

Professor Miguel Cordeiro

Digital Warehouse

Project Management

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Group A

Pedro Leite - 201906697

Ruben Pombo - 202302830

Stefan Samfirescu - 202302691

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1. Introduction

"MyCarrier Logistic Solutions" is a global logistics partner known for its integrated transportation and logistics services, operating across 8 countries. It's an highly successful and profitable company, with more than 2,300 employees, that serve around 23,000 customers.

With the goal of improving the efficiency, productivity and optimization of warehousing processes, we're looking at a new project proposal called "Digital Warehouse". This project will adopt technologies such as: IoT, AI, and mainly, drones in warehouse operations, enhancing real time information analysis, autonomous flight, payload transport, obstacle avoidance and fleet operations.

Drones are particularly enticing because of their cheap initial cost, availability of standardized hardware and adaptability of SaaS based applications. The API based connection and smooth cloud infrastructure connectivity will make it easier to integrate autonomous drone fleets into the current warehouse management systems. It also has customized panels that offer accurate control, remote operation capabilities made possible by state of the art 4G/5G technology and high definition video recording features designed to maximize inventory reconciliation, guarantee increased security and to facilitate identification in surveillance.

"Digital Warehouse" represents a strategic leap towards a future where innovation converges with logistics expertise, redefining warehouse operations through a fusion of cutting edge technology and a relentless commitment to safety and efficiency.

This paper offers a clear road map for the project resolution. It includes the methodology, objectives, stakeholder analyses, communication plans, stakeholder analyses, organizational structure of the team, risk managing, communication plans, indicator metrics and a Jira workspace for monitoring and control. All using a SCRUM framework and a meticulous Gantt Chart.

2. Strategic Goals

2.1. Capacity and Efficiency Enhancement

This goal targets boosting the capability of the existing logistics infrastructure. It involves optimizing processes, streamlining workflows and possibly expanding resources to handle larger volumes of cargo more effectively. For height based material verification, drones offer way more agility, compared to manual operator based inspections. For ground level based material verification, drones will thrive especially in shelving or bulk storage areas. By enhancing capacity while improving efficiency, the company can accommodate growing demands without sacrificing quality or speed.

2.2. Quick Implementation

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2.3. Top Operational Visibility

This goal emphasizes the need for comprehensive visibility and data driven insights into the warehouse operations. By leveraging different technologies, the project aims to enhance real time monitoring and data collection. This increased visibility enables better decision making, proactive issue resolution and a more responsive logistics system.

2.4. Competitive Tariffs and Customized Contracts

In the logistics sector, customized contracts that are suited to particular customer needs are essential. Providing competitive price structures and adaptable contract terms is the main objective here. The business can draw in, and keep customers by precisely matching services to the needs of each individual client.

2.5. Less Challenges with Manual Inventory

Errors, accidents and operational inefficiencies are caused by human error and improper use of mechanical equipment. The project's goal is to program drones equipped with cameras, sensors and scanners to replace human error in physical package inspection and barcode scanning.

3. Project Management Methodology

The agile methodology would benefit this project in different aspects:

- It would allow testing many prototypes of the drones.
- Accepts adjustments based on discoveries throughout drone development.
- Receiving feedback from personal as warehouse managers and logistic experts is important, this methodology facilitates communication with them.
- The continuous delivery would mean possible adjustments to improve the drone hardware and software based on the feedback.

4. Vision Scope

4.1. Project Objectives

4.1.1. MyCarrier Logistic Solutions: Business Context

- MyCarrier aims to enhance its position as a global logistics partner by integrating drone technology into its services, providing innovative solutions in transportation and logistics.
- Develop a Digital Warehouse project, leveraging drone technology to optimize logistics operations, improve efficiency, and enhance customer experience.

- Address the specific needs of the Automotive Business Unit by introducing drones in the logistics chain, focusing on the largest logistics contract in Portugal with Toyota.

4.1.2. Logistic Warehousing Drones: Project Scope

- Develop a drone capable of automating indoor inventory processes in heterogeneous warehouse environments, differentiating through barcode reading capabilities.
- Enhance MyCarrier's technological leadership by incorporating drones for inventory management, contributing to the ongoing "Digital Warehouse" project.
- Establish a secure, cost-effective, and efficient drone-based inventory system for the Automotive Business Unit, ensuring safety and compliance with regulatory standards.

4.1.3. Technical and Scientific Objectives

- Develop a drone with the ability to read barcodes in diverse warehouse environments, both at height and ground level.
- Ensure the drone's capability for autonomous flight, precise navigation, obstacle avoidance, and efficient inventory data collection.
- Integrate state-of-the-art technologies, including IoT, AI, and high-quality sensors, to enhance the drone's performance and data analysis capabilities.

4.1.4. R&D: State of the Art Technological Landscape

Explore existing drone applications and technologies in logistics, identifying limitations and opportunities for indoor inventory management.

4.1.5. R&D: Uncertainty Resolution

Conduct thorough research and development to address the challenges of indoor drone navigation, barcode reading, and integration with existing warehouse systems.

4.1.6. Methodology

Implement a systematic approach involving software development, hardware integration, and sensor technology adaptation to create a customized drone solution for heterogeneous warehouse environments.

