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H681 · MS HCI CAPSTONE

SPRING 2026

FINAL ACADEMIC REPORT

RESEARCH · DESIGN · EVALUATION · DEPLOYMENT

Designing for *Real Operations*: A Volunteer Management System for the IMPACT Center Food Pantry

End-to-end HCI research, iterative design, and live deployment of a real-time volunteer coordination system for a food pantry serving 400+ families monthly — from problem discovery through naturalistic evaluation with 189 registered volunteers.

AUTHORS

Tanishq Sardar · Ishita Umredkar · Karuna Saravanan

PROGRAM

MS Human-Computer Interaction · Dept. of Human-Centered Computing · Indiana University SICE

PRIMARY CONTACT

Jason Bratina, Warehouse & Inventory Coordinator · jbratina@mpccministry.com · 317.881.6727 ext 307

COURSE

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FACULTY ADVISOR

Prof. Amy Perry-Goldsmith · aperrygo@iu.edu

PARTNER ORGANIZATION

IMPACT Center · 381 N Bluff Road, Greenwood, IN 46142 · mpcc.info

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ABSTRACT

This report documents the research, design, and development of a volunteer management system for the IMPACT Center food pantry in Greenwood, Indiana, conducted as part of the Indiana University MS HCI Capstone program in partnership with the Toyota Mobility Foundation. The IMPACT Center serves over 400 families monthly through weekly distribution sessions relying on a volunteer workforce of 2–30 individuals per session, coordinated through printed task sheets and a single Operations Manager. Following discovery of fabricated data in prior semester work, the team restarted from genuine field research: semi-structured interviews, field observation at Gleaners Food Bank, a dot survey pilot experiment, competitive analysis of deployed pantry software, and a 20+ source literature review. Four structural problems were identified: knowledge concentration as a single point of failure, unpredictable volunteer counts breaking static coordination, absence of real-time task visibility, and no self-service path for new volunteers. Two systems were proposed at a February 11, 2026 stakeholder meeting; System 2 (Volunteer Management) was selected. The team designed and deployed a responsive web application spanning 64+ screens across three user roles (Operations Manager, Experienced Volunteer, New Volunteer) built on React 18, Firebase Realtime Database, Tailwind CSS, and Vercel. Three formal evaluation activities were conducted: (1) a Cognitive Walkthrough using the Wharton et al. (1994) method across three core task flows on March 26, 2026; (2) a controlled think-aloud usability workshop on March 23, 2026 with 10 participants achieving 100% task completion and 0 critical errors, yielding 6 thematic findings and a prioritized Design Iteration #4; and (3) a naturalistic live-session observation on April 15, 2026 in which 189 registered volunteers operated the first fully paper-free distribution session in IMPACT Center history. Zero critical errors were observed. The system was fully handed off to the IMPACT Center's IT contact before April 22, 2026 at no ongoing cost to the organization.

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Introduction & *Project Context*

The IMPACT Center food pantry operates under conditions that make standard volunteer coordination systems structurally unworkable. This section establishes the operational context, the partner network, the course correction from prior work, and project constraints.

1.1 The IMPACT Center

The IMPACT Center is a community food pantry operated by Mount Pleasant Christian Church (MPCC), located at 381 N Bluff Road, Greenwood, Indiana 46142 (mpcc.info). It is one of ten partner food pantries within the Indy Hunger Network (IHN) and serves over **400 families monthly** through weekly distribution sessions — primarily Wednesday mornings, with Saturday sessions led by a separate shift lead. Volunteer counts per session range from **2 to 30** with no advance notice, and donated food box contents are unknown until physically opened on-site — preventing all advance task planning.

The project addresses food insecurity for **31% of Marion County residents** (approximately 300,000 people, 16 million missed meals annually) within a Toyota Mobility Foundation initiative spanning 37 partner organizations and 50 core team employees. IHN partner pantries include Gleaners Food Bank of Indiana, Second Helpings, Southeast Community Services, and seven others alongside the IMPACT Center.

1.2 Stakeholders

NAME	ROLE
Jason Bratina	Warehouse & Inventory Coordinator — primary day-to-day contact, session lead
Steve Saunders	Executive Pastor — organizational leadership and strategic sponsor
Amber Clark	Center Coordinator — operations support, community liaison
Jay Miller	Experienced Volunteer & Saturday Shift Lead — 10 years at IMPACT Center, 35 years software engineering background
Matt	Church IT contact — technical handoff recipient
Prof. Amy Perry-Goldsmith	Faculty Advisor — facilitated Session 3 of usability workshop
Alex Sindorf	Director of Food Assistance Programs, Indy Hunger Network — primary community partner contact

1.3 Course Correction

At the outset of the final project semester, a critical review of prior deliverables discovered that the previous semester's report contained **fabricated research data** — including volunteer survey results and interview transcripts that were never conducted. This required a complete restart from primary sources, delaying the timeline but ensuring every finding in this report is grounded in genuine field work. Every quote, data point, and finding presented here is drawn from real stakeholder interviews, documented evaluation sessions, or observed field conditions.

1.4 Project Constraints

Budget: Limited to academic resources — no hardware budget. This drove the QR code access model over dedicated tablets, saving \$600–1,400.

Technology literacy: Volunteer population aged approximately 60–80 with variable tech comfort. Solutions must work without training, downloads, or passwords for general volunteers.

Sustainability: Must operate without ongoing student involvement after May 2026 — drove free-tier hosting (Vercel + Firebase Spark plan).

Accessibility: WCAG 2.1 Level AA compliance — minimum 4.5:1 color contrast for normal text (3:1 for large text), keyboard navigability, large touch targets (60×60px minimum), text resizable to 200%, semantic HTML markup compatible with screen readers.

Disruption: Solutions cannot interrupt active pantry operations. All research and testing fit around live distribution sessions, not in place of them.

Operational: Implementation must be adaptable to pantries with different operating models — designed as a generalizable framework, not a custom-only solution.

FIELD ENGAGEMENT – INDY HUNGER NETWORK FOOD PANTRY SUMMIT 2026

The IU team attended the Indy Hunger Network Food Pantry Summit 2026 — a convening of pantry operators, staff, and researchers from across the Marion County food assistance network. Research presented at the summit on negative client experiences and shopper feedback directly informed the project's problem framing and confirmed that the structural challenges identified at the IMPACT Center are systemic, not isolated.



IHN FOOD PANTRY SUMMIT 2026 – RESEARCH PRESENTED ON NEGATIVE CLIENT EXPERIENCES WITH CHARITABLE FOOD ASSISTANCE ACROSS MARION COUNTY



SUMMIT DATA ON NEGATIVE EXPERIENCES WITH CHARITABLE FOOD ASSISTANCE – EDUCATION, INCOME, GENDER, PLACE, AGE AMONG KEY VARIABLES



2026 BOULEVARD PLACE PANTRY: 96% OF SHOPPERS DEMAND CLIENT-CHOICE SHOPPING – VALIDATES THE IMPACT CENTER'S CHOICE MODEL APPROACH



IU RESEARCH TEAM AT THE IHN FOOD PANTRY SUMMIT – TANISHQ SARDAR, PROF. AMY PERRY-GOLDSMITH, AND ISHITA UMREDKAR

Literature Review

02

20+ peer-reviewed papers, industry reports, and organizational documents reviewed across four domains. Each domain directly informed a specific design decision. Sources included Feeding America national evaluations, a 104-page IHN best practices manual reviewed in full, and live competitive analysis of deployed pantry software.

2.1 Food Pantry Operations & Client Choice

Feeding America's NORC evaluation (2023) of the Child & Family Choice Program — spanning 28 food banks — provides the strongest evidence for choice models: **85% client satisfaction increase**, shorter wait times, less food waste, greater food diversity. The IMPACT Center operates a modified choice model, increasing sorting complexity and therefore volunteer coordination demands. A PMC systematic review (2023) found food insecurity rates among pantry clients at 50–84%. The Indy Hunger Network Manual of Best Practices (2025), analyzed in full at 104 pages, contextualizes the IMPACT Center within Marion County's food insecurity landscape and provides operational benchmarks for session structure and volunteer management.

2.2 Tablet-Guided Volunteer Coordination

Gleaners Food Bank of Indiana's volunteer documentation (2025) provided the closest existing proof of concept: a tablet-guided system directing volunteers in a warehouse. The critical distinction — Gleaners operates with **predictable, pre-sorted inventory**. The IMPACT Center's unknown-until-opened donations make Gleaners' architecture non-replicable but methodologically informative. Warehouse logistics research (3DLogistix, 2025; TeamViewer, 2025; Datex, 2024) documents pick-by-tablet and voice-picking systems assuming stable item locations and defined task lists — both unavailable in a donation-based pantry. These sources validated the real-time task routing concept while highlighting which assumptions could not be borrowed.

2.3 Inventory Management & Grant Compliance

The competitive analysis of PantrySoft at Southeast Community Services produced the most directly actionable finding: **negative inventory counts (-4,671 items)**. This proved that systems requiring manual entry as a separate step from physical operations consistently fail when the coordinator is simultaneously directing volunteers. Link2Feed's case study with Just Food (2022) — managing 1 million pounds with real-time tracking — demonstrated successful integration but required dedicated staff not available at the IMPACT Center. YPTC's guide (2025) confirmed that all major pantry inventory tools share this architectural flaw.

2.4 Knowledge Management in Nonprofits

The Bridgespan Group (2024) identifies knowledge concentration in single individuals as the defining vulnerability of small nonprofits: when the key person is occupied or departs, operational knowledge disappears. Mahasuar (2023) documents this as a structural condition — small nonprofits lack formal knowledge capture systems. MITRE's framework (2016) for avoiding single points of failure through knowledge sharing provided the theoretical grounding for the system's primary design goal: **externalizing operational knowledge into a digital medium accessible to all users**. Kampioni & Ciolfitto (2015) add practical implementation guidance emphasizing that technology solutions must integrate into existing cultural practices rather than require new ones.

Boardable and Kindful (2024–2025) volunteer management platform reviews confirmed no existing commercial platform was designed for the IMPACT Center's specific combination of constraints: unpredictable inventory, variable volunteer counts, older adult users, zero hardware budget, and a single-person coordination model.

2.5 Design for Older Adults

With a volunteer demographic aged approximately 60–80, the literature on designing for older adults directly shaped interface decisions. Research on touch target sizing (minimum 60×60px for reliable selection), cognitive load reduction (one primary action per screen), and reading level appropriate to older users (plain language, short instructions) informed all three user role interfaces. The Feeding America School Pantry Evaluation (2013) noted that 25% of non-participants didn't know pantries existed — validating the system's goal of reducing the information gap between what volunteers know and what they need to know to act independently.

