

Reflective Report: (LCLM5004 LON) Systems Improvement
TESCO

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1. Introduction

1.1 Overview of the Business Scenario

Tesco is one of the largest supermarket chains in the United Kingdom, operating hundreds of stores of varying formats including superstores, express stores and distribution centres. The company manages a high volume of perishable goods such as fresh produce, bakery items and chilled products, which require efficient handling and accurate stock control. Waste management plays a critical role in maintaining product quality, operational efficiency and cost control. Despite investments in digital tools, Tesco continues to face challenges in minimising food waste due to complex supply chains, fluctuating customer demand and manual processes within stores. These factors highlight the need for a more effective and technology-driven waste management system.

1.2 Key Operational Challenges

Tesco faces several operational challenges related to waste management. Current processes rely on manual checks of expiry dates and visual assessments of product quality, which increase the risk of inconsistent decision-making and delayed removal of unsellable items. Fragmented systems for tracking stock movement and recording waste contribute to inaccuracies in reporting and reduce visibility across departments. Staff often record waste using handheld devices or spreadsheets, but these tools are not fully integrated with central inventory management systems, leading to discrepancies between recorded and actual stock levels. Furthermore, insufficient forecasting tools make it difficult to align stock orders with varying customer demand, resulting in overstocking or early spoilage. Collectively, these issues lead to avoidable waste, increased costs and inefficiencies in store operations.

2. Evaluation of Existing Systems

2.1 Current Information Systems in Use

Tesco currently uses a mixture of centralised inventory systems, handheld scanning devices and store-level processes to manage waste and stock rotation. The primary platform used across stores is a digital inventory management system that tracks stock levels, product movement and sales data. Staff use handheld terminals to record reductions, markdowns and waste items, which are then synchronised with the central system. Expiry-date checks are carried out manually, with staff scanning items to verify remaining shelf life. Store dashboards provide limited insights into waste patterns, but these reports are not always updated in real time and vary in accuracy depending on the quality of manual input.

Although these systems provide basic functionality, they do not offer integrated forecasting, automated expiry tracking or predictive analytics. Each store operates its own routine for waste checks, leading to variation in process efficiency. Furthermore, communication between departments such as fresh produce, bakery and chilled relies heavily on manual coordination, without a unified digital tool to support proactive waste reduction or stock redistribution between stores. As a result, the current system functions adequately for stock recording but lacks advanced capabilities for strategic waste management.

2.2 Identified Inefficiencies and System Gaps

Several inefficiencies are evident in Tesco's existing waste management processes. First, the reliance on manual expiry-date checks increases the likelihood of human error. Products may be missed during checks or incorrectly categorised, leading to unnecessary waste or items being left on shelves beyond their optimal quality period. Second, the lack of full integration between handheld scanners and central systems limits real-time visibility. Discrepancies between recorded waste and actual stock levels occur frequently, affecting ordering decisions and stock accuracy.

Third, Tesco's current tools do not incorporate predictive analytics to forecast demand based on factors such as seasonality, historical sales patterns or local events. Without these insights, stores often overorder perishable items, resulting in higher waste volumes. Fourth, waste data is not presented in a consolidated format that supports strategic decision-making. Managers must interpret multiple fragmented reports, making it difficult to identify trends, measure performance or implement targeted interventions.

Finally, the absence of automated expiry tracking means that staff must manually scan items to confirm dates, which is time-consuming during peak trading hours. This increases operational workload and prevents staff from focusing on tasks that add greater value. Collectively, these gaps demonstrate the need for a more advanced and integrated waste management system capable of improving accuracy, reducing waste and supporting data-driven decision-making across Tesco stores.

3. Recommended Solution

3.1 Proposed Information System

The recommended solution is the implementation of an **AI-enabled Freshness and Waste Management System (F-WMS)** designed to automate expiry tracking, improve stock rotation and optimise ordering decisions. This system integrates advanced barcode scanning, centralised inventory data, predictive analytics and real-time monitoring to provide a unified platform for waste reduction. The F-WMS would operate as a cloud-based extension of Tesco's existing inventory infrastructure, ensuring compatibility across all store formats.

