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TPN Connect System Redesign and Feature Enhancement – Final Report

1. Problem Statement

TPN Connect was an original platform used as a hub of depot operations and control of consignment, communications and reporting. Nonetheless, the system experienced several shortcomings that influenced usability and efficiency in its operation. It had a cluttered interface making navigation slow and the cognitive load of the user high. There was a lot of miscommunication and delays in communicating between depots, which was mostly done by phone calls. The reporting of issues by drivers was also not structured and, in most cases, may not be fully reported or reported incompletely. Employees were also not able to search the information within a limited time because of using old manuals and documents.

Such difficulties resulted in backlogs in routine activities, sluggish decision-making and overall productivity. It needed to be redesigned to make it easier to use, have simplified user experience and incorporate features that focused directly on the pain points of the operations.

2. Introduction

This project was aimed at upgrading the TPN Connect with a better user interface and enhancement features to boost efficiency in operations. The redesign did not imply the complete rebuild of the backend but a front-end redesign with the addition of new tools.

It was listed as four priority features:

1. **Instant Depot-to-Depot Communication** – phone updates in real time substituted with live chat.
2. **AI-Assisted Issue Reporting** – helping drivers to report full and correct delivery issues.
3. **Cleaner, Simpler Dashboard** – providing a focused view of priority jobs and essential metrics.
4. **AI Assistant for Questions** – enabling staff to get instant answers to operational queries.

This report documents the entire software development lifecycle (SDLC) undertaken to deliver these enhancements, from requirements gathering to testing and conclusion.

3. Requirement Gathering

To ensure the redesign addressed actual user needs, we conducted detailed requirement gathering sessions. This involved:

- **User Feedback Sessions**: Interviewed depot staff, drivers, and supervisors to understand their day-to-day frustrations with the system.
- **Workflow Analysis**: Observed current processes in the old TPN Connect interface to identify inefficiencies.
- **Feature Prioritization**: Based on feedback and operational impact, the four features above were designated as high-priority for implementation.

Key requirements were documented, including the need for a real-time communication channel, a structured and AI-guided issue logging process, a clear dashboard with actionable data, and a smart assistant for quick access to operational knowledge. All requirements were verified with stakeholders before moving into the design phase.

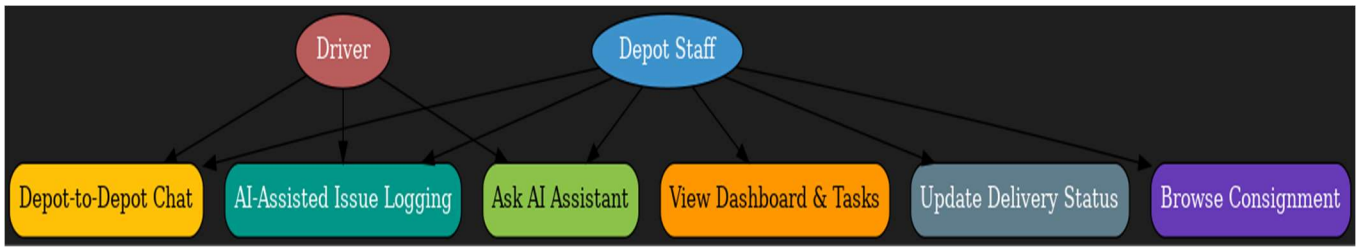
4. System Design

The design phase began with creating **Figma prototypes** for all screens that would undergo changes. This included:

- A redesigned dashboard with a prioritized To-Do list in the center.
- A dedicated chat interface for depot-to-depot communication with image sharing.
- A guided AI-assisted issue reporting flow for drivers.
- An AI assistant widget accessible from any screen.

