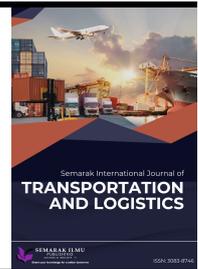




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Notification-Based Inventory System in the Security Industry : A Systematic Literature Review

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ABSTRACT

This systematic literature review investigates the effectiveness of notification-based inventory systems in the security industry, with KR META Security as a focal case. Despite advances in digital transformation, many firms continue to rely on manual tracking methods, creating risks of inaccuracy, delay, and asset misplacement. Using the PRISMA 2020 approach, 90 records were initially identified, and after screening and eligibility checks, 15 studies were included for final synthesis. The review revealed major barriers to adoption, including high cost, technical complexity, cybersecurity risks, and organizational resistance. Conversely, enablers such as government digitalization support, cloud scalability, and real-time alert mechanisms were highlighted as critical success factors. Compared with other industries, the security sector faces greater urgency due to the mission-critical nature of its assets, where inventory lapses can directly compromise operational readiness. To bridge these gaps, a three-layer conceptual framework comprising technological, operational, and management dimensions is proposed to improve inventory visibility, strengthen asset control, and accelerate incident response. This framework provides a tailored pathway for security firms to transition from manual practices to secure, efficient, and reliable notification-based systems.

1. Introduction

Because its assets such as surveillance gear, access control systems, and specialized tools are so vital, the security sector depends significantly on accurate inventory management. Financial losses, security lapses, and operational delays can result from ineffective inventory tracking. Due to the lack of real-time monitoring, traditional techniques like spreadsheets and manual logbooks result in erroneous stock levels and delayed replenishment. By guaranteeing timely notifications, lowering errors, and facilitating data-driven decision-making, integrating notification-based inventory

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reporting systems especially those connected to the Internet of Things and cloud computing offers a competitive edge [1].

1.2 Problem Statement

KR META Security, similar many SMEs in the security sector, still relies on outdated manual inventory methods. This reliance leads to frequent discrepancies, delayed responses during incidents, and an increased risk of asset loss. Unlike generic inventory systems, there is no tailored solution addressing the operational urgency and accountability requirements of security firms.

1.3 Research Objectives

- a) Assess how notification-based inventory systems specifically improve operational readiness and accuracy in security contexts.
- b) Determine the adoption hurdles and technology enablers in the context of the security business.
- c) Propose a conceptual framework tailored for KR META Security to enhance asset tracking, accountability, and incident response.

1.4 Research Questions

- a) How can notification-based systems improve operational efficiency in security inventory management?
- b) What are the key technological, organizational, and environmental factors affecting adoption?
- c) What framework can be implemented to enhance asset tracking and loss prevention?

1.5 Scope of Study

KR META Security serves as the study's focal case and focuses on inventory management procedures in the Malaysian security sector. It looks at both domestic and foreign best practices that apply to SMEs, with a focus on notification-based systems coupled with cloud and IoT technologies [2]

1.6 Significance of the Study

For security firms looking to update their inventory management systems, this study offers insights. The suggested framework can improve operational efficiency, lower losses, and facilitate adherence to industry standards by considering the requirements of the sector [3]. Unlike most existing studies that examine inventory management in general industrial contexts, this paper provides a security-specific perspective. The conceptual framework proposed here is uniquely tailored to the operational needs of security firms such as KR META Security, where asset criticality, accountability, and incident response times are far more sensitive compared to other industries.

1.7 Literature Review

1.7.1 Overview of inventory management in the security industry

Inventory management in the security industry is a mission-critical function due to the direct link between asset availability and operational readiness. Security firms often handle a wide range of specialized equipment, including CCTV cameras, alarm systems, radios, and protective gear. Inefficient management can lead to asset shortages or misplacements that compromise safety and service quality. Traditional systems often rely on manual stocktaking and periodic audits, which are prone to delays and inaccuracies. The emergence of automated systems offers real-time tracking, reduces manual intervention, and supports decision-making with accurate data feeds [1].

1.7.2 Notification-based inventory reporting systems

Automated alerts for things like low stock levels, equipment check-outs, and maintenance schedules are provided by notification-based inventory systems. Proactive asset management is made possible by the delivery of these alerts through integrated dashboards, SMS, or email. Such alerts are crucial in security contexts to guarantee prompt restocking of vital equipment and avoid operational disruptions. The integration of these systems with IoT sensors enhances precision, allowing real-time monitoring of stock movements and status changes [4].