A synthesis of all 20+ sources produced a clear convergence: the IMPACT Center's problems are not unique. They are structural conditions present in virtually every small food pantry operating on donated inventory with a variable volunteer workforce. This finding positioned the system as a generalizable framework rather than a custom solution from the earliest design phase.

How We *Learned*

PRIMARY RESEARCH

METHOD 1

Semi-Structured Stakeholder Interviews

Contextual inquiry interviews conducted on-site with the Operations Manager (Jason Bratina), Saturday shift lead Jay Miller (10 years IMPACT Center, 35 years software engineering), and multiple experienced volunteers across sessions. Interviews conducted during and immediately after live distribution sessions. Transcripts recorded via Otter AI and analyzed for recurring themes.

METHOD 2

Field Observation & Participatory Volunteering

Team worked as volunteers at the IMPACT Center. Site visit to Gleaners Food Bank of Indiana to observe tablet-guided coordination at scale. Spatial analysis documented the physical warehouse layout — bay positions, rack labels, zone structure, traffic patterns — directly informing location guidance fields in the system.

METHOD 3

Dot Survey — Freezer Knowledge Pilot

Dot-voting survey administered to 23 volunteers during a live session: "Do you know how to find what you need in the fridge?" Results: 14 YES, 9 NO — 40% of regular volunteers could not navigate the freezer. A "Freezer Guide" pilot intervention validated the hierarchical coordination model. Operations Manager reported fewer interruptions immediately. This experiment directly informed the two-tier volunteer role design.

SECONDARY RESEARCH & COMPETITIVE ANALYSIS

METHOD 4

Literature Review — 20+ Sources

Systematic review across food pantry operations (Feeding America, PMC, Food Bank News), volunteer coordination (Gleaners, 3DLogistix, TeamViewer), nonprofit knowledge management (Bridgespan, MITRE, Mahasuar), and inventory systems (PantrySoft, Link2Feed, YPTC). IHN Best Practices Manual (104 pages) analyzed in full.

METHOD 5

Competitive Analysis — Software Audit

Live deployment analysis of PantrySoft at Southeast Community Services revealed -4,671 negative inventory counts. Evaluated Food Bank Manager, Link2Feed, Boardable, Kindful. Critical finding: every existing solution assumes stable inventory, predictable task lists, and dedicated staff — conditions small pantries do not have.

ONGOING

100+ Hours Stakeholder Engagement

Iterative meetings with Operations Manager, Prof. Amy Perry-Goldsmith, and the volunteer community. Key milestones: Feb 11 system selection meeting, Mar 23 usability workshop, Mar 25 stakeholder decisions meeting, Mar 26 cognitive walkthrough, Apr 15 live session, Apr 27 follow-up Zoom.

Findings & Problem Analysis

04

Four structural problems emerged consistently across all five research methods. These were not failures of any individual — they were conditions built into how the pantry operated. No personal effort could overcome a structure routing all information through a single point.

Finding 1 — Single Point of Failure: Knowledge Concentration

All operational knowledge — task assignments, item locations, volunteer capabilities, session procedures — resided exclusively in the Operations Manager's memory. When occupied directing one volunteer, all others were blocked. The Bridgespan Group (2024) identifies this as the defining vulnerability of small nonprofits. At the IMPACT Center, this was structural: every question had to route through one person.

Finding 2 — Unpredictable Volunteer Counts Break Static Systems

2 to 30 volunteers could arrive with no advance notice. Printed task sheets prepared the night before were obsolete before sessions began. The existing whiteboard had no mechanism for real-time reallocation. Volunteers arriving late had no access to current task status.

Finding 3 — No Cross-Volunteer Task Visibility

Volunteers had no visibility into what was claimed, completed, or still available. Task duplication was common. "A volunteer does half a job, crosses out half the line, and then 30 other volunteers see it crossed out and skip it. The whole rack ends up empty." — Operations Manager Observer, workshop conclusion meeting.

Finding 4 — No Self-Service Path for New Volunteers

First-session volunteers had no independent guidance mechanism. Without direct verbal instruction from the Operations Manager, they could not work. The dot survey confirmed 40% of regular volunteers (14 of 23) did not know the freezer layout despite multiple sessions — the gap extended far beyond first-timers.

Success Metrics Established

Metric	Target
Reduce Operations Manager interruptions	60% reduction (~30 → ~10 per session)
Task completion rate	100% of tasks completed within shift
New volunteer independence	Work without help after first shift
System adoption rate	80%+ volunteers use system vs. asking directly
Digital board effectiveness	Volunteers check board before asking questions

The Competitive Analysis Finding

PantrySoft at Southeast Community Services showed **negative inventory (-4,671 items)** — not a software bug, but proof that systems requiring entry separate from physical operations fail when the coordinator is simultaneously directing volunteers. This established the non-negotiable design constraint: **integration into the existing workflow, not addition to it.**

"Looking down the road — three, five, ten years — to be able to have other locations, to expand, to duplicate what we have now. You can't replicate what we have now. It's not a model you could incorporate in other environments."

— Operations Manager · March 25, 2026 Stakeholder Meeting

Journey Mapping Insights

Journey mapping of the Operations Manager's Tuesday night sorting process revealed the critical integration opportunity: Jason opens donation boxes, decides what goes where, and sorts. This decision moment — where items are placed — is exactly when task data should be created. The sorting decision and the task creation are the same mental act, making them natural candidates for a single digital action.

Volunteer journey mapping revealed five friction peaks: (1) arriving with no task visibility, (2) not knowing where items go, (3) discovering a task is already claimed, (4) not knowing what to do after completion, (5) having no escalation path when stuck. Every interface decision in the system addresses at least one of these peaks.

Requirements Derivation

From findings, the requirements derivation produced two categories. **Functional requirements:** adapt to unpredictable inventory, provide real-time task visibility, reduce manager interruptions by 60%+, guide new volunteers independently, generate grant-ready records. **User requirements:** design for 60–80 year olds, large touch targets, high contrast, minimal cognitive load per screen, integrate into existing workflow, no additional steps or burdens, support variable tech comfort levels.

Two Systems, *One Choice*

System 1 — Live Inventory Tracking (Not Selected)

Proposed but deferred

Jason logs items during Tuesday night sorting → real-time inventory data created → visible for grant applications → integrates with PantrySoft. Tablet at sorting stage: one action creates both inventory record and task data simultaneously. Not selected now — Operations Manager's most acute daily bottleneck was volunteer coordination, not inventory. IMPACT Center was already proceeding with PantrySoft on their own timeline.

System 2 — Volunteer Management (Selected)

Selected by stakeholders — February 11, 2026

Digitizes the Operations Manager's manual Word document → print → pin workflow. Tasks created in-app. Tasks display on digital board instead of printed paper. Volunteers claim and complete in real-time. Eliminates weekly printing burden. Directly addresses the primary bottleneck: coordinating 2–30 volunteers Wednesday mornings.

Critical cost innovation: Rather than purchasing 5–10 tablets (\$1,000–2,000), the system uses a QR code that volunteers scan with personal smartphones — reducing equipment costs to approximately \$400–600 while eliminating charging logistics, device management, and app store dependencies. Savings: \$600–1,400 (60–70% reduction).

4-Week Development Timeline

PHASE	DATES	DELIVERABLES
Phase 1 — IA & Prototyping	Feb 12–Mar 4	9 IA diagrams, clickable prototype, stakeholder validation
Phase 2 — Core Development	Mar 5–Apr 1	All screens built, Firebase sync, SWOT analysis
Phase 3 — Integration & Testing	Apr 2–15	QR codes, workshop, post-workshop iteration
Phase 4 — Final Delivery	Apr 16–22	Live deployment, security rules, handoff to Matt

Three-Tier User Access Model

The system accommodates three distinct user types, each with different authentication requirements and capabilities — derived from the stakeholder analysis and field research:

Operations Manager

Username + password (Firebase-stored, self-changeable). Full CRUD on tasks. Task history with volunteer attribution. Real-time dashboard. Volunteer roster management. Import PantrySoft Excel data. Session time window control.

Experienced Volunteers

4-digit volunteer ID (last 4 of phone number, duplicate fallback). Browse task pool. Claim tasks autonomously. Mark complete. Unclaim if sidetracked. System tracks performance for future analytics. Can serve as area guides (Freezer Guide role).

New Volunteers

No authentication — anonymous tap-and-go. Simplified task list showing basic tasks only. Step-by-step instructions with bay-level location guidance. Tap to claim, tap Done to complete. Zero barrier to entry.

Pilot Experiment Validation

The Freezer Guide pilot — assigning an experienced volunteer to guide newcomers — had already demonstrated that reducing the Operations Manager's role as sole information source produced immediate improvements. System 2 digitized and scaled this concept: the task pool is the new "Freezer Guide" — always available, never occupied with something else.

Research Publication Goal

Prof. Amy Perry-Goldsmith identified a strategic goal during the February planning sessions: produce a research paper for academic publication. System designed as a generalizable framework. Target venues: CHI, CSCW, or ISCRAM. Documentation of design process and rationale, quantitative impact metrics, qualitative volunteer feedback, and implementation guide for other pantries are all required deliverables for this goal.

From Research to *Interface*

6.1 Core Design Principles

Integration Over Addition

Every interaction fits into an existing workflow step. Task creation happens when sorting decisions are already being made. No separate data entry step.

Design for 60–80

Large touch targets (60×60px min), WCAG 2.1 AA contrast, icons always paired with text labels, max 2 taps to any screen, one primary action per screen.

Role-Appropriate Access

Each user sees exactly what they need — no more, no less. Cognitive load managed by limiting screen content to the current task.

Zero Hardware Investment

QR code on printed card or existing display. Volunteers use own phones. No app download, no dedicated devices, no charging logistics.

Real-Time Everywhere

Every task state change visible to all users in under one second. Firebase Realtime Database delivers this without polling or manual refresh.

6.2 Technology Decisions

Responsive web app over native mobile: Eliminates app store dependency. Works on any device. Updates deploy instantly. Volunteers already familiar with browser-based web.

Firebase Realtime Database: Zero-latency sync. Spark plan free and sustainable at current volunteer scale. Supports future multi-location expansion.

React 18 + Tailwind CSS + Vite: Component architecture supports complex multi-role routing. Consistent design token application across 64+ screens. Deployed on Vercel with automatic CI/CD from GitHub.

Color system: IMPACT Center teal (#0D7B6E), Dark Navy (#0A2A3A). Orange explicitly excluded — conflicts with In Progress task status. No pure black — Dark Navy used as darkest color. Teal tag pills: #CCEDEB background / #09665E text — consistent across all 64+ screens.

