Famor Joshua Martin

Nodado, Alfred

Sato, Hanna

Project Description:

The Tom N Toms Inventory Management System is an all-inclusive solution that is easy to navigate for daily inventory operations at Tom N Toms Coffee. Team TAAL built the system to help manage the list of items and items, sales and items lifted out, and managing purchasing. The goal of the system is to allow staff and managers to prevent stock shortages or excessive stock levels, accurately record transactions and pulls, and to capture all stock movement.

The system encompasses multiple roles, such as managers and cashiers that utilize role access control, viewing detailed itemized sales, mapping items to ingredients, and tracking supplier movement. The system records and tracks in REAL time and states that it should assist in improving productivity, and ultimately creates a complete log of item movements, sales, and purchases for all locations. In using the Tom N Toms Inventory Management System, while it will help create daily operational effectiveness, you can also rely on it to communicate accurate data within departments, while supporting data integrity. The application is designed for food and beverages businesses looking to manage complex Inventory with ease and accuracy.

Requirements Summary:

	MINIMUM REQUIREMENTS	**RECOMMENDED REQUIREMENTS**
Processor Cores	Single Core	Dual Core or higher
Browser	49+, Firefox 45+, or equivalent	Latest version of Chrome, Firefox, Safari, or Edge
RAM	2 GB	4 GB or higher
Operating System	Windows 7, macOS 10.10, or Android 5.0 (Lollipop)	Windows 10+, macOS 11+, or Android 10+
Internet Connection	At least 1 Mbps	Stable connection with 5 Mbps or higher

Table 1. System Requirements

The Tom N Toms Inventory Web Application can run adequately well on a range of devices. It requires, at a minimum, a single-core processor, 2 GB of RAM, and access to a standard web browser (like Chrome or Firefox) on a variation of an operating system like Windows 7, macOS 10.10, or Android 5.0. For optimal performance, we recommend at least a dual-core processor, 4 GB of RAM, access to the most recent version of either Chrome, Firefox, Safari, or Edge on either Windows 10 and Android 10. A stable internet connection, along with basic permissions for local storage and notifications will allow you to use the application as intended.

Prototype Description

For the Tom N Toms Inventory Management System, the preliminary design and interface layout was planned using Figma. Using Figma was selected for its collaborative and interactive prototyping capabilities providing the team a shareable way of designing and sharing the user interface all at once. Although Figma was invaluable during the design process, the team has, more recently, produced a working prototype of the system, which holds the finished user interface and main features illustrated in the Figma designs.

Tom N Track Figma link:

figma.com/design/oLZjPJCU09SGMCfozncKLH/Famor_Nodado_Sato_M2_IT103_Wireframe?node-id=19-92

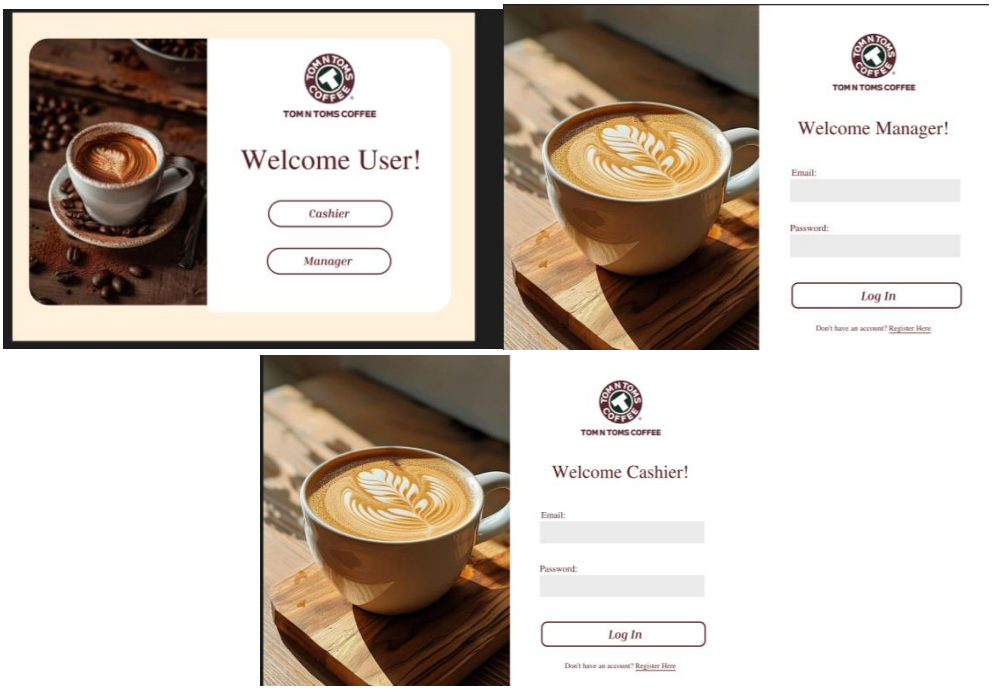
User Scenario:

John and Lisa, staff members at Tom N Toms, have been struggling to manage inventory due to inconsistent tracking and manual recording of pull-outs and stocks, leading to poor timelines for restocking and various ingredient shortages. One day, Lisa's colleague shared the Tom N Toms Inventory Management System with her, so she accessed the system to learn more about it. She learned from the actions of the application, which was to help manage inventory by offering real-time stock updates, low-stock alerting, and a clear view of items and suppliers. She saw it was super useful, so she shared it with John, who then also started to use the system to better help him with his daily inventory tasks.

