CASE STUDY 02

RFID Bin Audit and Tagging Workflow Automation

Field audit redesign | Tablet-enabled workflow | Live asset data | Exception reporting

Context

A field project to tag and verify waste bins with RFID stickers and correct serial numbers.

My role

Analysed why the paper process failed and designed a tablet-enabled future state.

Status

Concept with functional requirements and a pilot-first roadmap. Not a built system.

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The tagging failed because the workflow was static

Business problem

- Printed pages and a paper map
- Address order was hard to follow
- Bin and RFID data was unreliable
- Field exceptions could not be seen live

Field reality

- Bins often not out
- Some addresses did not exist
- Some bins already tagged
- Residents retrieved bins after collection

Project objective

- Improve data accuracy
- Reduce wasted field visits
- Remove manual re-entry
- Show live status and exceptions

Solution theme

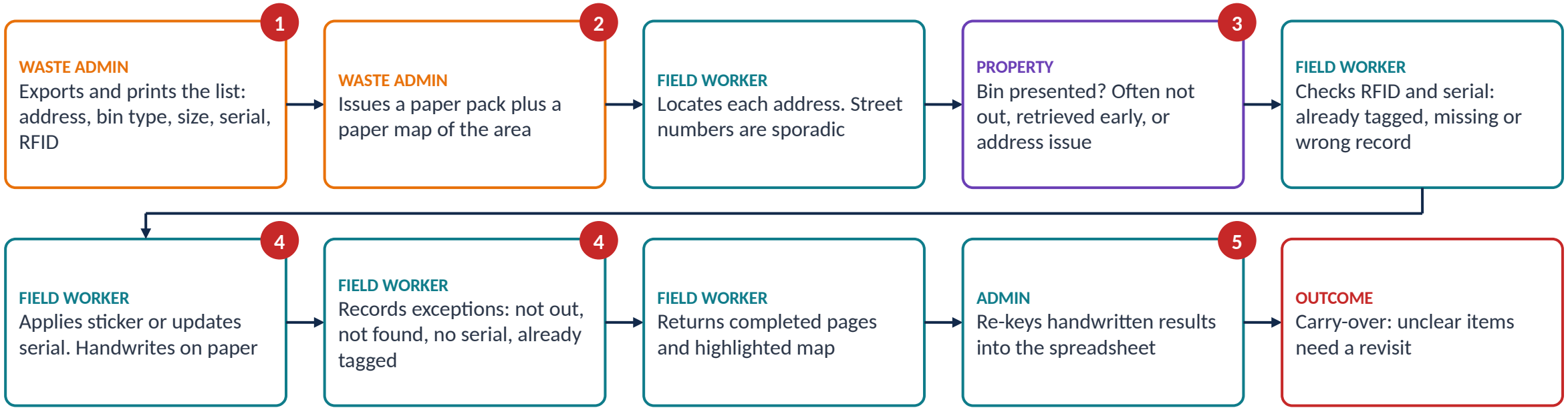
- Tablet worklist
- Live asset data
- Scan and validate
- Sync updates immediately

Recommended future state

Live data from the source system → Optimised field list by route and area → Tablet capture of RFID, serial, status → Exception dashboard → Immediate sync, no end-of-day re-entry

Key message: the issue was not the RFID stickers. It was the disconnected paper workflow and an unreliable data foundation.

Current state: a live data task run on static paper



1. Static printed list: corrections wait until later
2. Paper map tracking: no live view
3. Bins or addresses unavailable at the visit
4. Handwritten RFID, serials and notes can be unclear
5. Manual re-entry: delay and error risk

Paper-based: Yes | **Live progress: No** | **Manual re-entry: Yes** | **Carry-over risk: High**

Key observation: field staff did a live data-quality task with static paper. Issues found at the bin could not update the source record until later re-entry.

