Utilising Robotic Process Automation (RPA) for Emergency Trolley Electronic Checklist Phase 2 Enhancements

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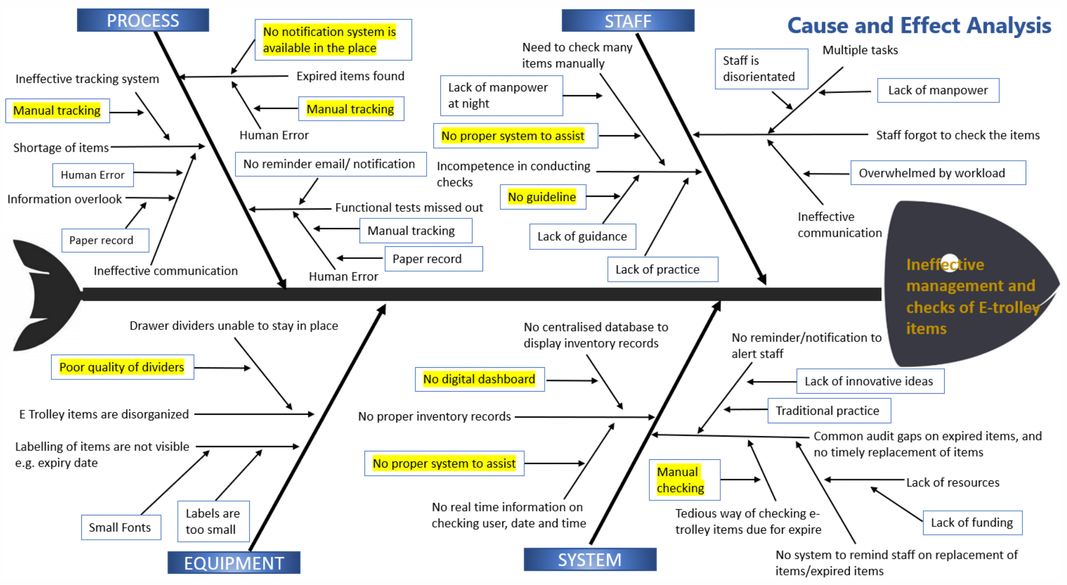
BACKGROUND

The Emergency Trolley Management System underwent significant enhancement from May to July 2024, building upon its initial RPA implementation in November 2023. This Phase 2 development addressed key operational challenges identified during the first six months of implementation. Eight major enhancements were introduced, including a real-time overview dashboard, streamlined expiry date management, and improved item tracking capabilities.

AIMS

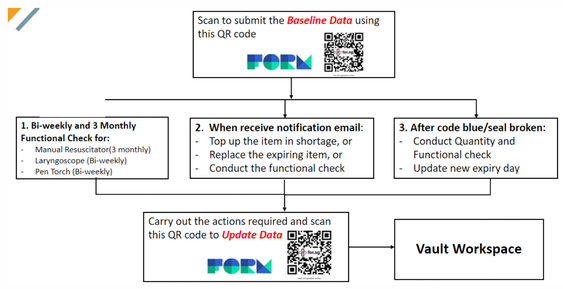
The Phase 2 enhancement of the Emergency Trolley Management System aimed to improve operational efficiency, strengthen oversight, and ensure patient safety across all wards. Key objectives included streamlining daily checks, implementing real-time monitoring through a comprehensive dashboard, eliminating expired items incidents, and reducing staff workload through automation.

ROOT CAUSES

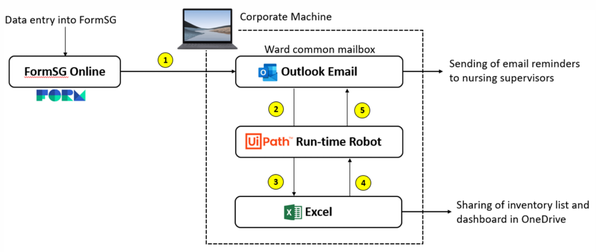


RPA SOLUTION and ENHANCEMENTS

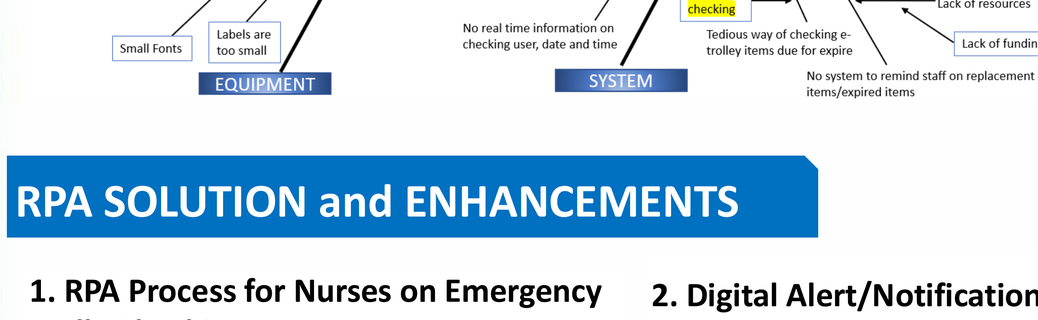
1. RPA Process for Nurses on Emergency Trolly Checking