4.1.7. Expected Outcomes

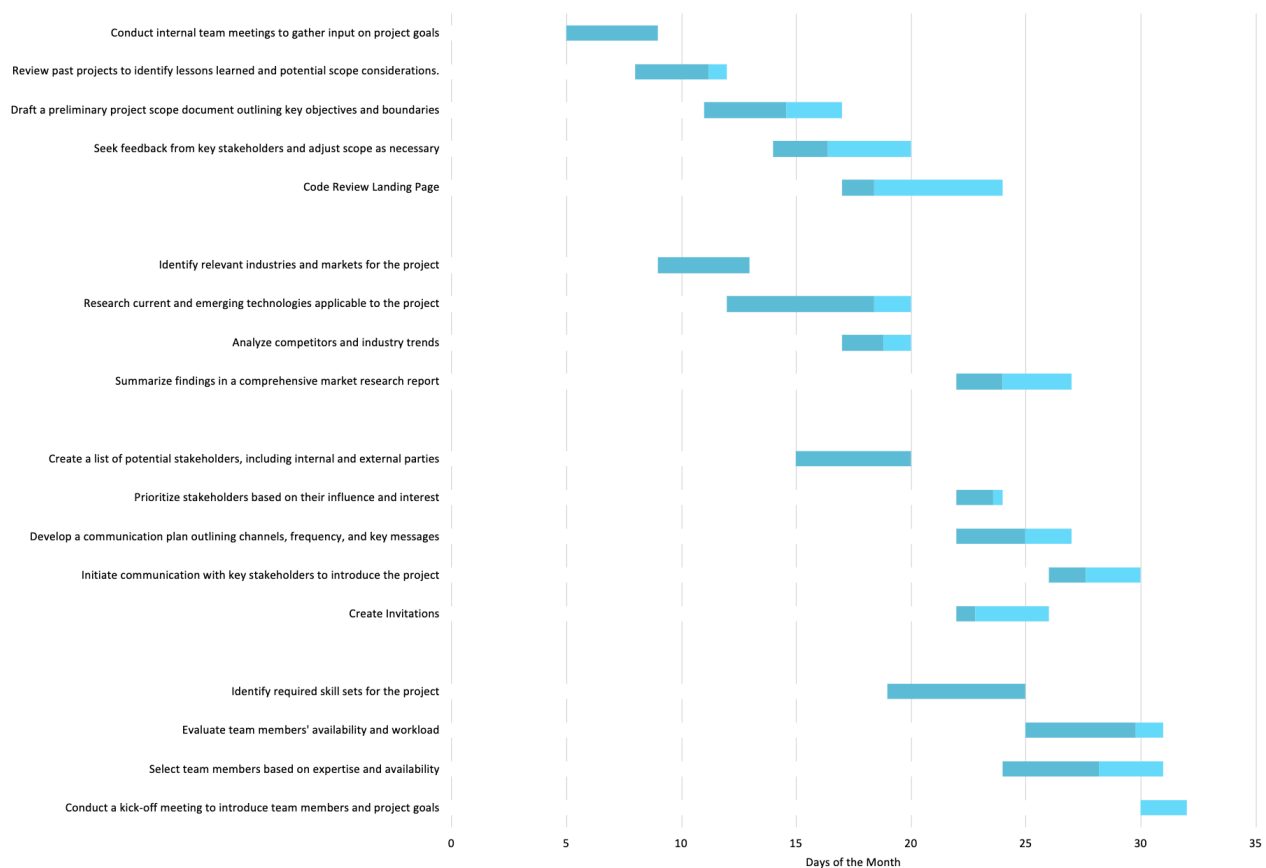
- Successful development of a drone prototype capable of autonomous indoor navigation and barcode reading.
- Integration of the drone into MyCarrier's logistics operations, contributing to the efficiency and innovation of the "Digital Warehouse" project.
- Establishment of a secure and compliant drone-based inventory system for the Automotive Business Unit, demonstrating the feasibility and advantages of drone technology in logistics.

4.2. Gantt Chart

TASK NAME	START DATE	DAY OF MONTH*	END DATE	DURATION* (WORK DAYS)	DAYS COMPLETE*	DAYS REMAINING*	TEAM MEMBER	PERCENT COMPLETE
Define Project Objectives and Scope								
Conduct internal team meetings to gather input on project goals	1/5	5	1/8	4	4	0	Nathan	100%
Review past projects to identify lessons learned and potential scope considerations.	1/8	8	1/11	4	3,2	0,8	Meredith	80%
Draft a preliminary project scope document outlining key objectives and boundaries	1/11	11	1/16	6	3,6	2,4	Brandon	60%
Seek feedback from key stakeholders and adjust scope as necessary	1/14	14	1/19	6	2,4	3,6	Michael	40%
Code Review Landing Page	1/17	17	1/23	7	1,4	5,6	Rachel	20%
Conduct Market Research and Technology Review								
Identify relevant industries and markets for the project	1/9	9	1/12	4	4	0	Nathan	100%
Research current and emerging technologies applicable to the project	1/12	12	1/19	8	6,4	1,6	Meredith	80%
Analyze competitors and industry trends	1/17	17	1/19	3	1,8	1,2	Brandon	60%
Summarize findings in a comprehensive market research report	1/22	22	1/26	5	2	3	Michael	40%

Identify Stakeholders and Establish Communication Plan								
Create a list of potential stakeholders, including internal and external parties	1/15	15	1/19	5	5	0	Nathan	100%
Prioritize stakeholders based on their influence and interest	1/22	22	1/23	2	1,6	0,4	Meredith	80%
Develop a communication plan outlining channels, frequency, and key messages	1/22	22	1/26	5	3	2	Brandon	60%
Initiate communication with key stakeholders to introduce the project	1/26	26	1/29	4	1,6	2,4	Michael	40%
Create Invitations	1/22	22	1/25	4	0,8	3,2	Rachel	20%
Form Cross-Functional Project Team								
Identify required skill sets for the project	1/19	19	1/24	6	6	0	Nathan	100%
Evaluate team members' availability and workload	1/25	25	1/30	6	4,8	1,2	Meredith	80%
Select team members based on expertise and availability	1/24	24	1/30	7	4,2	2,8	Michael	60%
Conduct a kick-off meeting to introduce team members and project goals	1/30	30	1/31	2	0	2	Rachel	0%
Develop High-Level Project Schedule								
Break down project objectives into major phases	1/26	26	1/24	#NÚM!	#NÚM!	#NÚM!	Nathan	100%
Estimate the duration of each phase based on historical data or expert judgment	1/29	29	1/30	2	1,6	0,4	Meredith	80%
Sequence project phases based on dependencies	1/27	27	1/30	4	2,4	1,6	Michael	60%
Create a visual representation of the milestones	1/31	31	1/31	1	0	1	Rachel	0%
Create Preliminary Budget Estimates								
Identify and list all potential costs associated with the project, including resources, equipment, and external services	1/30	30	2/1	3	3	0	Nathan	100%
Gather quotes and estimates from vendors or relevant departments for each cost category	2/2	2	2/4	3	2,4	0,6	Meredith	80%
Develop a preliminary budget by consolidating the estimated costs and ensuring alignment with project objectives	2/6	6	2/9	4	2,4	1,6	Michael	60%
Review the preliminary budget with key stakeholders and make adjustments as needed	2/7	7	2/10	4	0	4	Rachel	0%
Draft Project Charter and Gain Approval								
Compile project objectives, scope, and preliminary budget into a comprehensive project charter document	2/7	7	2/11	5	5	0	Nathan	100%
Share the draft project charter with relevant stakeholders for feedback	2/9	9	2/11	3	2,4	0,6	Meredith	80%
Address any feedback received and make necessary revisions to the project charter	2/11	11	2/14	4	2,4	1,6	Michael	60%
Present the final project charter to stakeholders for approval and obtain necessary signatures	2/13	13	2/16	4	0	4	Rachel	0%
Develop Initial Risk Management Plan								
Identify potential risks that could impact the project, considering internal and external factors	2/12	12	2/14	3	3	0	Nathan	100%
Assess the likelihood and impact of each identified risk	2/14	14	2/17	4	3,2	0,8	Meredith	80%
Develop risk response strategies to mitigate, transfer, or accept each risk	2/15	15	2/18	4	2,4	1,6	Michael	60%
Document the risk management plan, including risk identification, assessment, and response strategies	2/17	17	2/20	4	0	4	Rachel	0%