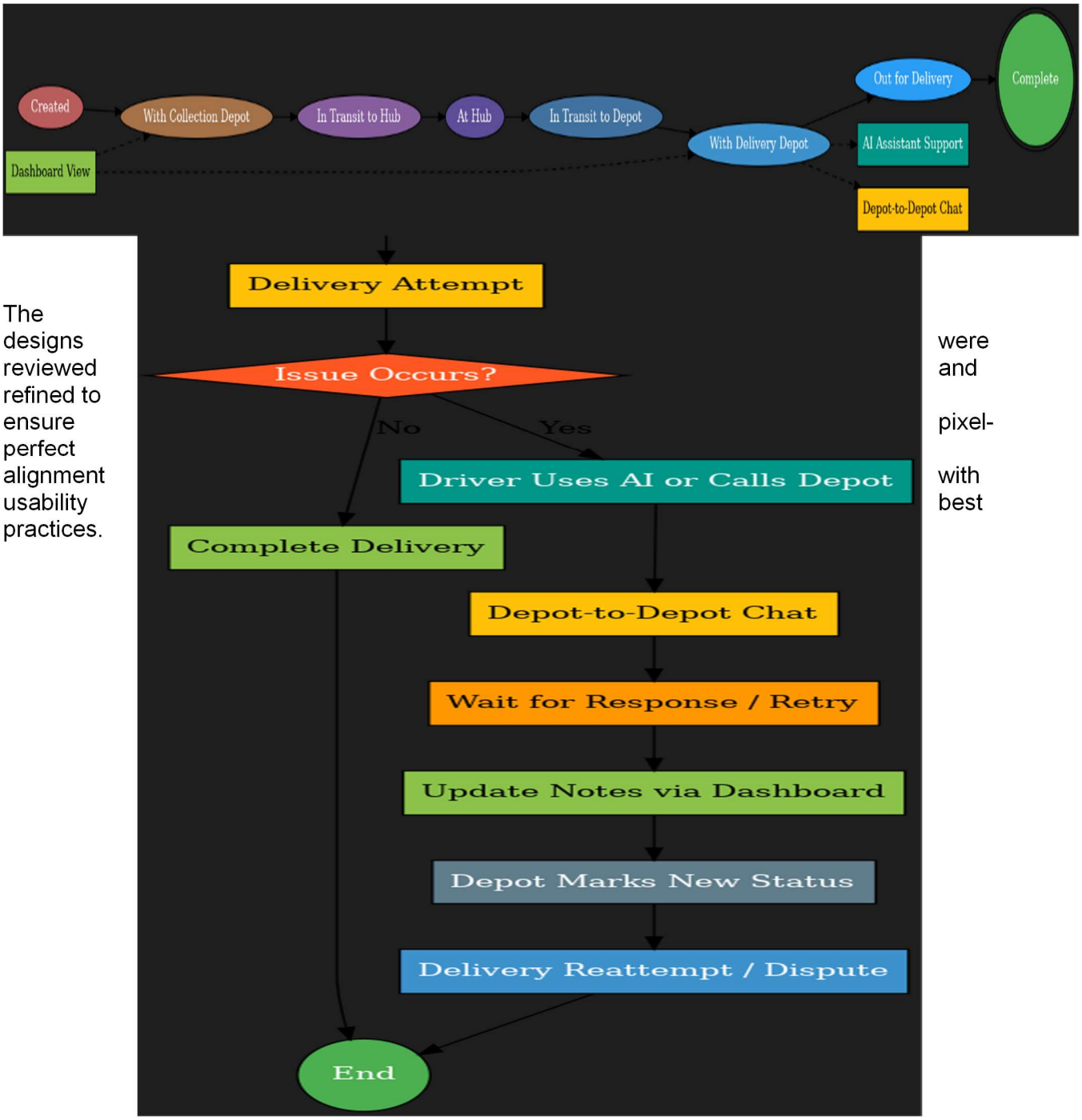
We also produced updated **UML diagrams** to reflect the new workflows:

- **Use Case Diagram** – Updated to show both old and new system features and their interactions with users.



- **Activity Diagram** – Detailed the improved workflows incorporating the new chat, AI reporting, and assistant functionalities.

- **State Chart Diagram** – Modeled the states of consignments and user interactions in the redesigned environment.



The designs were reviewed and refined to ensure pixel-perfect alignment with usability best practices.

5. Implementation Phase

The implementation phase involved converting the Figma designs into a fully functional front end using **mock data** to simulate live system behavior before backend integration.

Feature 1: Instant Depot-to-Depot Communication – Implemented as a thread-based real-time chat for each consignment, including text and image sharing. A mock WebSocket service was used to simulate live message exchange.

Feature 2: AI-Assisted Issue Reporting – Created as a step-by-step guided form that prompted drivers to choose an issue type, attach mandatory images, and add notes. Mock AI suggestions adapted based on the selected category.

Feature 3: Cleaner, Simpler Dashboard – Designed as a card-based layout displaying prioritized To-Do items, key metrics, and quick action buttons, optimized for both desktop and tablet use.

Feature 4: AI Assistant for Questions – Built as a chat-style interface connected to mock API responses, answering operational queries and accessible from anywhere in the system.

All features were developed with reusable components for consistency and responsiveness.

6. Testing Phase

After development, we conducted thorough testing to verify that all requirements had been met and that the new features functioned correctly in practical scenarios. Testing was carried out through **user testing** and **structured functional testing**.

In **user testing**, depot staff and drivers used the redesigned system in a controlled environment with mock data. Feedback confirmed improved navigation speed, faster communication, and greater confidence in task execution.

In **functional testing**, we executed predefined test cases for each feature, verifying outcomes against expected results. All cases passed successfully.