Tom n Tracks Mockup/Prototype:

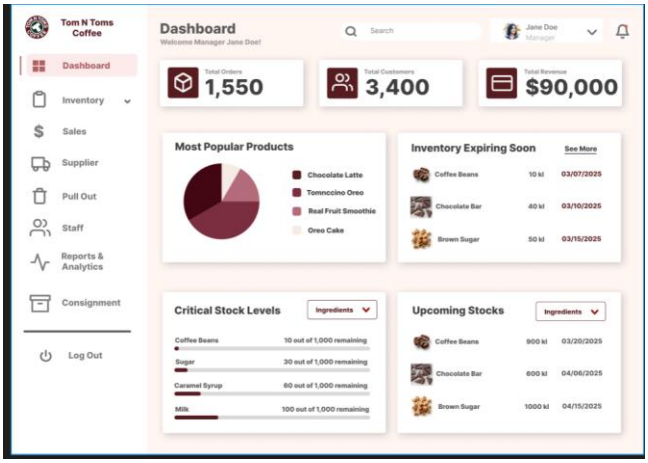
Login Page

This part is where the users can log in, they can either choose between a cashier or a manager. The user can either log in as a manager or a cashier.



Report Dashboard

They can see summarized reports here with graphs and other notifications such as low stocks alert and upcoming stocks.

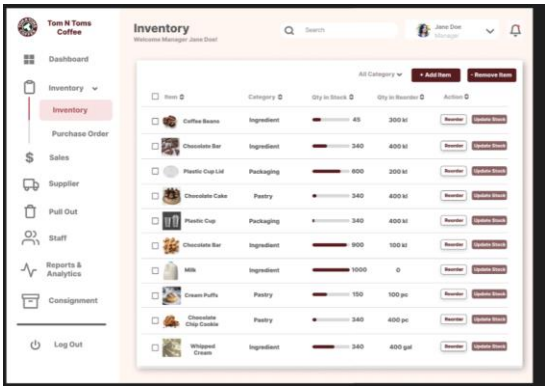


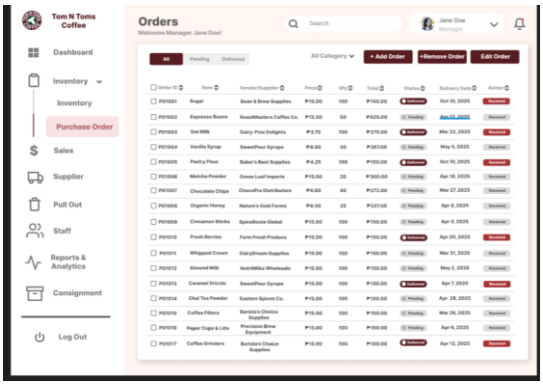
Inventory page

This page is dedicated as a inventory master list where they can see all the stocks and their status.

Purchase Order

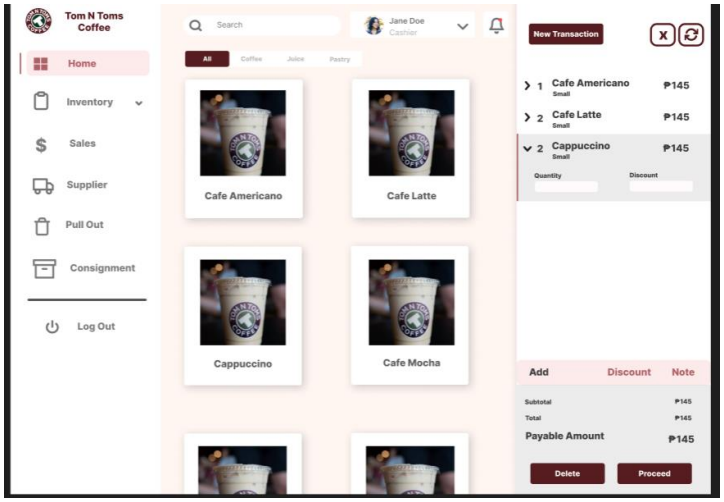
This is where the appended stocks are seen. All the items that need purchasing (low stocks alert) will be forwarded here.