Prepare Gantt Chart for Initial Planning Phase								
Outline the major tasks and milestones associated with the initial planning phase	2/18	18	2/21	4	4	0	Nathan	100%
Sequence the tasks based on dependencies, ensuring a logical flow of activities	2/21	21	2/23	3	2,4	0,6	Meredith	80%
Estimate the duration of each task and allocate resources accordingly	2/24	24	3/27	32	19,2	12,8	Michael	60%
Create a Gantt chart visualizing the timeline, tasks, and milestones for the initial planning phase	2/25	25	2/28	4	0	4	Rachel	0%
Conduct Stakeholder Briefing								
Prepare a presentation summarizing the project objectives, scope, budget, and initial plan	2/25	25	2/27	3	3	0	Nathan	100%
Schedule and conduct a briefing session with key stakeholders, allowing for questions and feedback	2/27	27	3/1	3	2,4	0,6	Meredith	80%
Address any concerns raised during the briefing and incorporate relevant feedback into the project plan	2/28	28	3/6	7	4,2	2,8	Michael	60%
Share updated project details and key takeaways with stakeholders	3/1	1	3/5	5	0	5	Rachel	0%
Finalize Initial Planning Phase Report								
Consolidate all relevant documents, including the project charter, budget, risk management plan, and Gantt chart	3/3	3	3/7	5	5	0	Nathan	100%
Review the initial planning phase activities and outcomes to ensure alignment with project goals	3/5	5	3/8	4	3,2	0,8	Meredith	80%
Prepare a comprehensive report summarizing the initial planning phase, including achievements, challenges, and next steps	3/8	8	4/7	31	18,6	12,4	Michael	60%
Share the final report with stakeholders for documentation and reference	3/9	9	3/12	4	0	4	Rachel	0%
				WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5



4.3. Stakeholders Analysis

Stakeholders are individuals and organizations that are actively involved in the project, or whose interests may be positively or negatively impacted as a result of the project's execution.

We're going to analyze each stakeholder, indicating his influence and importance to the project. Influence indicates the power and ability to make key decisions in the project or even the capacity to influence other elements or stakeholders. Importance indicates the degree to which the project cannot be deemed successful if needs, expectations, and issues are not addressed.

To understand how the different stakeholders are involved, we're also describing their interests and contributions to the project. Acknowledging the stakeholders interests allows you to coordinate project goals, gain their cooperation, and foresee probable problems. This information improves decision making, encourages teamwork, and guarantees that the project is in line with longer term corporate objectives for sustained success.

4.3.1. Internal Stakeholders

Internal stakeholders are the stakeholders associated with initiating and developing the project. And they are:

- Sponsor:
 - Influence: High.
 - Importance: High.
 - Interests: They're concerned with the project's alignment with the company's long term strategy, financial implications and overall impact on the brand's reputation.
 - Contribution: They provide strategic direction, allocate resources, approve budgets, and ensure that the project aligns with the company's mission and goals.
- Project Management Office:
 - Influence: High.
 - Importance: High.

- Interests: Coordinating resource distribution, putting project management procedures into place, monitoring resource alignment with business goals and guaranteeing project completion within the determined time frames.
 - Contribution: Helps with efficient project planning, scope control, risk management and communication among the stakeholders. Is responsible for decision making, resource management, and guaranteeing the project's success through alignment with the organization's long term objectives.
- Steering Committee:
- Influence: High.
 - Importance: High.
 - Interests: Making sure that the project is strategically aligned with the larger corporate objectives, keeping an eye on its advancement and staying within budget and schedule limits while meeting its milestones. They care about stakeholder satisfaction, risk management and how the project will affect long term business success.
 - Contribution: Is essential to making decisions, giving direction and resolving strategic problems. It also supervises compliance with regulations and guarantees that the project is in line with the company's goal, actively engaging in critical decision making processes throughout the project's lifecycle.
- Process Owner:
- Influence: High.
 - Importance: High.
 - Interests: Ensuring that the developed drone technology seamlessly integrates into warehouse operations, meeting functional objectives. They oversee the validation of functional requirements and hold accountability for decisions made during the validation phase.
 - Contribution: In order to guarantee alignment with business demands, they work closely with the clients to validate functional requirements. They lead and organize the clients, assigning validation tasks while maintaining responsibility for the results.

- Team:
 - Influence: High.
 - Importance: High.
 - Interests: They're focused on enhancing warehouse operations, optimizing logistics and improving efficiency in their operational scope.
 - Contribution: They offer domain expertise, operational insights and play a pivotal role in implementing and testing the drone technology within their logistics unit.

4.3.2. External Stakeholders

External stakeholders are the stakeholders outside the organization who have an interest in the project's outcomes and success. And they are:

- Suppliers:
 - Influence: Low.
 - Importance: High.
 - Interests: Reach the objectives outlined by the clients need in a certain time frame.
 - Contribution: Providing important parts like sensors, barcode scanners, navigational systems and materials, that are required for drone development. In order to accomplish project objectives and make sure the drone's capabilities match the project's technical needs, their proficiency in locating and supplying technology is essential.
- Regulators:
 - Influence: High.
 - Importance: High.
 - Interests: Ensuring that the project complies with all applicable laws, safety requirements, and airspace restrictions.
 - Contribution: Their participation is essential to ensure that the project complies with the legal requirements and that the operations are safely integrated into warehouse operations.

- Investors and Shareholders:
 - Influence: Low.
 - Importance: High.
 - Interests: Ensuring that the project is completed on schedule, within budget, and with the projected returns on investment. Interest lies in leveraging innovative technology to strengthen the company's market position and profitability.
 - Contribution: Funding, budgetary allocation, and strategic advice. Their financial support and investment choices enable the project's operational research, and development needs, which are essential to its success.

- Toyota:
 - Influence: Low.
 - Importance: Low.
 - Interests: Optimizing inventory control within their facilities, cutting down on errors, increasing productivity and streamlining warehouse operations.
 - Contribution: Providing real world testing grounds, valuable feedback on drone performance, guidance on improving barcode reading and offering insights into warehouse operations for better technology integration. They also contribute by aligning the project's goals with their logistical needs, ensuring practical relevance.

- Comercial Management:
 - Influence: Low.
 - Importance: High.
 - Interests: They want to make sure that drone technology meets market needs so that the business can provide creative and effective logistics solutions to customers.
 - Contribution: Essential to bringing drone technology into compliance with consumer demands and market demands. They assist by offering market insights, identifying potential revenue streams through this technology and ensuring that the developed solutions can be effectively marketed and integrated into the company's service portfolio.

- Key Users:
- Influence: Low.
- Importance: High.
- Interests: They're are looking for efficient logistics services that meet their requirements and budget.
- Contribution: Their approval and feedback of the technology and level of satisfaction as accountable stakeholders are critical to the project's success.

4.3.3. RACI Matrix

	Sponsor	PMO	SC	PO	Team
Initiation	A	R	R	C	C
Planing	A	R	R	C	C
Execution	A	R	R	R	R
Control	A	R	R	R	R
Close	A	R	R	C	C

	Regulators	I&S	Toyota	CM	KU
Initiation	C	C	I	C	I
Planing	C	C	C	C	C
Execution	C	C	C	C	C
Control	R	C	C	C	C
Close	C	C	C	C	C

4.4. Organizational Structure of the Team

4.4.1. Roles in the SCRUM Framework

- Scrum Master: Facilitates Scrum meetings, removes obstacles, ensures adherence to Scrum practices, and supports the team in achieving their sprint goals. The professional needs to have experience in agile projects to ensure that the methodology is being followed.

