Video Tutorials

c. Translate Materials

3.5.7. Local Collaboration

a. Identify and Engage Local Partners (such as hospitals)

b. Train Local Partners on Project Requirements

c. Establish Recipient Identification Process

3.5.8. Quality Control

a. Develop Quality Assurance Standards

b. Implement Testing Protocols

c. Conduct Quality Audits

3.5.9. Project Management

a. Project Planning

b. Resource Allocation

c. Risk Management

d. Communication Plan

e. Progress Monitoring and Reporting

3.5.10. Project Closure

a. Ensure Delivery of Motors

b. Evaluate Project Success

c. Document Lessons Learned

d. Handover to Maintenance Team

4. TIME

The work breakdown structure (WBS) was then transferred into Project to get the time needed for the project. The project file, is attached to the report, but you can also access it through this link:

However, as a summary, the time needed is about a year to start. As stated in the scope this does not include long term maintenance or maintaining shipments.

This includes just under 10000hrs of work.

5. COST

5.1. Labour Cost

According to Project the total Labour cost is around £250000. This is using the figures in Table 1, which has all the average salaries earned by each position.

Table 1: Labour costs

Resource Name	Std. Rate
App Developer	£28.50/hr(1)
Engineer	£19.70/hr(2)
Management	£15.85/hr(3)
Lawyer	£301/hr(4)
Tester	£17.95/hr(5)
Communications	£15.80/hr(6)
Marketing	£14.00/hr(7)
Logician	£26.47/hr(8)
Translator	£15.80/hr(9)

5.2. Outsourced Motor Costs

In a prosthetic arm, there are three nodes, which means that there has to be three precise tri-axial motors.

Reuters claim that there are up to 50000 Ukrainian amputees.(10) This means that the number of motors that need to be produced is about 150000.

Table 2 shows what we should expect for the outsourced motor costs.

The median average cost is about £3,375,000, however the cost could be expected to be a lot higher, at around £4,980,000.

5.3. Shipping Costs

After search we can infer costs would cost around $18(11) or around £14.36. This means for 50,000 packages, of 3 motors each, the cost would be around $900,000 or £718,000.

The cost of packaging, which will just be cardboard boxes, is between £50000-£100000.

5.4. Total that can be Expected

The total will be the sum of all these things. In table 3, the minimum and maximum possible cost is displayed.

The median average is £4,418,000. This should be what is expected to pay around, however it can vary by a large amount.

6. QUALITY

Our goal is a product and service that allows any veteran to receive a prosthetic arm, no matter how severe the damage to the limb or how much of it remains. Achieved through a streamlined and caring service to help make the process as easy as possible for the amputee.

The prosthetic's motion allows complete control over the flexing and extending movements of the fingers, one-axis rotation of the wrist, elbow and shoulder joint, twist and release mechanisms in the hand/forearm and forearm/upper arm connections, a comfortable and durable product to help veterans feel capable, where the prosthetic is cable chargeable using a provided cable that can attach to wall sockets of the country of origin, (type C and F for Ukraine) that will allow at least ten hours of battery life on a full charge and fully charge in one night.

The fishbone diagram of the project is shown in Fig. 1.

6.1. Laws and Regulations

According to (protezhub.com, 2023)(12), 'legislative changes in 2022 introduced by the Ministry of Social Policy, many bureaucratic hurdles to obtaining prostheses were removed'. Making our target market easier to reach and supply.

According to (Grover and Bern, 2023)(13), the prosthetic climate in Ukraine details that Getting prosthetics fitted elsewhere and abroad is possible, but 'the practice is not ideal given patients need long-term follow-up'. This struggle in the foreign prosthetic market makes our service more valuable and effective for veterans because our service will be set up in Ukraine and allow regular checkups and adjustments.

According to (Brkic and Hammar, 2023)(14), 'The MDR certification is required for medical device manufacturers to legally market and sell their products in the EU'. To sell prosthetics under EU law, although Ukraine is only an EU candidate country, it would require this MDR certification, which includes a 'Quality management system' tailored under 'ISO 13485' which our prosthetic would need to complete, but once completed, our quality will be ensured for our customers.

According to (Grover and Bern, 2023)(13), 'Before Russia's full-scale invasion 13 months ago, the ratio of lower limbs and upper limbs was about 9 to

Type of Cost -	Minimum/motor GBP	Minimum Total GBP	Maximum/motor GBP	Maximum Total GBP
Material	5	750,000	20	3,000,000
Equipment	1.50	225,000	3.50	525,000
Energy	0.60	90,000	1.20	180,000
Quality	1.50	225,000	2.50	375,000
Regulation	0.60	90,000	1	150,000
R&D	0.60	90,000	1	150,000
Supply Chain	1	150,000	2	300,000
Overhead	1	150,000	2	300,000
Total	11.80	1,770,000	33.20	4,980,000

Table 2: Outsourced motor costs

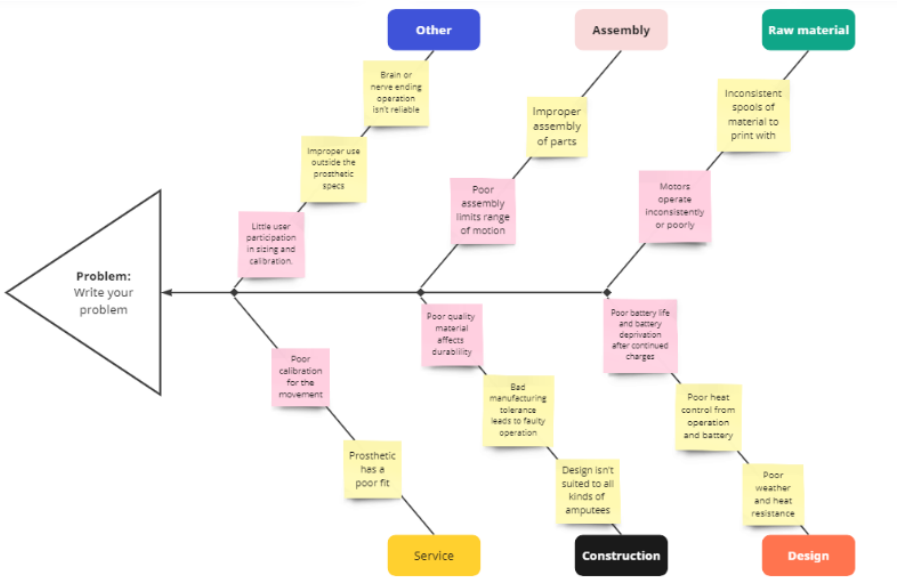


Fig. 1: Fishbone Diagram of Project

Table 3:

-	Minimum	Maximum
Labour	£250,000	£250,000
Outsource	£1,770,000	£4,980,000
Shipping	£718,000	£718,000
Packaging	£50,000	£100,000
Total	£2,788,000	£6,048,000

one, while it was now probably 50-50'. This change in demand will make our versatile prosthetic, which can be fitted to any amputee, much more valuable in the current market.

7. RISK

Risk is displayed in Table 4, as well as listed out here.

7.1. Prosthetic Malfunction

For our first risk of a prosthetic malfunction we must mitigate this risk. This can be done through making sure that the quality of our product is very high with its material and the way its manufactured. Furthermore through testing we will be able to predict the parts which are most likely to fail and the life span of these parts. With good communication with the customer and quick responses we will be able to mitigate the time the consumer is affected this higher consumer satisfaction.

7.2. Initial Investment

The large initial investment can be somewhat transferred, mitigated and accepted. Firstly we can transfer the problem of the large funding needed by getting the money required from investors. Next we can mitigate the problem by requiring less money to start the research and development. This can be

Risk Factor	Likelihood	Consequence	Impact Potential
Prosthetic Malfunction	Low(Dependent)	High	Minor/moderate
Large Initial Investment	High	Moderate	Moderately Serious
Lack of Specialised Staff	Moderate	Moderate	Moderate
Manufacturing Problem	Low	Moderate	Minor
App Crashes	Low	Low	Low
Unethical Combat Use	Minor	Moderate	Low

Table 4: Tabulated Risks

done through using university students as interns to do research for free or as little money as possible as they would be happy to get the experience. Finally we have to accept that this is a big risk as a lot of money is involved and it is hard to get the funding we need, also the time it will take to research this may be a while.

7.3. Specialised Staff

The lack of specialised staff can be transferred and mitigated. We are able to outsource the work of the staff by hiring them privately for whoever is available if necessary. Paying the staff good wages will lower the chance of them leaving and some chance more people would want to get into that line of work if they hear it pays well so through paying the employees well and increasing satisfaction we mitigate this risk.

7.4. Manufacturing Problems

Manufacturing problems must be mitigated. As parts will be 3D printed and manufactured in factories the quality will vary drastically. For the parts being 3D printed by the customers we must ensure that they are using a good 3D printer to get the best quality product possible as the one they use will vary drastically. The ones we manufacture can be quality control checked regularly for each part and the reliability of the machines used can be checked.

7.5. App Crashing

The app crashing again can be mitigated. Through regular checks and fast response times we can make sure that the app is functioning properly. Hiring an expert in this field to make sure it functions as well as it can will mitigate the risk of this happening.

7.6. Unethical Use

Finally we may have an ethical risk in that people that get injured in war may get given our product and will be sent back out which may cause severe emotional trauma, this has to be mitigated and accepted. We will mitigate this problem by trying not to sell our product to government bodies our consumers which we know have ill intent and will use it with this problem we have suggested. Also we have to accept the fact that this may happen as we do not have complete control on what happens and how people are able to obtain these as. As customers should be going to appointments with specialists we will be able to have data on them thus we can see there background and what they do for work so if they are in the army we could get them to sign a contract that they cannot go back whilst using our product.

