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EMBEDDED POST-PICK AUDIT IN SAP EXTENDED WAREHOUSE MANAGEMENT: A CONFIGURABLE OB41/OB42 FRAMEWORK FOR SCAN-VERIFIED ORDER ACCURACY

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Abstract

Post-pick order accuracy verification in pharmaceutical and medical device distribution is a regulatory and operational imperative, yet standard SAP Extended Warehouse Management (EWM) does not embed a scan-verified audit step within the physical pick execution sequence. Verification is typically handled as a downstream quality control function, introducing time lag, duplicate handling, and potential for pick-to-ship errors to pass through undetected. This paper presents a POSC-embedded post-pick audit framework implemented through the OB41 and OB42 process steps within EWM's Process-Oriented Storage Control sequence. The architecture intercepts each Warehouse Task at the post-confirmation boundary, triggers an RF device scan audit of the picked Handling Unit against the Outbound Delivery Order specification, and blocks Warehouse Order completion until the scan audit passes or a supervisor-authorised override is logged. A configurable control table externalises audit scope, exception routing, and bypass authorisation parameters, enabling site-level tuning without ABAP development. Deployed at a Johnson & Johnson healthcare distribution site, the framework reduced post-ship customer complaint events attributable to pick inaccuracy by 74% in the first operational year and delivered an annual quality and compliance cost saving of USD 150,000 (Author's primary implementation data, 2023). The contribution is a documented POSC-step audit design pattern applicable to any EWM deployment requiring embedded pick verification.

Keywords: Post-Pick Verification, Warehouse Task Validation, OB41/OB42, Handling Unit (HU) Verification.

1. Introduction

Pick accuracy in pharmaceutical and medical device distribution carries consequences beyond customer satisfaction: a mispick at a regulated healthcare distributor may constitute a GxP compliance event, trigger a regulatory deviation report, or — in worst-case scenarios — result in incorrect products reaching clinical settings. The cost of detecting and correcting pick errors downstream of the physical pick execution — through returned goods processing, expedited re-shipment, and compliance documentation — substantially exceeds the cost of preventing them at source.

SAP EWM provides a comprehensive Warehouse Task management framework supporting RF-guided picking, Handling Unit management, and Outbound Delivery Order confirmation. The standard process confirms pick accuracy implicitly through scan-to-pick guidance: the RF device directs the operator to a bin, the operator scans the HU or material barcode, and EWM records the pick. This guidance mechanism reduces gross errors — picking from the wrong bin — but does not constitute a formal audit: it does not verify that the HU placed in the outbound staging area matches the ODO specification after the pick is complete.

The audit gap exists because EWM's standard POSC sequence proceeds from pick confirmation directly to WO completion without an intermediate verification step. Any discrepancy between the physically picked HU and the ODO requirement is detectable only at the downstream packing or shipping confirmation step, by which point the pick operator has moved to the next task and corrective re-pick requires a new WT cycle.

This paper documents a POSC-embedded audit architecture that closes this gap by inserting a mandatory scan verification step at the OB41 process point — immediately following pick confirmation and before WO completion. The audit is executed on the RF device in the same physical workflow as the pick, requiring no additional handling or station visit. OB42 governs audit exception routing: failed scans trigger an immediate re-pick request, and supervisor-authorised bypasses are logged with user ID, timestamp, and exception reason to a dedicated audit table. The entire audit scope is governed by a configurable control table, enabling site managers to adjust which Storage Types and material classes require a full audit versus a spot-check audit without development involvement.

ii. Related Work

Order accuracy and pick error research in warehouse operations literature has concentrated on error type classification, root cause analysis, and the design of error-reduction strategies. De Koster, Le-Duc, and Roodbergen [1] identify mispick as the primary quality failure mode in manual order picking systems, noting that RF-guided picking reduces but does not eliminate pick errors due to operator scan workarounds and HU misidentification. Gu, Goetschalckx, and McGinnis [2] establish that quality verification integrated into the pick workflow — rather than applied as a downstream step — produces superior accuracy outcomes at lower operational cost.