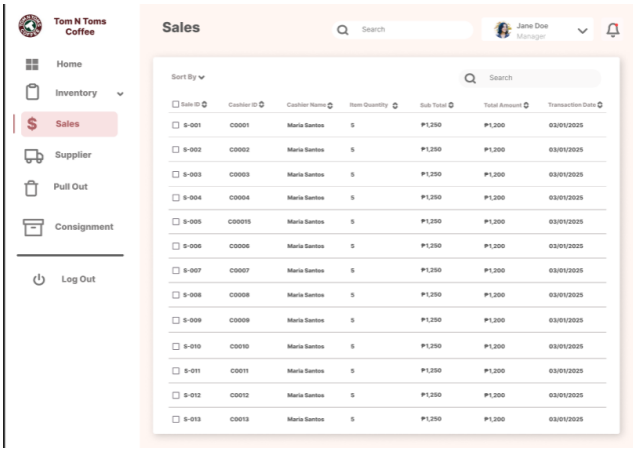
Point of sales

This page will be used to take orders, at the same time keep track of the sales and the ingredients being used.



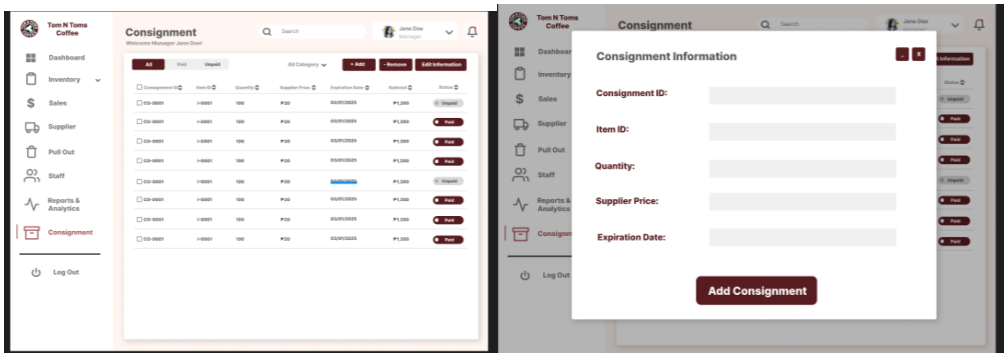
Sales page

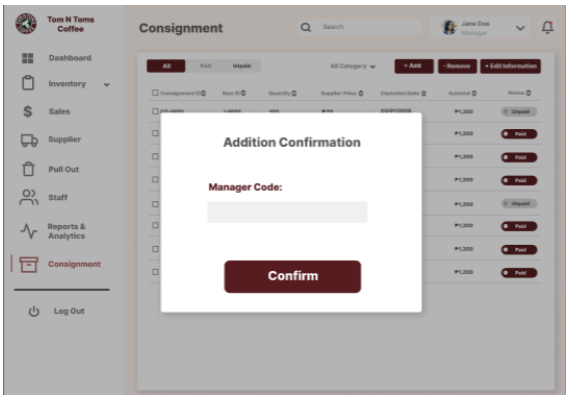
This page will keep a history of transactions (items sold).



Consignment

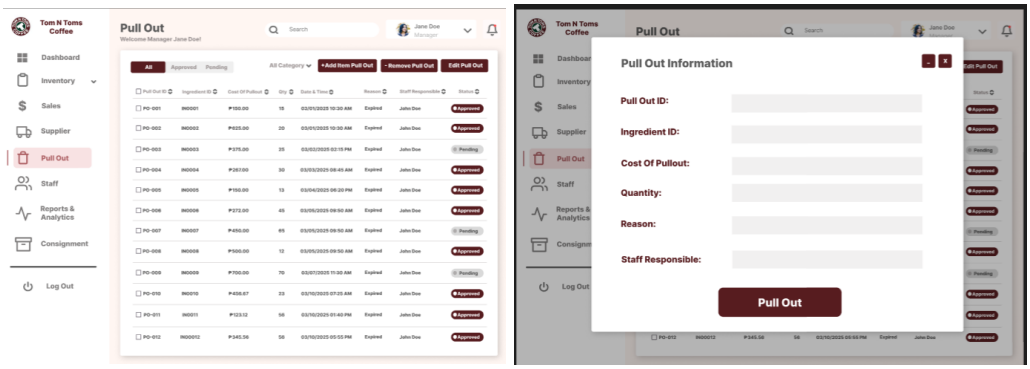
This page is given the option to keep track of consignments depending on the agreement with the suppliers.





