**Background pattern

Description automatically generatedRMIT University**

Engineering Capstone Project Part B - OENG1185

**OENG1185/COSC2503 Capstone Project Part B / Programming Project 2**

**COMPLETION PLAN**

**Smart Watering System for a Community Garden**

**based on the Water Shooting gun**

**Student team:** Calico

**Student name & ID:** Truong Tan Gia Huy - s3806881

Nguyen Bao Tuan - s3713061

Nguyen Mau Tung - s3755518

Nguyen Tri Nhan - s3826381

Nguyen Tuan Minh - s3877477

**Academic supervisors:** Dr. Alexandru Fechete

Dr. Byron Anthony Mason

**Company:**  RMIT Vietnam Sustainability

**Industry supervisor:**  Mrs. Trinh Thi Anh Phuong

Table of Contents

[INTRODUCTION 3](#_Toc171942384)

[PROJECT DESCRIPTION 4](#_Toc171942385)

[PROJECT STATUS AND TIMELINE 6](#_Toc171942386)

[REQUIRED RESOURCES 8](#_Toc171942387)

[PROJECT SUCCESS MEASUREMENT 10](#_Toc171942388)

[RISK MANAGEMENT PLAN 11](#_Toc171942389)

[Risk identification 11](#_Toc171942390)

[Risk Mitigation 12](#_Toc171942391)

[CONCLUSION 14](#_Toc171942392)

[REFERENCE 14](#_Toc171942393)

# INTRODUCTION

This report will give an overview and finalized planning for the "smart watering system for community garden based on water shooting gun" developed by Team Calico as part of Capstone Project B, following the completion of the Progress Report from Capstone Project A. The topics included in the report will be Project Description, Project Status and Timeline, Required Resources, Project Success Measurement, and Risk Planning. Through this detailed plan, the team can ensure effective results and the project is completed on time.

# PROJECT DESCRIPTION

***Project Scope of Work***

The initial project scope envisioned the ambitious development of a comprehensive practical gardening system. However, a strategic shift has been made towards the creation of a scaled-down prototype. This prototype will serve as a crucial stepping stone in the overall development process. While possessing a reduced feature set compared to the final system, this initial iteration will faithfully represent the core functionalities and operational principles of the real gardening system. The updated project scope of work will be used to adjust the project completion plan in Capstone B. Notably, most of the deliverables for both the prototype and the final system will remain consistent in essence, though the methods of achieving those deliverables will differ.

* 1. **Develop and refine an automated prototype model for water and energy efficiency:** As the preceding reports are designed for the real-world system, the automated model is designed to schedule and automate the plant watering operation with real-time data from the sensors. However, this operation needs to be done once or twice a day for multiple days, so it takes time to demonstrate the result and progress of the operation. Therefore, at this phase, our team keeps the function of integrating sensors to control the system, but the schedule function will be adjusted for the demonstration.
  2. **Build a working model of the watering system based on water shooting:** In the previous phase, this scope was divided into two, which are:
* Create detailed CAD drawings for the shooting range target.
* Design a water gun system with volume monitoring.

But our team realizes these two are created in the same build model, so they should merge into one. Bycreating detailed CAD drawings for the shooting range, shooting target, and irrigation system. Diagram, component schematics, and assembly drawing of the shooting range. Previous CAD must be scaled down as an exhibition model for the demonstration.

* 1. **Plan the location and coverage of the irrigation system:** In the prior phase of this project's scope, the location and coverage were planned for the real-scale garden behind building 9 at RMIT. A thorough analysis of its location was conducted to facilitate the planning of the shooting range and irrigation system placement. However, the target of this current phase has shifted to an optimal location plan in the exhibition area for the prototype.
  2. **Design the nozzle plan, pipe, and storage components’ location map of the irrigation system**: Based on the plant prototype landscape, in this phase, our team designs how the plant will be planted. The design still includes nozzles, pipes, and storages.
* Water Storage: The storage size considers plant needs and garden size to meet water demands.
* Pipe Network: This network delivers water throughout the system. Pipes are chosen based on pressure and durability (e.g., PVC, polyethylene, galvanized steel). The layout ensures efficient water delivery to all garden areas.
* Nozzles: Nozzle selection prioritizes specific plant watering needs and the overall garden layout.
  1. **Prepare a project budget and maintain communication with stakeholders:** This process involves a detailed analysis of resource requirements, including personnel costs, material procurement, and any necessary equipment or services. This scope of work remains the same.