1.7.3 IoT and cloud integration in inventory management

Because it allows connected devices to gather, share, and analyze data, the Internet of Things (IoT) has revolutionized inventory management. These capabilities are further enhanced by cloud-based platforms, which offer scalable, remote access to inventory data from any location. Real-time cloud database updates and automated stock counting are possible with IoT sensors like RFID tags, load cells, and ultrasonic detectors [5]. For security companies, this entails smooth coordination between various operational units and storage locations, guaranteeing that asset availability is constantly tracked and updated [6].

1.7.4 Comparative analysis from literature review table

The automation, accuracy, and security of stock management have significantly improved, according to a thorough analysis of the literature on IoT-enabled inventory systems. Key studies pertinent to the deployment of a notification-based inventory management system for the security sector are compiled in Table 1. Although issues like high upfront costs and cybersecurity threats still exist, the results demonstrate that IoT integration enhances inventory visibility, reduces human error, and makes predictive analytics possible for demand forecasting [1].

Table 1

Key studies pertinent to the deployment of a notification-based inventory management system for the security sector

Year	Citation	Title	Methodology	Identify Enablers
2022	[7]	Impact of IoT on Inventory Management	Systematic Literature Review	IoT improves visibility and accuracy but faces integration challenges.
2023	[4]	Inventory Management Using IoT	Prototype Development	Real-time tracking reduced stockouts and improved restocking decisions
2024	[2]	IoT-Powered Inventory Management	Systematic Literature Review	Enhanced automation and forecasting; SMEs face high cost barriers.
2025	[8]	Advanced Inventory Management with IoT & AI	System Design	Improved forecasting accuracy by 22% and reduced holding costs by 18%.

2. Methodology

2.1 Research Design

The PRISMA 2020 framework serves as the guide for this study's Systematic Literature Review (SLR) methodology. Finding, evaluating, and synthesizing prior research pertinent to notification-based inventory reporting systems, especially in security industry contexts, is made transparent, repeatable, and organized by the SLR method. Empirical research, prototypes, and reviews addressing IoT, cloud integration, and automated notifications in inventory systems that were published between 2013 and 2025 are intended to be captured by the methodology [6].

2.2 Search Strategy

Three significant academic databases such as Scopus, Web of Science, and Google Scholar were the focus of the search strategy for this study because of their extensive coverage of interdisciplinary research. To ensure that the most relevant studies were identified, Boolean search strings were used to combine key terms related to the research focus, such as "inventory management" OR "stock control" AND "notification" OR "alert" AND "IoT" OR "Internet of Things" AND "security industry" OR "KR META Security" OR "Malaysia" within the publication years 2013 to 2025. The approach included grey literature, such as government reports, vendor case studies, and industry white papers, in

addition to peer-reviewed academic sources to ensure the review's thoroughness and practical applicability [6].

2.3 Inclusion and Exclusion Strategy

Inclusion criteria ensured that only studies meeting the following requirements were considered:

- a) Empirical or systematic review methodology.
- b) Focus on IoT-enabled or notification-based inventory systems.
- c) Relevance to security, defense, or high-value asset management.
- d) Published between 2013 and 2025.

Exclusion criteria removed studies that:

- a) Focused solely on household or retail inventory contexts without operational parallels.
- b) Addressed inventory systems without notification or IoT integration.
- c) Were opinion articles, editorials, or lacking methodological detail.

2.4 Screening Process

The literature pool was methodically reduced using the PRISMA four-stage process: identification, deduplication, screening, and eligibility assessment. Ninety records were obtained from databases and grey literature during the identification process. After deduplication, 76 unique records remained after 14 duplicates were eliminated. Thirty-two full-text articles were left for eligibility evaluation after 44 records that did not fit the inclusion criteria were eliminated by abstract and title screening. There were 15 final studies for qualitative synthesis after 17 were eliminated for lack of methodological rigor or relevance [7]. The entire process is summarised in the PRISMA flow diagram presented in Figure 1.