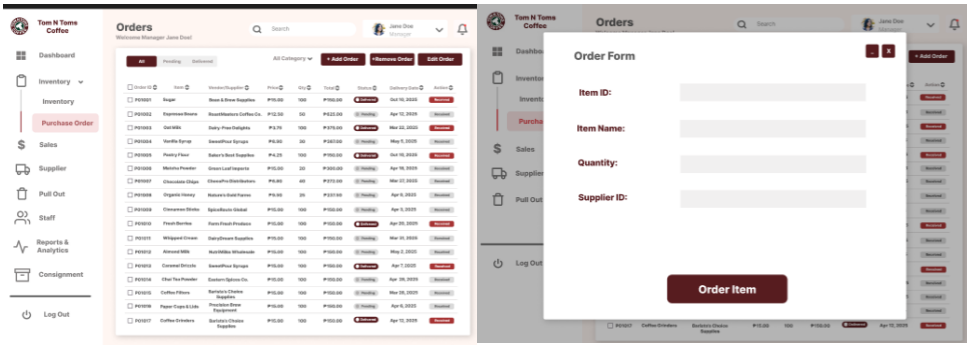
Pull out Page

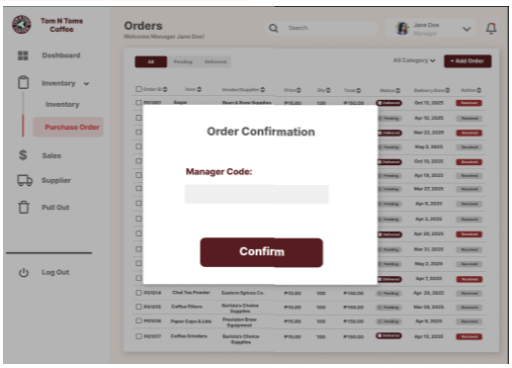
This page will display the appended items that need to be pullout.



Purchase Order Page

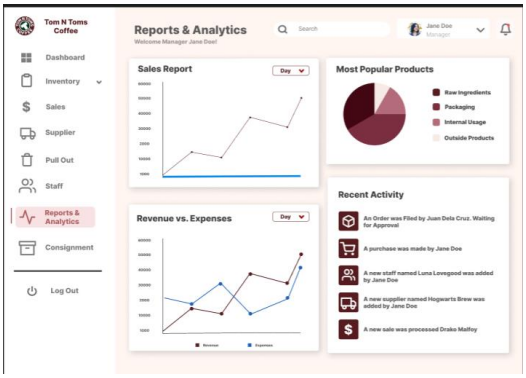
This page will display the the items that are in need of a PO (purhcase order).





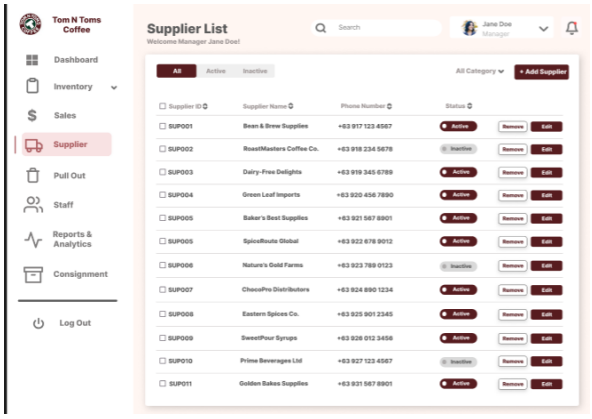
Reports and Analytics

Visual graphs and activity audit is seen here.



Suppliers Page

Contact details and status of the suppliers are also keep in record in this page



Prototype Flow:

Figure 1: Login Module

The flow is initiated at the Welcome User screen where users will choose if they want to register as either a manager or cashier. If they have already created an account, they will be taken to the login page for the user's respective role. However, if they haven't registered for an account yet, they will be able to click the registration option which will take them to the Registration screen. After registering, the user will be taken back to the role selection screen where they will do the same and log in. The design of the flow ensures a seamless help in onboarding an end user by having an action based on whether they have or have not registered.

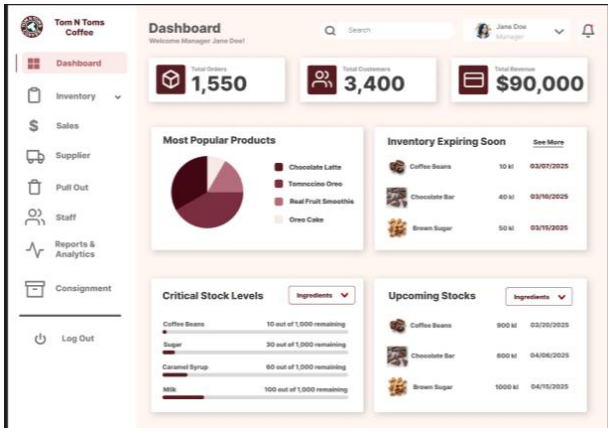


Figure 2: Manger View

All-important pages are accessible from the left sidebar in the Tom N Toms Inventory Dashboard. In this menu, there are links from Inventory, Sales, Supplier, Pull Out, Staff, Reports & Analytics, to Consignment. The layout is easy to navigate so that users can quickly move between different modules and complete tasks efficiently with a few clicks.