8. STAKEHOLDERS

Our company has several key stakeholders both from an investment standpoint and also the many thousand that will benfit from our products once the war in Ukraine has come to a close. Our main stakeholders will be the UK Government, Red Cross, Doctors without borders, Ukrainian Army and the world population.

8.1. UK Government

Our vision is that the UK Government will be the largest stakeholder in our company from a financial point of view. The UK has an ODA budget of £15.4bn(16), and we would require bilateral ODA and to act as an official government partner. Interest from the powerful government will be high as they will seek to provide aid in a form other than weapons, and medical devices would be an extremely positive resource to provide to achieve both an exceptional result and exceptional publicity. To encourage a higher level of the engagement we could possibly work with the NHS in the future to provide amputees with prosthetics.

8.2. Red Cross and Doctors without Borders

The red cross and doctors without borders are both huge organisations that have massive power globally. Providing boots on the ground in countries affected by conflict, they would be hugely valuable organisations to collaborate with both in terms of supplying the prosthetics and also spreading awareness that this is a possibility for the soliders to regain both functionality and dignity so hey can live normal lives post-conflict. One of the aims of the red cross is to restore dignity and not only will the

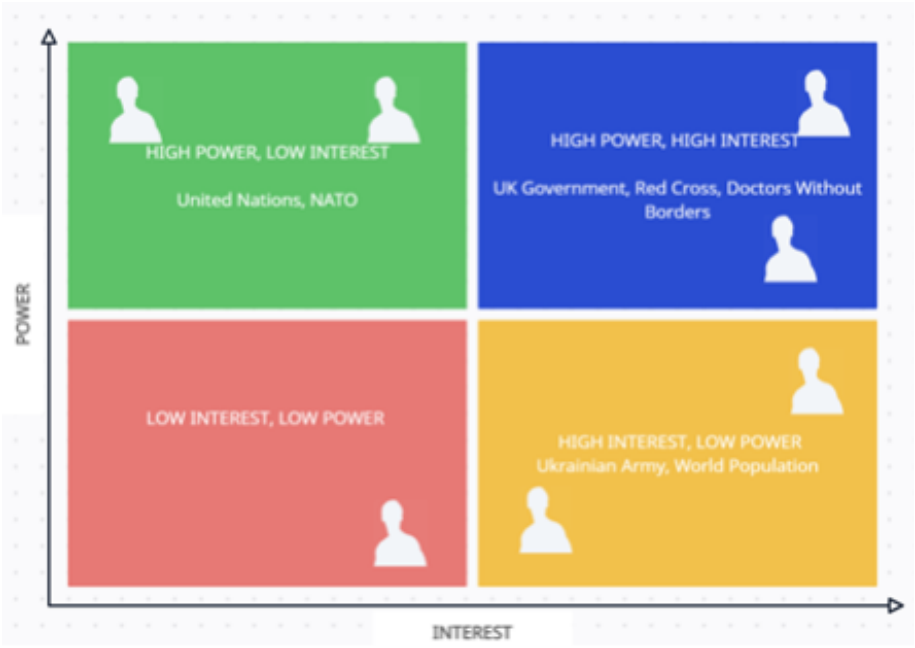


Fig. 2: Stakeholders Engagement Matrix(15)

prosthetics change lives but they will also meet this need.

8.3. Ukrainian Army

Members of the Ukrainian Army are aslo a very important stakeholder as they are the people who will be benefitting from the product directly. By providing prototype models as well as online talks with those most affected by the conflict, we could increase both interest and support. If the product was at a very low cost to them as a result from the bilateral ODA, the project would gain huge support and traction as well as word of mouth advertising to those who may be in a similar situation. Once people receive the products they may also want to help and provide support for newer users to adapt to their new product.

8.4. World Population

The world population may also hear about our company and decide they want to do something to help. Whether that be in the form of a financial donation, research contribution or by spreading positive publicity. If our idea begins to rapidly gain traction it would support us by providing more in depth and varied research and experience as well as the possibility for new ideas and innovation that our small team may never have thought of. It may also encourage amputees to step forward to inform us of what we can do better so we can grow more as a company and help as many people as possible.

8.5. Stakeholder Table

The Power/Interest Gird of Stakeholders is shown in Table 5. C represents Current Engagement and D represents the desired level.

9. COMMUNICATION

As a company we are very much aware of the importance of communication within the business. According to a survey by the Computing Technology Industry Association(17), 28 percent reported poor communication as the primary cause of failing to deliver a project within its original time frame. As a result we have anticipated possible obstacles that might happen during our communication with the stakeholders and we have taken necessary precautions.

With the UK government, lack of clarity over regulations or changes in policies could affect our product developers and delivery times. We have ensured that we maintain an open channel of communication with government agencies to keep up with regulatory changes. We plan to further keep our legal assistants in the loop and regularly provide documents and updates on product development to maintain regulatory requirements.

With the Red Cross, A difficulty might occur such as limited access to remote or conflict-affected areas may hinder communication with Red Cross personnel, making it challenging to gather timely feedback or coordinate prosthetic distribution efforts. As a solution to that, we are collaborating with local partners or community leaders to facilitate

Stakeholder	Unaware	Resistant	Neutral	Supportive	Leading
UK Government	-	-	-	C	D
Red Cross	C	-	-	D	-
Doctors without Borders	C	-	-	D	-
World Population	C	-	-	D	-
Ukrainian Army	-	-	C	D	-

Table 5: Power/Interest grid of stakeholders

Stakeholder	Method	Frequency	Attending	Purpose
UK Government (Department of Health and Social care)	Reports, formal letters and meetings	Monthly or quarterly updates	Project manager, Legal advisor, Communication officer	Progress updates on the development and distribution of prosthetics, including any regulatory compliance issues or changes.
Red Cross	Regular email updates, conference calls and field visits	Monthly updates, with more frequent communication during emergency response situations.	Project manager, Logistics coordinator, Medical advisor, communication officer	Updates on the availability and distribution of prosthetics in areas affected by conflicts or natural disasters.
Doctors without borders	Face to Face meetings during conferences or seminars, email updates and occasional webinars	Quarterly meetings, with additional updates as new developments occur.	Project manager, medical director, technical expert, communications specialists	Progress updates on technological advancements, availability of prosthetics, and collaboration opportunities.
Ukrainian army	Dedicated liaison officers for direct communication, Periodic Reports, Secure Communication Channels	Bi-weekly updates during active conflicts, with monthly reports during peacetime or as needed.	Project manager, Military Liaison Officer, Technical Specialist, Communication Officer	Updates on the availability and distribution of prosthetics for injured soldiers, as well as any specific requirements or feedback from the field
World Population	Social media campaigns, press releases, website updates, and occasional public events or exhibitions	Continuous updates through social media channels, with periodic press releases or events for major milestones or campaigns	Project manager, Marketing specialist, Outreach coordinator, Communication officer	General awareness about the impact of prosthetics on improving quality of life, fundraising campaigns, and success stories

Fig. 3: Communication Plan Figure

information sharing and coordinate logistics in hard-to-reach areas.

For doctors without borders, the differences in organisational priorities, workflows or even communication styles could result in misalignment or misunderstandings about the project scope or collaboration opportunities. To solve that we have established and maintained defined and agreed-upon modes of communication and checkpoints discussing a spirit of collaboration through the joint planning sessions.

As the Ukrainian Army is one of our biggest stakeholders, there are many problems that can happen due to miscommunication such as, the capital controls and other financial restrictions applicable under wartime conditions can prevent private-sector profits flowing out of Ukraine, with its associated liquidity events and investment opportunities. To get ahead of that we are coordinating with Ukrainian financial institutions to understand availability of strategies to manage profits locally in Ukraine, for example, making reinvestments back to expand the business, undertaking research and development or improving the supply chain. Furthermore engaging legal and financial advisors to understand the relevant regulatory regime(18) and identify avenues for potential sustainable growth and investment in the local market going forward.

Another possible issue is the uncertainty about the political and military situation in Ukraine with new front lines, mobilisation and demobilisation, and a possible return of refugees to their homes would affect operations and the human resources available for our prosthetic business.(19) We are maintaining regular engagement with government officials, and security experts to keep abreast of geopolitical developments to prepare for the impact on business operations.

REFERENCES

[1] Updog (2015).*Mobile App Developers Cost.* [online] Updog.com. Available at:

https://www.upwork.com/en-gb/hire/mobile-app-developers/cost/ [Accessed 6 May 2024].

[2] Talent (n.d.).*Engineer Salary in United Kingdom - Average Salary* [online] Talent.com. Available at: https://uk.talent.com/salary?job=engineer [Accessed 6 May 2024].

[3] Indeed (2024) *Manager salary in United Kingdom* [online] uk.indeed.com. Available at: https://uk.indeed.com/career/manager/salaries [Accessed 6 May 2024].

[4] House of Commons and HM Courts & Tribunals Service (2019). *Solicitors' guideline hourly rates* [online] GOV.UK. Available at: https://www.gov.uk/guidance/solicitors-guideline-hourly-rates.

[5] Talent (2024). *Tester Salary in United Kingdom - Average Salary.* [online] Talent.com. Available at: https://uk.talent.com/salary?job=tester#:~:text=The%20average%20tester%20salary%20in [Accessed 6 May 2024].

[6] Indeed (2024) *Communications officer salary in United Kingdom.* [online] uk.indeed.com. Available at: https://uk.indeed.com/career/communications-officer/salaries [Accessed 6 May 2024].