Root causes: unreliable data and paper tools

Issue	Root cause	Operational effect	Business impact	Priority
Unreliable source data	Bin serial numbers often wrong or missing	Worker could not trust the printed records	Data-quality risk and repeated corrections	**High**
Paper worklist	Spreadsheet printed and taken into the field	No live updates, filtering or validation	Delayed corrections, manual handling	**High**
Poor address ordering	Street numbers sporadic, not in order	Inefficient movement through streets	More travel time, missed addresses	**High**
Bins not presented	Earlier tagging only captured bins out on collection day	Many properties could not be completed	Carry-over and incomplete coverage	**High**
Already tagged bins	Some had RFID stickers but needed serial updates	Task varied from sticker install to data correction	Confusion, rework, inconsistent outcomes	**Medium**
Manual map highlighting	Progress tracked on a paper map	No real-time management visibility	Hard to monitor coverage and exceptions	**Medium**
Manual re-entry	Admin typed handwritten updates at end of day	Duplicate effort and transcription risk	Delay, errors, administration cost	**High**

Note: priorities are an initial assessment to validate with operations, waste services, ICT and data-governance stakeholders.

Future state: tablet-enabled RFID audit



Tablet decision logic



Management visibility

- Live counts of completed, skipped and exception records
- Street-level coverage map
- Carry-over list generated automatically

Field worker benefit

- No paper pages to update
- Less manual searching through lists
- Clear next address and required action on screen

Digital field app: functional requirements

Live worklist

- Address and property reference
- Bin type and size
- Known serial and RFID
- Collection day and area
- Current status and priority

Field capture

- RFID sticker serial scan
- Serial capture or no-serial flag
- Bin type and size check
- Notes and exception reason
- Photo, GPS and time stamp if required

Validation rules

- Warn on duplicate RFID
- Warn on unexpected bin type
- Require a reason if not completed
- Separate already tagged from new sticker
- Flag missing or unreadable serials

Sync and control

- Offline capable
- Conflict handling
- Audit log
- User ID and time stamp
- Supervisor review queue

Design principle: capture the field truth once, at the point of observation, and synchronise it to the live source record with an audit trail.