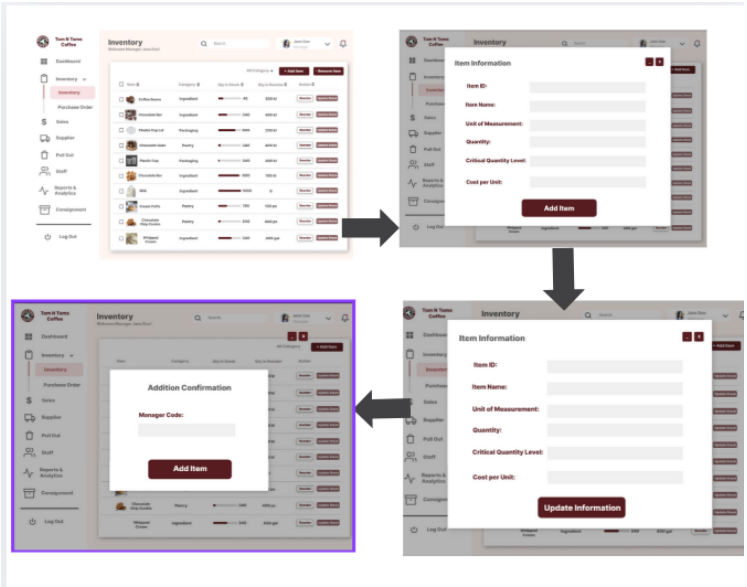


Figure 3: Inventory Module

This is an illustration of the flow of the Inventory Management module. They will have access to a view of the whole inventory and can add, modify or delete items as needed. Once again, to maintain security and proper access, every change (adding a new item, updating a currently existing item, etc.) requires a manager code to be entered. This way, critical inventory data is only modified by manager authorized data, enhancing control and accountability with the module.

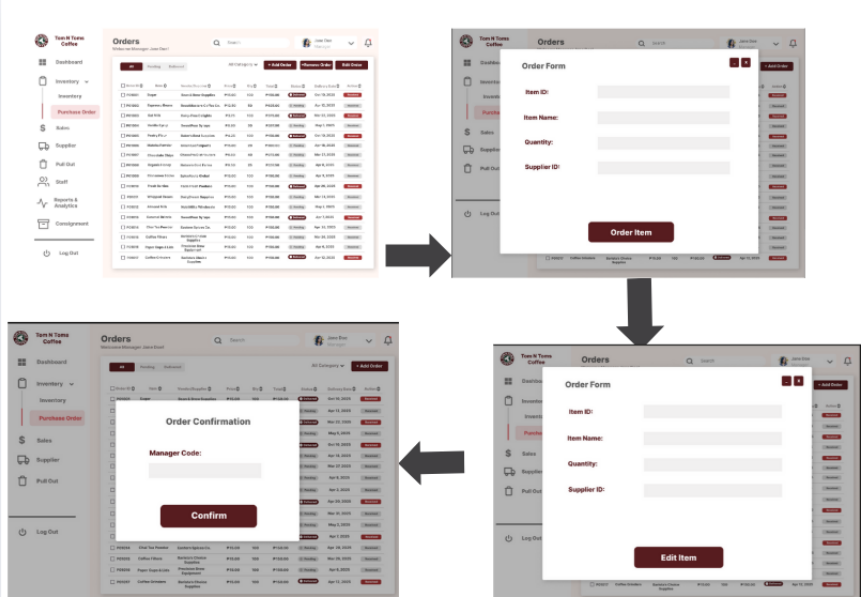


Figure 4: Purchase Order Module

Shown in figure 4 is a representation of the Purchase Order functionality in the system. Certain items will automatically have details populated in this area as a result of the sales performed. The user can also edit existing purchases and/or add new orders if they need to. The process will involve completing an order form with details of the item, quantity, and then confirming the manager code for the purchase order to verify that it is a valid request from the manager. This allows for automatically replenishing stock inventory, along with equally allowing the employee to also complete purchases in the system and the company manager to maintain control and approval over stock purchasing.