Feature 1: Instant Depot-to-Depot Communication (Chat)

TC ID	Module	Title	Pre-condition	Test Data	Steps	Expected Result	Actual Result	Status

CHAT-001	Depot Chat	Send text message in consignment chat	Logged in as Depot Staff; consignment thread exists	Consignment ID: C-10234; Message: “Please confirm ETA.”	1. Open Consignment C-10234 → Chat tab 2. Type message → Send	Message appears instantly with timestamp and sender	As expected	Pass
CHAT-002	Depot Chat	Receive reply from other depot	Two test users active; same consignment thread	Reply: “ETA 14:30.”	1. Depot B sends reply 2. Depot A views thread	Reply visible within 2s; unread badge clears	As expected	Pass
CHAT-003	Depot Chat	Attach and send photo evidence	Logged in; thread open	JPG ≤2MB	1. Click “Attach” → choose file → Send	Image thumbnail visible; opens preview; upload shown	As expected	Pass
CHAT-004	Depot Chat	Chat history persists per consignment	Thread with ≥5 messages	C-10234	1. Close chat → reopen	Full message history loads chronologically	As expected	Pass
CHAT-005	Depot Chat	Offline send retry	Dev tools simulate offline	Message: “Testing retry.”	1. Type → go offline → send → online	Message retries on reconnect; no duplicate	As expected	Pass

Feature 2: AI-Assisted Issue Reporting

TC ID	Module	Title	Pre-condition	Test Data	Steps	Expected Result	Actual Result	Status
ISSUE-001	Issue Reporting	Log “Customer not at home” with photo	Driver logged in; delivery attempt failed	Type: “Customer not at home”; Photo: door.jpg; Notes: “Gate locked”	1. Open Report Issue → select type 2. Upload photo → add notes → Submit	AI prompts for photo; submission succeeds; visible to depot	As expected	Pass
ISSUE-002	Issue Reporting	Validation blocks incomplete submission	Driver logged in	Type: Requires photo; none uploaded	1. Select type; leave photo empty → Submit	Error “Photo required”; submit blocked	As expected	Pass
ISSUE-003	Issue Reporting	Clarification on vague input	Driver logged in	“problem”	1. Type “problem” → Continue	AI suggests categories; requires selection	As expected	Pass
ISSUE-004	Issue Routing	Auto-route issue to correct depot	Consignment linked to Depot B	C-10234	1. Submit issue on C-10234	Issue appears in Depot B queue/chat	As expected	Pass
ISSUE-005	Issue Reporting	Attach multiple images	Driver logged in	3 JPGs ≤2MB	1. Add 3 images → Submit	All thumbnails visible; order preserved	As expected	Pass

Feature 3: Cleaner, Simpler Dashboard

TC ID	Module	Title	Pre-condition	Test Data	Steps	Expected Result	Actual Result	Status
DASH-001	Dashboard	To-Do list shows highest-priority jobs first	Mock data with priorities	10 jobs mixed	1. Open Dashboard	Sorted Critical → High → Normal; badges visible	As expected	Pass
DASH-002	Dashboard	Quick actions on a To-Do card	Logged in as Depot Staff	Actions: View, Chat, Mark Done	1. Hover card → click actions	Correct screens/actions load; Mark Done removes card	As expected	Pass
DASH-003	Dashboard	Metrics/cards reflect dataset	Known counts in mock	JSON dataset	1. Compare counts to mock	Values match mock	As expected	Pass
DASH-004	Dashboard	To-Do deep links to details	C-IDs present	C-10234	1. Click item → Details	Opens correct consignment view	As expected	Pass
DASH-005	Dashboard	Tablet view layout	Browser 1024×768	—	1. Resize to tablet → reload	Cards reflow correctly; no overlap	As expected	Pass

Feature 4: AI Assistant for Questions

TC ID	Module	Title	Pre-condition	Test Data	Steps	Expected Result	Actual Result	Status

AIA-001	AI Assistant	Pricing query (half pallet)	Logged in; pricing in mock	“What are the prices for a half pallet?”	1. Open Assistant → ask query	Returns correct price	As expected	Pass
AIA-002	AI Assistant	Service rules query	Mock FAQs loaded	“Max weight for full pallet?”	1. Ask question	Returns correct weight	As expected	Pass
AIA-003	AI Assistant	Unknown question fallback	—	“Claim fuel surcharge rebate?”	1. Ask question	Suggests related topics	As expected	Pass
AIA-004	AI Assistant	Open from any screen	Floating button enabled	—	1. Open on Dashboard 2. Open on Consignment View	Loads same widget; retains chat history	As expected	Pass
AIA-005	AI Assistant	Copy answer and paste in chat	Assistant & chat enabled	Copy “half pallet price”	1. Copy → open chat → paste → send	Text pasted intact; chat sends correctly	As expected	Pass

7. Conclusion

The redesigned TPN Connect system successfully addresses the major pain points identified during the requirement gathering phase. By implementing a cleaner dashboard, real-time depot communication, AI-assisted issue reporting, and a built-in AI assistant, the system now enables faster operations, clearer communication, and a more intuitive user experience.

Testing confirmed that all new features perform reliably, integrate seamlessly with existing workflows, and deliver measurable productivity improvements. This project demonstrates how

targeted UX/UI improvements, combined with carefully selected functional enhancements, can significantly improve operational efficiency without the need for a full backend rebuild.