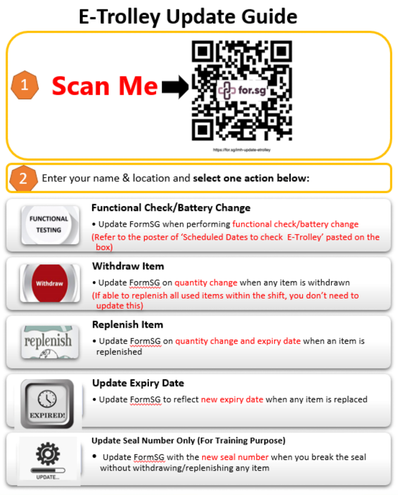
2. Digital Alert/Notification System



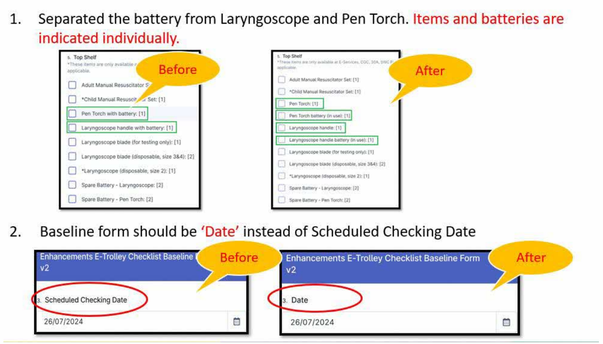
3. Real-time Live Dashboard (Enhancement)



4. Quick Start Guide (Enhancement)



5. E-Kit Management Optimization/Expanded Item Selection (Enhancement)



RESULTS

The RPA solution of Emergency Trolley has been fully implemented in IMH, including 49 wards, Emergency Room and 7 Outpatient clinics. For expired items and shortages, zero audit gaps were recorded, marking a notable improvement from the 2-3 incidents observed in previous years. Regarding functional checking, a 100% compliance rate was attained, as verified through Live Dashboard monitoring. This transformation has set a new standard in E-Trolley management, demonstrating the successful integration of RPA with real-time monitoring system.

Metrics	Before Phase 1 (Manual)	After Phase 1 (RPA)	After Phase 2 (Enhanced)
Time Saving Metrics			
Time per item update	40 mins	5 mins	2 mins
Time spent per ward/year	1040 mins	60 mins	24 mins
Time saved per ward/year	-	980 mins	1016 mins
Total hospital time saved/year	-	931 hours	965 hours
Financial Metrics			
Manpower cost savings/year	-	$27,930	$28,950
RPA license cost/year	-	$3,000	$3,000
Net financial savings/year	-	$24,930	$25,950
Efficiency Gains			
Time reduction from baseline	-	94.2%	97.7%
Additional savings from Phase 1	-	Baseline	$1,020

2. Survey Results on staff satisfaction and usability improvement

No.	Enhancement Feature	Rating (out of 5)	Positive Feedback (n=150)	Key Benefit	User Comments
1	E-Kit Management Optimization	4.7	142 (95%)	Reduced redundancy	"Fewer emails, better workflow"
2	Expanded Item Selection	4.6	138 (92%)	Better inventory control	"More comprehensive options"
3	Combined Update Function	4.8	144 (96%)	Time efficiency	"Saves significant time"
4	Battery Expiry Management	4.5	135 (90%)	Better compliance	"Fewer missed updates"
5	Non-Expiry Items Process	4.4	132 (88%)	Simplified workflow	"Less manual entry"
6	Overview Dashboard	4.8	145 (97%)	Better monitoring	"Excellent oversight tool"
7	Detailed Breakdown Lists	4.7	141 (94%)	Enhanced tracking	"Better inventory control"
8	Quick Start Guide	4.5	135 (90%)	Easier learning	"Very user-friendly"

3. Cross-Institution Knowledge Transfer and System Adoption

IMH's successful implementation of the Emergency Trolley RPA system has become a benchmark for innovation in NHG. The enhanced solution has attracted significant interest from other healthcare institutions, leading to successful knowledge transfer and system adoption. NHGP has fully implemented a similar RPA system across its institution, while KTPH is currently in the implementation phase. Learning visits from TTSH and WH demonstrate the growing recognition of this solution's effectiveness. This cross-institution scaling showcases the system's versatility and potential for standardizing E-trolley tracking management across different healthcare settings, from hospitals to polyclinics.

EFFECTS OF CHANGES

The implementation of the Enhanced Emergency Trolley RPA system has delivered significant operational improvements. Staff productivity increased through 97.7% reduction in checking time, from 40 to 2 minutes per trolley. Patient safety enhanced with zero expired items found in 2024, compared to 2-3 incidents annually in previous years. The real-time dashboard enables immediate issue detection and resolution within 24 hours. Financial benefits include annual savings of $25,950. The system's success has influenced healthcare transformation beyond IMH, with NHGP's adoption and other institutions' interest demonstrating its value as a scalable healthcare innovation.

END USER EXPERIENCE

Staff feedback indicates high satisfaction with the enhanced system, citing significant time savings and easier workflow. The intuitive dashboard, automated alerts, and streamlined checking process have reduced workload stress. Users particularly appreciate the combined update function and real-time monitoring capabilities, leading to 98% user satisfaction rate.

LESSON LEARNT

The project's success hinged on strong user engagement and a phased implementation approach. Regular feedback collection enabled targeted enhancements, while maintaining safety standards. The willingness to share knowledge with other healthcare institutions demonstrated the system's scalability and value, proving that collaborative innovation yields the best results.