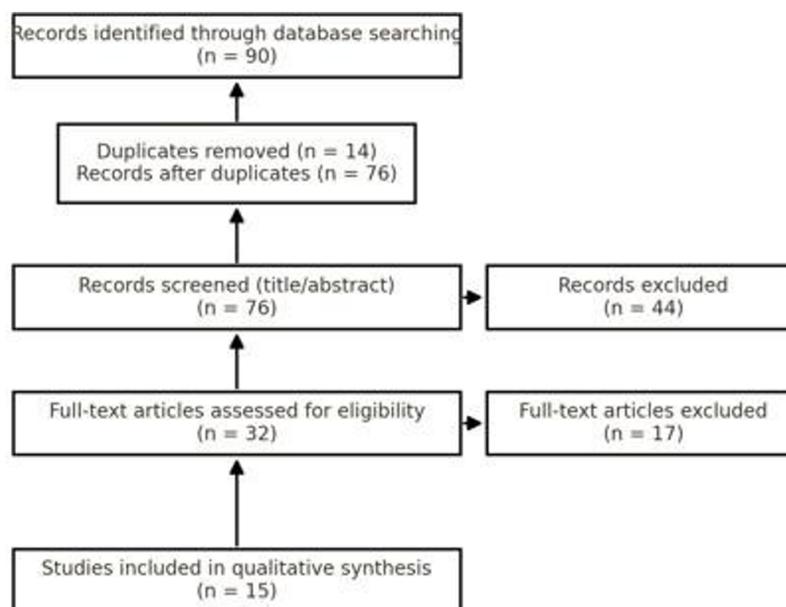


Fig. 1. PRISMA flow diagram of the literature screening process

2.5 Data Extraction and Analysis

A standardized template that captured bibliographic information, methodology, technological focus, barriers, enablers, and key outcomes was used to extract data from each included study. After that, thematic analysis was used to find recurrent themes and group them into organizational, technological, and operational categories. A comprehensive grasp of the advantages and limitations of notification-based inventory systems in security contexts was made possible by this process [1].

3. Results

3.1 Characteristics of Included Studies

Following the PRISMA screening procedure, a total of 15 studies satisfied the inclusion requirements. These studies, which covered both empirical and prototype-based research on IoT-enabled and notification-based inventory systems, were published between 2013 and 2025. The approaches included systematic literature reviews, case studies, and prototype development. Malaysia and other Southeast Asian countries were covered geographically, as well as international applications in manufacturing, SMEs, and security-sensitive industries [7].

3.2 Identified Barriers

Several obstacles to implementing notification-based inventory systems were identified by the analysis of the included studies. Since deploying IoT hardware, cloud platforms, and integration tools necessitates a substantial financial investment, one of the primary obstacles is the high initial cost. Furthermore, because they frequently lack the internal knowledge necessary to configure and maintain IoT systems, many small and medium-sized businesses (SMEs) deal with technical complexity [9]. Given that systems are more susceptible to data breaches and manipulation because of greater connection, cybersecurity threats also become a significant obstacle. Additionally, employees who are used to manual operations often exhibit resistance to change, making them reluctant to embrace new technologies. Lastly, integration issues still exist since businesses usually have trouble integrating new systems with legacy software and operational operations [10].

3.3 Identified Enablers

Several enablers that support the acceptance and effective deployment of notification-based inventory systems were also identified in the literature. Support from the government and policies, including grants, incentives, and digitalization projects, is essential in motivating SMEs to update their procedures. By enabling inventory solutions to be scaled gradually without incurring significant infrastructure costs, cloud scalability further encourages adoption. Real-time alerts improve operational readiness by shortening response times, minimizing downtime, and preventing stockouts. Furthermore, operational efficiency is improved through streamlined processes and reduced manual intervention, resulting in faster and more accurate decision-making. Finally, collaboration among stakeholders, particularly through collaborations with technology suppliers and consultants, adds to improved system customisation and smoother deployment [10]. Compared to manufacturing or retail SMEs, security firms face an added layer of urgency due to the mission-critical nature of their assets. While cost and technical barriers are common across industries, in security contexts, even minor delays or misplacements can compromise client safety and operational

readiness. This distinction highlights the need for frameworks that prioritize accountability, redundancy, and compliance with defence-related standards. To consolidate these interrelated factors, a conceptual framework tailored to the security industry is proposed and illustrated in Figure 2, highlighting the integration of technological, operational, and management layers for effective notification-based inventory systems [11].

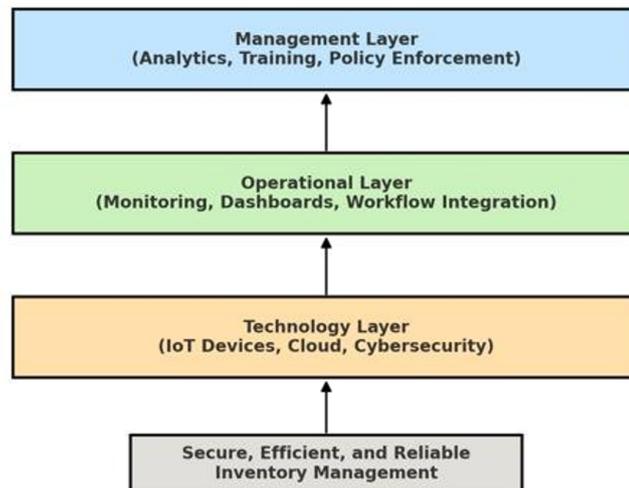


Fig. 2. Conceptual framework for notification-based inventory systems in the security industry

3.4 Security Industry-Specific Insights

Inventory management is more important for security firms like KR META Security because assets are critical. Any delay in replenishment or misplacement of equipment has a direct impact on operational readiness. Notification-based systems customized for security contexts offer advantages such as:

- i. Enhanced accountability through digital tracking of issued and returned assets.
- ii. Incident-triggered notifications for rapid replacement of damaged or lost equipment.
- iii. Integration with access control systems to ensure only authorized personnel handle sensitive items.