**Controller Function**

The previous report describes a technology for an intelligent irrigation system. There are not many changes in terms of functionalities and key components for the project model. However, the model utilizes various components to automate watering based on real-time data and user-defined schedules.

**Key Components:**

* Controller: The brain of the system, it sets schedules, gathers sensor data, and controls water flow.
* Sensors: These monitor soil moisture, temperature, humidity, and water levels of storage, allowing for adjustments based on plant needs and weather.
* Solenoid Valve: Acts as an on/off switch for water flow, controlled by the controller.
* Web Server: Enables remote access to sensor data and manual control of watering.

**Functionalities:**

* Users can schedule watering times.
* Sensors provide real-time data for automatic adjustments.
* The system prevents overflows by monitoring water levels.
* Users can trigger manual watering through a button.

All the functions of the system for the prototype remain the same when compared to the system for the real-world system that is proposed in the preceding report, except for the scheduling function. The scheduling function for the real-world system will be at least a day-long time interval. However, for the prototype, this time interval is too long. Therefore, it is necessary to shorten the time interval into minutes to demonstrate this function. While typical plants don't require such frequent watering, our team needs a way to showcase the automated system's effectiveness with plants. Our team proposes recording the system in action for one to two months, monitoring the plants' health throughout the period. This will provide a clear picture of how well the system functions.

# PROJECT STATUS AND TIMELINE



Figure : Updated project status

The project milestone for Capstone B has been updated to align with industry partners and academic supervisor's requirements. Each task in the project milestones corresponds to an objective that the team needs to follow to ensure successful deliverable outcomes.

* The first milestone “Project Planning” is crucial to design the tasks for other milestones and achieve the desired goal. In this milestone, the team will identify the project requirements and objectives.
* The second milestone “System Design” is to research irrigation technologies and shooting target mechanisms. Also, design the watering strategy and the water shooting range.
* The third milestone “Hardware Design” is to research and select components with criteria based on the project requirements. Moreover, the team will build the system prototype in this phase.
* The fourth milestone “Control & Calibration” is the development of software functions to control the sensors, microcontroller, and pump pressure.
* The fifth milestone “Unit Testing & Validation” is to test the system’s functionalities and fix malfunctions during testing. Moreover, the team will simulate different watering scenarios and analyse sensor data.
* The final milestone “Demonstration” showcases the prototype in RMIT capstone showcasing with user manuals for system operation and maintenance. This milestone replaced the “Implementation” milestones from Semester 1.

Due to page limitation, the Gantt Chart cannot clearly be shown in this document, therefore, the detailed Gantt Chart can be accessed with the following link: [Gantt Chart](https://rmiteduau-my.sharepoint.com/:x:/g/personal/s3826381_rmit_edu_vn/EaPip4ys7z5Brsed3F32YWwB1ceW9Gohi523o1VR9rmE9g?e=yGBAwm)

**What has been done and what not**

In Semester 1, the team followed strictly to the tasks for each milestone and completed all outcomes for the “Project Planning” and “System Design” milestones. The tasks for the first milestone “Project Planning” are well-structured and provide the overall view for upcoming assignments. As a result, the team Calico’s Semester 1 assignments are always on time and well-thought-out. However, the team did not plan much time after the academic supervisors reviewed the final report and the team still fixed the report until the last minute. Additionally, the Calico team identify the project scope and deliverables with feedback from academic supervisors to make a Gantt Chart with detailed milestones for Capstone A and B. These milestones are a roadmap that helped the team to meet the deadlines and requirements.

For the second milestone “System Design”, the team conducted intensive market research on smart watering systems, water-saving technologies, and target mechanisms. During this phase, the team had an on-site inspection with industry supervisors to observe the garden location’s condition and determine the watering strategy. After completing the previous tasks, the team designed the system model using SolidWorks with great details and received approval from academic supervisors and industry supervisors to use for the making of the prototype in the third milestone.

The third milestone “Hardware Design” is completed with research, design, and select hardware components. The components had been selected carefully for compatibility and performance. The team selected affordable and quality vendors for BOM and sent to academic supervisors and industry supervisors for review and feedback. Initially, the team planned to order components during semester break and start making the prototype as soon as possible, but the team was occupied with assignments at the end of Capstone A and did not pick component’s vendors in time.