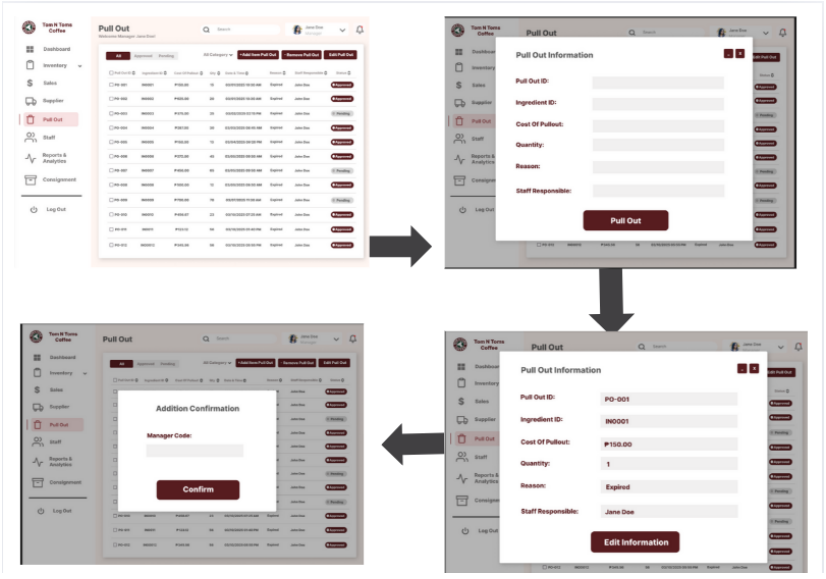


Figure 5: Pull out Module

Figure 5 shows the Pull Out flow which is focused on sales. When something is sold, the system automatically tracks the ingredient used. However, in some cases there are reasons such as expired, damaged, or wasted items that will require a manual pull-out. In these cases, users simply fill out the pull-out form with the ingredient ID, quantity, and reason, and in order to confirm the action, the user must provide a manager code. Users may also edit a pull-out entry if a user requires an update. This process ensures that the reduction of inventory is accurate, traceable, and correlates with actual sales and operational losses.

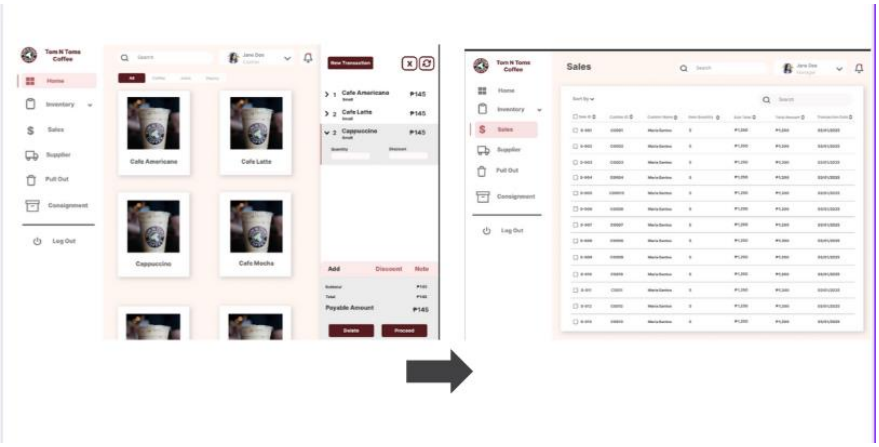


Figure 6: Sales and Cashier Module

Figure 6 above illustrates the Sales/Cashier Module of the internal system. The left side contains the POS (Point of Sales) interface. This is where cashiers select the products purchased, apply discounts, and charge the customer. The right side contains the Sales History page with all transactions from the previous 12 months. Each transaction displays a detailed list of the items, total charge, and date/time. Staff can track, manage and record sales in real time via the sales module while keeping accurate records for recordkeeping and reporting.

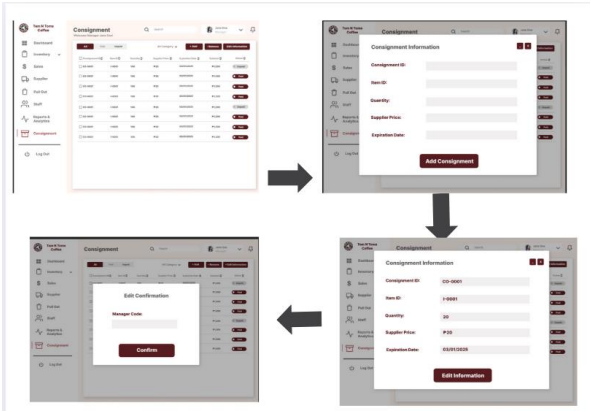


Figure 7: Consignment Module

Figure 7 is of the Consignment Module where expired items or those which are flagged for review are automatically placed. All consignment information will show complete details about the Item ID, Quantity, Supplier Price, Expiry Date, as well as Supplier Information. Users can proceed to add or make changes to the consigned items as needed. The same as other modules, editing the information in the consigned items section will require the manager code to ensure the integrity of any said data and to limit the security risks of dealing with suppliers.