- **Product Owner:** Represents the stakeholders' interests, defines the project vision, and prioritizes the product backlog items for maximum value delivery. His profile is meant to be a Logistics Manager with deep knowledge of logistics operations and a clear vision of how drone technology can optimize these processes.
- **Scrum Team:** Composed of cross-functional members who work collaboratively to deliver the project increment. The team's composition reflects the diverse technical expertise required for the project.

4.4.2. Key Technical Profiles in the SCRUM Team

- **Software Engineers:** Their role is to integrate hardware and software components, ensuring seamless and efficient functionality. Key responsibilities include developing software for drone control and implementing computer vision tools to facilitate accurate barcode reading.
- **Business Analysts:** Researches market trends and technological advancements. Plays a vital role in aligning the product development with market needs and identifying potential business opportunities.
- **Mechanical Engineers:** Responsible for the physical design and construction of drone prototypes. Works closely with the software team to ensure hardware compatibility.
- **Drone Technician:** Provides specialized knowledge in drone operation and maintenance. Ensures prototypes meet operational standards and advises on practical aspects of drone technology. The expert is expected to work close to the mechanical Engineers in search of improvements and solving bugs of the machine.
- **Data Scientist:** Similar role to software engineer, focusing on real-time data analysis, optimization algorithms, and machine learning models to enhance drone performance and efficiency in warehouse environments.

- **Quality Assurance Specialist:** Ensures the quality and reliability of both software and hardware components. Conducts testing and validation processes to identify and rectify defects.
- **Supply Chain/Logistics Expert:** Understands the intricacies of warehouse operations and logistics. Their insights will be crucial in tailoring drone functionalities to meet specific logistical needs.
- **Regulatory Compliance Officer:** Monitors compliance with drone regulations and safety standards, which is vital given the evolving nature of drone laws and regulations.

4.5. Risks

4.5.1. Risk Identification and Description

1. **State of the Art Technology Complexity:** The integration of advanced technology introduces complexity and uncertainties into the project, potentially leading to unforeseen technical challenges.
2. **Warehouse Diversity and Drone Adaptation:** Warehouse characteristics might vary in different aspects, each one has its one nature. It means that drones who have learned for an specific environment could have problems in the adaptation leading to poor performance in other warehouses.
3. **Extended Project Timeline:** Projects involving cutting-edge technology often face unforeseen technical hurdles, the ambitious timeline might face challenges, leading to project delays and an extended completion period.
4. **Challenges in Label Reading and Distinction:** Difficulty in distinguishing labels in areas with closely packed small boxes, necessitating enhanced label reading capabilities.
5. **Indoor navigation and Autonomy Challenges in Drone Technology:** Current drones, often reliant on manual control or GPS guidance, might face significant

challenges in indoor navigation due to limitations in signal reception and the complexities of autonomous flight.

6. **Technological Dependencies and Integration Challenges:** Reliance on various technologies (software, sensors, hardware) and their integration might lead to compatibility issues or delays in development.

4.5.2. Risk Assessment Matrix

	High			
Probability	Medium		3 and 4	1 and 5
	Low		6	2
		Low	Medium	High
			Impact	

4.5.3 Risk Mitigation

1. A well-rounded and expert Scrum Team with high knowledge in software tools is necessary to avoid obstacles.
2. Perform extensive testing in a variety of simulated warehouse environments. Develop adaptable drone designs that can be easily modified for different settings.
3. Implement strict milestone tracking and agile methodologies to adapt quickly to any changes or delays. Regularly review project timelines and adjust resource allocation as needed. In case the mitigation plan does not result enough to stop a extension in the expected date, it should be developed a contingency plan, which could consist of a communication plan to manage stakeholder expectations, and have a buffer in the budget and resources for potential extensions.
4. Software engineers, as expected, must make use of advanced sensor technology. It is important to test with different computer vision algorithms. If certain label types continue to pose challenges, work with clients to standardize label formats.

5. Experiment with different sensor types and AI algorithms for navigation without GPS. Develop semi-autonomous models with enhanced manual control features for easier operation. Although it's not our goal, it would make an improvement of the actual logistics plan.
 6. The scrum team must be proactive and open to communication, mainly the software and data engineers, who must develop programs with high compatibility. In case of significant integration issues, consider simplifying the system to isolate and address the problem areas.
- To effectively manage project risks, it's essential to periodically review and update the Risk Register, which involves tasks as review the status and severity of each risk, add new emerging risks to the register and communicate the new register to the stakeholders.

4.6. Communication Plan

4.6.1. Internal Stakeholders

- Sponsor:
 - Communication Channels: Monthly strategic review meetings, quarterly project status reports.
 - Governance: Approval of high-level project decisions, budget allocations, and strategic direction.
- Project Management Office:
 - Communication Channels: Weekly project status meetings, project management tools for real-time updates.
 - Governance: Oversee project management procedures, resource allocation, and ensure alignment with business goals.

- Steering Committee:
 - Communication Channels: Bi-weekly progress reports, quarterly steering committee meetings.
 - Governance: Decision-making on strategic issues, milestone reviews, and budget compliance.

- Process Owner:
 - Communication Channels: Weekly progress meetings, validation phase workshops.
 - Governance: Lead functional requirements validation, ensure alignment with business demands.

- Team:
 - Communication Channels: Daily stand-up meetings, collaborative project management tools.
 - Governance: Active involvement in implementation and testing, providing domain expertise.

4.6.2. External Stakeholders

- Suppliers:
 - Communication Channels: Regular updates on project timelines, collaborative platforms for technical discussions.
 - Governance: Timely delivery of required components, coordination on technical specifications.

- Regulators:
 - Communication Channels: Periodic compliance updates, regulatory workshops.
 - Governance: Ensure project compliance with laws, safety regulations, and airspace restrictions.

- Investors and Shareholders:
 - Communication Channels: Quarterly financial reports, annual meetings.
 - Governance: Budget approval, strategic advice, and monitoring project returns on investment.

- Toyota:
 - Communication Channels: Monthly project updates, on-site testing feedback sessions.
 - Governance: Provide real-world testing grounds, insights into warehouse operations, and feedback on technology integration.

- Commercial Management:
 - Communication Channels: Market research presentations, bi-monthly reviews.
 - Governance: Ensure alignment with market demands, identify potential revenue streams, and support marketing efforts.

- Key Users:
 - Communication Channels: User feedback sessions, post-implementation surveys.
 - Governance: Approval of technology, satisfaction assessments, and accountability for project success.

4.6.3. Key Principals

- Tailored Communication: Adjust communication frequency and detail based on stakeholder interests and influence.
- Transparency: Share both successes and challenges openly to maintain trust.
- Agile Adaptation: Be flexible in the communication plan to address changing project dynamics.
- Stakeholder Involvement: Engage stakeholders in decision-making processes relevant to their interests.

4.7. Jira: Tool to Monitor and Control the Activities

4.7.1. Epics

We started by dividing the project in its most important and general bodies of work, the epics. And they are:

- Epic 1: Initiation:
 - Responsibilities: Mainly the PMO, but also the Sponsor and the SC, have important roles, the other stakeholders can also be consulted.
 - Timeframe: 1 week.