The fourth milestone “Control & Calibration” progress is on schedule. The software functions development is completed with sensor testing, connecting to the microcontroller remotely, and developing a user interface. The controller’s functionalities include controlling the pump, valves, LED strip lights to turn on or off, and monitoring soil moisture and water level sensors.

Overall, the team’s current status is on track with project milestones but the delay from component procurement will set the team back 2 to 3 weeks. Moreover, the team did well in maintaining communication with stakeholders through weekly meetings and ensured the project outcomes aligned with the project scope.

**Milestones for this semester**

The milestones for semester 2 have been updated to align with the team’s current progress and project deliverables. Moreover, the assignments for Capstone B have been added to the “Project Planning” milestones. Following the project timeline, the team status by now is working on the final tasks of “Hardware Selection” and “Control & Calibration” milestones. For Capstone B, the team will need to order components to build the prototype and implement an automated system to control the pump. Then, after receiving and assembling the components, the team can work on the “Unit Testing & Validation” milestone. In this milestone, the team will integrate the shooting range into the irrigation plan, test system functionality, and conduct sensor data validation. All the tasks in this milestone will ensure the development of the prototype is on track and successful. Finally, the “Demonstration” milestone will involve showcasing the smart watering system based on water shooting gun prototype with all working features and accurate sensor data. In this semester, the team will come up with a much better deadline for tasks and finish the work to review or fix as soon as possible to minimize unnecessary mistakes made in Capstone A assignments.

***Milestones***

Table : Calico Team Capstone B milestones

|  |  |  |
| --- | --- | --- |
| **Milestone** | **Outcome** | **Date** |
| Hardware Selection and Procurement | Efficient, cost-effective, noise reduction, equipment’s safety and durability | 7/15/2024 - 6/30/2024 |
| Control and Calibration of Automated System | Watering timing, water-efficiency, humidity sensors, liquid level switch. | 7/15/2024 - 8/21/2024 |
| Unit Testing and Validation | Flawless automated system, accurate sensor data. Safety and ease of use. | 7/7/2024 - 7/28/2024 |
| Demonstration | Fully automated, healthy plant, water saving, user manual. | 8/22/2024 - 9/30/2024 |

# REQUIRED RESOURCES

After multiple meetings with the course supervisors, course coordinator and RMIT Sustainability Team, our team has resolved all uncertainties and questions regarding the project outcome. The team has successfully created a detailed Bill of Materials for procurement, ready for implementation. Every component, including the smallest parts, has been meticulously considered and selected to ensure that nothing is unnecessary and that all items fit within the limited budget. The tables below outline the primary components required for each element of the project:

Table 2: Calico Team Bill of Materials for Irrigation System

|  |  |  |  |
| --- | --- | --- | --- |
| **NO** | **COMPONENTS NAME** | **QUANTITY** | **PRICE (in VND)** |
| **1** | Raspberry Pi 4 Model B 4Gb | 1 | 2.000.000 |
| **2** | Adapter for Raspberry Pi 4 (US) | 1 | 310.000 |
| **3** | 12VDC Water Pump (Power output Female, Pipe output 10mm) | 1 | 99.000 |
| **4** | 5V Relay | 3 | 135.000 |
| **5** | Jack DC 5/5\*2.1 (3 Female, 3 Male) | 6 | 20.000 |
| **6** | PH Wire (PH2-2P) | 40 | 40.000 |
| **7** | Alligator Clip | 20 | 42.000 |
| **8** | Solenoid Valve (Male 21mm) | 4 | 408.000 |
| **9** | 360° Sprinklers ELGO MF-360 | 3 | 165.000 |
| **10** | Assemble Basin with Legs | 1 | 339.000 |
| **11** | 12V 3A Male Adapter | 1 | 75.000 |
| **12** | 30cm Jumper Wires (3 Female-Female, 3 Female-Male, 3 Male-Male) | 9 | 15.900 |
| **13** | Water Gun (Blue) | 1 | 435.000 |
| **14** | Water Level Sensor | 5 | 35.000 |
| **15** | Anti-Fold Soft Hose Cord 1m Φ 22 | 1 meter | 45.000 |
| **16** | Springs (6 V Springs, 6 Round Springs) | 12 | 38.400 |
| **17** | LED ARGB WS2812B (60 LED/m IP65) | 5 meters | 210.000 |
| **18** | Inox Latch (4F) | 3 | 10.500 |
| **19** | Anti-Overflow Mechanical Float JUNY (Φ21 mm) | 1 | 280.000 |
| **20** | Black tube (Φ 25mm) | 4 meters | 339.000 |
| **21** | Anti-Fold Soft Hose Cord Φ 22 | 1 meter | 45.000 |
| **22** | T-Connector 16MM ANTELCO | 2 | 20,000 |
| **23** | Thread Converter 21 to 27 | 6 | 60,000 |
| **24** | Internal Thread Connector 27MM to 16MM Pipe ANTELCO | 6 | 180,000 |
| **25** | Electric welding torch (40W straight) | 1 | 92.000 |
| **26** | Hose clamp (phi 25) | 10 | 45.000 |
| **27** | Lead roll VINACHI | 1 | 15.000 |
| **28** | Rubber tube rolled | 2 | 6.000 |
| **29** | Silicon Glue Tube | 1 | 25.200 |
| **30** | Glue Gun (green without troughs) | 1 | 32.000 |
| **31** | MICA Sheets for Water tanks and Shooting Range (3mm – 5mm thick, clear and white colour) |  | 2.650.000 |
| **TOTAL** | 7.962.000 | | |