6.3 Design Iteration Timeline

FEB 2026 — ITERATION 1

Information Architecture (9 Diagrams)

Site map, user flows for all 3 roles, screen inventory (15 initial screens), low-fidelity wireframes. Three-tier access model confirmed at February 11 meeting. Initial task status system defined: Available (white) → In Progress (orange) → Complete (green).

FEB-MAR 2026 — ITERATION 2

Low-Fidelity Clickable Prototype

Clickable wireframes for all major user flows. Validated with Operations Manager before proceeding to high-fidelity. Tag filter bar retained but flagged for redesign. Smart task suggestion engine architecture defined — pattern recognition, volunteer matching, task bundling.

MAR 2026 — ITERATION 3

High-Fidelity Design in Figma

Full design system: color tokens, text styles, component library. Designed at 390px (volunteer mobile) and 1280px (manager desktop). Four design iteration rounds. Figma file: XHu2KoJOkjTUR2MM4M2cxD. Design-to-code handoff via screenshots to Claude Code with side-by-side comparison at each screen.

MAR-APR 2026 — ITERATION 4

Post-Workshop Iteration (Major)

6 thematic findings from the March 23 workshop drove the most significant iteration cycle. See Section 11 — Design Iteration #4 for full documentation of changes, design decisions, and tradeoff analysis.

6.4 Workshop Flow Structure

The workshop was designed as a two-phase evaluation: individual think-aloud sessions first (preventing opinion contamination between participants), followed by group scenario runs. The full flow:

Brief → 1:1 think-aloud sessions (Operations Manager, experienced volunteers, new volunteers, each individually) → **Operations Manager creates tasks → Experienced volunteers claim → "Food picked up"** (mid-session donation arrival) → **Operations Manager creates new tasks → Experienced volunteers claim again → Group tasks / Individual tasks / Urgent task scenarios → Conclusion meetings ×2**

This two-phase structure was specifically designed so that the 1:1 think-aloud sessions would capture uninfluenced individual reactions before participants could share perceptions with each other in the group scenarios.

7.1 All Major Design Decisions Documented

DECISION	RATIONALE	EVIDENCE SOURCE
4-digit ID — last 4 of phone. Duplicate triggers full-number fallback.	"I typed my phone number in Google and the first four things were my family. My wife's name, my name, our address. That's terrifying." Full phone number creates security risk — surfaces name, address, family members.	Operations Manager · March 25 meeting
Two-step claim flow — tap card to view, separate Claim button	Prevents accidental claims on touch interfaces. Workshop initially flagged as redundant; retained after Operations Manager confirmed accidental claims are a real operational problem with paper system.	Workshop Session 1 · Operations Manager
Four task statuses: Available → In Progress → Incomplete → Complete	"Red is still outstanding. Yellow is in process. Green is done." 3 statuses insufficient — volunteers got sidetracked, tasks stayed orange indefinitely. Incomplete enables recovery from abandoned tasks.	Jay Miller · Workshop Session 3 · Mar 25
Bay numbers in location field (e.g., "bay 3 → Rack 3")	40% of volunteers could not locate freezer items. "Warehouse" alone caused searching. Bay numbers physically installed at pantry between Mar 23 workshop and Mar 25 meeting — 2 days later.	Dot survey · Workshop Session 2 · Mar 25
Incomplete auto-rollover to next session if unresolved	"That would be a big deal — if Wednesday tasks roll over to Thursday so you know exactly what still needs to be done." Operations Manager. Incomplete tasks surface at top of next session's pool automatically.	March 25 stakeholder meeting
Session time window — tasks only claimable during defined shift hours	Prevents bad actors claiming tasks from home before arriving. "At 8:30, I want to make sure I get that before somebody else does." Tasks lock between sessions automatically.	March 25 stakeholder meeting (new req)
Tag filter removed from volunteer view	All 3 individual workshop sessions independently flagged the filter bar as confusing — participants thought tapping a tag meant they were IN that area, not filtering for it. Fundamental mental model mismatch.	All 3 workshop sessions · CWR-001 Step 4
Mode selection screen for driver-tagged volunteers	Volunteers serving both pantry and delivery roles need "What are you doing today?" routing without separate IDs or logins.	Delivery module requirements
"Operations Manager" everywhere — never personal names in UI	Role-generic language ensures system validity when staff changes. Future coordinators inherit a system that speaks to their role.	Handoff planning · March 25 meeting

Physical changes made to the IMPACT Center warehouse in response to prototype feedback — bay numbers on shelving, paper task board updated with In Progress/Completed columns, rack labels added — confirm co-evolution of the digital system and physical space. All three changes were implemented by the Operations Manager team independently, in the two days between the March 23 workshop and the March 25 meeting.

System *Description*

A deployed, production-grade responsive web application — 64+ screens, 3 user roles, 2 modules (Pantry + Delivery), real-time Firebase sync — accessible via QR code on any smartphone. No app installation. No dedicated hardware. No ongoing cost.

8.1 Technical Architecture

Frontend: React 18 + Vite + Tailwind CSS. Deployed on Vercel with automatic CI/CD from GitHub (tpscodes/impact-center-volunteer-system). vercel.json configured for client-side routing refresh support.

Backend: Firebase Realtime Database (Spark plan — free, sustainable). Real-time JSON structure for all task state, volunteer records, session data, delivery routes. Security rules tightened before handoff. Admin password Firebase-stored (self-changeable by Operations Manager without developer involvement).

Authentication: Three-tier. Operations Manager: username + password. Experienced volunteers: 4-digit ID with duplicate fallback. New volunteers: name entry only — zero barrier.

Live URL: impact-center-volunteer-system.vercel.app. Vercel account transferred to Matt (church IT) before April 22, 2026.

8.2 Full Screen Inventory

Module	Screen	Role
Pantry	Landing Page	ALL
	Manager Login	MANAGER
	Manager Dashboard	MANAGER
	Create / Edit Task	MANAGER
	Volunteer Management	MANAGER
	Task History	MANAGER
	ID Entry + Task Pool + Detail	EXP. VOL
	New Volunteer Entry + Tasks	NEW VOL
	Mode Select (driver routing)	DRIVER
Delivery	Delivery Dashboard + Routes	MANAGER
	Create Delivery Route	MANAGER
	Drivers + Delivery History	MANAGER
	Driver Task Pool + Route Detail	DRIVER
	All screens exist in mobile (390px) and desktop (1280px) variants	—

8.3 Task Tag System

Tasks are categorized using a tag system that the Operations Manager applies at creation. Tags inform which volunteers should work which tasks and support area-based filtering in the manager view:

Tag	Use
Warehouse	Storage area — moving boxes, organizing bins
Fridge	Main refrigerator restocking
Freezer	Freezer area restocking
Sorting	Sorting incoming donations at sorting table
Produce	Fresh produce — bins, shelves, rotation
Delivery	Pickup/delivery — Kroger runs, receiving trucks
Shift Leader	Experienced volunteer supervising newer ones
Warm	Dry goods, shelf-stable items
Kitchen	Kitchen area tasks
Clothing	Clothing section tasks
General	Catch-all / uncategorized

8.4 Delivery Module

The Delivery module handles home delivery route coordination — managing **driver schedules** (which driver covers which route, on which dates) rather than client addresses. It reuses the pantry task framework (claim/unclaim/complete) at route level. Sidebar navigation swaps entirely between Pantry and Delivery modes — not filtered, fully replaced. Weekly recurring routes supported up to two months ahead, matching the Operations Manager’s actual advance planning behavior.

8.5 Handoff Status

Component	Status	Note
Vercel Deployment	LIVE	Account transferred to Matt (church IT)
Firebase Database	LIVE	Spark plan — free, sustainable
Firebase Security Rules	DONE	Tightened pre-handoff
GitHub Repository	PUBLIC	tpscodes/impact-center-volunteer-system
Admin Password	DONE	Firebase-stored, manager self-changeable
Custom Domain	OPTIONAL	\$5–50/yr GoDaddy if desired

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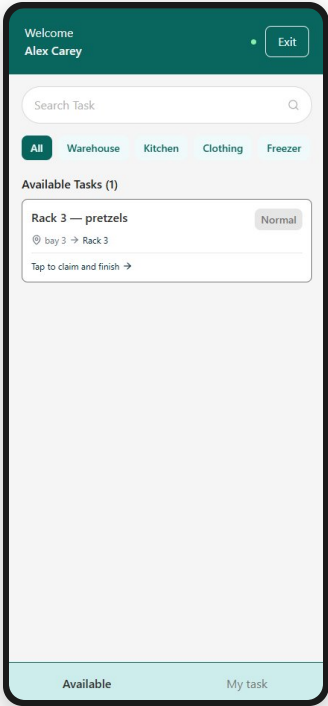
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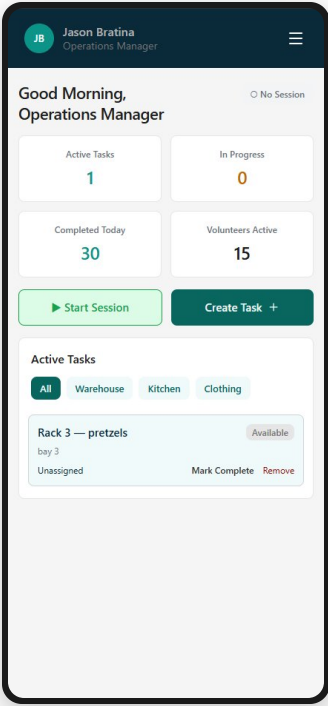
8.7 Smart Task Suggestion Engine

The system includes a task suggestion mechanism that learns from historical patterns — auto-suggesting recurring tasks (e.g., "Fill Coffee → Rack 7" every Tuesday). Suggestion logic covers pattern recognition, volunteer matching, and task bundling. Requires 4–6 weeks of operational data before reliable suggestions emerge.