- Epic 2: Planning:
 - Responsibilities: Mainly the PMO, but also the Sponsor and the SC, have important roles, the other stakeholders can also be consulted.
 - Timeframe: 1 week.

- Epic 3: Drone Development:
 - Responsibilities: Mainly the PO (and the Team), but also every stakeholder.
 - Timeframe: 16 weeks

- Epic 4: Application Development:
 - Responsibilities: Mainly the PO (and the Team), but also every stakeholder.
 - Timeframe: 4 weeks.

- Epic 5: Preparation:
 - Responsibilities: Mainly the PO (and the Team), but also every stakeholder.
 - Timeframe: 4 weeks.

- Epic 6: Safety:
 - Responsibilities: Mainly the PO (and the Team and Regulators), but also every stakeholder.
 - Timeframe: 2 weeks.

- Epic 7: Close:

- Responsibilities: Mainly the PMO and PO, but every stakeholder.
- Timeframe: 3 weeks.

4.7.2. Sprints and User Stories

We further divided the epics into sprints, they're less generalized tasks, that don't take more than 1 month. And they are composed by user stories". User stories represent individual pieces of work, and they have this form "As a ... I want to ... so that I ...". Our epics and their user stories are:

- Sprint 0: Project Initiation:

- User Stories::
 - As a project stakeholder, I want to specify the project's goals, objectives, and vision so that we have a clear direction from the outset.
 - As a team member, I want to establish roles and responsibilities so that everyone knows their tasks and contributions.
 - As a developer, I want to set up the development environment and project infrastructure to ensure a smooth workflow.
 - As a project organizer, I want to determine the parties involved and hold the first meetings to kickstart collaboration and communication.
- Epic: Initiation.
- Responsibilities: Mainly the PMO, but also the Sponsor and the SC, have important roles, the other stakeholders can also be consulted.
- Timeframe: 1 week.

- Sprint 1: Research and Analysis:

- User Stories:
 - As a market analyst, I want to understand the market to identify trends and demands accurately.
 - As a competitor analyst, I want to examine rivals and market developments to gain a competitive edge.

- As a technical expert, I want to establish the project's precise technical needs to guide development accurately.
- Epic: Planning.
- Responsibilities: Mainly the PMO, but also the Sponsor and the SC, have important roles, the other stakeholders can also be consulted.
- Timeframe: 1 week.

- Sprint 2: Phase 1.1:

- User Stories:
 - As a drone developer, I want to create the drone technology's first prototype to initiate the development process.
 - As a technology enthusiast, I want to focus on developing the fundamentals of barcode scanning and drone flight to ensure core functionalities.
 - As a team member, I want to collaborate on creating the prototype to contribute to its successful development.
- Epic: Drone Development.
- Responsibilities: Mainly the PO (and the Team), but also every stakeholder.
- Timeframe: 4 weeks.

- Sprint 3: Phase 1.2:

User Stories:

- As a quality assurance analyst, I want to test the first prototype under controlled settings to identify any issues or flaws.
- As a stakeholder, I want to provide input and feedback to enhance the prototype's functionality based on its initial testing.
- As a developer, I want to refine and improve the prototype based on stakeholder and testing team feedback.
- Epic: Drone Development.
- Responsibilities: Mainly the PO (and the Team), but also every stakeholder.
- Timeframe: 2 weeks.

- Sprint 4: Phase 1.3:

- User Stories:
 - As a development team member, I want to implement improvements based on received feedback to enhance the drone's functionality.
 - As a systems integrator, I want to ensure compatibility with existing systems for a seamless operational workflow.
 - As a stakeholder, I want to validate that necessary features are added to improve the drone's overall performance.
- Epic: Drone Developments.
- Responsibilities: Mainly the PO (and the Team), but also every stakeholder.
- Timeframe: 4 weeks.

- Sprint 5: Phase 2.1:

- User Stories:
 - As a drone developer, I want to work on developing a more sophisticated drone model to advance its capabilities.
 - As a performance analyst, I want to enhance the drone's performance in terms of speed, accuracy, and overall handling for optimal results.
 - As a team member, I want to contribute to the development of the sophisticated drone model for a comprehensive and successful outcome.
- Epic: Drone Development.
- Responsibilities: Mainly the PO (and the Team), but also every stakeholder.
- Timeframe: 4 weeks.

- Sprint 6: Phase 2.2:

- User Stories:
 - As a testing coordinator, I want to evaluate the sophisticated prototype in practical situations to identify real-world challenges.
 - As a stakeholder, I want to provide user input to ensure the drone's practical functionality meets operational requirements.
 - As a developer, I want to address any problems or restrictions found during the prototype's practical evaluation.
- Epic: Drone Development.

- Responsibilities: Mainly the PO (and the Team), but also every stakeholder.
- Timeframe: 2 weeks.

- Sprint 7: Application Dev:

- User Stories:
 - As a software developer, I want to develop the application for barcode interpretation and data organization to complement the drone system.
 - As an integration specialist, I want to integrate the application seamlessly with the drone system for unified functionality.
 - As a stakeholder, I want to ensure the application meets operational needs and facilitates efficient data management.
- Epic: Application Development.
- Responsibilities: Mainly the PO (and the Team), but also every stakeholder.
- Timeframe: 4 weeks.

- Sprint 8: Mass Inventory:

- User Stories:
 - As an inventory manager, I want the drone prepared for scenarios involving mass inventory to streamline the inventory process.
 - As a system optimizer, I want to improve the drone's ability to read and understand barcodes in large storage areas for accurate inventory management.
 - As a stakeholder, I want to ensure the drone's readiness for handling large-scale inventory operations effectively.
- Epic: Preparation.
- Responsibilities: Mainly the PO (and the Team), but also every stakeholder.
- Timeframe: 2 weeks.

- Sprint 9: Optimization:

- User Stories:
 - As a drone engineer, I want to enhance flight speed while maintaining accuracy to optimize operational efficiency.
 - As an efficiency analyst, I want to address any efficiency tradeoffs identified in previous sprints to ensure optimal performance.

- As a stakeholder, I want the drone's efficiency optimized without compromising accuracy or safety.
- Epic: Preparation.
- Responsibilities: Mainly the PO (and the Team), but also every stakeholder.
- Timeframe: 2 weeks.

- Sprint 10: Safety:

- User Stories:
 - As a safety compliance officer, I want to ensure all drone safety precautions meet certification standards for regulatory compliance.
 - As a sensor systems developer, I want to create and implement sensor systems to enhance safety during drone operations.
 - As a documentation specialist, I want to prepare documentation to meet certification requirements for safe drone operation.
- Epic: Safety.
- Responsibilities: Mainly the PO (and the Team and Regulators), but also every stakeholder.
- Timeframe: 2 weeks.

