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.

Overview

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.

Technique	Description
Usability Specifications	Usability Specifications were applied to evaluate how intuitive and effective the Tom N Toms Inventory System is for actual store operations. Baristas and a manager were assigned specific tasks such as navigating modules, processing sales, and updating inventory. The team observed how quickly and accurately users completed each task. This helped identify usability challenges and determine how user-friendly the system is in a real-world café setting.
Heuristics Evaluation	Heuristics Evaluation was used to assess the system's interface and interaction design based on widely accepted usability principles. This method provided a structured and efficient way to identify design flaws and areas for improvement, ensuring the system meets industry standards even when time and resources are limited.

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.

Method of conducting test

On site testing

Data Presentation

Data Analysis

While conducting the on-site testing of the Tom N Toms Inventory Management System, the team saw that users interacted confidently and fluently with the prototype. Most baristas and the manager were able to complete the assigned tasks with little direction or problem. As the testing proceeded, users became even more accustomed to the overall flow and navigation of the system, with strong recall and little difficulty.

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. Task Time

Table 3: Task Time demonstrates the performance benchmarks for evaluating user engagement with specific modules of the Tom N Toms Inventory System. The three (3) task sections: Main Navigation, Inventory Tasks, and Sales & Pull Out, were assessed for all participants' completion times. The tasks completed in within the prescriptive time benchmarks were deemed very acceptable. All completed tasks were marked successful: indicating high usability. Tasks that exceeded the time benchmarks were deemed not acceptable and thus unsuccessful. Unsuccessful tasks indicate areas for possible interface or process improvement. The team was able to measure the efficiency of the system and user confidence of completing the system in real-world scenarios.

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 tool 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 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.

Heuristic Evaluation

The Tom N Toms Inventory Management System was examined using Jakob Nielsen's 10 Usability Heuristics to evaluate the overall user experience. The evaluators found that the system had strong alignment with user-centered design best practices in testing, although a couple of areas merit further improvement:

- Match Between System and the Real World

The interface employs language and processes common to their workflow for real café operations. Features like "Pull Out" and "Add Item," and "Order," are in line with what the staff would naturally use in the course of their duties, which reduces cognitive overload.

- User Control and Freedom

Users can easily undo or cancel the action with the available buttons such as "Cancel" or "Back". This information supports staff to reevaluate mistakes that may be unintentional or through unintended clicks, re-establishing their focus on their workflow.

- Consistency and Standards

The terminology, visual layout and position of controls have remained consistent across the suite of modules through various interactions. However, it was noted that minor inconsistencies in the positioning of buttons will be adjusted in future iterations.

- Error Prevention

Submission of all critical functions requires manager code, which has supported cognizance of intentional logging. Although effective, small oversights in the UI were outlined and should be addressed to avoid form field errors.

- Recognition Rather Than Recall

Most features supporting useful recognition through dropdowns, labels or autofilled data helps the user speedily traverse the interface and minimizes cognitive load between stages, especially beginner users.

- Flexibility and Efficiency of Use

The system supports novice and experienced users, who can benefit from searching, filtering, and quick-access tools to expedite task completion.

- Aesthetic and Minimalist Design

The system is clean and modern in design, and provides only relevant tools and information on the page, which helps with usability by improving focus and limit distractions.

- Help Users Recognize, Diagnose, and Recover from Errors

The system highlights invalid actions that are attempted (e.g., missing input, or invalid code), but it is possible to include additional ways to provide plain language prompts to help users or indicate corrective actions.

- Help and Documentation

There is a basic level of guidance built into each form to identify what is being requested. During sessions when usability testing was performed there were team members to provide extra assistance and support that can be built in to help feature later.

Heuristics Conclusion

The prototype, in summary, is well aligned against the 10 usability heuristics. The system was effective in implementing the majority of work. Some fine tuning; especially related to the system's error recovery and consistent UI will improve the experience for the user in the next version.