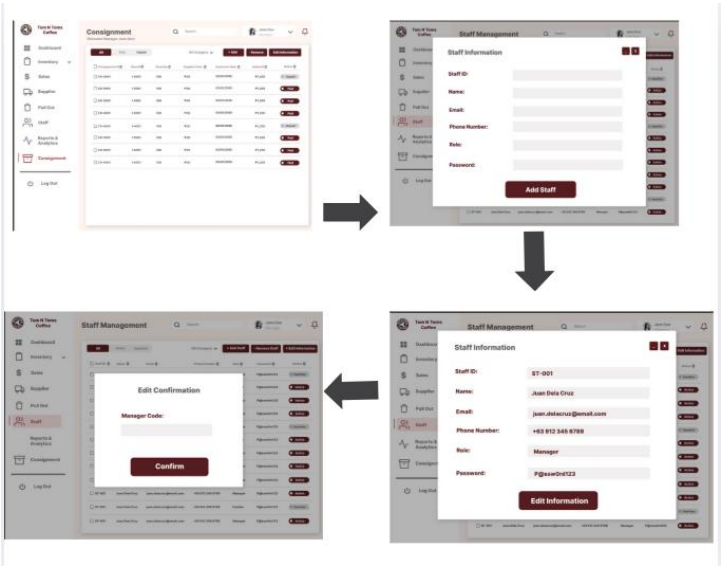


Figure 8: Staff Module

Figure 8 shows the Staff Management Module of the system. This feature allows administrators to manage staff records by adding new staff or editing existing staff detail such as name, email, phone number, role (Manager or Cashier), and password. A manager code must be entered to approve any changes to safeguard data when any record is modified (e.g., editing staff). This module maintains organized data on staff and ensures that only authorized users are able to perform touchy operations.

Rationale:

The team leveraged Figma to develop a fully usable prototype of the Tom N Toms Inventory Management System, using its collaborative and interactive capacities. While Figma was an important part of the design team process, the team did build a fully usable and functional prototype of the system. This functional prototype has the finalized interface and core features that were originally presented in the Figma design, but allows users to engage with and tests actual functionality.

Changes to the Requirements:

Although the system requirements to develop the Tom N Toms Inventory Management System remained the same, the usability evaluation criteria were adjusted slightly to be more realistic in terms of usability in practice. While the authors were still evaluating the system against usability standards, they decided to shift focus to the efficiency and intuitiveness of the system whilst staff are simply using it every day. In keeping with supporting principles rooted in the 10 Usability Heuristics, the developer team began to focus on simplicity, clarity, consistency and control. One of the features that limited the change to evaluative criteria was features such as online-sync that the team were aware was not a feasible target to build towards based on the very short timeline for intended use. Overall, the developers wanted to achieve an intuitive and learning system that operated simply for all users regardless of whether they had technical experience or not.

Initial Evaluation Plan:

Considering the practical aspect of the Tom N Toms Inventory Management System, the team conducted an on-site evaluation to view meaningful interaction with the working prototype in real time. During the site visit, actual staff were asked to test the system and perform relevant tasks such as logging in, inventory management, sales processing, and pull-outs with the system. The field evaluation provided immediate feedback based on authentic user experience in the real working environment. The field evaluation was conducted in three parts: Usability Specifications, Heuristic Evaluation, and Participant Survey and Feedback. This evaluation covered technical aspects of the system's functionality, product design aspects, and user satisfaction aspects.

Usability Specifications

The Tom N Toms Inventory Management System has many usability intentions established to ensure that end users—primarily, store staff and managers—are well catered for and that their needs are satisfactorily met. The next section will present the details of the specified intentions that encompassed the development and evaluation of the system:

Effectiveness - Assesses how well and how accurately users can perform tasks such as adding inventory, processing sales or pulling items.

Efficiency - Measures how quickly and the degree of ease that users can perform day-to-day operations in the system.

Utility - Refers to whether the system provides all options and operations the user needs to accomplish tasks related to inventory/sales/staff management.

Learnability - Describes how well first-time users understand the system and are able to use it, with minor to no training.

Memorability - Involves how well users can remember how to use the system, after not using it for a time period, and not having to relearn the steps.

User Testing Population

Overall, 10 baristas and 1 manager participated in user testing for the Tom N Toms Inventory Management System. The participants were asked to perform key tasks that represent the core functionalities of the system to determine the usability of the different tasks involved in using the system. The required tasks were key actions which involved the daily and managerial work of the organization including logging in, making sales through the POS, pulling out expired items, entering inventory items, and checking out suppliers. These testing conditions effectively represented the daily operations of staff and management.

Prototype Tasks

Tasks identified were logically grouped according to the key functionalities of Tom N Toms Inventory Management System.

• Main Navigation Tasks

Start and log on

Move between main modules (Inventory, Sales, Pull Out, Staff, Purchase and Consignment)

• Inventory Management Tasks

Add an inventory item

Edit details for an existing entry

Delete an inventory item (manager code confirmation)

Filter search for specific items

• Sales & Pull Out Tasks

Complete a sale transaction using the POS module

View transaction history

Do a manual pull-out and indicate reason

See reviewed lower stock or expired items

The tasks were selected to evaluate if the system would provide simple navigation and intuitive usage of features, and full CRUD capabilities for inventory and sales management.

Roles

Team Member/Developer	**Task**
Famor Joshua	Will document the time each participant spends interacting with the specific task section, gain insight to their overall experience, and provide detailed instructions specific to each task they participate to complete. Notes will be taken of ease of use, navigation actions, and barriers that were identified throughout overall process. The notes taken will inform both efficiency and user satisfaction for the key functions identified in the system.
Nodado Alfred	Will document the time each participant spends interacting with the specific task section, gain insight to their overall experience, and provide detailed instructions specific to each task they participate to complete. Notes will be taken of ease of use, navigation actions, and barriers that were identified throughout overall process. The notes taken will inform both efficiency and user satisfaction for the key functions identified in the system.
Sato Hanna	Will document the time each participant spends interacting with the specific task section, gain insight to their overall experience, and provide detailed instructions specific to each task they participate to complete. Notes will be taken of ease of use, navigation actions, and barriers that were identified throughout overall process. The notes taken will inform both efficiency and user satisfaction for the key functions identified in the system.