Table 3: Colour annotations

|  |  |
| --- | --- |
| **COLOR** | **COMPONENTS FIELD** |
|  | Irrigation System |
|  | Water Shooting Range and Water Tanks |
|  | Tools and Accessories |

The total price listed above does not include the delivery fee of each component. Each component has been carefully researched, and we have made every effort to source as many components as possible from the same vendor and from those available in Ho Chi Minh City to minimize the delivery costs as well as delivery time. Most vendors are accessed through online shopping platform Shopee, with some gardening parts from Maka.vn and MICA sheets custom-cut at Makerstore.vn – a fabrication store.

It is evident that the total cost of the components remains within the budget limit, leaving approximately 2 million VND available for the addition or replacement of equipment if necessary.

Electrical and mechanical tools are also noticed and considered. In order to minimize cost, the team decided to purchase only the unavailable tools for implementation. Many team members already own tools such as drills, wrenches, and screwdrivers. Additionally, the team will make extensive use of the tools available at the RMIT campus.

For software, SOLIDWORKS is used to design the 3D models of the water shooting range and water tanks for laser cutting MICA sheets. This software is covered under RMIT’s licensing agreement.

The components are expected to be available within 2-3 weeks after submitting the Bill of Materials to RMIT Technician. Upon receiving all necessary components, the team will collaborate on Campus to build prototypes and testing all system functions. Due to a slight delay in component procurement compared to the initial plan outlined in the previous Gantt chart, each team member is expected to exert additional effort to compensate for the lost time. To ensure timely project completion with optimal performance, every member should commit to spending at least 20 hours per week on face-to-face collaboration.

By the time this report is submitted, the Bill of Materials has not been fully approved and purchased by the RMIT Technician. Consequently, there might be some modifications to the components model or suppliers in the future. However, the fundamental nature and function of the components will remain consistent, and these potential changes are not expected to significantly impact the project's outcome.