[7] Payscale (2024) *Digital Marketing Hourly Rate in United Kingdom — PayScale.* [online] www.payscale.com. Available at: https://www.payscale.com/research/UK/Skill=Digital_Marketing/Hourly_Rate. [Accessed 6 May 2024].

[8] Indeed (2024) *Logician salary in United Kingdom* [online] uk.indeed.com. Available at: https://uk.indeed.com/career/logician/salaries [Accessed 6 May 2024].

[9] Indeed (2024) *Translator salary in United Kingdom* [online] uk.indeed.com. Available at: https://uk.indeed.com/career/translator/salaries [Accessed 6 May 2024].

[10] Peter, T., Lyubysh-Kirdey, I. and Hnidiy, V.(2024)*Meet the Ukrainian amputees returning to the front to resist Russian advance.* [online]Reuters.com. Available at: https://www.reuters.com/world/europe/ukrainian-amputees-returning-front-resist-russian-advance-2024-04-11/#:~:text=While%20the%20Kyiv%20government%20declined,at%20between%2020%2C000%20and%2050%2C000. [Accessed 6 May 2024].

[11] Ukraposhta (2024). *Tariffs for international items.* [online] Ukraposhta.ua. Available at: https://www.ukrposhta.ua/en/taryfy-mizhnarodni-vidpravlennia [Accessed 7 May 2024].

[12] protezhub.com. (n.d.). *Ukraine Limb Prosthetics Industry Survey: Analysis and Report. — Protez Hub.* [online] Available at: https://protezhub.com/en/blog/ukraine-limb-prosthetics-industry-survey-analysis-and-report [Accessed 11 May 2024].

[13] Grover, N. and Bern, S. (2023). *Ukraine needs more prosthetics clinicians as war toll mounts* [online] 28 Mar. Available at: https://www.reuters.com/world/europe/ukraine-needs-more-prosthetics-clinicians-war-toll-mounts-2023-03-28/.

[14] Brkic, K.Z. and Hammar, M. (2023). *What is the EU MDR? — In-depth explanation of the regulation.* [online] advisera.com. Available at: https://advisera.com/13485academy/what-is-eu-mdr/#:~:text=being%20of%20patients.- [Accessed 12 May 2024].

[15] Creately (n.d.). *Power Interest Grid for Stakeholder Analysis — Creately.* [online] creately.com. Available at: https://creately.com/diagram/example/jripkdb22/power-interest-grid-for-stakeholder-analysis [Accessed 12 May 2024].

[16] Foreign, Commonwealth and Development Office (2024). *Statistics on International Development: Final UK Aid Spend 2022.* [online] GOV.UK. Available at: https://www.gov.uk/government/statistics/statistics-on-international-development-final-uk-aid-spend-2022/statistics-on-international-development-final-uk-aid-spend-2022 [Accessed 12 May 2024].

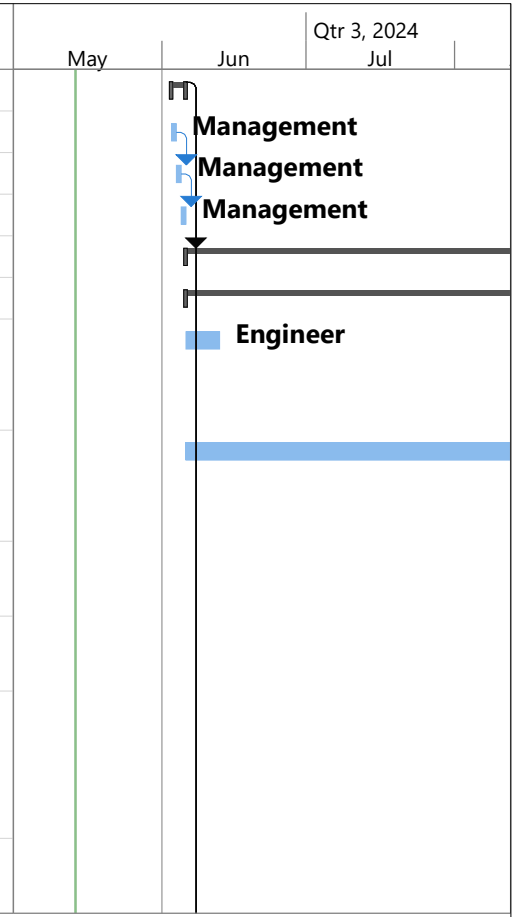
[17] BlueSource (2018). *20 astonishing stats about business communications.* [online] bluesource. Available at: https://www.bluesource.co.uk/20-astonishing-stats-business-communications/ [Accessed 13 May 2024].

[18] Zinchenko, S. (2024). *Challenges and priorities for industry in Ukraine during the war — Opinions — GMK Center.* [online] GMK. Available at: https://gmk.center/en/opinion/challenges-and-priorities-for-industry-in-ukraine-during-the-war/ [Accessed 14 May 2024].

[19] Jones, M. and Harmash, O. (2024). *Companies in Ukraine see problems pile up, but most tough it out.* [online] The Japan Times. Available at: https://www.japantimes.co.jp/business/2024/03/01/companies/ukraine-companies-resilience/ [Accessed 14 May 2024].

.

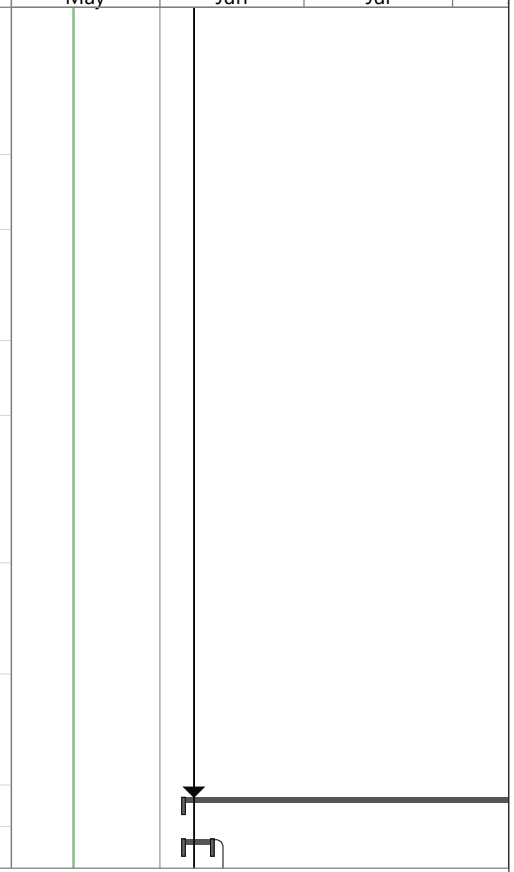
ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors	Resource Names
1		**Project initiation**	**3 days**	**Mon 03/06/2**	**Wed 05/06/2**		
2		Define Project Objectives	1 day	Mon 03/06/2	Mon 03/06/2		Management
3		Identify Stakeholders	1 day	Tue 04/06/24	Tue 04/06/24	2	Management
4		Establish Project Team	1 day	Wed 05/06/2	Wed 05/06/2	3	Management
5		**Design and Sourcing**	**140 days**	**Thu 06/06/2**	**Wed 18/12/2**	**1**	
6		**Research Motor Requireme**	**60 days**	**Thu 06/06/2**	**Wed 28/08/2**		
7		Identify required torque, size, weight, and power specifications.	1 wk	Thu 06/06/24	Wed 12/06/24		Engineer
8		Consult with prosthetists and engineers for specific motor needs.	3 mons	Thu 06/06/24	Wed 28/08/24		Engineer
9		**Source Potential Motor Suppliers**	**15 days**	**Thu 29/08/24**	**Wed 18/09/24**	**6**	
10		Research motor suppliers that meet	1 wk	Thu 29/08/24	Wed 04/09/24		Engineer
11		Contact potential suppliers for product catalogues, pricing, and technical specifications.	2 wks	Thu 05/09/24	Wed 18/09/24	10	Engineer
12		**Evaluate and Select Motor Supplier(s)**	**20 days**	**Thu 19/09/24**	**Wed 16/10/24**	**9**	



Project: Final Scope
Date: Tue 14/05/24

Task	Inactive Summary	External Tasks
Split	Manual Task	External Milestone
Milestone	Duration-only	Deadline
Summary	Manual Summary Rollup	Progress
Project Summary	Manual Summary	Manual Progress
Inactive Task	Start-only	
Inactive Milestone	Finish-only	