Recommended field statuses

Sticker Applied

RFID installed and record updated

Already Tagged

Existing RFID recorded or verified

Serial Updated

RFID present, serial corrected

Bin Not Out

Resident did not present the bin

Address Not Found

Property could not be located

No Serial

Bin lacks a readable serial

Wrong Bin Type

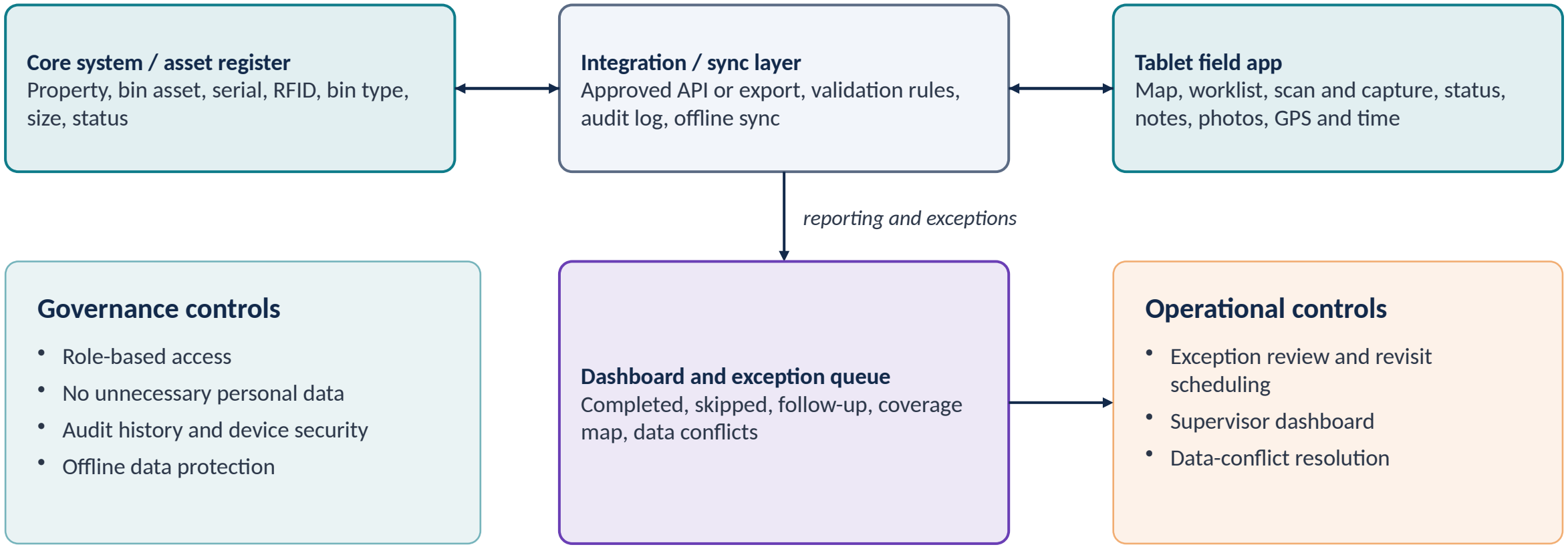
Expected and actual bin differ

Follow-Up Required

Supervisor or admin review needed

Why separate statuses matter: each status tells operations what happens next: finished, revisit, correct the data, or escalate. Unclear items become actionable jobs instead of silent carry-over.

Conceptual solution architecture



Architecture note: the integration method needs confirming with ICT, system owners and vendors. This shows the target information flow, not a confirmed implementation.

Benefits: better completion and data quality

Less manual admin

Higher data accuracy

Fewer revisits

Live progress view

Better coverage

Benefit area	How it improves	Business value
Field efficiency	Live map and worklist reduce searching, wrong addresses, paper handling	More productive time on valid jobs
Data quality	Serial and RFID captured once at the bin and validated before sync	Cleaner asset register, fewer correction tasks
Completion rate	Exceptions recorded immediately. Revisits scheduled from a filtered list	Less carry-over: unclear items separated from actionable jobs
Administration	No end-of-day transcription from handwritten pages	Less duplicate entry, lower error risk
Management visibility	Dashboard of completed, skipped, not-out and conflict records	Better planning, reporting and accountability

Financial model: quantify admin time, revisits, kilometres, completion rate and rework after a small pilot validates the baseline.

Implementation roadmap: pilot before scaling

1. Baseline
Confirm steps, volumes, error types, time spent

→

2. Data review
Audit bin, property, RFID and serial quality

→

3. Prototype
Tablet mock-up, status list, sample worklist

→

4. Pilot
Small-area trial with field feedback

→

5. Refine
Improve statuses, map flow, validation, reporting

→

6. Rollout
Train staff, migrate, monitor adoption

Pilot success measures

- Completed records per day
- Not-out and exception rate
- Manual re-entry time removed
- Data-conflict rate
- Revisit backlog reduced
- Field worker feedback

Delivery risk	Proposed mitigation
Poor source-data quality	Audit existing data in stage 2
Integration limitations	Confirm sync options with ICT early
Offline mobile coverage	Offline-capable app with later sync
Change adoption by field staff	Involve staff in the prototype
Device handling and security	Device policy and role-based access
Unclear exception ownership	Assign queue owners before the pilot

Recommendation: start with a controlled pilot in one suburb or collection area, validate the data model and status options, then scale once usability and data quality are proven.

What this case study demonstrates

Business analysis

- Current-state analysis
- Problem definition
- Requirements thinking
- Exception handling

Process improvement

- Waste identification
- Paper-to-digital redesign
- Rework reduction
- Field-work optimisation

Digital solution design

- Tablet workflow
- Live worklists
- Validation rules
- Dashboard concepts

Operational insight

- Collection-day constraints
- Bin asset data
- Field exceptions
- Implementation risks

I can observe a failing field process, find the underlying data and workflow issues, design a practical tablet-enabled future state and present it to operational and executive stakeholders.

Concept only. Integration method, costs and benefits need confirming with ICT, system owners and a pilot.