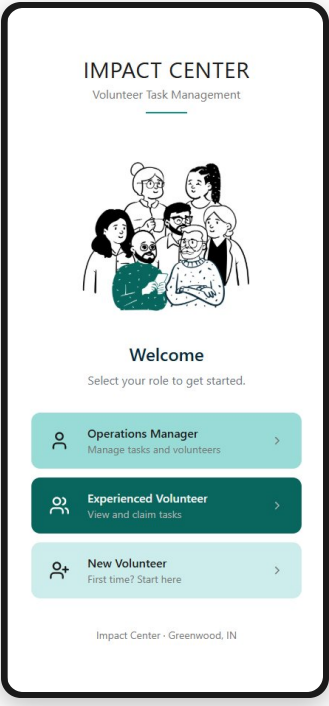
LIVE SYSTEM SCREENSHOTS — IMPACT-CENTER-VOLUNTEER-SYSTEM.VERCEL.APP



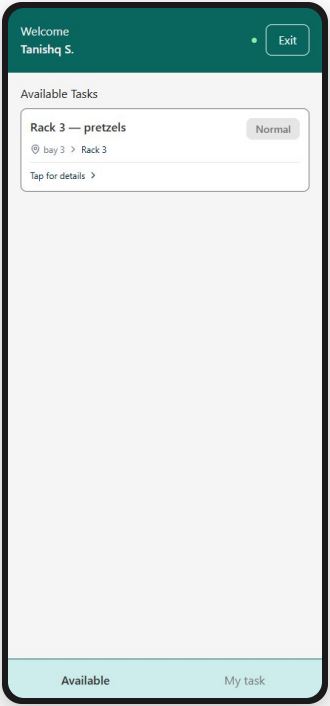
EXPERIENCED VOLUNTEER
TASK POOL



OPERATIONS MANAGER
DASHBOARD



LANDING PAGE
ROLE SELECTION



NEW VOLUNTEER
TASK VIEW

All screens shown above are live in production. Volunteers access via QR code at the pantry entrance — no app download, no account creation required. The Operations Manager dashboard is accessible on any desktop browser. The system handled 189 registered volunteers with stable Firebase Realtime Database sync throughout the April 15 live session.

Information *Architecture*

The system's information architecture was documented across 9 diagrams before any development began. This section presents the high-level IA structure and optional technology infrastructure concepts explored during the design phase.

THREE-TIER ACCESS ARCHITECTURE

TIER	ENTRY	KEY SCREENS	PERSISTENCE
Operations Manager	Username + password	Dashboard, Create Task, Volunteer Mgmt, History, Delivery (7 screens)	Named account
Experienced Volunteer	4-digit ID	ID Entry, Task Pool, Task Detail, My Tasks, Mode Select	Session-scoped by ID
New Volunteer	Name entry only	Name Entry, Simplified Task List, Task Detail	Anonymous

TASK LIFECYCLE STATE MACHINE

STATE	COLOR	TRIGGER	WHO CHANGES
Available	White/Gray	Task created & published	Operations Manager
In Progress	Teal	Volunteer claims (2-step)	Experienced Volunteer
Incomplete	Red	Unclaim or manager flags	Volunteer / Manager / Shift Lead
Complete	Green	Volunteer marks done	Volunteer / Manager

Incomplete tasks auto-rollover to next session. Complete tasks move to Task History with full volunteer attribution.

FIREBASE DATA ARCHITECTURE

NODE	CONTENTS
/tasks	All pantry tasks — status, assignee, location, priority, tags, timestamps
/volunteers	189+ registered — ID, name, isDriver flag, session history
/sessions	Session open/close times, active task window
/completedTasks	Completed tasks with volunteer attribution, timestamp, duration
/routeTemplates	Delivery route templates, driver assignments, recurrence rules
/routeOccurrences	Weekly delivery instances generated from templates
/appSettings	Admin credentials, session time window, org name, delivery days

NAVIGATION STRUCTURE

Landing Page → Role Selection

Three large role buttons (Operations Manager, Experienced Volunteer, New Volunteer). Color-coded and icon-labeled. All workshop participants clicked the correct role without prompting. Same URL for all users — role determines the experience fork.

Pantry ↔ Delivery Mode Switch

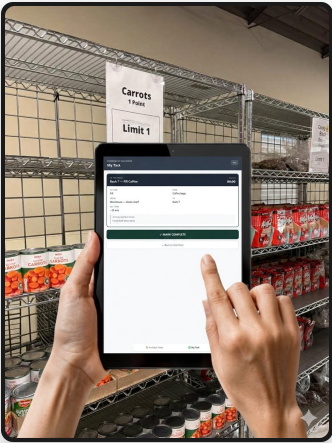
Sidebar navigation swaps entirely between Pantry and Delivery modes — not filtered, fully replaced. Operations Manager sees both. Drivers with the isDriver flag see a mode selection screen after ID entry. All content completely separate between modes.

Maximum 2 Taps to Any Action

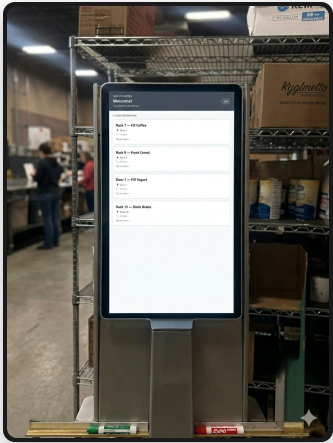
Core IA constraint from the design-for-60–80 principle. Landing page → role → task pool is 2 taps. Task pool → task detail → claim is 2 taps. No screen requires more than 2 taps from any previous screen to reach its primary action.

OPTIONAL TECHNOLOGY INFRASTRUCTURE

Two optional hardware concepts explored during design — not required for the current system:



Option A — Tablets in Warehouse: 5–10 tablets (\$1,000–2,000) at key zones. No dependency on volunteers having smartphones. Trade-off: charging, device management, and cost — QR code approach selected instead.



Option B — Wall Kiosk / Digital Board: Single large touchscreen (\$400–600). New volunteers tap to claim tasks without any device. QR code on board for phone access simultaneously. Validated in workshop — most likely near-term hardware addition.

Usability Evaluation Plan

09

Formal evaluation plan developed prior to workshop. This section documents the evaluation design rationale, method selection justification, and variable analysis that preceded the March 23, 2026 study.

9.1 Variable Analysis

User Availability — High. Participants were existing IMPACT Center volunteers, shift leads, and Operations Manager staff already present at the pantry on the workshop day. Because the system was built specifically for this community, recruitment required no external outreach — the Operations Manager coordinated participant availability directly.

Team Size — 3 members. Each member (Ishita Umredkar, Tanishq Sardar, Karuna Saravanan) facilitated one individual session, allowing parallel data collection across three groups simultaneously with no cross-contamination.

Interface Size — Medium-large. 32 screens across 3 distinct user flows at the time of evaluation: Operations Manager (login, dashboard, task creation, management, history), Experienced Volunteer (ID entry, task pool, task detail, claim, complete), New Volunteer (anonymous task list, tap-to-claim, tap-to-complete). Evaluation focused on the Experienced Volunteer flow as the most complex and frequently used path.

9.2 Why Think-Aloud Protocol

Think-aloud protocol was selected as the primary method for three reasons:

Task-driven interface: Every volunteer interaction is centered on finding, claiming, and completing a task — making task-based scenarios a natural fit for the evaluation structure.

Real-time confusion capture: For volunteers aged 60–80 with variable tech comfort, think-aloud captures the moment of confusion before participants rationalize or forget their initial reaction. Post-task surveys require participants to recall and articulate issues after the fact — less reliable for this demographic.

Time-constrained users: Volunteers are available only during pantry hours in short windows. Think-aloud yields rich data quickly without requiring extended sessions.

9.3 Why Contextual Group Discussion

Contextual group discussion in the conclusion meetings was selected as a complementary method because individual sessions cannot surface operational knowledge held collectively by the volunteer community. Issues like the incomplete task status, role stratification across volunteer types, and touchscreen board behavior only emerged when experienced volunteers and Operations Manager staff discussed the system together — each building on observations the others hadn't considered individually.

Together the two methods provided both micro-level usability data (specific UI friction points) and macro-level design validation (does the system actually fit how the pantry operates).

9.4 Test Overview

VARIABLE	THINK-ALOUD SESSIONS	CONCLUSION MEETINGS
Format	Moderated, in-person	Moderated, in-person
Sessions	3 individual (concurrent)	2 group sessions (sequential)
Participants	6 (2 per session)	~8 (all remaining)
User Type	Experienced Volunteers	Volunteers + Ops Manager staff
Duration	10–15 min each	~45 min total
Recording	Notes + observer per participant	Group notes

9.5 Recruitment Strategy

Participants recruited directly through the Operations Manager from the existing volunteer and staff community. No external recruitment was required — participants are the actual end users. This targeted strategy ensured feedback reflected real operational knowledge and tech comfort levels rather than proxy user responses. 10 participants total: Operations Manager staff (3), experienced volunteers (4), and new volunteer roles filled by the IU team (3).

9.6 Pre-Session Setup Protocol

A full pre-session checklist was followed to ensure participants' time was spent on genuine usability insights rather than technical issues: demo data reset in Firebase, 10 pre-loaded tasks seeded (Rack 7 — Fill Coffee, Door 1 — Fill Yogurt, Fridge — Restock Milk, Freezer — Fill Chicken, Kroger Pickup — Produce Donation, and others), volunteer IDs 1001–1005 active, manager credentials confirmed, QR codes tested on multiple device types, printed observation notes templates prepared per participant.

Evaluation Study #1

10

Method: Think-aloud protocol with task-based activities + contextual group discussion
Date: March 23, 2026 · IMPACT Center, Greenwood, Indiana
Participants: 10 total across 3 sessions + 2 conclusion meetings
Duration: ~2.5 hours total
Result: 100% task completion · 0 critical errors · 6 thematic findings

10.1 Participant Profiles

ID	ROLE	TECH COMFORT	NOTES
P1	Exp. Volunteer (Wed)	Low-Moderate	2+ years at IMPACT Center, weekly volunteer
P2	Exp. Volunteer (Wed)	Low-Moderate	Regular volunteer, focuses on refrigerated items
P3	Exp. Volunteer (Sat)	Moderate-High	Jay Miller — Saturday Shift Lead, 10 years IMPACT Center, 35 years software engineering
P4	Ops Manager Observer	Moderate	Operations Manager staff — observed Rhea's session, provided operational context
P5	Exp. Volunteer	Low	Older volunteer, first time interacting with a task management system
P6	Exp. Volunteer	Moderate	Comfortable with smartphones, prefers QR code access
P7-P10	Mixed	Mixed	Conclusion meeting participants including Operations Manager (Jason), experienced shift volunteers

Participant demographics reflect the real IMPACT Center volunteer population: primarily adults aged 40–75, variable tech comfort, strong familiarity with pantry operations, no prior experience with digital task management systems.

10.2 Session Scenarios

SCENARIO 1 — EXPERIENCED VOLUNTEER

Find and Claim a Task

Wednesday morning. The Operations Manager has told you to log in and find a task. You are an experienced volunteer — ID is 1003. Open the system via QR code, select your role, enter your ID, browse the task pool, select and claim a task, then mark it done.

