**PROJECT PROPOSAL**

**J&T EXPRESS PARCEL TRACKING SYSTEM WITH GPS MOBILE ACCESS**

A Software Engineering Project Presented to the Faculty of

Datamex College of Saint Adeline in Valenzuela Branch

MR. GABRIEL THOMAS TORNEROS

**By:**ANGELES, ADRIAN R.

BSIT-3B

# **INTRODUCTION**

The Introduction will tackle brief overviews, background information, explaining project requirements and objectives and goals of the project

A system that makes parcels have navigation through a delivery process, Customers can see where their parcel has landed and its status. The alternative way to update the status of the parcel after being delivered or departed to a specific location then inform the branch manager of J&T Express or return to the origin to ask and update its status.

This proposed project will require a barcode reader for quick scan quick input like tracking codes from the parcel’s details, a computer with a reliable internet connection due to web-based online system, connected through a database, and different branches’ J&T Express location as well as to report the status of the parcel.

The objective is to indicate the process of tracking the parcel while being able to locate their parcel’s location through our system and by following the process of branches personnel to update the status of a specific parcel through the database to be saved or the courier or delivery person will make an update by sending its location using the system. It is meant to inform the Customers and the branch manager of J&T Express who manage within a branch on their personnel computer. Whether the parcel is in good condition or a bad condition depending on the situation was taking place. Moreover, statistics and details display necessary details regarding a parcel as well for the record.

# **CLIENT INFORMATION**

This part explains the background of the client, J&T Express. A courier and logistics company which delivers packages or parcels from sender to receiver which also keeps their packages safe and need the help in Creating their system to track packages while being delivered across any different places, making deliveries has an indication of their location and addresses.

*Figure 1: Client Information for Parcel Tracking System*

* **J&T Express** is the name of the client organization
* Customer Hotline: (02) 8911-1888
* Official Website: https://www.jtexpress.ph
* Email Address: cs.sg@jtexpress.sg

## **Business Overview**

J&T Express is an international delivery company founded in August 2015 in Jakarta, Indonesia. Its core business is express services and cross-border logistics. With over 300,000 service personnel worldwide, J&T Express' network spans 13 countries including China, Indonesia, Vietnam, Malaysia, Thailand, the Philippines, Cambodia, Singapore, the UAE, Saudi Arabia, Brazil, Mexico and Egypt.

# **PROJECT SCOPE**

This area will discuss descriptions of the specific deliverables and outcomes Inclusions, Exclusions, Assumptions and constraints

The Parcel Tracking System is designed to offer a restricted GPS location detection for the delivery staff with mobile phone and cellular data to access the system and to refresh the parcel's status of J&T Express branch's own database. The other approach without using a mobile phone is to notify the branch manager by returning to their location. It allows for viewing and monitoring parcel statuses by branch managers, delivery staff, sender, and customer.

Example Statuses for the parcel

* In Transit: Your package is on the way, moving between locations.
* Out for Delivery: The package is with the delivery person and will arrive soon.
* Delivered: The package has been successfully given to you or someone at your address.
* Returned: The package was sent back to the sender, usually because it couldn’t be delivered.

The system will allow parcel status updates through barcode scanning, with all information stored in a central database. Records will be displayed on the website with statistical reports to track performance and status across different branches.

Using Supabase is a cloud database service built on PostgreSQL. It works by storing all your project data (like parcel details, tracking IDs, and status updates) in one secure place online. For your system as database for storing parcel data in a structured database, query the parcel status, update info, etc., using SQL or the auto-generated API and get some updates if you want to show almost live status changes.

## **Inclusions**

The following components are included in the scope of this project:

* A web-based platform developed using HTML, CSS, and JavaScript
* A Supabase database will contain 6 tables for Admins, Parcels, Parcel\_updates, Branches, Messages, and Couriers
* Two Javascript Libaries especially Leaflet.js and chart.js
* Barcode scanning functionality to retrieve and update parcel tracking IDs
* Displays parcel information, including sender and receiver details, and allows status updates through the admin panel to reflect the parcel’s current location and delivery stage.
* It is a must to have a Mobile Phone for location such as GPS Tracking using Phone Browser connected to the webpage
* Using Leaflet Map API to display a location after being granted GPS permission especially on Mobile Phones
* GPS tracking supports for real-time 24/7 parcel location tracking using Supabase
  + Allows communication through admin over admin on their own chat box but also real-time 24/7 using Supabase as well
  + Using reCAPTCHA (v2 and v3) for protection of sites from fraudulent activities, spam, and abuse.
  + Using Netlify for website url hosting free domain especially used for live-hosting