SECTION 1: General Experience

Question	Mean	Interpretation	Classification
On a scale of 1 to 5, how would you rate your experience with the system?	4.55	Highly Acceptable	Successful
On a scale of 1 to 5, how was the UI design of the system?	4.60	Highly Acceptable	Successful

How easily were you able to follow the tasks provided?	4.50	Highly Acceptable	Successful

SECTION 2: Feature-Specific Feedback

Feature	Mean	Interpretation	Classification
Inventory Navigation	4.55	Highly Acceptable	Successful
Processing Sales	4.60	Highly Acceptable	Successful
Pulling Out Items	4.52	Highly Acceptable	Successful
Ordering Inventory	4.82	Highly Acceptable	Successful
Adding or Editing Inventory	4.75	Highly Acceptable	Successful
Managing Staff	4.64	Highly Acceptable	Successful
Accessing Reports	4.64	Highly Acceptable	Successful
Viewing Consignments	4.50	Highly Acceptable	Successful
Sorting Inventory	4.55	Highly Acceptable	Successful
Deleting Inventory Records	4.60	Highly Acceptable	Successful

Average Score: 4.61 – Highly Acceptable and Successful

Table 4. Results table

Table 4 shows the results from the Tom N Toms Inventory Management System indicate a very positive end-user experience across the areas of inquiry. Each of the review components received scores in the Highly Acceptable range, suggesting that participants found the system efficient, easy-to-use, and appropriately designed. Participants rated the core functionalities of inventory management, transaction processing, and employee handling most positively. The system averaged 4.61 overall, indicating that the system meets expectations and functions very well in a practical café environment.

Feedback and Design Implications

The Tom N Toms Inventory Management System elicited very positive feedback from participants, with users commenting on the functionality of the system, the design of the system, and ease of use as satisfactory. Most users stated that they felt the interface was intuitive and efficient for completing their daily inventory and sales transactions, they enjoyed using the system overall, and they were looking forward to using it in a store context.

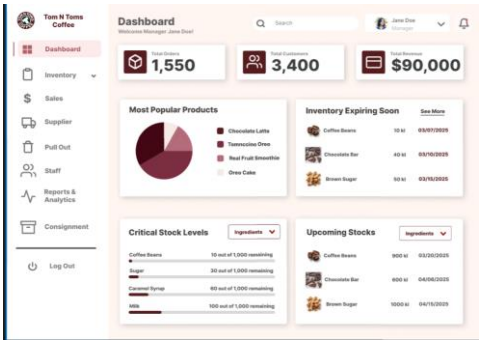
Design Considerations:

Does the system need modifications based on the responses, or was it fully successful?

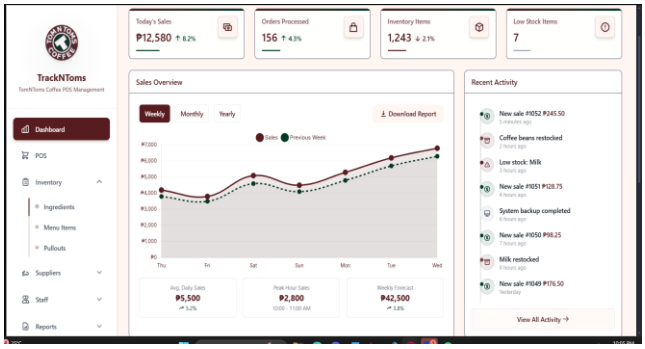
The system was viewed in a fully successful light, with users navigating tasks effortlessly and recognizing the flow of the system with little effort. Users had overwhelmingly positive feedback but we were open to refining aspects of the design based on their feedback.

What improvements were made to rectify the shortcomings?

The team, in order to maximize the usefulness of the system, implement additional functionality based on AI components in the predictive analytics space. This would provide the system with the ability to not only forecast inventories, but also provide suggested actions based on data-driven recommendations allowing managers to decide a proactive inventory level and assist in their decision-making.



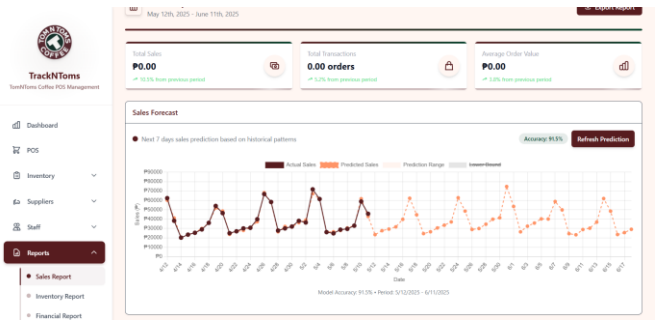
Before Altercation



After Altercation

The reworked Tom N Toms Inventory System dashboard rates much higher in terms of design and functionality in comparison to the original dashboard. With the original dashboard, the entire layout focused on holding static information like general totals for orders, customers, and revenue, plus some basic but critical stock levels and future inventory. After the reconstruction of the inventory dashboard and functionality, the client now has an inventory dashboard that has more dynamic visual components based on data. Now, the dashboard has a sales graph for tracking weekly, monthly, and yearly trends, clearer KPI boxes (such as sales today, low stock items), and a recent activity section so that the client can see how the system was used

in real-time. This redesign makes the inventory system much more informative, data-driven, and user-friendly for the client to monitor from day-to-day.