However, successful adoption requires addressing industry-specific challenges such as compliance with defence sector standards and ensuring redundancy to maintain operations during system downtime [12].

3.5 Conceptual Framework

A conceptual framework to improve inventory management has been put forth, based on the synthesis of the literature and the needs of the security sector. The framework creates a single platform that combines cloud-based analytics, automated notifications, and real-time tracking enabled by IoT. Three fundamental dimensions form its foundation. To support dependable and secure operations, the technology layer focuses on IoT devices, cloud infrastructure, and cybersecurity measures. The operational layer places a strong emphasis on using real-time monitoring dashboards to increase responsiveness, standardizing workflows, and integrating with

current systems seamlessly. Lastly, to improve accountability and decision-making, the management layer incorporates performance analytics, employee training, and policy enforcement. The framework guarantees that asset security, operational efficiency, and compliance are accomplished in a coordinated way by lining up these three layers [1].

4. Conclusions

4.1 Summary of Findings

With KR META Security as the main case, this study carried out a thorough literature review to investigate the potential of notification-based inventory reporting and management systems in improving operational efficiency within the security industry. Analysis of 15 excellent studies that were published between 2013 and 2025 showed the advantages and disadvantages of cloud-integrated, IoT-enabled inventory systems. As asset availability is directly related to service quality and safety in security operations, the results validate that such systems increase inventory accuracy, lower human error, and facilitate proactive replenishment [2].

4.2 Practical Implications

The findings have immediate ramifications for security companies looking to update their inventory control procedures. These businesses can lower the chance of loss incidents and maintain constant asset visibility by implementing notification-based systems. Through real-time alerts, they can also speed up response times, guaranteeing that vital resources are available when needed. Predictive analytics helps with more precise demand forecasting and efficient budget planning, while asset tracking integrated with operational workflows improves accountability throughout the company. Implementing such a system could greatly improve operational readiness and guarantee adherence to accepted security industry standards, especially for KR META Security [10]. Beyond KR META Security, the framework aligns with Malaysia's Digital Economy Blueprint, which encourages SMEs to adopt digital solutions. The recommendations also hold regional value, as many ASEAN security firms share similar challenges of resource constraints, operational urgency, and the need for scalable solutions [13].

4.3 Recommendations for Implementation

A few suggestions are made to direct the implementation of notification-based inventory systems, considering the literature as well as the requirements of the security sector. Prior to full implementation, businesses should start with a pilot deployment, carrying out a small-scale rollout to see if the system works with current workflows. Second, to guarantee seamless adoption and efficient use of the new technology, staff members should receive focused training. Third, strong cybersecurity integration is necessary to guard against possible manipulation or breaches of sensitive asset data. Fourth, working with knowledgeable IoT and cloud solution providers can assist in tailoring the system to the needs of the security industry. Finally, inventory management policies must be aligned with the new system's capabilities and procedures to ensure consistency, compliance, and long-term sustainability [14].

4.4 Limitations of the Study

While the study provides useful insights, it is limited by the availability of literature focusing especially on the security industry. Much of the research examined is based on broader industrial contexts, which may not completely represent the specific operational demands of security organizations. Furthermore, the lack of primary data gathering by KR META Security limits the capacity to directly validate the suggested methodology in practice [7].

4.5 Suggestions for Future Research

Future study could be expanded in numerous directions to improve our understanding of notification-based inventory systems in the security sector. One potential approach is to undertake case studies on security organizations that have already implemented such systems, which can provide practical insights into real-world obstacles and rewards. Another is looking into cost-benefit studies aimed exclusively at SMEs in the security industry, which can help evaluate financial feasibility and long-term value [15]. Researchers might also investigate the use of AI-powered analytics for predictive maintenance and incident prevention, which would improve system effectiveness and operational reliability. Furthermore, researching user adoption behavior inside security businesses will assist identify training requirements and change management techniques required for successful deployment [16]. Future research may also explore cross-country comparisons in ASEAN to identify the best regional practices and opportunities for harmonizing security inventory standards.

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