# PROJECT SUCCESS MEASUREMENT

*Table 4: Project Success Measurement Guideline*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| No. | Quantifiable Metrics for Success | Category | Score Criteria (0-5) | Score by |
| 1 | Reduction in water usage (in percentage) | Software function | 0: No reduction,  5: ≥ 10% reduction | Course Coordinator and Academic Supervisor |
| 2 | Reduction in energy consumption (in percentage) | Software function | 0: No reduction,  5: ≥ 10% reduction | Course Coordinator and Academic Supervisor |
| 3 | Automation efficiency (percentage of processes automated) | Software function | 0: No automation,  5: ≥ 90% automated | Course Coordinator and Academic Supervisor |
| 4 | Software user-friendly rating | Software function | 0: Very dissatisfied, 5: Very satisfied | Course Coordinator and Academic Supervisor Industry Supervisors |
| 5 | CAD drawings completion (percentage completed) | Hardware design | 0: 0%,  5: 100% | Course Coordinator and Academic Supervisor |
| 6 | CAD drawings accuracy in details (percentage error rate) | Hardware design | 0: ≥ 50% error,  5: < 5% error | Course Coordinator and Academic Supervisor |
| 7 | CAD drawings Accuracy in dimensions (percentage error rate) | Hardware design | 0: ≥ 20% error,  5: 0% error | Course Coordinator and Academic Supervisor |
| 8 | Completeness of component schematics (percentage completed) | Hardware design | 0: 0%,  5: 100% | Course Coordinator and Academic Supervisor |
| 9 | Completion of investment phases (percentage completed) | Irrigation system | 0: 0%,  5: 100% | Course Coordinator and Academic, Industry Supervisor |
| 10 | Coverage radius (in coverage % of the area) | Irrigation system | 0: ≤ 10%,  5: ≥ 95% | Course Coordinator and Academic, Industry Supervisor |
| 11 | Leakage management in the storage components (leakage percentage) | Irrigation system | 0: ≥ 10%,  5: 0% | Course Coordinator |
| 12 | **Number of nozzles accurately installed** | Irrigation system | 0: 0 nozzles,  5: ≥ 5 nozzles | Course Coordinator and Academic Supervisor |
| 13 | Nozzle distribution Efficiency (percentage coverage) | Irrigation system | 0: ≤ 50%,  5: 100% | Course Coordinator and Academic, Industry Supervisor |
| 14 | **Watering time** (in minutes) | Irrigation system | 0: ≥ 60 minutes, 5: ≤ 10 minutes | Technicians |
| 15 | Budget accuracy (percentage deviation from actual costs) | Project management | 0: ≥ 20% deviation,  5: 0% deviation | Course Coordinator |
| 16 | Frequency of communication with stakeholders (number of meetings/emails) | Project management | 0: 0 communications, 5: Weekly communications | Stakeholders like Academic Supervisors, and Industry Supervisors |
| 17 | Demonstration completion (percentage of successfully rate in demonstration) | Project management | 0: 0%,  5: 100% | Course Coordinator and Academic, Industry Supervisor |
| 18 | Timeliness of report submission (percentage on time) | Project management | 0: 0%,  5: 100% | Course Coordinator and Academic, Industry Supervisor |
| 19 | Evaluation scores (average rating from each member) | Project management | 0: No contribution,  5: Excellent | Calico members |
| 20 | Effectiveness of risk mitigation (percentage of risks mitigated) | Risk management | 0: 0%,  5: 100% | Calico members |

The Success Measurement is based on the scope of work and deliverables of the project. The Calico team figures the total score should be 100 points, which would give the maximum of 5 points for each of the 20 different criteria. The categories include Software function, hardware design, irrigation system, to project management and risk management. In the success management table, the project team has also listed the relevant stakeholder that would evaluate the results of the project. By doing this, the project result enhances the fairness and the thoroughness.

# RISK MANAGEMENT PLAN

## Risk identification

*Table 5: Risk identification table*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **No.** | **Risk** | **Risk Type** | **Likelihood** | **Consequences** | **Risk Score [**1] |
| 1 | Voltage source fluctuations. Short circuit or damage to the electronics | Technical | Possible - 3 | Catastrophic -5 | Extreme - 15 |
| 2 | Broken equipment after ordering and during implementation | Technical | Possible - 3 | Major - 4 | High -12 |
| 3 | Asynchronization between software and the designed hardware | Technical | Likely - 4 | Catastrophic - 5 | Extreme - 20 |
| 4 | Unexpected weather condition | Environmental | Possible - 3 | Moderate – 3 | High - 9 |
| 5 | Animal interference. The pest and mice in campus can chew the wires in the implementation product. | Environmental | Unlikely - 2 | Major - 4 | High - 8 |
| 6 | Water supply disruptions | Environmental | Unlikely - 2 | Catastrophic - 5 | High - 10 |
| 7 | RMIT Campus regulations in finalising activities. The shooting range might have some features that requires safe approval from the school. | Legal | Likely - 4 | Major - 4 | Extreme - 16 |
| 8 | Changing location for the implementation of the project | Legal | Possible - 3 | Moderate - 3 | High - 9 |
| 9 | Insufficient resources (personnel, budget, expertise) | Project management | Possible - 3 | Major - 4 | High - 12 |
| 10 | Project team conflict | Project management | Possible - 3 | Moderate - 3 | High - 9 |