In pharmaceutical distribution specifically, GxP compliance requirements for track-and-trace and lot-level accuracy impose verification obligations that exceed standard warehouse accuracy benchmarks. Atieh et al. [3] document that automated scan verification at the pick station level reduces pharmaceutical distribution errors by measurable margins in controlled deployment environments. The use of RF devices as verification tools in EWM workflows is addressed by Tadejko [4] in the context of IoT-enabled logistics systems, establishing the technical precedent for scan-based audit within warehouse management software.

POSC customisation as an extension mechanism for EWM business logic is documented in the enterprise ERP customisation literature reviewed by Botta-Genoulaz, Millet, and Grabot [5]. The specific application of OB-series process steps to embed custom validation logic — as distinct from using them for standard replenishment and task management — is not addressed in existing published work, representing the gap that motivates the present contribution. Boysen, de Koster, and Weidinger [6] and Henn and Wäscher [7] provide contemporary context on warehouse operations research, within which the accuracy-at-source design principle underlying this architecture is situated.

III. Architecture

III-A. POSC Step Integration

OB41 and OB42 are process steps within the EWM POSC sequence, activated by configuration in the EWM Warehouse Structure Customising for each relevant Storage Type. In the standard POSC configuration, OB41 is available as a post-pick trigger point: it fires after the pick Warehouse Task is confirmed by the RF operator and before the parent WO is flagged as complete. The custom OB41 implementation executes a scan audit request to the operator's RF device, presenting the ODO line item specification — expected material, lot number, quantity, and HU barcode — and requiring a physical scan of the picked HU before the process step completes.

OB42 handles audit completion and exception routing. A successful scan at OB41 causes OB42 to close the audit loop and release the WO for completion. A failed scan — HU barcode does not match ODO specification, or quantity discrepancy detected — causes OB42 to route the exception to one of three paths: immediate re-pick (a new WT is created for the discrepant line), supervisor hold (WO is held pending supervisor review and authorised resolution), or bypass (supervisor scans their authorisation badge and enters an exception reason, which is logged and the WO is released). All exception paths write a record to ZARC_AUDIT_LOG with full transaction context.

III-B. RF Device Interaction

The audit scan is presented on the same RF device screen as the pick confirmation — no additional device, station, or application is required. The OB41 custom logic calls the EWM RF framework transaction /SCWM/RFUI to render the audit screen, passing the ODO line specification as display parameters. The operator scans the HU in their hands; the scan result is validated against the ODO specification in real time. Screen response time is under 2 seconds on standard EWM RF infrastructure, confirmed across deployment hardware at J&J distribution sites. The interaction adds approximately 8–12 seconds per pick line to the operator workflow — a deliberate design trade-off against the downstream cost of a pick error reaching the ship door.

POSC Step	Trigger	Audit Action	Exception Path
OB41	Post-pick WT confirmation	RF scan of picked HU vs. ODO spec	Failed scan → OB42 exception routing
OB42 — Pass	Scan verified successfully	WO released for completion	—
OB42 — Re-pick	HU barcode mismatch	New WT created for discrepant line	ZARC_AUDIT_LOG entry
OB42 — Supervisor Hold	Quantity discrepancy	WO held; supervisor review required	ZARC_AUDIT_LOG entry
OB42 — Bypass	Supervisor authorised override	Exception reason logged; WO released	ZARC_AUDIT_LOG entry + badge scan

Table i. POSC OB41/OB42 Audit Process Step Actions. Source: Author's primary implementation data.

III-C. Audit Scope Control Table

The audit control table (ZAUDIT_SCOPE) externalises the parameters governing which transactions require full audit, which require spot-check audit, and which are exempt. The table is keyed by Warehouse Number and Storage Type, enabling per-zone audit configuration across a multi-zone site. Key fields include: AUDIT_MODE (F=Full, S=Spot-check, X=Exempt), SPOT_PCT (percentage of transactions audited in spot-check mode, 1–100), BYPASS_ROLE (SAP role required for OB42 bypass authorisation), and LOG_LEVEL (1=Exceptions only, 2=All audits). Configuration changes take effect immediately on save, without EWM restart or transport request.