- Sprint 11: Final Test:

- User Stories:
 - As a quality assurance analyst, I want to thoroughly test the system to ensure all components function as intended before final deployment.
 - As a stakeholder, I want any lingering problems or enhancements identified during testing to be addressed for a robust final product.
 - As a developer, I want to finalize any necessary adjustments based on the final testing results for a fully operational system.
- Epic: Close.
- Responsibilities: Mainly the PO (and the Team), but also every stakeholder.
- Timeframe: 2 weeks.

- Sprint 12: Conclusion:

- User Stories:

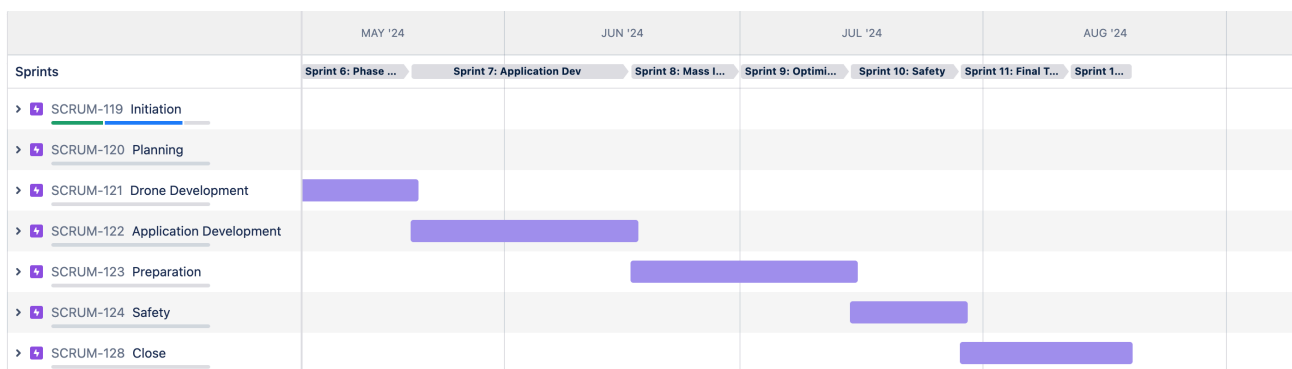
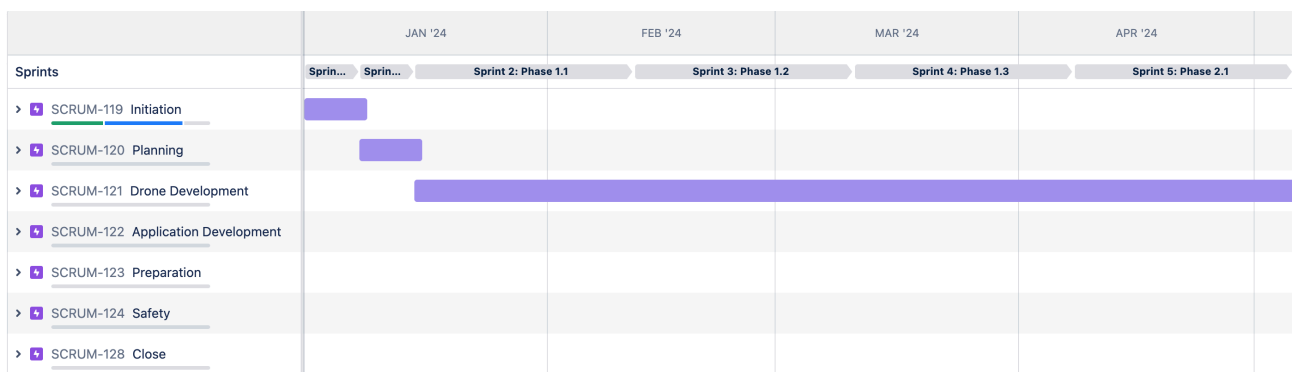
- As a project manager, I want to finalize project documentation and reports for a comprehensive project conclusion and handover.
- As a stakeholder, I want to ensure all project deliverables meet expectations for a successful conclusion and transition.
- As a team member, I want to prepare for the project conclusion and handover to ensure a smooth transition of responsibilities.

- Epic: Close.

- Responsibilities: Mainly the PMO, but also the Sponsor and the SC, have important roles, the other stakeholders can also be consulted.

- Timeframe: 1 week.