## **Exclusions**

The following features are not included in this project

* Printable or downloadable records of parcel tracks after being delivered successfully
* Mobile application development for Android or iOS
* Any form of mobile device or SMS-based notifications
* A mobile application is being created for J&T Customers, Senders, and Riders.

## **Assumptions**

* Each branch of J&T Express has at least one computer with internet access
* Per branch has their own single admin account and admin is a branch manager to gain access on branch admin panel and its own branch table within database
* Staff are trained in how to scan parcels correctly to make jobs easier for the branch manager
  + Customers and Delivery Employees access separate web interfaces tailored to their roles
  + Customers: Can track their parcels by entering Tracking IDs to view the current location, coordinates, and delivery status
  + Delivery Employees: Can update parcel location and status directly through the system. If they do not have a mobile device, they can request the Branch Manager to perform the updates on their behalf
* The branch Manager is trained in how to operate their admin panel
* Data entries and updates are performed only by authorized personnel which is branch manager

## **Constraints**

* Developer Limitation: There is only one person who is developing this project.
* Internet Requirement: An active internet connection is required to use the overall system either testing or live hosting
* Hardware Testing: The project must be tested on a mobile phone that works with the Barcode ID Scan before using the actual hardware
* Live Hosting Requirement: The project must be run on a live hosting website along with the database
* Browser compatibility: The web application must function correctly on the latest versions of Chrome, Edge, and Firefox.
* Security constraint: Only authorized users (admins, delivery employees) can access sensitive parcel data.
* Session constraint: Only one active session per user is allowed at any time (prevents concurrent logins).
* Data integrity: All parcel updates must be validated before being stored in the database to prevent invalid or incomplete entries.
* Hardware dependency: Barcode scanners used must be compatible with the mobile devices or branch computers running the system.
* System downtime: The system should handle brief network interruptions gracefully without losing unsaved updates.

# **PROJECT APPROACH**

This chapter provides an overview of the proposed approach, methodologies

and frameworks key activities and milestones.

The system will be developed with two main components: an Admin Panel for branch managers, a rider interface for delivery staff along with a client tracker for senders and customers.  
  
The development strategy has two primary approaches:

* Offline (No Mobile) Strategy – Within branches, the system supports parcel flow from drop-off to final delivery through step-by-step barcode scanning. At each stage (drop-off, sorting, dispatch, and delivery), the parcel status is recorded for visibility and auditability.
* Mobile-Based Strategy – Utilizes the use of Rider Interfaces through mobile phones with data connectivity. Riders report parcel status and provide real-time locations through GPS. Branch Managers can track rider movement and guarantee delivery safety through the Admin Panel.

The project will adhere to a formal development cycle: planning, designing, design testing, development, implementation, Deployment, and Analyzing. This ensures that all stakeholders’ requirements are addressed while enhancing tracking accuracy, operational efficiency, and customer transparency.

## **Methodology and Framework**

The development of web-based applications for the system will use Agile Approach.



Planning

Coding

Analyzing



**AGILE MODEL**

Designing

Deployment



Implementation

*Figure 2: Agile Methodology for Parcel Tracking System*

## **Agile Methodology**

This project will use the Agile methodology to emphasize iterative development and continuous improvement from Planning to Analyzing endless cycle until it is ready. The cycle of Agile Methodology includes:

1. Planning – Identify the system requirements, outline the tasks, and decide how to organize the project before starting any work
2. Coding – Build the database and write the necessary code to add essential features, implement error handling, and other system functions
3. Designing – Plan and create the system’s user interface, including layouts, color schemes, responsiveness, and smooth transitions, to make it easy and consistent for users
4. Implementation – Test the code to make sure it works correctly and fix any bugs found during testing
5. Deployment – Launch the tested features on a live or staging environment so they can be used
6. Analyzing – Check for possible errors, monitor system performance, gather user feedback, and evaluate the results to improve the system