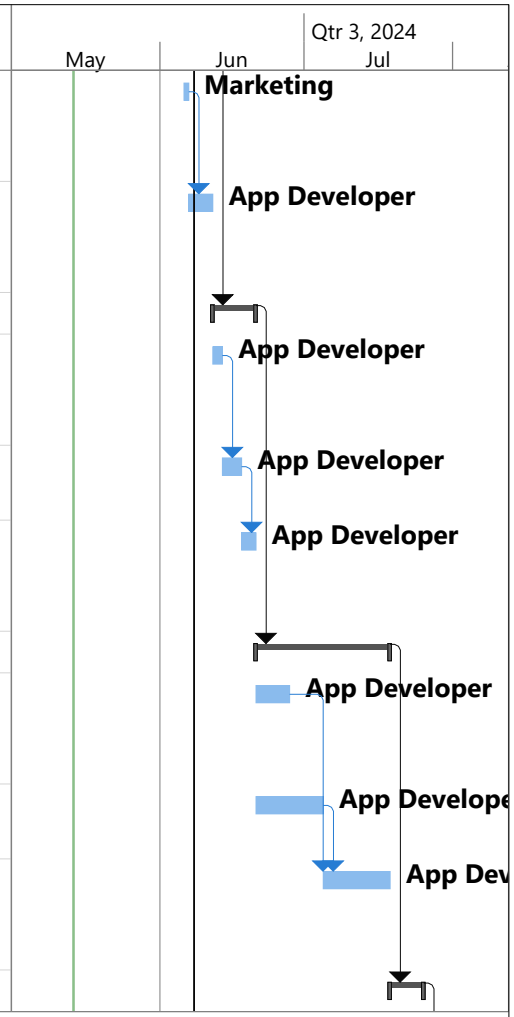
ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors	Resource Names
13		Review supplier proposals and compare motor specifications, pricing, and delivery	2 days	Thu 19/09/24	Fri 20/09/24		Management
14		Assess supplier reliability and track record.	2 days	Thu 19/09/24	Fri 20/09/24		Management
15		Conduct negotiations and select suppliers based on evaluation	1 mon	Thu 19/09/24	Wed 16/10/24		Communications
16		**Negotiate Contracts and Agreements**	**45 days**	**Thu 17/10/24**	**Wed 18/12/24**	**12**	
17		Negotiate terms and conditions, including pricing, delivery schedules, and	1 mon	Thu 17/10/24	Wed 13/11/24		Communications
18		Create contracts or agreements with selected motor	1 wk	Thu 14/11/24	Wed 20/11/24	17	Lawyer
19		Ensure legal review and approval of contracts before finalisation.	1 mon	Thu 21/11/24	Wed 18/12/24	18	Lawyer
20		**App/Web Development**	**71 days**	**Thu 06/06/2**	**Thu 12/09/2**	**1**	
21		**Planning and Research**	**4 days**	**Thu 06/06/2**	**Tue 11/06/2**		



Project: Final Scope
Date: Tue 14/05/24

Task	Inactive Summary	External Tasks	
Split	Manual Task	External Milestone	
Milestone	Duration-only	Deadline	
Summary	Manual Summary Rollup	Progress	
Project Summary	Manual Summary	Manual Progress	
Inactive Task	Start-only		
Inactive Milestone	Finish-only		

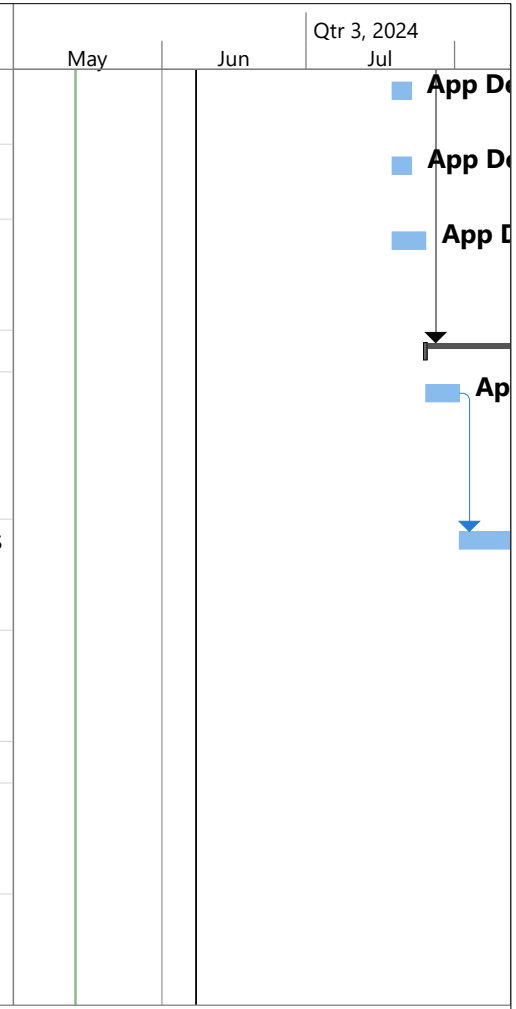
ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors	Resource Names
22		Conduct market research to identify trends and user	1 day	Thu 06/06/24	Thu 06/06/24		Marketing
23		Determine technical requirements and platforms for	3 days	Fri 07/06/24	Tue 11/06/24	22	App Developer
24		**UI/UX Design and Prototyp**	**7 days**	**Wed 12/06/2**	**Thu 20/06/2**	**21**	
25		Create wireframes and prototypes to visualize app layout and user	2 days	Wed 12/06/24	Thu 13/06/24		App Developer
26		Design intuitive and visually appealing user	2 days	Fri 14/06/24	Mon 17/06/24	25	App Developer
27		Focus on optimizing user experience through usability testing.	3 days	Tue 18/06/24	Thu 20/06/24	26	App Developer
28		**Development and Integrati**	**20 days**	**Fri 21/06/24**	**Thu 18/07/2**	**24**	
29		Develop frontend components using appropriate	1 wk	Fri 21/06/24	Thu 27/06/24		App Developer
30		Build backend infrastructure to support	2 wks	Fri 21/06/24	Thu 04/07/24		App Developer
31		Integrate frontend and backend components to create a fully functional	2 wks	Fri 05/07/24	Thu 18/07/24	30,29	App Developer
32		**Testing and Quality Assura**	**5 days**	**Fri 19/07/24**	**Thu 25/07/2**	**28**	



Project: Final Scope
Date: Tue 14/05/24

Task	Inactive Summary	External Tasks
Split	Manual Task	External Milestone
Milestone	Duration-only	Deadline
Summary	Manual Summary Rollup	Progress
Project Summary	Manual Summary	Manual Progress
Inactive Task	Start-only	
Inactive Milestone	Finish-only	

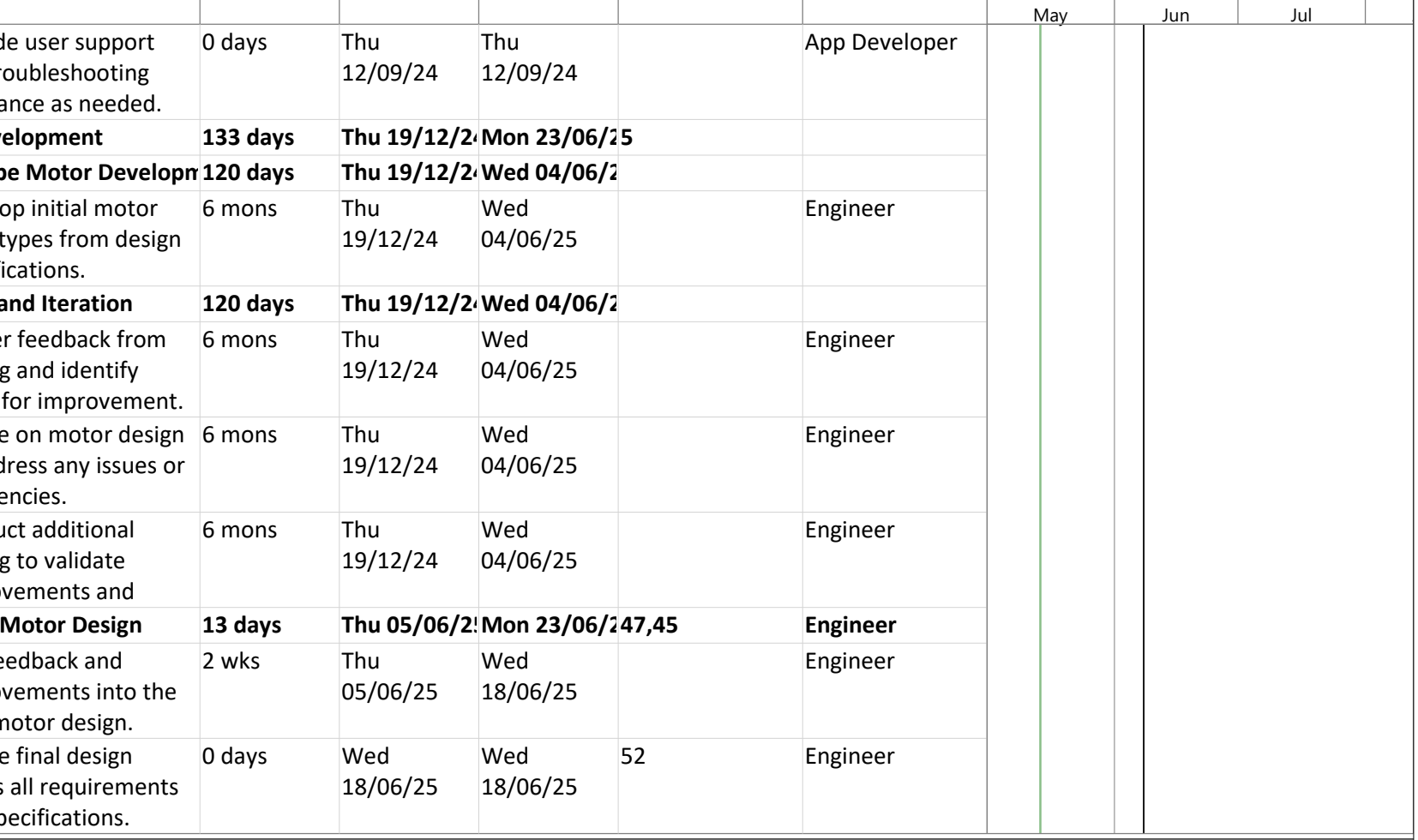
ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors	Resource Names
33		Conduct thorough testing to identify and fix	2 days	Fri 19/07/24	Mon 22/07/24		App Developer
34		Ensure compatibility across devices and	2 days	Fri 19/07/24	Mon 22/07/24		App Developer
35		Optimize performance and usability through testing iterations.	1 wk	Fri 19/07/24	Thu 25/07/24		App Developer
36		**Deployment and Distributi**	**35 days**	**Fri 26/07/24**	**Thu 12/09/2**	**32**	
37		Prepare app for submission to relevant app stores (e.g., App Store, Google Play	1 wk	Fri 26/07/24	Thu 01/08/24		App Developer
38		Compile necessary documentation and app metadata for	2 wks	Fri 02/08/24	Thu 15/08/24	37	Communications
39		Conduct beta testing and address any issues before public release.	4 wks	Fri 16/08/24	Thu 12/09/24	38	App Developer
40		**Maintenance and Support**	**0 days**	**Thu 12/09/2**	**Thu 12/09/2**	**36**	
41		Monitor app performance and user feedback for ongoing	0 days	Thu 12/09/24	Thu 12/09/24		App Developer
42		Release regular updates to address bugs and enhance functionality.	0 days	Thu 12/09/24	Thu 12/09/24		App Developer