SCENARIO 2 — OPERATIONS MANAGER

Create and Publish a Task

Tuesday night — donations sorted. Log in as Operations Manager, navigate to task creation, fill in details for a real pantry task (e.g. Fill yogurt — Door 1 — Walk-in fridge), set priority, publish, confirm task appears in pool.

SCENARIO 3 — NEW VOLUNTEER

Complete a Simple Task

First time volunteering. A shift lead pointed you to the board. Open the system — no login required. Select New Volunteer. Find something easy to do and complete it.

10.3 Session Findings & Quotes

Session 1 — Tanishq Sardar · P1, P2

"That doesn't make sense to me. If you punch fridge, I don't see why it would populate all the ones that are for the fridge."

— P2, Experienced Volunteer · Session 1, March 23, 2026

"Claim task bothers me a little bit. By punching it, you've claimed it. But it says claim task, so now I need to push that button again?"

— Experienced Volunteer · Session 1, March 23, 2026

Positives: One-task-at-a-time constraint understood and accepted. Real-time sync impressed participants — they watched tasks change live across devices. Task history with volunteer attribution well received.

Session 2 — Rhea · P2, P4 (Ops Manager Observer)

"Is there a way to know where in the warehouse the cereal is — exactly within the warehouse, where is it?"

— P2, Experienced Volunteer · Session 2, March 23, 2026

"Each bay would have a number — they could add that so volunteers stop spending time looking for things."

— P4, Operations Manager Observer · Session 2, March 23, 2026

"Scan the QR code, boom, it's all on there."

— Experienced Volunteer · Session 2, March 23, 2026

Insight: "My husband and I always do the meat on Wednesdays." Volunteers have territorial task preferences — filtering by area supports this natural behavior already present in pantry culture.

10.4 Thematic Analysis — 6 Themes

- T1 HIGH** Workflow Friction — tag filter confusion, two-step claim ambiguity. Flagged independently in all 3 sessions.
- T2 HIGH** Information Overload — task detail duplicates card, estimated time unanimously dismissed.
- T3 HIGH** Task Visibility & Status — 3 statuses insufficient, Incomplete state missing, no unclaim.
- T4 MED** Spatial Disorientation — "Warehouse" too vague, bay numbers needed for navigation.
- T5 MED** Role Ambiguity — drivers, kitchen, clothing, pantry need separate access.
- T6 LOW** Technology Comfort — QR code preferred, wall display validated.

10.5 What Surprised the Team

- 1. Incomplete status:** We designed 3 states. The conclusion meetings revealed a 4th state that pantry operations require — abandoned tasks. We hadn't anticipated this until participants described it in operational terms.
- 2. Jay Miller — power user we didn't know we had:** Planned for a novice user in Session 3. Within 10 minutes Jay provided the most technically precise feedback of any participant — unclaim gap, priority visibility, repackaging task type, multi-claim scenario.
- 3. Tag filter more confusing than expected:** Flagged independently in all 3 sessions without cross-contamination. The mental model mismatch — IN an area vs. FILTERING for it — was fundamental, not cosmetic.
- 4 & 5.** 100% task completion with 0 errors — confirmed the core architecture is sound. Volunteers also revealed territorial task preferences ("my husband and I always do the meat") — validating tag filtering as a future feature.

Session 3 — Prof. Amy Perry-Goldsmith · P3 (Jay Miller)

"On days I have seven volunteers, having the priorities important because we might not get through everything."

— Jay Miller, Saturday Shift Lead · Session 3, March 23, 2026

"There's no option to unclaim. If you start something and get sidetracked, the task stays orange and nobody else picks it up. That happens on Saturdays."

— Jay Miller, Saturday Shift Lead · Session 3, March 23, 2026

Conclusion Meetings — Combined Group

"Red is still outstanding. Yellow is in process. Green is done. That's what I need to see on the board."

— Jay Miller · Conclusion Meeting, March 23, 2026

"This happens quite often — a volunteer does half a job, crosses out half the line, and then 30 other volunteers see it crossed out and skip it. The whole rack ends up empty."

— Operations Manager Observer · Conclusion Meeting, March 23, 2026

10.4 Thematic Findings (6 Themes)

- T1 HIGH** Workflow Friction — tag filter confusion, two-step claim ambiguity. Raised independently in all 3 sessions.
- T2 HIGH** Information Overload — task detail duplicates card info, estimated time unanimously dismissed.
- T3 HIGH** Task Visibility & Status — 3 statuses insufficient, Incomplete state missing, no unclaim mechanism.
- T4 MED** Spatial Disorientation — "Warehouse" too vague, bay/row numbers needed for navigation.
- T5 MED** Role Ambiguity — drivers, kitchen, clothing, pantry volunteers need separate task access.
- T6 LOW** Technology Comfort — QR code universally preferred over app download, wall display validated.

10.5 What Surprised the Team

- 1. Incomplete status:** We designed 3 states. The conclusion meetings revealed a 4th state that pantry operations require. We hadn't anticipated abandoned tasks as a distinct state until participants described it in operational terms.
- 2. Jay Miller — a power user we didn't know we had:** Planned for a novice user in Session 3. Within 10 minutes, Jay provided the most technically precise feedback of any participant — identifying unclaim gap, priority visibility, repackaging task type, and multi-claim scenario for experienced volunteers.
- 3. Tag filter more confusing than expected:** Flagged independently in all 3 individual sessions without cross-contamination. The mental model mismatch (IN an area vs. FILTERING for an area) was fundamental, not cosmetic.
- 4. 100% task completion with 0 errors:** We expected some failure given variable tech comfort. The completion rate validated the core architecture — participants who struggled with specific elements still found their way to the correct outcome.
- 5. Territorial task preferences:** Volunteers self-assign to the same tasks each session. This natural behavior was not explicitly designed for but validates the tag filtering concept as a future feature once the UI confusion is resolved.

USABILITY WORKSHOP – IMPACT CENTER, GREENWOOD, INDIANA · MARCH 23, 2026

The following photographs document the March 23, 2026 usability workshop. Three concurrent individual think-aloud sessions were facilitated by separate team members, followed by two back-to-back conclusion meetings. All 10 participants were existing IMPACT Center volunteers and staff — actual end users of the system, not recruited proxies.



CONCLUSION MEETING – ALL PARTICIPANTS AND IU TEAM AT THE IMPACT CENTER



CONCLUSION MEETING – VOLUNTEERS AND OPERATIONS MANAGER STAFF IN STRUCTURED GROUP DISCUSSION



1:1 THINK-ALoud SESSION – TANISHQ SARDAR FACILITATING WITH AN EXPERIENCED VOLUNTEER WORKING THROUGH THE TASK POOL FLOW



FACILITATOR PRESENTING DURING THE BRIEFING PHASE – EXPLAINING THE THINK-ALoud PROTOCOL AND THAT THE SYSTEM, NOT THE PARTICIPANT, IS BEING EVALUATED



SYSTEM DEMONSTRATED ON WALL-MOUNTED DISPLAY DURING GROUP SCENARIO PHASE – LIVE DEPLOYED PROTOTYPE USED THROUGHOUT ALL WORKSHOP SESSIONS

Design Iteration #4

Design Iteration #4 documents all changes implemented and decided as a direct result of the March 23 usability workshop. It includes one completed change, five in-development changes, and explicit tradeoff analysis for each major design decision.

11.1 Change Implemented — Live on Prototype

✓ **Mark Complete Button — Changed to Green (#34C759)**

Source: Jay Miller (P3), Session 3. Original button styling created ambiguity between completing and canceling a task. Green universally signals "done" and the visual distinction matters especially when volunteers are moving quickly through tasks. Deployed to live prototype. No tradeoffs — unambiguous improvement.

11.2 In-Development Changes

Four-State Task Status System

White (Not Started) → Orange (In Progress) → Red (Incomplete) → Green (Complete). Replaces original 3-state model. Incomplete state directly addresses the paper-system failure: volunteers cross out half a task, subsequent volunteers skip it thinking it's done — the whole rack empties. Digital Incomplete makes abandonment visible to everyone.

Unclaim / Release Button

Added to task detail screen for claimed tasks. Returns task to available pool with Incomplete status. Mirrors Jay Miller's operational reality: "volunteers get sidetracked, task stays orange indefinitely, nobody else picks it up because it looks claimed." Gives volunteers a clean handoff mechanism.

Tag Filter Bar — Removed from Volunteer View

All 3 individual sessions flagged independently as confusing. Tags remain in Operations Manager view for task creation. Volunteers see clean unfiltered task list. Area filtering happens through Operations Manager verbal assignment — matching existing pantry practice. Tradeoff: Removes useful feature for regulars who prefer filtering by area. Selected because for the 60–80 demographic, Option A (remove entirely) is simpler and the verbal assignment is sufficient current practice.

Priority Badge on Task Detail Screen

Urgency/priority badge currently only in task pool list. Added to task detail screen as well. Jay's specific request: "on days with 7 volunteers, priority determines which tasks get done before the session ends. Volunteers need to see urgency at every point in the flow."

Volunteer ID Backend Management UI

Operations Manager can add, edit, and remove experienced volunteer profiles. Currently IDs are hardcoded (1001–1005). Conclusion meetings confirmed the Operations Manager needs to manage this independently — adding new experienced volunteers as they graduate from new status, removing inactive ones. Accessible only from Operations Manager dashboard.

11.3 Tradeoff Analysis — Major Decisions

PROBLEM 1 — TAG FILTER CONFUSION (ALL SESSIONS)

Fix Option A: Remove tags from volunteer view (Selected)

Clean unfiltered task list. Operations Manager verbally assigns sections as currently practiced. Tradeoff: removes feature some regulars use. Selected because: 60–80 demographic, verbal assignment sufficient, confusion was fundamental not cosmetic.

PROBLEM 2 — TWO-STEP CLAIM FLOW (ALL SESSIONS)

Fix Option B: Tap opens simplified detail, single Claim button (Selected)

Single card tap opens lightweight detail view with special instructions and Claim button. One additional tap confirms. Option A (single tap claims immediately) risks accidental claims on touchscreens. Option B retains review step but reduces detail screen clutter. Selected: balances simplicity with operational need to review instructions before committing.

PROBLEM 3 — NO UNCLAIM OPTION (JAY MILLER + OPS MANAGER)

Fix Option A: Add unclaim button — returns task as Incomplete (Selected)

Option B (auto-timeout at 60 minutes) rejected by conclusion meetings: pantry tasks don't have predictable durations, auto-timeout would create false Incomplete states for legitimately long tasks. Option A requires volunteer action but is reliable and non-disruptive.