Calico has decided to separate the identified risks into 4 categories, including technical, environmental, legal, and project management. By considering risks from multiple factors like this, the risk management plan got a more overview, and thorough analysis. In the identified risk table, we can see that there are 3 risks that have the risk code as extreme, and the other 7 risks considered as high risk. The methodology to assigning these risk code followed the “Assigning risk assessment code guidelines from Gadzoom [2]

## Risk Mitigation

*Table 6: Risk mitigation table*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **No** | **Mitigation** | **Risk type** | **Likelihood** | **Consequence** | **Mitigated Risk Score after mitigation** |
| 1 | Install a voltage regulator or fuse as safety feature. Regularly maintain the electrical components | Technical | Unlikely - 2 | Major - 4 | High - 8 |
| 2 | Understand equipment instructions and mechanisms. Implement thorough quality control during equipment installation. Keeping some spare parts in inventory for quick replacement. | Technical | Rare - 1 | Moderate - 3 | Low-3 |
| 3 | Conduct rigorous testing and debugging during software integration. Software and hardware responsible members collaborate closely and have regular discussions while designing and implementing it in the prototyping process. | Technical | Unlikely - 2 | Major - 4 | High - 8 |
| 4 | Design weather-resistant enclosures for critical components. Monitor weather forecasts and take preventive measures by the sensors like soil moistures sensors. | Environmental | Unlikely - 2 | Moderate - 3 | Moderate - 6 |
| 5 | Seal cable entry points with chew-resistant and rodent resistant wires. Regular inspect and address any damage. | Environmental | Rare - 1 | Moderate - 3 | Low - 3 |
| 6 | Install backup water storage or installing the warning feature in the software to announce to the users on water shortage. | Environmental | Unlikely - 2 | Major - 4 | High - 8 |
| 7 | Collaborate with RMIT Sustainability authorities early in the project. Checking the necessary approvals and ensuring our product aligns with safety regulations at RMIT. | Legal | Possible - 3 | Moderate - 3 | High - 9 |
| 8 | Building a flexible design that can be adjustable with the locations. Have regular meetings with industry supervisors to get the latest update on location. Consider logistics, accessibility, and environmental factors in the design process | Legal | Unlikely - 2 | Moderate - 3 | Moderate - 6 |
| 9 | Prioritize resource allocation and have consultation with academic supervisors along with the course coordinators and technician. Should not use all the budget in the first purchase proposal since Calico team can spend a little amount for emergencies. | Project management | Rare -1 | Major - 4 | Moderate - 4 |
| 10 | Does the expectation alignment with team members, have open communication when discussing any ideas or conflicts? Having a common management space for task tracking of the team contribution, and feedback. | Project management | Rare - 1 | Moderate - 3 | Low - 3 |

After the mitigation plan, realistically most risks have the risk score reduced in both likelihood code ranking, and consequences. However, there are some risks like risk 3 and risk 9 on water disruption and budget constraints, we can only reduce the likelihood of happen the risk, but the consequences effect to the project would be kept the same. After mitigation, there are 3 risks that fall into the low-risk rank, which would rarely happen, and 3 risks are considered as moderate. The other 4 risks are high risk, but it is still manageable since most of the high risks are likelihood of unlikely.

# CONCLUSION

To summarize, the RMIT University Garden Project’s Smart Watering System planning, and design stages have been completed by Team Calico. modifying the project's scope to concentrate on creating a workable prototype that can be used as a demonstration. The main features of the fully functional watering system that is intended for the actual garden will be demonstrated by this prototype. Although there were some delays brought on by difficulties with component sourcing, we have modified the schedule for semester 2 to lessen these obstacles. The team's progress toward obtaining the end result is delineated in the sections on the project status and timeframe. Furthermore, the second semester's milestones are well-defined, guaranteeing that the project continues course to be completed. The goal of Team Calico is to complete the Capstone Project B showcase with an informative and successful prototype. To do this, the team is dedicated to upholding open lines of communication with our stakeholders and following the updated project schedule.

# REFERENCE

[1] A. Author, "A standard risk matrix," [Online]. Available: https://www.researchgate.net/figure/A-standard-risk-matrix\_fig1. [Accessed: 15-Jul-2024].

[2] "How To Assign Risk Assessment Codes," Gadzoom Blog, [Online]. Available: https://www.gadzoom.com/blog/how-to-assign-risk-assessment-codes. [Accessed: 15-Jul-2024].