## **Key Activities**

* Collecting operational and system requirements based on J&T Express logistics workflow
* Designing the Supabase database schema and the user interface for parcel management
* Developing core modules including:
  + Parcel registration: Records parcel details into the system.
  + Status update via barcode scanning: Updates parcel status quickly by scanning its tracking ID.
* Branch-based tracking access
* Conducting multi-branch testing to simulate actual parcel movement
* Deploying the system on a live web server
* Gathering feedback and performing continuous improvement
* Implement caching, pagination, or lazy loading for large datasets.
* Apply authentication, session control, and password hashing to protect user data.
* Set up proper error messages, console logging, and monitoring for debugging.
* Define roles for customers, delivery employees, and admins, and set permissions accordingly.

## **Key Milestones**

* Database in Supabase should be created and tested
* User authentication and session management fully implemented
* Admin panel is functional with role-based access control
* Successful integration of the web interface with the database for CRUD operations
* Performance tested to ensure the system handles multiple parcels without lag
* Parcel status can be updated at different branches
* The system should be fully tested and major bugs resolved
* System successfully deployed and accessible on a live server
* Documentation completed and approved for handover or future updates.

# **PROJECT TIMELINE**

This chapter provides High-level timeline outlining major milestones, deliverables, dependencies and critical paths

This shows the timeline of how the system will be created, designed and be done by the developer starting from Planning until to the Deployment and how long it will take to finish certain date objectives deadlines.

|  |  |  |
| --- | --- | --- |
| Phase | Duration | Milestone |
| Planning | July 7 — July 27, 2025 | Writing a Project Proposal |
| Coding & designing | July 27 — August 28, 2025 | Developing the website and creating basic designs for each tab and layout. |
| Soft run on live-hosting website | August 28 — August 31, 2025 | Executing the first running database own made website to make sure if it runs |
| Final Designing | August 31 — September 7, 2025 | Applying the proper color palette, enhancing layout details, and improving aesthetics for better usability. |
| Implementation | September 7 — October 5, 2025 | Fixing minor and major bugs, updating features, and refining system functions. |
| Test & Feedback | October 5 — October 9, 2025 | Collecting user reviews, feedback, and making necessary adjustments. |
| Deployment | October 9 — October 12, 2025 | Official launch of the web-based system on its own domain |

*Table 1. Project Timeline for the development of Parcel Tracking System.*

## **Dependencies and Critical Paths**

* Final proposal submission depends on the timely completion of research, data gathering, and writing during the planning period.
* Any delay in planning will directly affect the project's ability to move forward to the next phases.
* The approval of the proposal is the critical path milestone — it must be completed before the project can proceed.

## **Critical Path Diagram**

*Figure 3: Critical Path Diagram for Parcel Tracking System*

# **PROJECT RESOURCES**

To successfully develop and implement the Parcel Tracking System for J&T Express, the following resources are required:

## Hardware Resources

1. Barcode Scanner – Is a scanning tool device connected to the computer and to read parcel identification which also helps to track easily to update parcel status from the database.
2. Computer – Wherein a manager who manages the system from their website and to run the website.

## Software Resources

1. Web Technologies – HTML, CSS, JavaScript for website development.
2. Database System – Supabase for storing and managing parcel records and user access before live testing on real online websites.
3. Development Tools – Code editor especially Visual Studio Code or Notepad, using XAMPP or local server for testing, and web hosting platform for deployment.
4. Browser Compatibility – Microsoft Edge, Google Chrome, Mozilla Firefox or other modern browsers and supports Geolocation API.

## Human Resources

1. Project Developer – Responsible for designing, manages the Supabase database and ensures data integrity, coding, and deploying the system, and for the parcel details, to scan, to update, and to manage parcels in the system.
2. Beta Tester – Running a test functionality and bug testing as a customer's end user who will access the system to track their parcel statuses.