PROBLEM 4 — NEW VOLUNTEER FORGETTING TO MARK DONE

Fix Option B: Incomplete status — Operations Manager can trigger (Selected)

Neither option eliminates root problem (volunteer forgetting to tap Done) but both provide recovery paths. Option B (Incomplete status) is more scalable — distributes recovery responsibility to shift leads rather than concentrating it in Operations Manager.

11.4 Features Validated — No Change

Workshop confirmed these features are working correctly and require no modification: one-task-at-a-time constraint for experienced volunteers, anonymous New Volunteer flow, Task History with volunteer attribution and timestamps, real-time sync via Firebase, color-coded role buttons on landing page.

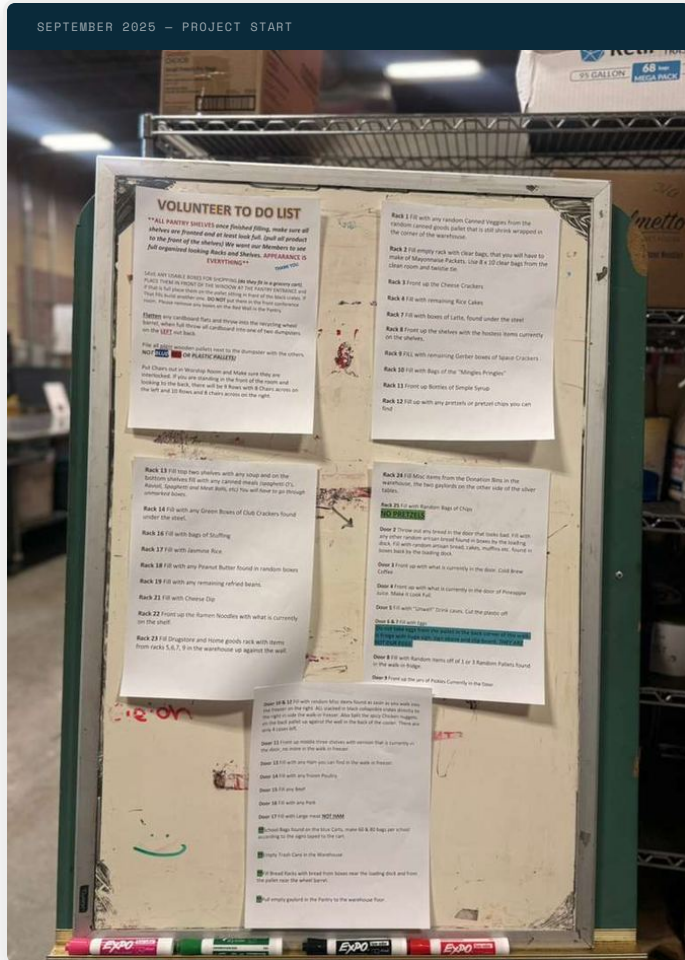
11.5 Design #5 Targets (Post-Iteration 4)

Bay/row numbers added to task location field (pending Operations Manager confirmation at March 25 meeting), experienced volunteer multi-claim up to 3 tasks (pending stakeholder confirmation), digital board / touchscreen wall display for TV, full unit testing across all three user flows, final QA pass before handoff.

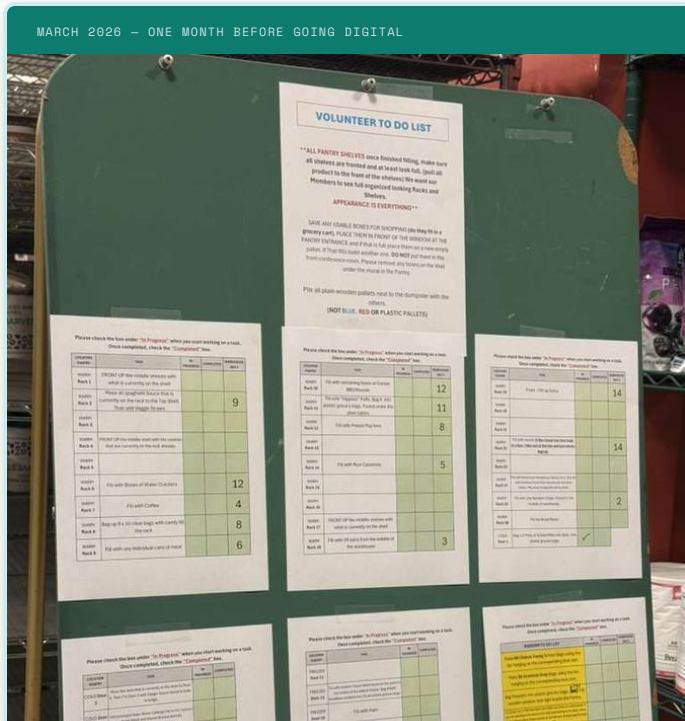
How the *Pantry Itself* Changed

Over the course of the project, the IMPACT Center's physical operations, coordination structures, and workflows evolved in direct response to research and prototype feedback — often before the digital system was ready. This co-evolution is one of the most significant outcomes of the project.

THE TASK BOARD — SEPTEMBER 2025 VS MARCH 2026



SINGLE PRINTED SHEET WITH HANDWRITTEN POST-ITS AND COLORED STICKERS. NO STATUS TRACKING, NO COMPLETION MECHANISM, NO LOCATION SPECIFICITY BEYOND RACK NAME.



CHRONOLOGICAL EVOLUTION OF OPERATIONAL CHANGES

SEP 2025 — PROJECT KICKOFF

Baseline: Single Sheet, No Structure

Volunteer task board was a single printed sheet with handwritten post-its and colored stickers. No status tracking, no completion mechanism, all coordination verbal through the Operations Manager. No rack numbering system.

OCT-DEC 2025 — RESEARCH PHASE

Rack Naming & Physical Labeling Begins

Following field observation and spatial analysis, warehouse racks began receiving consistent naming conventions. The research team documented the pantry layout — rack positions, door numbers, freezer zones — creating a shared vocabulary that became the foundation for location guidance fields in the digital system.

FEB 2026 — POST RESEARCH MEETING

Task Board Gains Structured Format

Operations Manager began restructuring the physical board into zone-based cards — Warm Racks, Cold Doors, Freezer Doors — each with a consistent column format. Task numbers added alongside descriptions. Board started resembling the structured task model the digital system was being built around.

MAR 23-25, 2026 — POST-WORKSHOP (48 HOURS)

Bay Numbers Installed + Status Columns Added

In the 48 hours between the workshop and the March 25 meeting, the Operations Manager team independently: (1) attached "BAY 14" style physical labels to all warehouse shelving, (2) added In Progress and Completed columns to the task board, (3) added storage rack labels (Merch Rack, Large Bulk, Pet Supplies, Drug Store). These changes were made without being asked.

MAR 25, 2026 — STAKEHOLDER MEETING

Shift Leader Role Formalized

The Shift Leader role — previously informal (Jay Miller, Saturday sessions) — was codified digitally. Shift Lead claims a special task at session start, gaining elevated controls. Morning volunteer meeting model adopted: Operations Manager assigns areas verbally, volunteers filter by tag.

APR 2026 — DELIVERY DIGITIZATION

Driver Operations Moved from Excel to Digital

Delivery route coordination — Kroger pickups, Second Helpings runs, driver schedules — was managed entirely in an Excel spreadsheet manually updated each week. The Delivery module digitized this: route templates, recurring schedules 2 months ahead, driver task pool reusing the claim/complete framework.

APR 15, 2026 — LIVE SESSION

Paper Board Retired Entirely

First session in IMPACT Center history with no paper task board backup. The physical board — significantly evolved over 6 months of collaboration — was no longer needed. Digital system carried the full coordination load for 400+ families with 189 registered volunteers.

Pantry Code System

One of the most operationally significant changes was the establishment of a **pantry code system** — a shared vocabulary for pickup and drop-off locations that both the digital system and volunteers could understand without ambiguity.

ZONE	CODE FORMAT	EXAMPLE
Warehouse Racks	Rack [N]	Rack 7, Rack 14
Bay Numbers	Bay [N]	Bay 3, Bay 14
Walk-in Fridge Doors	Door [N]	Door 1, Door 3, Door 8
Freezer Doors	Freezer Door [N]	Freezer Door 10, Door 14
Named Racks	Rack Name	Merch Rack, Large Bulk
General Areas	Area label	Green Shelf, Loading Dock

This system is embedded in every task created in the digital system. The task creation form prompts for a source location and destination using these codes, and the task detail screen shows volunteers exactly where to pick up and drop — eliminating the need to ask the Operations Manager for directions.

Shift Leader Role

What the Shift Leader Can Do Claims a "Shift Leader" tagged task at session start — triggering elevated controls. Can mark tasks Incomplete when volunteers get sidetracked. Supervises new volunteer tasks. Has task pool access for their assigned area. Cannot access Operations Manager credentials or dashboard.
Morning Volunteer Meeting Model Operations Manager sets firm volunteer arrival time (e.g. 8:30am). Brief 5-minute meeting: assigns areas verbally ("Ron, you're the freezer guy today"). Shift lead takes warehouse. Volunteers filter task pool by their assigned tag. No new screens required — the existing tag system becomes the role assignment mechanism.

Delivery — From Excel to Digital

Route Templates → Weekly Instances Fixed route templates stored once (Kroger North, Second Helpings Run, etc.). Each week the Operations Manager generates instances from templates — including weekly recurring schedules up to 2 months ahead. No re-entering the same route information every week.
Driver Tag + Mode Selection Volunteers with the isDriver flag see a "What are you doing today?" mode selection screen after ID entry. They choose Pantry or Delivery — routing to the appropriate task pool without separate logins or credentials.
Dual-Role Volunteers Some experienced volunteers serve both pantry and delivery roles. One ID handles both — the mode select screen routes them correctly, with separate task history and attribution for each mode.
Delivery History Separate from Pantry Completed delivery records stored and displayed entirely separately from pantry task history. Operations Manager can review which driver completed which route, when — a capability that did not exist in the Excel workflow.