4.7.3. Timeline



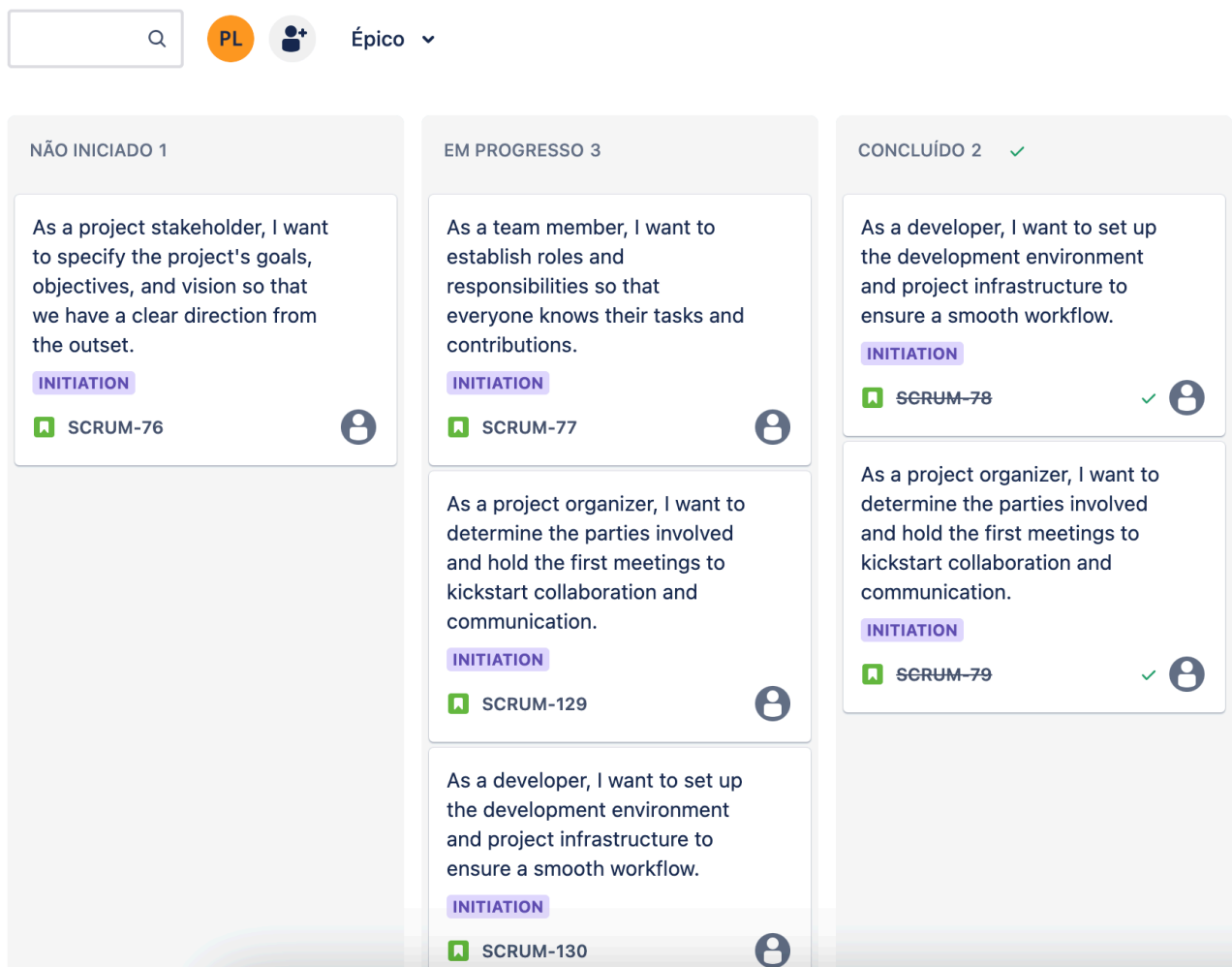
4.7.4. Backlog

▼ Sprint 0: Project Initiation 1 jan – 8 jan (4 problemas)			0 0 0	Iniciar sprint	...
SCRUM-76	As a project stakeholder, I want to specify the project's goals, objectives, and vision so that we have a clear direction fro...	INITIATION	A FAZER ▼	-	👤
SCRUM-77	As a team member, I want to establish roles and responsibilities so that everyone knows their tasks and contributions.	INITIATION	EM PROGRESSO ▼	-	👤
SCRUM-129	As a project organizer, I want to determine the parties involved and hold the first meetings to kickstart collaboration and...	INITIATION	EM PROGRESSO ▼	-	👤
SCRUM-130	As a developer, I want to set up the development environment and project infrastructure to ensure a smooth workflow.	INITIATION	EM PROGRESSO ▼	-	👤
+ Criar problema					
▼ Sprint 1: Research & Analysis 8 jan – 15 jan (3 problemas)			0 0 0	Iniciar sprint	...
SCRUM-80	As a market analyst, I want to understand the market to identify trends and demands accurately.	PLANNING	A FAZER ▼	-	👤
SCRUM-82	As a competitor analyst, I want to examine rivals and market developments to gain a competitive edge.	PLANNING	A FAZER ▼	-	👤
SCRUM-81	As a technical expert, I want to establish the project's precise technical needs to guide development accurately.	PLANNING	A FAZER ▼	-	👤
+ Criar problema					
▼ Sprint 2: Phase 1.1 15 jan – 12 fev (3 problemas)			0 0 0	Iniciar sprint	...
SCRUM-83	As a technology enthusiast, I want to focus on developing the fundamentals of barcode scanning and drone flight to ens...	DRONE DEVELOPMENT	A FAZER ▼	-	👤
SCRUM-85	As a drone developer, I want to create the drone technology's first prototype to initiate the development process.	DRONE DEVELOPMENT	A FAZER ▼	-	👤
SCRUM-84	As a team member, I want to collaborate on creating the prototype to contribute to its successful development.	DRONE DEVELOPMENT	A FAZER ▼	-	👤
+ Criar problema					
▼ Sprint 3: Phase 1.2 12 fev – 11 mar (3 problemas)			0 0 0	Iniciar sprint	...
SCRUM-86	As a stakeholder, I want to provide input and feedback to enhance the prototype's functionality based on its initial testing.	DRONE DEVELOPMENT	A FAZER ▼	-	👤
SCRUM-87	As a developer, I want to refine and improve the prototype based on stakeholder and testing team feedback.	DRONE DEVELOPMENT	A FAZER ▼	-	👤
SCRUM-88	As a quality assurance analyst, I want to test the first prototype under controlled settings to identify any issues or flaws.	DRONE DEVELOPMENT	A FAZER ▼	-	👤
+ Criar problema					
▼ Sprint 4: Phase 1.3 11 mar – 8 abr (3 problemas)			0 0 0	Iniciar sprint	...
SCRUM-89	As a systems integrator, I want to ensure compatibility with existing systems for a seamless operational workflow.	DRONE DEVELOPMENT	A FAZER ▼	-	👤
SCRUM-90	As a development team member, I want to implement improvements based on received feedback to enhance the drone's...	DRONE DEVELOPMENT	A FAZER ▼	-	👤
SCRUM-91	As a stakeholder, I want to validate that necessary features are added to improve the drone's overall performance.	DRONE DEVELOPMENT	A FAZER ▼	-	👤
+ Criar problema					
▼ Sprint 5: Phase 2.1 8 abr – 6 mai (3 problemas)			0 0 0	Iniciar sprint	...
SCRUM-93	As a drone developer, I want to work on developing a more sophisticated drone model to advance its capabilities.	DRONE DEVELOPMENT	A FAZER ▼	-	👤
SCRUM-92	As a performance analyst, I want to enhance the drone's performance in terms of speed, accuracy, and overall handling f...	DRONE DEVELOPMENT	A FAZER ▼	-	👤
SCRUM-94	As a team member, I want to contribute to the development of the sophisticated drone model for a comprehensive and s...	DRONE DEVELOPMENT	A FAZER ▼	-	👤
+ Criar problema					
▼ Sprint 6: Phase 2.2 6 mai – 20 mai (3 problemas)			0 0 0	Iniciar sprint	...
SCRUM-95	As a testing coordinator, I want to evaluate the sophisticated prototype in practical situations to identify real-world challe...	DRONE DEVELOPMENT	A FAZER ▼	-	👤
SCRUM-96	As a stakeholder, I want to provide user input to ensure the drone's practical functionality meets operational requirements.	DRONE DEVELOPMENT	A FAZER ▼	-	👤
SCRUM-97	As a developer, I want to address any problems or restrictions found during the prototype's practical evaluation.	DRONE DEVELOPMENT	A FAZER ▼	-	👤
+ Criar problema					
▼ Sprint 7: Application Dev 20 mai – 17 jun (3 problemas)			0 0 0	Iniciar sprint	...
SCRUM-98	As a software developer, I want to develop the application for barcode interpretation and data organization to compleme...	APPLICATION DEVEL...	A FAZER ▼	-	👤
SCRUM-100	As an integration specialist, I want to integrate the application seamlessly with the drone system for unified functionality.	APPLICATION DEVEL...	A FAZER ▼	-	👤
SCRUM-99	As a stakeholder, I want to ensure the application meets operational needs and facilitates efficient data management.	APPLICATION DEVEL...	A FAZER ▼	-	👤
+ Criar problema					
▼ Sprint 8: Mass Inventory 17 jun – 1 jul (3 problemas)			0 0 0	Iniciar sprint	...
SCRUM-125	As an inventory manager, I want the drone prepared for scenarios involving mass inventory to streamline the inventory p...	PREPARATION	A FAZER ▼	-	👤
SCRUM-127	As a system optimizer, I want to improve the drone's ability to read and understand barcodes in large storage areas for ...	PREPARATION	A FAZER ▼	-	👤
SCRUM-126	As a stakeholder, I want to ensure the drone's readiness for handling large-scale inventory operations effectively.	PREPARATION	A FAZER ▼	-	👤
+ Criar problema					