Project: Final Scope
Date: Tue 14/05/24

Task	Inactive Summary	External Tasks
Split	Manual Task	External Milestone
Milestone	Duration-only	Deadline
Summary	Manual Summary Rollup	Progress
Project Summary	Manual Summary	Manual Progress
Inactive Task	Start-only	
Inactive Milestone	Finish-only	

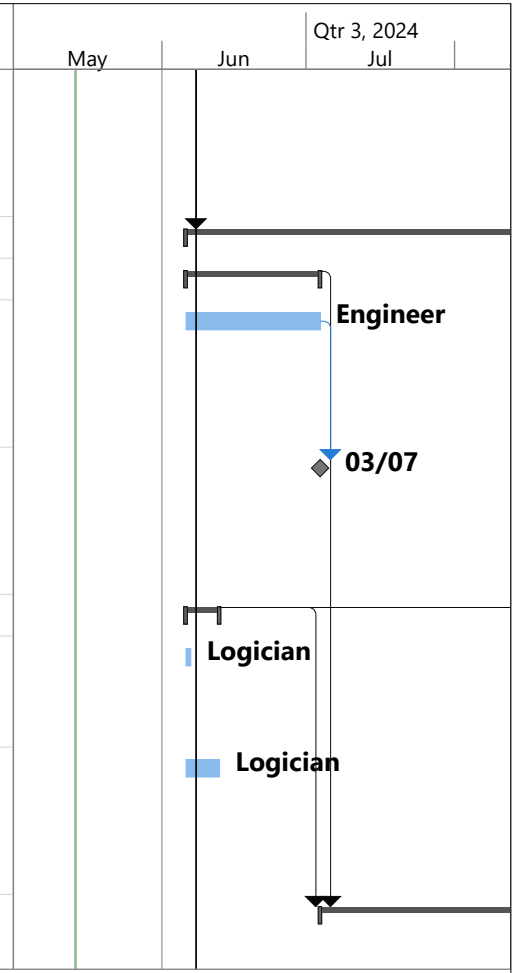
ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors	Resource Names
43		Provide user support and troubleshooting assistance as needed.	0 days	Thu 12/09/24	Thu 12/09/24		App Developer
44		**Motor Development**	**133 days**	**Thu 19/12/2**	**Mon 23/06/2**	**5**	
45		**Prototype Motor Developm**	**120 days**	**Thu 19/12/2**	**Wed 04/06/2**		
46		Develop initial motor prototypes from design specifications.	6 mons	Thu 19/12/24	Wed 04/06/25		Engineer
47		**Testing and Iteration**	**120 days**	**Thu 19/12/2**	**Wed 04/06/2**		
48		Gather feedback from testing and identify areas for improvement.	6 mons	Thu 19/12/24	Wed 04/06/25		Engineer
49		Iterate on motor design to address any issues or deficiencies.	6 mons	Thu 19/12/24	Wed 04/06/25		Engineer
50		Conduct additional testing to validate improvements and	6 mons	Thu 19/12/24	Wed 04/06/25		Engineer
51		**Finalize Motor Design**	**13 days**	**Thu 05/06/2**	**Mon 23/06/2**	**47,45**	**Engineer**
52		Use feedback and improvements into the final motor design.	2 wks	Thu 05/06/25	Wed 18/06/25		Engineer
53		Ensure final design meets all requirements and specifications.	0 days	Wed 18/06/25	Wed 18/06/25	52	Engineer



Project: Final Scope
Date: Tue 14/05/24

Task
Split
Milestone
Summary
Project Summary
Inactive Task
Inactive Milestone
Inactive Summary
Manual Task
Duration-only
Manual Summary Rollup
Manual Summary
Start-only
Finish-only
External Tasks
External Milestone
Deadline
Progress
Manual Progress

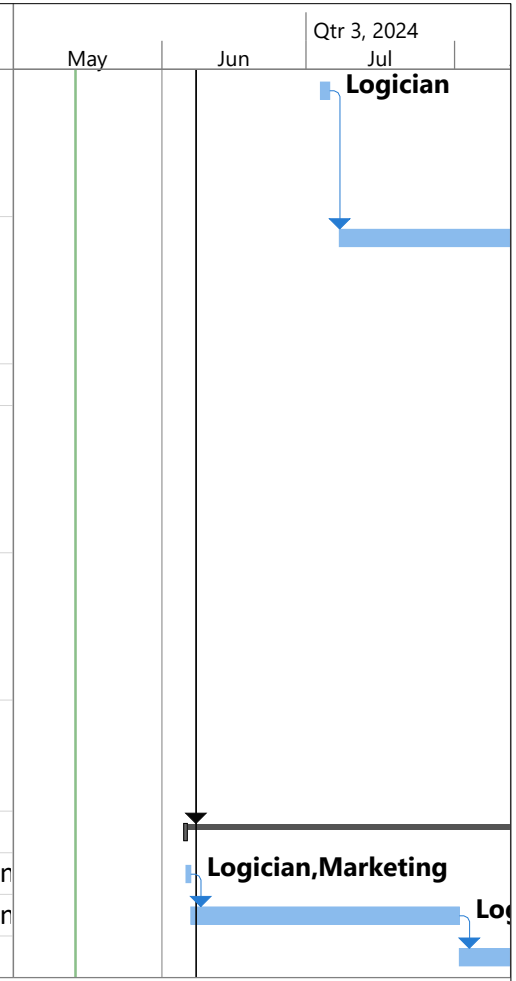
ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors	Resource Names
54		Prepare design documentation and specifications for mass production.	3 days	Thu 19/06/25	Mon 23/06/25	53	Engineer
55		**Postal Distribution System**	**107 days**	**Thu 06/06/2**	**Fri 01/11/24**	**1**	
56		**Design Packaging for Moto**	**20 days**	**Thu 06/06/2**	**Wed 03/07/2**		
57		Develop packaging materials that protect motors during transit and storage.	1 mon	Thu 06/06/24	Wed 03/07/24		Engineer
58		Consider factors such as size, weight, and fragility of motors when designing packaging.	0 days	Wed 03/07/24	Wed 03/07/24	57	Engineer
59		**Develop Shipping Logistics**	**5 days**	**Thu 06/06/2**	**Wed 12/06/2**		
60		Establish procedures for packaging and labelling motors for shipment.	1 day	Thu 06/06/24	Thu 06/06/24		Logician
61		Determine shipping methods, routes, and carriers based on destination locations.	1 wk	Thu 06/06/24	Wed 12/06/24		Logician
62		**Establish Partnerships with Postal Services**	**42 days**	**Thu 04/07/24**	**Fri 30/08/24**	**56,59**	**Logician**



Project: Final Scope
Date: Tue 14/05/24

Task		Inactive Summary		External Tasks	
Split		Manual Task		External Milestone	
Milestone		Duration-only		Deadline	
Summary		Manual Summary Rollup		Progress	
Project Summary		Manual Summary		Manual Progress	
Inactive Task		Start-only			
Inactive Milestone		Finish-only			

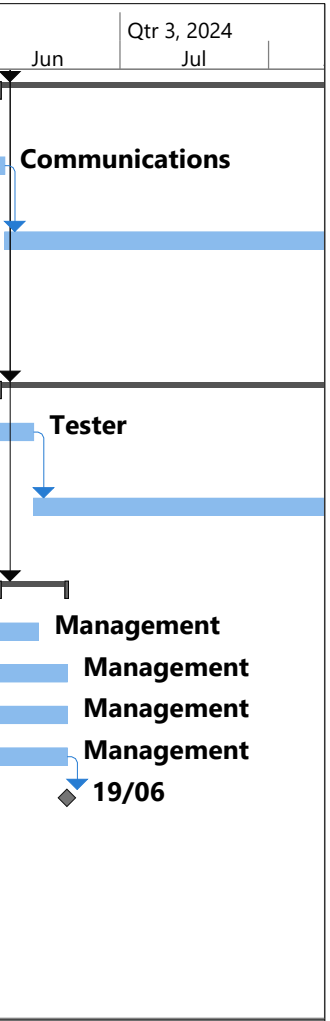
ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors	Resource Names
63		Identify and reach out to postal services or shipping companies operating in	2 days	Thu 04/07/24	Fri 05/07/24		Logician
64		Negotiate agreements or partnerships to facilitate motor distribution through	2 mons	Mon 08/07/24	Fri 30/08/24	63	Logician
65		**Test Shipping Procedures**	**45 days**	**Mon 02/09/2**	**Fri 01/11/24**	**62**	
66		Start trial shipments to verify the effectiveness of packaging and shipping logistics.	1 mon	Mon 02/09/24	Fri 27/09/24		Tester
67		Identify and address any issues or challenges encountered during test shipments.	1 wk	Mon 30/09/24	Fri 04/10/24	66	Tester
68		Refine shipping procedures based on test results for efficiency	1 mon	Mon 07/10/24	Fri 01/11/24	67	Tester
69		**Instructional Materials**	**51 days**	**Thu 06/06/2**	**Thu 15/08/2**	**1**	
70		Create Assembly Manuals	1 day	Thu 06/06/2	Thu 06/06/2		Logician,Marketin
71		Produce Video Tutorials	2 mons	Fri 07/06/24	Thu 01/08/2	70	Logician,Marketin
72		Translate Materials	2 wks	Fri 02/08/24	Thu 15/08/2	71	Translator