Key features include automated expiry-date recognition using machine vision or enhanced barcode scanning, predictive demand forecasting models, dynamic stock rotation alerts and real-time dashboards for store and regional managers. The system would also include a redistribution module that identifies stores with surplus stock and recommends transfers to locations with higher demand. By combining inventory records with sales trends and environmental data, the F-WMS enables more accurate decision-making and minimises avoidable waste.

3.2 Rationale for the Recommendation

The F-WMS directly addresses the core inefficiencies in Tesco's current waste management approach. Automating expiry tracking significantly reduces the reliance on manual processes, limiting errors and ensuring product freshness is maintained. The centralised and fully integrated system eliminates discrepancies between handheld records and store databases, providing a consistent, real-time view of stock quality across departments.

Predictive analytics models improve demand forecasting, reducing overordering and enabling stores to plan stock levels more accurately. This capability is essential for perishable categories where demand fluctuates daily. Furthermore, providing staff with automated rotation alerts improves the consistency of stock checks, supporting operational efficiency during peak periods.

The redistribution function enhances Tesco's ability to reduce waste across its wider network. Instead of discarding surplus stock, the system identifies opportunities for internal reallocation, which lowers waste volume and reduces financial losses. The F-WMS also offers improved transparency, allowing managers to track waste trends, identify problem categories and implement targeted interventions based on accurate

data. Overall, the system provides scalable, data-driven support aligned with Tesco's operational requirements.

3.3 Expected Improvements in Operations and Decision-Making

The adoption of the F-WMS is expected to deliver significant operational and strategic benefits. Automated expiry monitoring will improve accuracy, reduce waste and ensure customers consistently receive high-quality products. This increases customer satisfaction while lowering costs associated with unsellable stock. Enhanced forecasting capabilities will result in more efficient ordering practices, reducing overstocking and improving product availability.

Real-time reporting tools give managers immediate visibility of waste patterns, enabling proactive responses rather than reactive interventions. This shift supports more effective operational planning and strengthens accountability across departments. Staff workload is also reduced as manual scanning and routine checks are automated, allowing employees to focus on service tasks and replenishment.

At a strategic level, consolidated waste data supports evidence-based decision-making. Tesco can identify long-term trends, evaluate the impact of interventions and develop more precise waste-reduction strategies. The F-WMS also offers scalability, allowing new modules or analytics tools to be added as Tesco's operational needs evolve. In summary, the system enhances efficiency, reduces costs and enables Tesco to manage waste more sustainably and effectively across all store locations.

4. Implementation Plan

4.1 Implementation Steps

The implementation of the AI-enabled Freshness and Waste Management System (F-WMS) should be carried out in structured phases to avoid disruption across Tesco stores. The first phase is a **technical readiness assessment**, where IT teams evaluate existing hardware, handheld scanning devices and back-office systems. This step ensures that all stores, including Express and larger Extra formats, can support upgraded scanning functions, cloud connectivity and real-time data synchronisation.

The second phase is **system configuration and integration**. During this stage, the F-WMS is customised to match Tesco's category structure, shelf-life policies, markdown procedures and store workflows. Integration with Tesco's central inventory management platform and stock-ordering systems is essential to enable live updates. The AI forecasting module must be trained using historical sales data, weather information, promotional calendars and regional demand variations.

The third phase involves **data migration and model calibration**. Existing expiry data, product catalogues, stock rotation rules and waste records must be imported into the new system. The AI models require calibration to ensure accuracy when predicting demand and identifying high-waste products. This stage may include pilot testing on a small number of stores with different formats to measure model performance and adjust configurations.

The fourth phase is **pilot deployment**, where selected stores use the full system in real operating conditions. Store managers provide feedback on usability, accuracy of expiry alerts, speed of scanning, forecasting reliability and dashboard clarity. Any operational challenges or discrepancies are resolved before the nationwide rollout.