Summary — What Changed Because of This Project

WHAT CHANGED	BEFORE	AFTER
Task board	Single printed sheet, post-its	Structured zone cards → digital system
Location references	Vague ("the fridge")	Pantry code: Rack N, Door N, Bay N
Rack identification	No numbering	Physical BAY labels + named rack labels
Task status	Crossed-out lines	4-state digital: Available → In Progress → Incomplete → Complete
Shift leadership	Informal, non-transferable	Formal role, digitally claimed
New volunteer guidance	Verbal from Operations Manager	Digital tasks with step-by-step instructions and exact location codes
Delivery coordination	Manual Excel, weekly updates	Digital route templates, recurring schedules, driver task pool, delivery history
Volunteer identification	Verbal, no system	4-digit ID, 189 registered volunteers, history attribution

Cognitive Walkthrough *CWR-001*

Method: Wharton et al. (1994) Cognitive Walkthrough · Date: March 26, 2026 · Conducted by: Tanishq Sardar, Ishita Umredkar, Karuna Saravanan · Tasks evaluated: 3 core user flows

12.1 Method

The cognitive walkthrough follows the Wharton et al. (1994) framework, evaluating each interface action against four questions: (1) Will the user be trying to achieve the right effect? (2) Will the user know that the correct action is available? (3) Will the user know that the correct action will achieve the desired effect? (4) If the correct action is taken, will the user see that things are going ok?

The walkthrough was conducted internally by the team on March 26, 2026 — three days after the usability workshop — to systematically document issues identified in the study and evaluate the full 7-step experienced volunteer flow in structured format.

12.2 Task 1 — Experienced Volunteer Claiming a Task

7-step flow: Open app via QR code → Tap Experienced Volunteer → Enter 4-digit ID → Browse task pool → Tap task card → Claim Task → Mark Complete

STEP 3 – ENTER 4-DIGIT ID → TASK POOL LOADS		
Will the user know the correct action is available?	X	First-time experienced volunteers may not know their ID until told by the Operations Manager. No on-screen guidance about where to get the ID if forgotten.
If correct action taken, will they see things are ok?	X	Error message says "Not recognized — check with your session coordinator." One workshop participant was confused about who the "session coordinator" was. Fix: name the Operations Manager directly.
STEP 4 – TAP TASK CARD → TASK DETAIL SCREEN		
Will the user know the correct action is available?	X	Tag filter bar (Warehouse/Fridge/Freezer) obscured the task list. Participants tapped filter bar instead of task card, then were confused why the list changed.
Will the user know the correct action will achieve the desired effect?	X	Purpose of tapping a card vs. tapping a tag was unclear. Largest usability issue in the flow. Tag filter bar since removed from volunteer task pool view based on workshop findings.
STEP 5 – TAP 'CLAIM TASK' → TASK TURNS ORANGE		
Will the user know the correct action is available?	X	Multiple participants: two-step flow felt redundant. "I already selected it — why do I need to claim it again?" Reason for separate button not communicated.
Will the user know it will achieve the desired effect?	X	Fix: consolidate — tap card opens simplified detail, single clear Claim Task button confirms. Priority fix currently in development.
STEP 7 – TAP 'MARK COMPLETE' → TASK MOVES TO HISTORY		
Will the user know the correct action will achieve the desired effect?	X	Before green color update, Mark Complete button was visually similar to other buttons — ambiguity between completing and canceling. Jay Miller flagged this specifically. Fixed: button now green (#34C759) — deployed.

12.3 Task 2 — Operations Manager Creating a Task

5-step flow: Open app → Enter credentials → Tap Create Task → Fill form → Tap Publish Task

STEP 4 – FILL IN TASK DETAILS → FORM VALIDATES		
Will the user know the correct action is available?	✗	Many fields. New Operations Managers or shift leads filling tasks for the first time may not know which fields are required vs. optional.
Will the user know it will achieve the desired effect?	✗	Relationship between 'source' and 'destination' fields may be unclear without prior context. Enhancement: add placeholder examples (e.g. "Walk-in fridge" for source field). Low-priority.
STEP 5 – TAP 'PUBLISH TASK' → APPEARS IN VOLUNTEER POOL		
If correct action taken, will they see things are ok?	✓	Task appears instantly via Firebase real-time sync. Workshop participants were impressed — could watch tasks appear on other devices in real time. Major improvement over printing and pinning a paper board. No issues.

12.4 Task 3 — New Volunteer Completing a Task

5-step flow: Approach display/scan QR → Tap New Volunteer → Tap task to claim → Complete physical task → Return and tap Done

STEP 3 – TAP TASK TO CLAIM → TASK TURNS ORANGE		
Will the user know the correct action will achieve the desired effect?	✗	New volunteer may not understand that tapping claims the task vs. just viewing it. One-tap design is intentional but orange color change may not communicate the claim clearly. Low-priority fix: brief confirmation message.
STEP 4 – COMPLETE PHYSICAL TASK → TASK STAYS ORANGE		
Will the user be trying to achieve the right effect?	✗	Highest risk step in the new volunteer flow. Volunteer may forget to return to the app after completing the task — especially high school volunteers. No reminder or nudge exists. Addressed by Incomplete status: shift lead or Operations Manager can manually mark tasks complete when volunteers forget.

12.5 Summary of Issues by Severity

PROBLEM	SEVERITY	STATUS
Tag filter bar confusion	HIGH	Removed from volunteer view
Two-step claim flow redundancy	HIGH	In development
No unclaim mechanism	HIGH	In development
Mark Complete button ambiguity	MEDIUM	Fixed — green deployed
Task detail information overload	MEDIUM	In development
Error message — "session coordinator"	MEDIUM	Fix: name Operations Manager
New volunteer forgetting to mark done	MEDIUM	Addressed by Incomplete status
Form field clarity for new managers	LOW	Future enhancement

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The CWR-001 walkthrough confirmed the three high-severity issues identified independently in all three workshop sessions — validating that findings were not artifacts of facilitator prompting. Multiple independent methods converging on the same issues is a strong signal of genuine usability problems.

MARCH 25, 2026 · IMPACT CENTER, GREENWOOD IN · TANISHQ SARDAR + PROF. AMY + OPERATIONS MANAGER TEAM

Post-Workshop *Decisions*

Two days after the March 23 workshop, the team met with the Operations Manager team at the IMPACT Center. Before the meeting had even started, three physical changes had been made to the pantry — a signal of stakeholder investment that exceeded expectations.

13.1 Physical Changes Made Before the Meeting

1. Bay Numbers Added to Warehouse Shelving

Physical "BAY 14" style labels attached to all warehouse shelving units. Directly addresses spatial disorientation theme from all three workshop sessions. Bay numbers ready to be entered into the digital task system immediately — no further action needed.

2. Paper Task Board Updated

Printed volunteer to-do list updated with In Progress and Completed checkbox columns — a manual bridge implementation of the status tracking the workshop identified as critical. "The transition from this to what is being created will be almost seamless."

3. Warehouse Rack Labels Added

Storage racks labeled (Merch Rack, Large Bulk, Pet Supplies, Drug Store) — making item locations clearer for volunteers who don't know the pantry layout. Addresses spatial disorientation theme.

"Bay numbers — that's like a game changer. It's the simplest thing, but you just need another set of eyes. Now the transition from that to whatever we're creating will be almost seamless."

– Operations Manager · March 25, 2026

13.2 Key Decisions Made

TOPIC	DECISION
Volunteer ID	Keep last 4 digits. Fallback to full number on duplicate.
4th Task Status	Named Incomplete not Pending. Signals started but abandoned.
Incomplete Trigger	Manual by shift lead or Operations Manager. Auto-timer rejected.
Incomplete Rollover	Auto-carries to next session if unresolved at shift end.
Task Time Window	NEW — tasks only claimable during defined shift hours. Board locks between sessions.
Shift Leader Role	Validated. Morning meeting: Operations Manager assigns areas verbally, volunteers filter by tag.
Handoff Owner	Matt (church IT) — not Jay Miller (not a church member).
Scalability	Multi-location interest confirmed. Firebase architecture supports it.

13.3 Notable Quotes

"I didn't hear any real resistance. People were saying, oh my gosh, this could really save Jason time. This could really save us from pestering him. They could see it too."

– Operations Manager · March 25, 2026

"If you could have that meeting and say: Ron, today I want you to be the fridge guy. Then the way the tags work — if I'm the freezer guy, I click the freezer tag and only those tasks come up. That's the task list I start working on."

– Operations Manager · March 25, 2026 (describing morning volunteer meeting model)

"Looking down the road — three, five, ten years from now — to be able to have other locations, to expand, to duplicate what we have now. You can't replicate what we have now. It's not a model you could incorporate in other environments."

– Operations Manager · March 25, 2026

"We can get so blinded by routine. A fresh set of eyes is really important." / "You guys are hireable no matter where you go — all the way from research to handing off the product. That's huge."

– Operations Manager · March 25, 2026

13.4 New Requirements from March 25

Task time window (new security requirement): Volunteers should only see and claim tasks during defined shift hours. Prevents bad actors opening the app from home and claiming tasks before arriving. "At 8:30, I want to make sure I get that before somebody else does." Proposed logic: tasks open at shift start (e.g. 8:30am), close at shift end, board locks between sessions.

Morning volunteer meeting integration: Set a firm volunteer arrival time. Hold a brief meeting — Operations Manager assigns roles verbally (freezer guy, fridge guy, shift lead). Each volunteer knows their area for the day. Shift lead claims the shift lead task in the app — gains access to supervise new volunteer tasks. This model requires no new screens — uses existing tag filter system as role assignment mechanism.

Evaluation Study #2

14

Method: Naturalistic observation via remote Firebase system monitoring

Date: Wednesday, April 15, 2026

Setting: Live IMPACT Center distribution session — no researchers present, no paper backup

Registered Volunteers: 189 in system

Outcome: First fully paper-free session in IMPACT Center history. Zero critical errors.

14.1 Method Rationale

Naturalistic observation was selected because the system had been deployed to production and was being used in actual operations. Naturalistic observation is a qualitative method observing participants in their natural environment without intervention. Remote system monitoring — observing live Firebase Realtime Database state from a distance — is a recognized variant, eliminating the observer effect entirely.

The IMPACT Center ran this session **without the research team on site and without a paper backup**. This was not designed by the research protocol — it was a choice made by the Operations Manager and staff. This choice is itself the strongest ecological validity signal the project produced.

14.2 Pre-Session Fixes Deployed

- Edit Published Task**

Operations Manager can now edit task name, location, priority, and details on live tasks without removing and recreating them.
- Mobile Layout — CreateTask.jsx**

Task creation form renders correctly on 390px viewport — previously fields overflowed on small screens.
- Desktop Flickering — Delivery Routes**

Right panel no longer unmounts/remounts on route selection — flickering eliminated.
- Mobile Top Bar Overflow**

Header and navigation render cleanly on 390px viewport.