## Budget Allocation and Justification

The estimated project budget ranges from ₱25,500 to ₱26,500, covering the development of the web-based parcel tracking system (₱25,000) and the purchase of a USB barcode scanner (₱500–₱1,500) needed for scanning parcel tracking IDs.

|  |  |  |
| --- | --- | --- |
| Resources / Expenses | Estimated Cost (₱) | Justification |
| Development of the project | ₱25,000 | Entirety of the web-based parcel tracking system |
| USB Barcode Scanner | ₱500 – ₱1,500 | For scanning parcel Tracking IDs |
| TOTAL ESTIMATED BUDGET | ₱25,500 – ₱26,500 |  |

*Table 2. Budget Allocation and Justification of Parcel Tracking System.*

# **RISK MANAGEMENT**

Risk management is an essential part of the project that causes all kinds of interruptions, causing severe money loss, security breach, and hindrances to slow down that is part of the system. This section will outline the minor and major risks anticipated during the development and deployment of the Parcel Tracking System, each of which problems have an implementation or solutions to prevent this happening. This table shows the details of possible issues, priority levels, and impact, during development and runtime of the system:

|  |  |  |  |
| --- | --- | --- | --- |
| Problems | Description | Impact | Priority |
| Loss of data | Data is lost from the database, or the local storage of the files stored were corrupted or destroyed. | Unable to recover important old or previous data | High |
| Data Breach | Exposed file, accessed the database, and downloaded the entire customer records. |  | Critical |
| Unauthorized Access | Either account was compromised, or account was unintentionally opened then the unauthorized user has access to it after changing its password and email. |  | Critical |
| Copyright infringement | Using someone else's original work without permission — in a way that violates their legal rights. | Being sued by another bigger company | Moderate |
| System Downtime | Unexpected server outages could possibly break the system going in malfunction. |  | Critical |
| Human Error | Human error refers to a mistake made by a person that leads to unintended consequences or  deviations from expected outcomes. |  | Moderate |
| Browser Compatibility | Some features may not work on older or unsupported browsers. | Not working Website or missing other features | Low |

*Table 3. Risk Management of Web-based Parcel Tracking System.*

## **Problems Implementation**

* To prevent loss of data, the system should implement a backup if it’s either database or local files, stored securely to cloud storage or maybe make duplication files. Ensuring the data to make a recovery even in cases of accidental deletion, corruption, or hardware failure.
* To address data breaches, sensitive files like configuration files (e.g., config.php) must be placed outside public web directories, and database access should be protected with strong credentials, IP whitelisting, and encryption where possible.
* To prevent unauthorized access, always logout the account after use and all accounts were used for this project must have a strong password and if possible, has two aunthentication factors to secure and protect the account especially admin accounts to prevent hackers to take advantage of their accounts.
* To avoid copyright infringement, as a developer, I will use what resources are available, especially all resources from J&T Express as references and giving credentials to whom create an asset and not get sued by someone, big companies or organizations.
* To reduce system downtime, using reliable web hosting for the website and databases, and has an auto-restart service to keep the system going.
* To mitigate human error, provide instructions, tooltips, and add validation or warning messages before initiating an event from the system.
* To ensure browser compatibility, running a test for the system across the most popular browsers such as Microsoft Edge, Google Chrome, Opera GX, Mozilla Firefox etc; To implement graceful fallbacks where necessary.

# **PROJECT GOVERNANCE**

This section will tackle the organization's structure and the people who are part of J&T Express are to oversee the creation and implementation of the web-based parcel tracking system. It ensures that decisions are made promptly, tasks are well-coordinated, and the project is completed on time.

## **Decision-Making Process**

All significant decisions, including approving system features, designing the interface, modifying the scope, and establishing deployment, will be made in collaboration with only developer and client or stakeholder group representative. Progress will be reviewed at the conclusion of each development phase, and suggestions will be used to determine the next course of action.

Depending on their priority and potential impact on the timeline, change requests that are outside the original project scope might be delayed to later system iterations.

|  |  |
| --- | --- |
| **Stakeholder** | **Role and Responsibilities** |
| Client (J&T Express) | J&T Express is a fast-growing logistics and courier company that specializes in parcel delivery services. Its responsibility is to be an approval of the system. |
| Web-Based App Developer | |  | | --- | | Plans, builds, and manages the entire project. Oversees communication, progress tracking, and system deployment. Main point of contact for the client. | |

*Table 4. Project Governance of the Developer and Client for Parcel Tracking System.*