Table 2. Team Member Task

Task Section	Time Benchmark	Acceptability	Result
Main Navigation	Within 1 minute or below	Highly Acceptable	Successful
	Above 1 minute	Not Acceptable	Unsuccessful
Inventory Tasks	Within 5 minutes or below	Highly Acceptable	Successful
	Above 5 minutes	Not Acceptable	Unsuccessful
Sales & Pull Out	Within 5 minutes or below	Highly Acceptable	Successful
	Above 5 minutes	Not Acceptable	Unsuccessful

Table 3. Time Interpretation

Heuristic Evaluation

The evaluation of the Tom N Toms Inventory Management System follows Jakob Nielsen's 10 Usability Heuristics, ensuring a user-centered design approach during prototype testing and refinement:

- Visibility of System Status
  The system keeps users informed through real-time updates such as confirmation prompts, loading indicators, and alerts for actions like successful logins, low-stock warnings, and completed transactions.
- Match Between System and the Real World
  The interface uses familiar terms and logical flow that align with the day-to-day tasks of baristas and managers (e.g., "Pull Out," "Order Item," "Inventory"). The structure reflects real-world inventory and sales processes to reduce confusion.
- User Control and Freedom
  Users are able to cancel actions or go back from unwanted states easily. Dialog boxes include clear exit or cancel options, allowing staff to recover from mistakes without unnecessary steps.

- Consistency and Standards
  Terminologies, icons, and interface behaviors remain consistent across all modules—ensuring that buttons, labels, and processes behave as expected throughout the system.
- Error Prevention
  Before submitting critical actions (e.g., adding inventory, confirming orders), the system prompts for manager code verification. This prevents accidental or unauthorized changes.
- Recognition Rather than Recall

  Key options and information (i.e. item names, quantity, attribute category) are either always visible, or selectable from dropdowns. Users do not have to remember codes and manual steps.
- Flexibility and Efficiency of Use

  This system accommodates new users using this interface but also allows experienced staff to have access to quick tools and filters for efficiency (e.g. sorting orders; searching inventory).
- Aesthetic and Minimalist Design

  The interface is nice and clean, focused and streamlined. Each page presented only the tools necessary for the current task. This focused tools helps clarity and user focus.
- Help Users Recognize, Diagnose, and Recover from Errors

  For example, the system includes clear plain-language messages when a user misses inputs or if the a code is incorrect and includes suggestions for why/what to try.
- Help and Documentation

  Although the system can be self-explanatory, each form or action contains embedded guidance nuancing everything to tell staff what is needed or required for each task.

Participant Survey and Feedback

After conducting the on-site user testing, the team gathered feedback from participants using two primary methods:

DATA GATHERING METHOD	**DESCRIPTION**
Survey (Quantitative)	After testing, a survey was distributed to baristas and the manager to collect ratings on their experience with the

	system. Responses were measured using a 5-point Likert scale (see Table 5).
Feedback (Qualitative)	The survey included a feedback section where participants could share additional comments, issues, or suggestions related to the system's functionality and usability.

Table 4. Data Gathering Methods

The table above presents the data gathering methods used during the evaluation of the Tom N Toms Inventory System.

The following survey was administered to participants after they tested the system:

Question	**Method of Answer**
Participant Number	Short Answer
On a scale of 1 to 5, how would you rate your experience with the system?	5-Point Scale
On a scale of 1 to 5, how was the user interface design of the system?	5-Point Scale
How easily were you able to follow the tasks provided?	5-Point Scale
Inventory Navigation	5-Point Scale
Processing Sales	5-Point Scale
Pulling Out Items	5-Point Scale
Adding and Editing Inventory	5-Point Scale
Managing Staff Records	5-Point Scale
Viewing Reports or Analytics	5-Point Scale
Supplier or Consignment Access	5-Point Scale
Your Feedback	Short Answer

Table 5. Survey Questionnaire

The table above presents the Questions that will be present in the survey for this Prototype

Scale	Range Value	Interpretation	Classification
5	4.50 - 5.00	Highly Acceptable	Successful
4	3.50 - 4.49	Acceptable	
3	2.50 - 3.49	Moderately Acceptable	Neutral
2	1.50 - 2.49	Fairly Acceptable	Unsuccessful
1	1.00 - 1.49	Not Acceptable	

Table 6. 5-Point Likert Scale Survey Interpretation

Table 5 displays the interpretation of survey responses that were gathered during testing. It will help to determine if the Tom N Toms Inventory System's features and design were considered by the users successful, satisfactory, or needing improvement based on your experience.