14.3 Task Flows Evaluated

#	TASK / SCENARIO	EXPECTED OUTCOME
1	Experienced volunteer authentication	Successful 4-digit ID auth, no errors
2	Task browsing and claiming	Status changes to In Progress, attributed correctly
3	Task completion	Task attributed to volunteer, moves to Completed
4	Operations Manager session management	Real-time stat cards update correctly
5	Operations Manager task creation	Task appears immediately in volunteer pool

14.4 Results

EVALUATION QUESTION	OUTCOME
Volunteers authenticate with 4-digit ID independently?	CONFIRMED
Volunteers claim tasks without manager intervention?	CONFIRMED
Tasks marked complete accurately in real time?	CONFIRMED
Dashboard reflects live session data correctly?	CONFIRMED
Previously identified bugs remain resolved?	CONFIRMED

189

Volunteers registered in the system — multiple simultaneous logins observed. Scale validation: earlier cycles used groups of 2–10 in controlled settings.

0

Erroneous task claims — the two-step claim flow held under real operational conditions despite initial workshop criticism.

100%

System uptime — Firebase Realtime Database and Vercel deployment stable under concurrent operational load.

14.5 What Surprised the Team

Scale of simultaneous engagement: 189 registered volunteers with multiple simultaneous logins, real-time task claims, and live status updates — remained stable. Proved architectural resilience that controlled testing could not have produced.

Independence signal: The IMPACT Center operating without the research team, without a paper backup — an unobserved operational choice made by staff because they trusted the system. In HCI research, system adoption is often measured through self-report or researcher-observed compliance. This was neither. It was a genuine adoption decision.

What This *Means*

15.1 The Integration Principle Validated

The central design hypothesis — a system integrated into existing workflows outperforms one that adds separate steps — was validated across all three evaluation activities and confirmed by the live deployment. PantrySoft's -4,671 negative inventory demonstrates the failure mode of addition-based design. The IMPACT Center's April 15 session demonstrates the alternative. Task creation happens at the sorting moment; claiming happens at the shelf; marking complete happens at the task completion point. No separate data entry step exists.

15.2 Structural vs. Individual Problems

A key theoretical contribution is the explicit reframing of food pantry coordination failures as **structural problems**, not individual ones. The Operations Manager was not poorly organized — he operated within a system that concentrated all information through a single point by design. Any competent individual would face the same bottleneck. The solution required changing the structure, not the person. This has implications for how technology interventions in nonprofit contexts should be designed and evaluated.

15.3 Designing for 60–80 Benefits Everyone

Design decisions made specifically for older adults — large touch targets, minimal cognitive load per screen, QR code over app download, icons paired with text — did not create a worse experience for younger or more tech-literate users. Jay Miller, with 35 years of software engineering experience, praised the same features the older volunteer population found accessible. This supports the universal design principle: designing for the most constrained user expands the accessible range without narrowing the unconstrained range.

15.4 Physical–Digital Co–Evolution

The physical changes made to the IMPACT Center warehouse in response to prototype feedback — bay numbers, rack labels, updated paper task board — represent a research process that changed the physical environment, not just the tools. This co-evolution was not planned; it emerged from genuine stakeholder engagement. The digital system and the physical space improved together, each reinforcing the other's usability.

15.5 Three–Method Evaluation Triangulation

The evaluation sequence — Cognitive Walkthrough → Think-Aloud Workshop → Live Session Observation — provided triangulated evidence across three methods with different strengths. The CWR identified systematic issues at the step level. The workshop captured real user behavior and surfaced unexpected insights (Incomplete status, Jay Miller's power-user feedback, territorial task preferences). The live session provided ecological validity no controlled study could match. Findings across all three methods converged on the same core issues (task visibility, status clarity, spatial navigation) while each method contributed unique insights the others could not have surfaced.

15.6 Adoption Signals vs. Measured Adoption

The April 15 session provides a strong *signal* of adoption but not a quantitative adoption measure. The team did not establish a pre-intervention baseline of Operations Manager interruptions per session, task completion rates, or new volunteer onboarding time. The stated 60% interruption reduction target remains a hypothesis to be measured. Future longitudinal study tracking session-over-session metrics — using data now being captured in Firebase — would provide the quantitative evidence needed to confirm or revise these targets.

15.7 Generalizability

The system addresses four structural problems — knowledge concentration, volunteer variability, task invisibility, new volunteer onboarding — present in virtually every small food pantry on donated inventory. Marion County alone has 210+ food pantries. The technical stack (free hosting, open source codebase, zero hardware cost) minimizes the barrier to adoption. The March 25 meeting confirmed the Operations Manager's own interest in replicating at additional locations — a near-term opportunity requiring primarily configuration changes.

"From zero to one product. From research to handing off the product. Generally in our coursework it would be just design the product. This is something — it's a big thing for us."

— Tanisha Sardar · March 25, 2026 Stakeholder Meeting

HONEST ASSESSMENT

What We *Didn't* Solve

16.1 Research Limitations

Single-site study. All research at one food pantry. Structural problems likely generalizable, but specific design solutions reflect IMPACT Center's particular layout, demographics, and culture.

No pre-intervention baseline. The 60% interruption reduction target was not measured before deployment. Future work should establish baseline measurements before deploying at additional sites.

Limited evaluation window. Three evaluation activities is a solid foundation but not a longitudinal dataset. Behavioral change over time requires session-over-session tracking.

Course correction impact. Restarting from primary sources compressed available time. A full additional semester of evaluation cycles would have strengthened the evidence base.

Observer effect in Study 1. Workshop participants knew they were in a research session. Study 2's naturalistic approach eliminates this limitation for the live deployment context.

16.2 System Limitations

Inventory tracking not implemented. The IMPACT Center's active grant applications require real-time inventory data as a funding condition. Descope to ensure volunteer coordination was fully deployed and stable. Most important unbuilt feature.

Analytics dashboard incomplete. Session-over-session analytics planned but not built. Firebase data is being captured — visualization layer is future work.

Repackaging task type not implemented. Jay Miller identified a task type with different data fields (bag size, quantity, no destination rack). Documented as future work.

Multi-location not tested. Architecture supports multi-location but has not been deployed or evaluated at a second location.

No reminder for new volunteers. The cognitive walkthrough identified that new volunteers may forget to return to mark tasks done. No nudge mechanism exists. Addressed indirectly by Incomplete status enabling Operations Manager recovery.

WHAT COMES NEXT

Future *Work*

HIGH PRIORITY · NEAR TERM

Inventory Tracking Module

Log items at the sorting stage — same moment the Operations Manager makes placement decisions. One action creates inventory record (grant compliance) and task data (for volunteers). This is System 1 from the February 11 presentation — buildable on top of the stable volunteer coordination foundation. Directly addresses IMPACT Center's active grant requirements.

HIGH PRIORITY · NEAR TERM

Analytics Dashboard

Session-over-session metrics using data already captured in Firebase: task completion rates, volunteer activity patterns, busiest periods, most common task types, average task duration. Also provides quantitative evidence for the 60% interruption reduction hypothesis.

MEDIUM PRIORITY

Longitudinal Impact Study

Measure pre/post changes in Operations Manager interruption frequency, volunteer onboarding time, and task completion rates across 10+ sessions. Essential for confirming the 60% reduction hypothesis and for the HCI conference submission.

MEDIUM PRIORITY

Replication at Additional Pantries

Apply the generalized framework to other IHN partner pantries in Marion County. Tests generalizability hypothesis. The Operations Manager's March 25 interest in replication at IMPACT Center's own additional locations represents the lowest-friction first step.

LONG TERM

Research Publication

Scope, mixed-method design, real-world deployment, and structural problem reframing position the project for submission to CHI, CSCW, or ISCRAM. Prof. Amy Perry-Goldsmith identified this as a strategic goal in February 2026. Integration-over-addition design principle and physical-digital co-evolution are theoretical contributions beyond this specific system.

Conclusion

What started as a capstone assignment — with a false start and a complete restart — became a live system serving hundreds of families. A summary of the contribution and what the project demonstrated about HCI research embedded in community operations.

The IMPACT Center Volunteer Management System began with a problem: a food pantry in Greenwood, Indiana was operationally fragile because all coordination knowledge lived in one person's memory. Every Wednesday morning, the same bottleneck recurred regardless of how well the Operations Manager prepared the night before. Volunteers waited. New participants struggled. Tasks were missed or duplicated. The coordination system itself was the constraint on service.

The research process — restarted from scratch after discovering fabricated data — produced a more rigorous foundation than the original approach would have. Real interviews, real observation, real pilot experiments, and real competitive analysis of deployed systems produced findings that were specific, verifiable, and sometimes surprising. The 40% freezer navigation gap. The -4,671 negative inventory at Southeast Community Services. The physical changes made by the Operations Manager team in the two days between the March 23 workshop and the March 25 meeting. None of these came from assumptions.

Three formal evaluation activities — a Cognitive Walkthrough, a controlled think-aloud workshop with 10 participants, and a naturalistic live-session observation — provided triangulated evidence across different methods. Each surfaced insights the others could not have produced. The cognitive walkthrough identified systematic step-level issues. The workshop revealed the missing Incomplete status and Jay Miller as an unexpected power user. The live session proved architectural resilience at operational scale.

On April 15, 2026, the IMPACT Center ran a full Wednesday distribution session — 400+ families served, 189 registered volunteers, no paper task sheets, no research team present. The system handled it. That session is the proof of concept the project was built toward.

"Just putting stuff into action — what you guys have brought to the table. The transition from this to what is being created is tremendous."

— Operations Manager • March 25, 2026

Reflection on HCI in Community Settings

The project demonstrated that HCI research embedded in community operations — with real stakeholders, real constraints, and real consequences — produces qualitatively different insights than lab-based or simulated contexts. The Operations Manager's concern about phone numbers in Google exposing family addresses could not have been anticipated from a persona. The Incomplete status could not have been surfaced by a researcher who had never watched a volunteer abandon a task mid-session. The bay number implementation could not have happened without a research team present in the physical space to document the gap.

Community-embedded HCI is slower, less controlled, and less predictable than lab research. It also produces systems that communities actually use, rather than systems evaluated in labs and never deployed. The April 15 session is evidence that the slower path produces real outcomes.

The system is now sustained independently of the student team. The Operations Manager controls it, the church IT contact maintains it, and the codebase is publicly available for future developers. The project ends where good HCI research should end: with a community that owns its own tool.

Acknowledgements

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We also acknowledge the 189 volunteers at the IMPACT Center — most of them older adults navigating new technology under time pressure on Wednesday mornings — who used the system not because they were asked to, but because it made their work easier. That is the outcome worth documenting.

APA FORMAT · ACADEMIC & INDUSTRY SOURCES + PRIMARY PROJECT DOCUMENTATION

ACADEMIC & INDUSTRY SOURCES

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