Project: Final Scope
Date: Tue 14/05/24

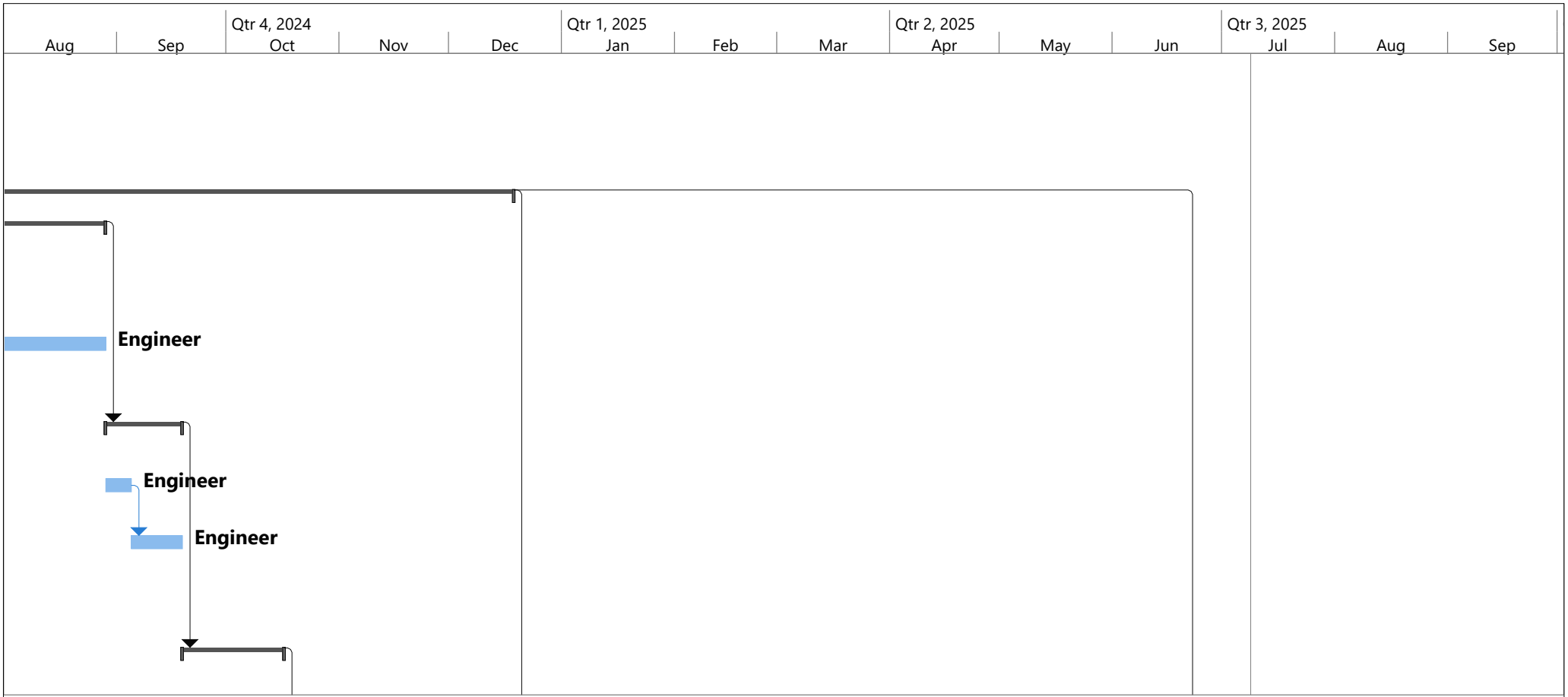
Task	Inactive Summary	External Tasks	
Split	Manual Task	External Milestone	
Milestone	Duration-only	Deadline	
Summary	Manual Summary Rollup	Progress	
Project Summary	Manual Summary	Manual Progress	
Inactive Task	Start-only		
Inactive Milestone	Finish-only		

ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors	Resource Names
73		**Collaboration with Local Organizations**	**126 days**	**Thu 06/06/24**	**Thu 28/11/24**	**1**	
74		Identify and Engage Local Partners	1 day	Thu 06/06/24	Thu 06/06/24		Communications
75		Train Local Partners on Project Requirements	6 mons	Fri 07/06/24	Thu 21/11/24	74	Communications
76		Establish Recipient Identification Process	1 wk	Fri 22/11/24	Thu 28/11/24	75	Communications
77		**Quality Control**	**65 days**	**Thu 06/06/2**	**Wed 04/09/2**	**1**	
78		Develop Quality Assurance Standards	1 wk	Thu 06/06/24	Wed 12/06/24		Tester
79		Implement Testing Protocol	3 mons	Thu 13/06/2	Wed 04/09/2	78	Tester
80		Conduct Quality Audits	0 days	Wed 04/09/2	Wed 04/09/2	79	Tester
81		**Project Management**	**10 days**	**Thu 06/06/2**	**Wed 19/06/2**	**1**	
82		Project Planning	6 days	Thu 06/06/2	Thu 13/06/2		Management
83		Resource Allocation	2 wks	Thu 06/06/2	Wed 19/06/2		Management
84		Risk Management	2 wks	Thu 06/06/2	Wed 19/06/2		Management
85		Communication Plan	2 wks	Thu 06/06/2	Wed 19/06/2		Management
86		Progress Monitoring and Reporting	0 days	Wed 19/06/24	Wed 19/06/24	85	Management
87		**Project Closure**	**11 days**	**Mon 23/06/2**	**Tue 08/07/2**	**77,73,69,65,62,59**	
88		Ensure Delivery of Motors	0 days	Mon 23/06/2	Mon 23/06/2		Management
89		Evaluate Project Success	1 day	Tue 24/06/2	Tue 24/06/2	88	Management
90		Document Lessons Learned	2 wks	Wed 25/06/2	Tue 08/07/2	89	Management



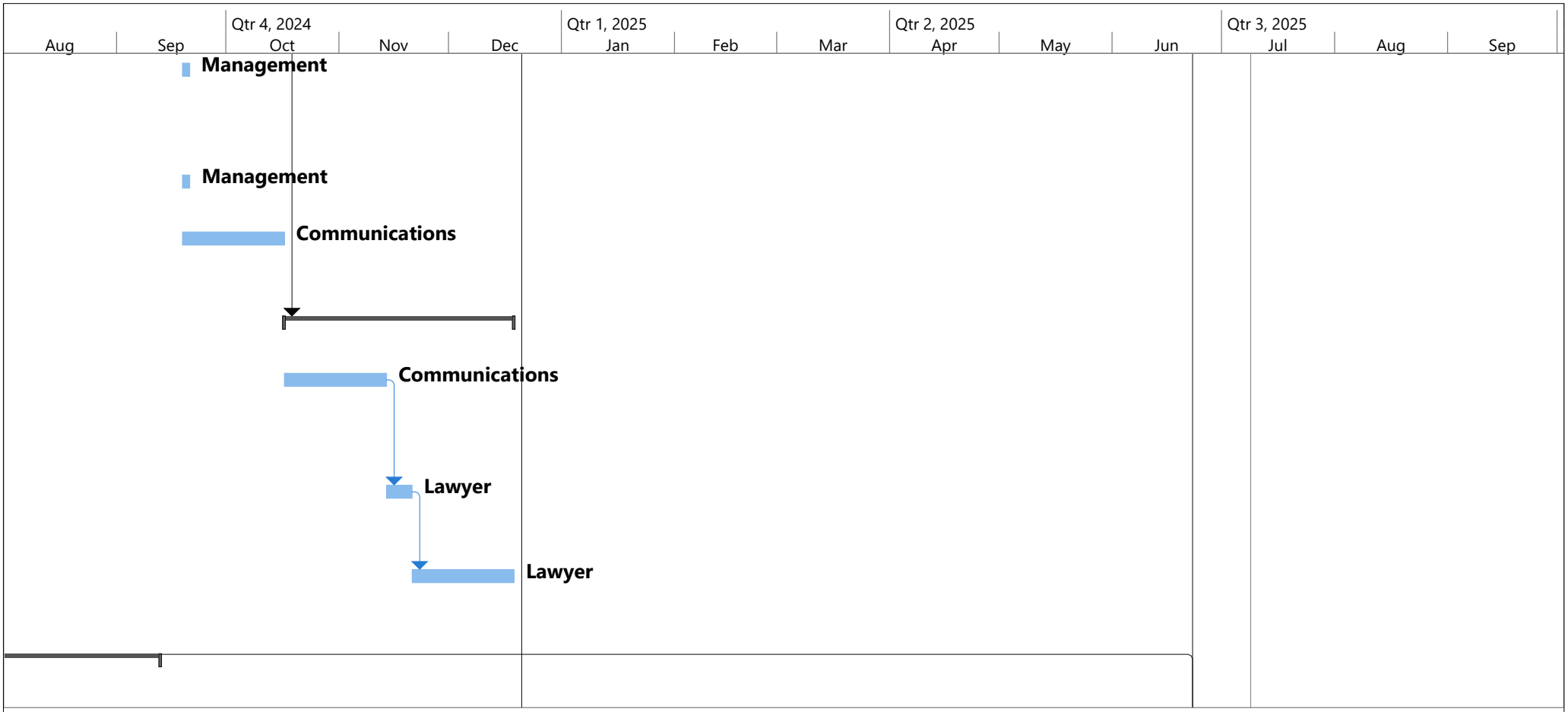
Project: Final Scope
Date: Tue 14/05/24

Task	Inactive Summary	External Tasks
Split	Manual Task	External Milestone
Milestone	Duration-only	Deadline
Summary	Manual Summary Rollup	Progress
Project Summary	Manual Summary	Manual Progress
Inactive Task	Start-only	
Inactive Milestone	Finish-only	