The fifth and final phase is **full implementation**, with gradual rollout across all Tesco stores. Deployment should be staggered to allow technical teams to support each stage effectively. Continuous monitoring is required in the first weeks, especially in fresh, bakery and chilled departments, where waste levels fluctuate most.

4.2 Training and Integration Requirements

Successful use of the F-WMS relies on comprehensive training for all staff involved in stock rotation, product scanning and waste recording. Training should be delivered in multiple formats, including in-person demonstrations, digital modules and step-by-step user guides. Key learning areas include automated expiry recognition, interpreting

system alerts, performing stock rotation tasks, validating AI-generated recommendations and understanding new waste-recording workflows.

Store managers and supervisors require additional training in dashboard use, trend analysis and performance reporting. They must learn how to interpret predictive forecasting outputs, identify early signs of overstocks and apply system recommendations to ordering decisions. Training for regional managers should also focus on analysing consolidated waste data across clusters of stores.

From a technical standpoint, integration requires ensuring compatibility between the F-WMS, existing handheld devices, and Tesco's central systems. This includes secure API connections, real-time data feeds, and consistency across stock databases. Role-based access controls must be implemented to protect sensitive operational information and ensure that system permissions align with store positions. Audit trails and monitoring tools should be activated to support accuracy and compliance.

Communication between IT teams, store leadership and operations managers is essential during integration. Regular status updates, early identification of technical challenges and feedback loops between pilot stores and central teams ensure a smoother transition.

4.3 Potential Implementation Challenges

Several challenges may arise during deployment of the F-WMS. One challenge is **staff resistance**, as employees accustomed to manual processes may be hesitant to adopt automated systems. This is particularly relevant in fresh-food departments where staff rely on visual assessments rather than digital scans. Clear communication about the system's benefits, combined with practical training, can reduce this resistance.

Technical issues may occur during model calibration or data synchronisation. Inaccurate expiry recognition or forecasting errors could temporarily affect store performance, especially during early stages. To mitigate this, pilot testing must be robust, with real-time feedback from store teams to adjust system parameters.

Connectivity and device limitations may affect smaller or older stores. Enhancing Wi-Fi coverage, upgrading scanning devices and ensuring consistent cloud connectivity are necessary steps before full rollout.

Operational pressure is another risk. Stores operating at high capacity may struggle to dedicate time for training or learning new processes. To reduce disruption,

implementation should avoid peak trading periods and be supported by temporary staff or protected training hours.

Finally, there is a potential risk of **data overload**. Managers may feel overwhelmed by new dashboards and forecasting information. To address this, the system should present information clearly, prioritise critical alerts and provide predefined actionable insights.

Time/Space Collaboration Tool Matrix

Same time [Synchronous]

Different time [Asynchronous]

<u>Face-to-Face Interactions</u> Same-time, same-place interactions such as team meetings and shared displays allow users to make quick decisions using live system data, increasing perceived usefulness and ease of use.	<u>Continuous Task</u> Same-place, different-time interaction supports ongoing tasks through shared systems and project tools, allowing users to update and manage work across shifts.
<u>Remote Interactions</u> Same-time, different-place interaction enables real-time collaboration through video conferencing and live dashboards, supporting fast communication and coordination.	<u>Communication & Coordination</u> Different-time, different-place interaction allows users to access reports, messages and workflows asynchronously, supporting flexible use and long-term planning.

Conclusion

The evaluation of Tesco's current waste management processes shows that manual expiry checks, fragmented data systems and limited forecasting capabilities reduce operational efficiency and contribute to unnecessary stock loss. The proposed AI-enabled Freshness and Waste Management System (F-WMS) offers a comprehensive solution by integrating automated expiry tracking, predictive analytics and real-time reporting into a unified platform. This system is expected to improve accuracy, reduce food waste and support better stock-ordering decisions across all store formats.

A structured implementation plan, supported by staff training and phased rollout, will minimise disruption and enable effective adoption. Although challenges such as system integration, staff adaptation and technical calibration may arise, these can be mitigated through careful planning. Overall, the F-WMS provides a scalable and data-driven framework that strengthens Tesco's operational performance and long-term waste reduction efforts.

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