Field	Type	Description	Default
LGNUM	CHAR 4	Warehouse Number (key)	—
LGTYP	CHAR 4	Storage Type (key)	—
AUDIT_MODE	CHAR 1	F=Full audit, S=Spot-check, X=Exempt	F
SPOT_PCT	INT1	Spot-check percentage (1–100)	20
BYPASS_ROLE	CHAR 30	SAP role required for OB42 bypass authorisation	Z_WH_SUPERVISOR
LOG_LEVEL	INT1	1=Exceptions only, 2=All audit events	1

Table ii. ZAUDIT_SCOPE Control Table Structure. Source: Author's primary implementation data.

iv. Results

The OB41/OB42 audit framework was deployed at a Johnson & Johnson healthcare distribution site processing pharmaceutical and medical device orders for hospital and pharmacy customers (Author's primary implementation data, 2023). Pre-implementation baseline measurement over 90 days recorded an average pick error rate of 1.8 per 1,000 pick lines confirmed, with 62% of errors detected at downstream packing, 24% detected at shipping confirmation, and 14% detected post-shipment via customer complaint. The 14% post-shipment detection rate represented the highest-cost category: each event required a returned goods authorisation, expedited replacement shipment, and regulatory deviation documentation.

Post-implementation measurement over an equivalent 90-day period recorded: pick error detection at OB41 accounted for 91% of all errors identified (up from 0% at this stage); post-shipment customer complaint events attributable to pick inaccuracy decreased by 74%; average time-to-detection for pick errors reduced from 18.4 hours (downstream detection average) to 0.2 hours (immediate OB41 detection). Supervisor bypass events averaged 2.3 per shift — within the design target of fewer than 5 — confirming that the audit is generating genuine verification value rather than being routinely bypassed.

The combined annual saving — from eliminated returned goods processing, expedited re-shipment costs, regulatory documentation overhead, and reduced customer penalty events — was USD 150,000 (Author's primary implementation data, 2023). The 8–12 second per-pick-line audit overhead represented an aggregate throughput cost of approximately 0.4% of total shift pick time, which is operationally acceptable given the compliance and cost benefit.

v. Discussion

Embedding the audit at OB41 — within the RF operator's existing workflow, on the same device, without additional handling — is the design feature that explains the low bypass rate. Verification steps that require operators to move to a separate station, change device, or interrupt their task sequence generate workaround pressure that degrades compliance over time. At the OB41 point, the operator has the HU in hand and the RF device active: the audit scan is a 3-second extension of a motion already in progress, not an additional task.

The supervisor bypass mechanism deserves specific attention as a design constraint. A zero-bypass architecture — where no exception can release a failed audit — would create operational gridlock: legitimate HU relabelling events, emergency kit fulfilment, and system barcode registration errors must have a resolution path. The ZAUDIT_SCOPE LOG_LEVEL=2 setting, recommended for initial deployment periods, provides complete audit trail coverage that enables bypass pattern analysis and identification of systemic barcode or HU registration issues that should be resolved in the master data rather than routinely bypassed.

The architecture is generalisable beyond pharmaceutical distribution. Any EWM deployment requiring lot-level, serial-number-level, or HU-level pick verification at the point of execution — medical devices, controlled substances, high-value electronics, food safety-regulated products — can implement the OB41/OB42 framework with Storage Type-specific audit scope configuration. The absence of middleware or external quality system integration keeps the solution within the standard EWM support boundary.

vi. Conclusion

This paper has presented a POSC-embedded post-pick audit framework for SAP EWM, implemented through configurable OB41 and OB42 process steps with RF device scan verification, exception routing, and supervisor-authorised bypass logging. The design closes the pick accuracy verification gap in standard EWM by inserting a mandatory, workflow-integrated audit step at the point of highest error detectability — immediately after pick confirmation and before WO release.

Deployment at a J&J healthcare distribution site demonstrated a 74% reduction in post-shipment pick error complaints and an annual saving of USD 150,000. The configurable ZAUDIT_SCOPE table enables site-level audit scope management without development involvement, supporting both full-audit and spot-check deployment modes. The contribution — a documented POSC-step audit design pattern with primary enterprise deployment evidence — addresses a gap in the EWM customisation literature and provides a directly implementable reference for GxP-regulated distribution environments.

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