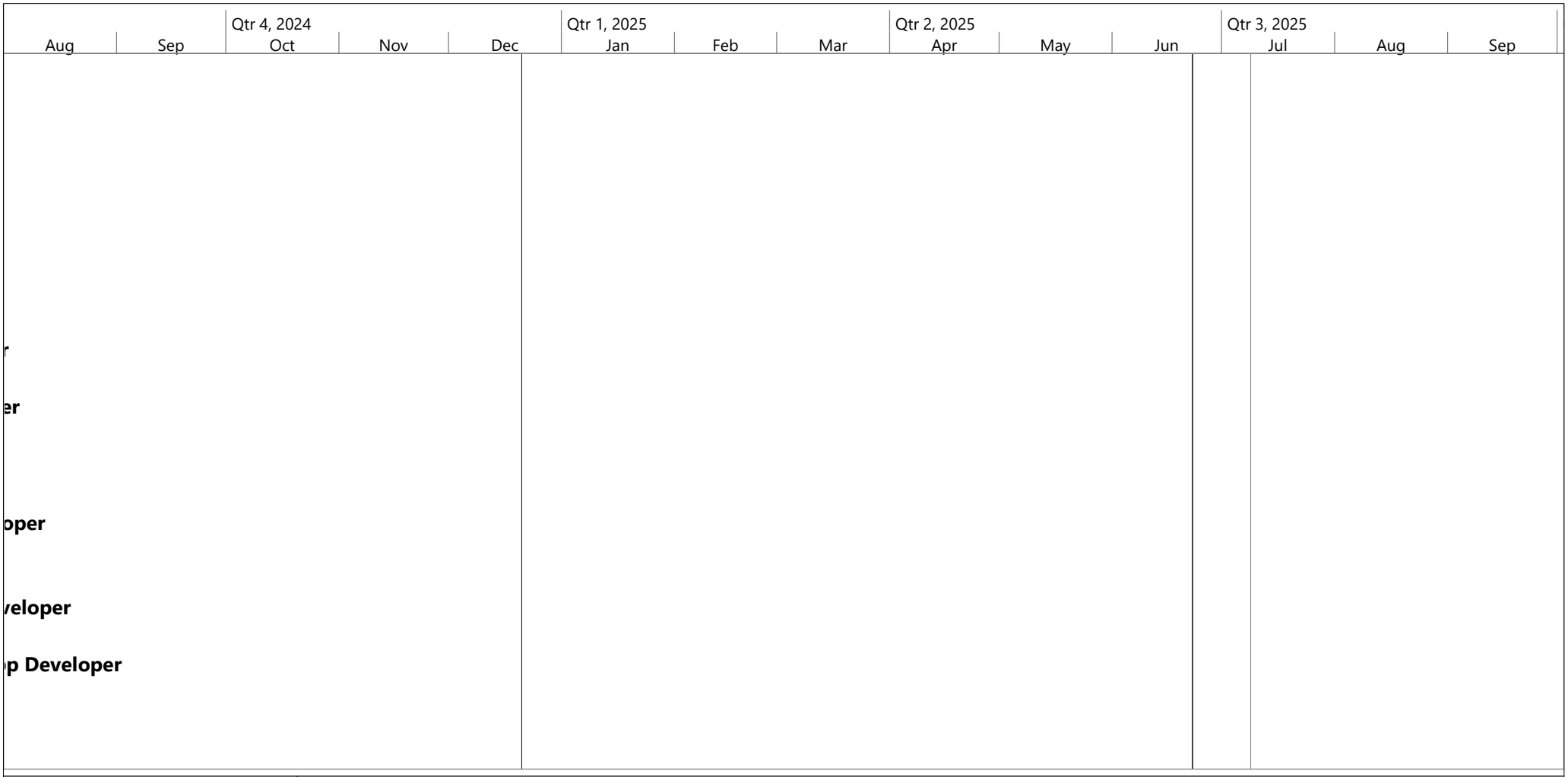
Project: Final Scope
Date: Tue 14/05/24

Task		Inactive Summary		External Tasks	
Split		Manual Task		External Milestone	
Milestone		Duration-only		Deadline	
Summary		Manual Summary Rollup		Progress	
Project Summary		Manual Summary		Manual Progress	
Inactive Task		Start-only			
Inactive Milestone		Finish-only			



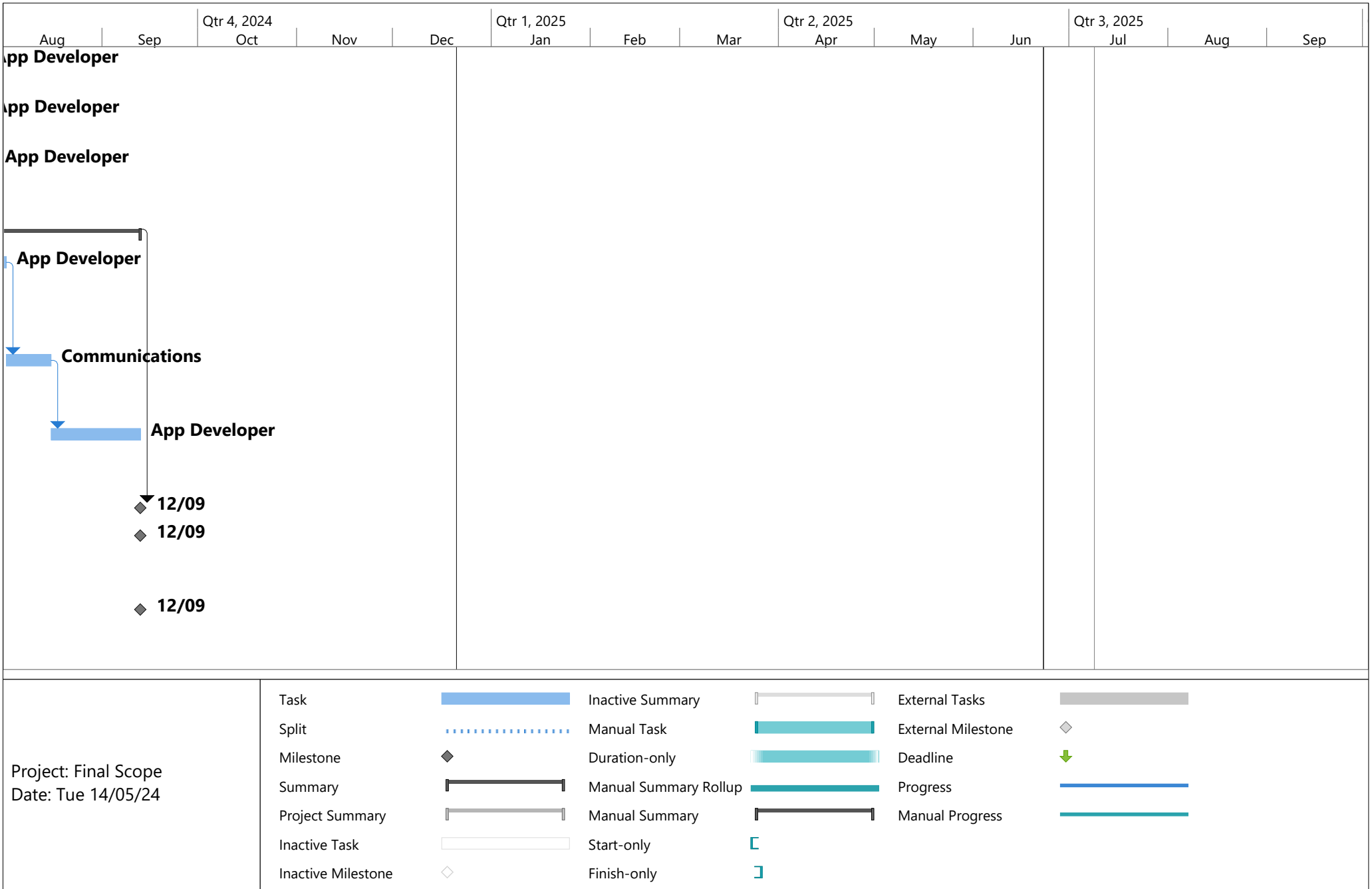
Project: Final Scope
Date: Tue 14/05/24

Task	Inactive Summary	External Tasks
Split	Manual Task	External Milestone
Milestone	Duration-only	Deadline
Summary	Manual Summary Rollup	Progress
Project Summary	Manual Summary	Manual Progress
Inactive Task	Start-only	
Inactive Milestone	Finish-only	