<div> <div> <div>▼</div> <div>Sprint 9: Optimization</div> <div>1 jul – 15 jul (3 problemas)</div> </div> <div> <div>0</div> <div>0</div> <div>0</div> </div> <div> <div>Iniciar sprint</div> <div>...</div> </div> </div>		
SCRUM-106	As a drone engineer, I want to enhance flight speed while maintaining accuracy to optimize operational efficiency.	PREPARATION
A FAZER		-
SCRUM-104	As an efficiency analyst, I want to address any efficiency tradeoffs identified in previous sprints to ensure optimal perfor...	PREPARATION
A FAZER		-
SCRUM-105	As a stakeholder, I want the drone's efficiency optimized without compromising accuracy or safety.	PREPARATION
A FAZER		-
<div>+ Criar problema</div>		
<div> <div> <div>▼</div> <div>Sprint 10: Safety</div> <div>15 jul – 29 jul (3 problemas)</div> </div> <div> <div>0</div> <div>0</div> <div>0</div> </div> <div> <div>Iniciar sprint</div> <div>...</div> </div> </div>		
SCRUM-111	As a safety compliance officer, I want to ensure all drone safety precautions meet certification standards for regulatory c...	SAFETY
A FAZER		-
SCRUM-110	As a documentation specialist, I want to prepare documentation to meet certification requirements for safe drone operat...	SAFETY
A FAZER		-
SCRUM-112	As a sensor systems developer, I want to create and implement sensor systems to enhance safety during drone operatio...	SAFETY
A FAZER		-
<div>+ Criar problema</div>		
<div> <div> <div>▼</div> <div>Sprint 11: Final Test</div> <div>29 jul – 12 ago (3 problemas)</div> </div> <div> <div>0</div> <div>0</div> <div>0</div> </div> <div> <div>Iniciar sprint</div> <div>...</div> </div> </div>		
SCRUM-114	As a stakeholder, I want any lingering problems or enhancements identified during testing to be addressed for a robust fi...	CLOSE
A FAZER		-
SCRUM-115	As a developer, I want to finalize any necessary adjustments based on the final testing results for a fully operational syst...	CLOSE
A FAZER		-
SCRUM-113	As a quality assurance analyst, I want to thoroughly test the system to ensure all components function as intended befor...	CLOSE
A FAZER		-
<div>+ Criar problema</div>		
<div> <div> <div>▼</div> <div>Sprint 12: Conclusion</div> <div>12 ago – 19 ago (3 problemas)</div> </div> <div> <div>0</div> <div>0</div> <div>0</div> </div> <div> <div>Iniciar sprint</div> <div>...</div> </div> </div>		
SCRUM-116	As a stakeholder, I want to ensure all project deliverables meet expectations for a successful conclusion and transition.	CLOSE
A FAZER		-
SCRUM-117	As a project manager, I want to finalize project documentation and reports for a comprehensive project conclusion and h...	CLOSE
A FAZER		-
SCRUM-118	As a team member, I want to prepare for the project conclusion and handover to ensure a smooth transition of responsib...	CLOSE
A FAZER		-
<div>+ Criar problema</div>		

4.7.5. Board

Example for the initiation:



4.8. Indicators and Metrics to Control the Project

4.8.1. During Development

- Task Progress and Completion:
 - KPI: Percentage of tasks completed against the planned tasks.
 - Metric: $\text{Number of tasks completed} / \text{Total planned tasks} * 100$.
 - Purpose: Provides insights into the overall progress of the project and helps identify potential delays.

- Effort Variance:
 - KPI: Deviation in actual effort from estimated effort.
 - Metric: Actual effort - Estimated effort.
 - Purpose: Indicates how well the project team's estimates align with the current effort required for tasks.

- Defect Density:
 - KPI: Number of defects identified per unit of code (eg, per 1000 lines of code).
 - Metric: Total defects / Size of the code base.
 - Purpose: Measures the quality of the code and helps identify areas that may require additional attention.

- Code Churn Rate:
 - KPI: Frequency of code changes and updates.
 - Metric: Number of code changes / Total lines of code.
 - Purpose: Indicates the stability of the codebase and the level of ongoing development activity.

- Burn-down Rate:
 - KPI: Rate at which work is completed against the planned rate.
 - Metric: Remaining effort / Time remaining.
 - Purpose: Helps predict whether the project will be completed on time based on current progress.

4.8.2. After Development

- Defect Removal Efficiency:
 - KPI: Effectiveness of defect removal during testing.
 - Metric: (Total defects identified before release - Total defects after release) / Total defects identified before release.
 - Purpose: Measures the testing process's ability to identify and remove defects before the product is released.

- Customer Satisfaction:
 - KPI: Satisfaction level of end-users or customers.
 - Metric: Surveys, feedback scores, or Net Promoter Score (NPS).
 - Purpose: Assesses how well the delivered product meets customer expectations and needs.

- On-time Delivery:
 - KPI: Percentage of projects delivered on or before the planned delivery date.
 - Metric: $\text{Number of projects delivered on time} / \text{Total projects} * 100$.
 - Purpose: Reflects the project team's ability to meet deadlines and deliver within the agreed-upon timeframe.

- Budget Variance:
 - KPI: Deviation in actual project costs from the budgeted costs.
 - Metric: $\text{Actual cost} - \text{Budgeted cost}$.
 - Purpose: Evaluates the financial performance of the project and cost management effectiveness.

- Post-Implementation Defect Rate:
 - KPI: Number of defects identified after the product is released.
 - Metric: Total defects reported post-release.
 - Purpose: Measures the product's stability and the effectiveness of post-release support.

5. Conclusion

This comprehensive project plan outlines a strategic, methodical approach for the implementation of the Logistic Warehousing Drones initiative under the MyCarrier Logistic Solutions. We have set clear strategic goals aimed at enhancing capacity and efficiency, ensuring quick implementation, and providing top operational visibility, all while offering competitive tariffs and reducing the challenges associated with manual inventory processes.

Our adoption of the SCRUM framework for project management ensures agility and flexibility, allowing us to adapt to changing requirements and emerging challenges effectively. The detailed vision scope, encompassing both business context and technical objectives, sets a solid foundation for the project's success. The inclusion of an extensive R&D component emphasizes our commitment to staying at the forefront of technological innovation, tackling uncertainties, and delivering state-of-the-art solutions.

The Gantt chart, stakeholders analysis, and RACI matrix provide a clear roadmap and define responsibilities, ensuring every team member understands their role in the project's success.

Risk management has been a focal point, with a comprehensive risk assessment matrix and mitigation strategies ensuring preparedness for potential hurdles. Our communication plan guarantees consistent and effective interaction with both internal and external stakeholders, fostering transparency and collaboration.

Utilizing Jira as a tool for monitoring and controlling activities enables us to track progress meticulously, manage our sprints and user stories efficiently, and maintain a clear view of our backlog and project timeline.

Finally, the defined indicators and metrics for controlling the project during and after development ensure that we are on track to meet our objectives and can make data-driven decisions to steer the project towards its successful completion.