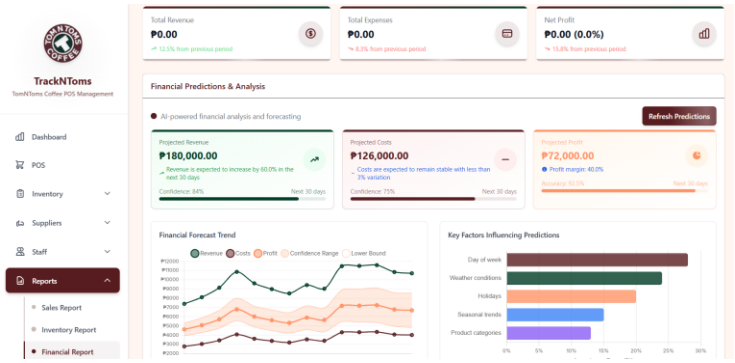


Before Altercation **After Altercation**

The redesigned Reports & Analytics module of the Tom N Toms Inventory System now embraces a more intelligent and data-driven UI. The previous incarnation of the module consisted of basic visualizations of sales reports, revenue/expenses, most popular products, and a feed of recent activities. After the redesign, the module now has an AI driven sales forecast that provides predictive analysis of historical sales trends which expands the insights available and managers' decision making by anticipating demand in advance, along with visuals on accuracy ratings and a few forecasting aids.

Did you discover any major flaws that would suggest a completely different type of design?

There were no major identified flaws to recommend a full-on redesign for the Tom N Toms Inventory Management System. The overall structure and layout were satisfactory and well received by users. The only significant change is the inclusion of AI components for predictive analysis. AI components were added after the system was conceptualized in order to inform better decision making and provide smarter forecasting, as these components did not drastically alter the main design of the system.



This is a new page added to the web app with Ai predictive analysis for financial reports.

Critique and Summary

What were the advantages and disadvantages of your evaluation?

- The evaluation of Tom N Toms Inventory Management System had numerous benefits. Most significantly, it enabled the team to acquire important performance data and user feedback that confirmed the system was working appropriately. By conducting the evaluation at the site, it was easier to observe in-the-moment interactions and gain some immediacy with the staff, especially the baristas and the manager. One limitation was the availability of testing timelines, as staff were balancing their work responsibilities with the evaluation. Another limitation was that although the system was tested in a real context, there were time constraints with which to simulate more complex scenarios or extended-use scenarios that likely would have led to more information.

What would you have done differently knowing what you know now (both designwise and evaluation-wise)? Given more resources, what could you have done that would have produced significantly more insightful evaluation results (again, whether this is an improved prototype or a different evaluation path).

- If the team had had more time and resources, they would have conducted two separate rounds of evaluation—one on the original prototype and one on the modified prototype. This would have generated more feedback and stronger feedback at different levels of development. Furthermore, the team would have added more advanced functions to the system even earlier, such as notifications, access online, and a stronger real-time database link. Given more resources, the team would have put time and money into full back-end development and turned the system into a web-based or POS-ready application.

Summary of the Project

The evaluation provided the team with an understanding of the positives as well as some negatives of the system. Benchmark tasks related to updating inventories, processing sales, and tracking pull-outs were valuable in determining the ability of users to engage initially with the system. Some of the positives included: the value provided by the CRUD, a clear navigation approach, and effective role-based access control, while the negatives mentioned were: the ability to edit inventory examples and minor, superficial navigation differences. Although the team did not attempt to implement an online feature at first, they were able to add AI-generated predictive analysis in the final iterations, which added value to the total area of the system.

The objective of this project was to show that designing a working inventory system requires consideration of technical aspects, as well as a clear understanding of what users need. It also exemplified how well a group of first-time users could adapt with little training to what they were being asked to do. All in all, it was the teams' final understanding that the prototype was adequate and worked effectively, and the final system is a successful solution, that fits the operational needs of a real-life coffee shop environment.