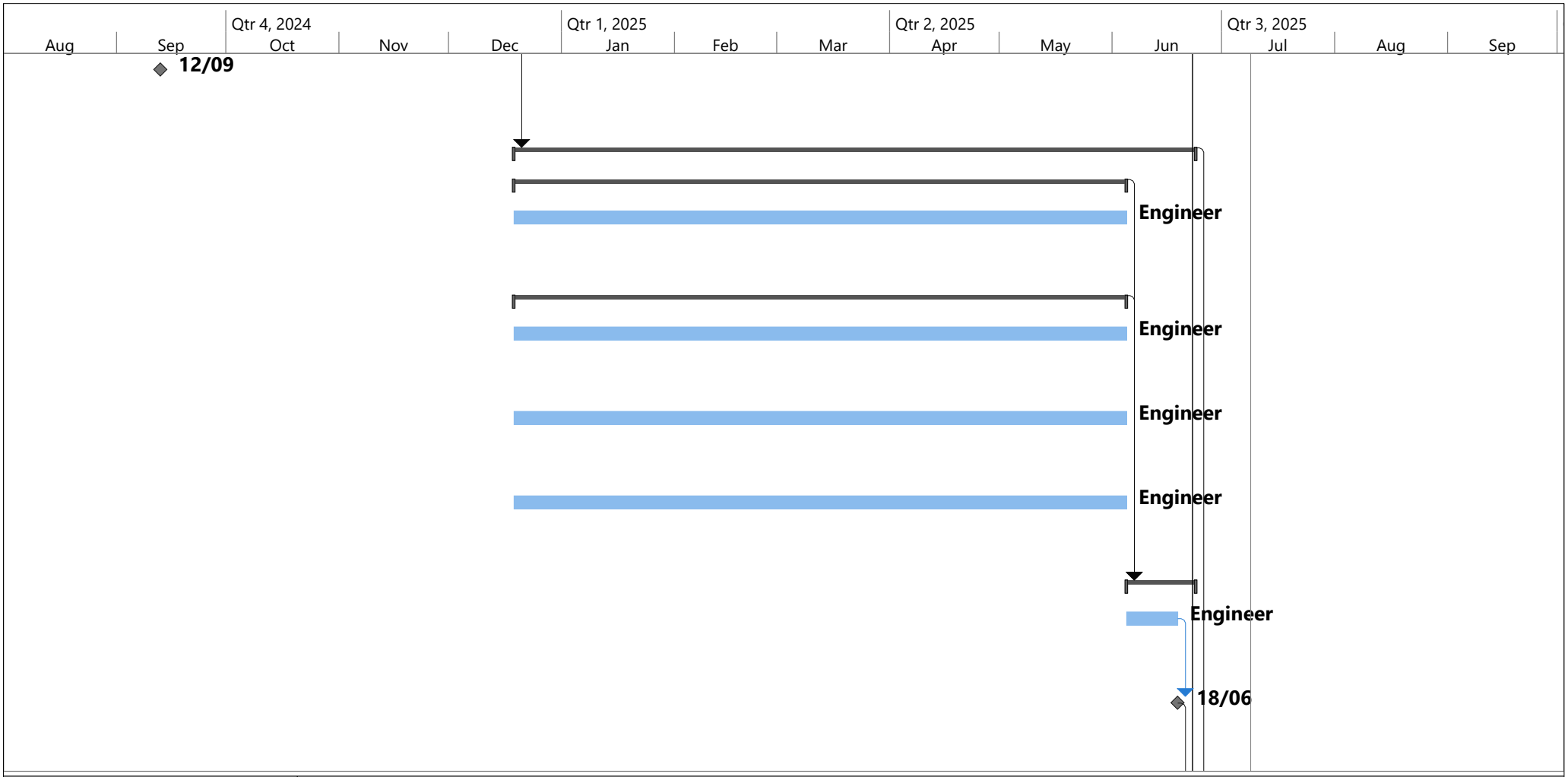
Project: Final Scope
Date: Tue 14/05/24

Task	Inactive Summary	External Tasks
Split	Manual Task	External Milestone
Milestone	Duration-only	Deadline
Summary	Manual Summary Rollup	Progress
Project Summary	Manual Summary	Manual Progress
Inactive Task	Start-only	
Inactive Milestone	Finish-only	



Project: Final Scope
Date: Tue 14/05/24

Task	Inactive Summary	External Tasks
Split	Manual Task	External Milestone
Milestone	Duration-only	Deadline
Summary	Manual Summary Rollup	Progress
Project Summary	Manual Summary	Manual Progress
Inactive Task	Start-only	
Inactive Milestone	Finish-only	



Project: Final Scope
Date: Tue 14/05/24

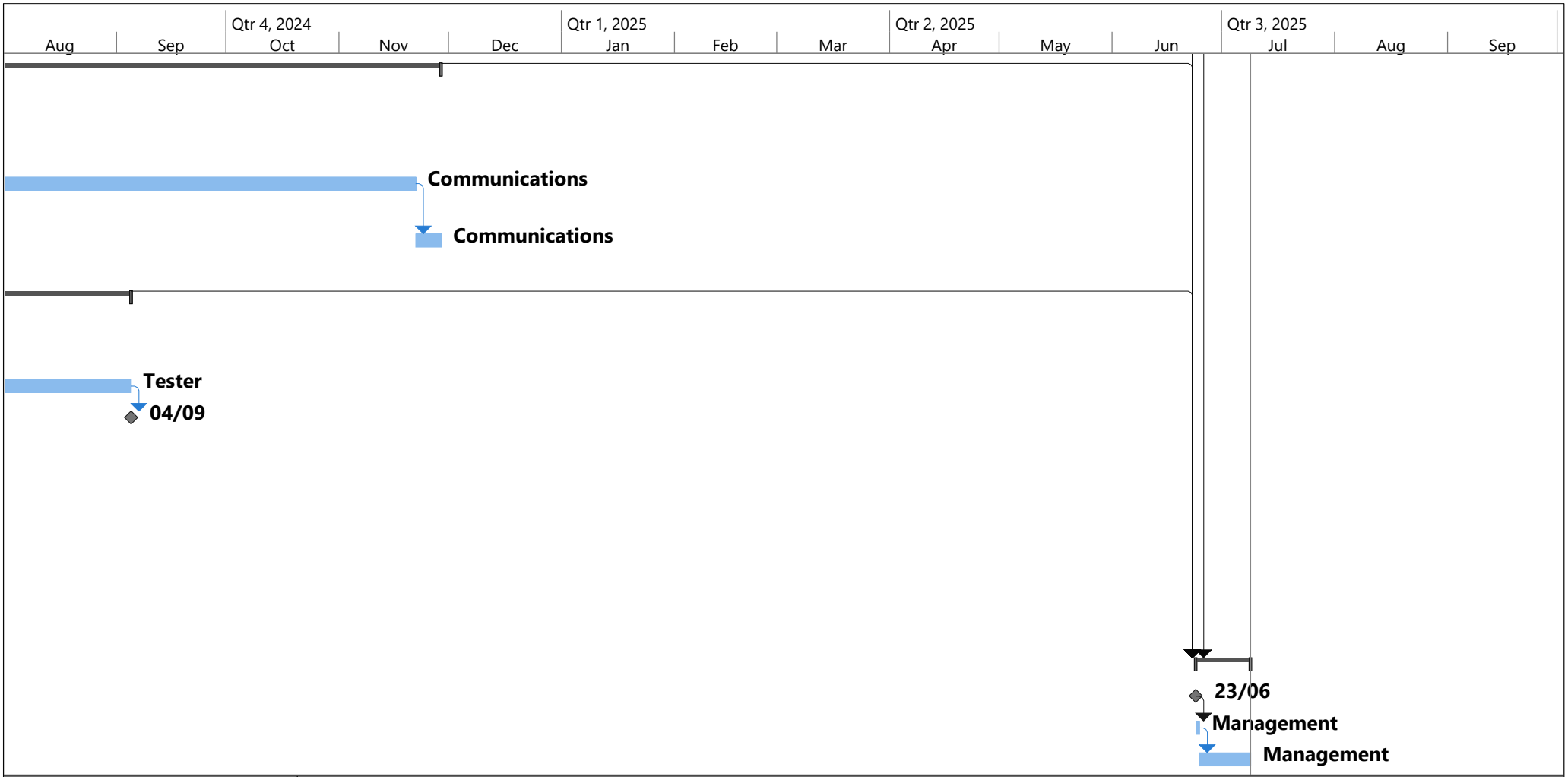
Task	Inactive Summary	External Tasks
Split	Manual Task	External Milestone
Milestone	Duration-only	Deadline
Summary	Manual Summary Rollup	Progress
Project Summary	Manual Summary	Manual Progress
Inactive Task	Start-only	
Inactive Milestone	Finish-only	

Project: Final Scope
Date: Tue 14/05/24

Task		Inactive Summary		External Tasks	
Split		Manual Task		External Milestone	
Milestone		Duration-only		Deadline	
Summary		Manual Summary Rollup		Progress	
Project Summary		Manual Summary		Manual Progress	
Inactive Task		Start-only			
Inactive Milestone		Finish-only			

Project: Final Scope
Date: Tue 14/05/24

Task		Inactive Summary		External Tasks	
Split		Manual Task		External Milestone	
Milestone		Duration-only		Deadline	
Summary		Manual Summary Rollup		Progress	
Project Summary		Manual Summary		Manual Progress	
Inactive Task		Start-only			
Inactive Milestone		Finish-only			



Project: Final Scope
Date: Tue 14/05/24

Task	Inactive Summary	External Tasks
Split	Manual Task	External Milestone
Milestone	Duration-only	Deadline
Summary	Manual Summary Rollup	Progress
Project Summary	Manual Summary	Manual Progress
Inactive Task	Start-only	
Inactive Milestone	Finish-only	