Technical Report Draft: Smart Checkout Nexus

Alex M. Frear

College of Science, Engineering, and Technology, Grand Canyon University

Course Number: CST-326 Written and Verbal Communication for Software Development

Professor Stephanie Macuga

04/20/2025

Project Overview

The *Smart Checkout Nexus* project was designed to improve efficiency and user experience at self-checkout kiosks in grocery store settings. The system provided user interface flows for both customer and attendant roles, integrating features like scanning, cart management, produce lookup, scale interaction, receipt options, assistance requests, and attendant override responses. The development process emphasized user-centered design and modular, testable features, driven by Agile-based practices to allow for incremental progress and continuous refinement.

The quality of the project can be assessed through several lenses: alignment with the original functional and non-functional requirements, ease of navigation in wireframes, and overall system cohesion. Deliverables like the Software Functional Requirements Document (SFRD), Technical Design Document (TDD), and Acceptance Test Procedure (ATP) demonstrated clear attention to detail and project scope. Additionally, creating wireframes for nine unique interface screens helped visualize the user flow and offered a clearer blueprint for implementation in later stages.

Because this was a solo project simulating a team environment, direct client feedback was not available. However, each milestone simulated interactions and expectations from a fictional client, which guided prioritization. In a real-world setting, regular stakeholder reviews would provide validation or course correction. To address that gap, user empathy and critical thinking were used to prioritize the most practical and essential features—such as the ability to request help during checkout or print a receipt after a transaction. These were treated as high-priority tasks in the Trello board, based on typical user pain points in retail environments.

If future revisions are made, usability testing should be a primary focus. While the wireframes suggest a logical, user-friendly layout, they have not yet been tested with actual users. According to Krug (2014), "if something requires a large investment of time—or looks like it will—it’s less likely to be used" (p. 19). This makes early user testing and feedback crucial, even for wireframes. Improvements could also include expanded accessibility options (e.g., voice commands, larger fonts) and a deeper focus on ADA compliance. Adding integration with real backend data services like SAP or payment processors would further enhance the system’s realism and allow for end-to-end workflow validation.

Agile-Based Project Management

The project followed an Agile-inspired approach modeled after the Scrum framework. Although the team only included one member, the workflow still mirrored core Agile practices such as iterative development, sprint planning, backlog grooming, and requirement tracking. Trello was used as the main Agile tool to create and update cards for each functional and non-functional requirement, as well as to attach wireframes, update progress, and simulate sprint milestones.

Each milestone served as a mini sprint, with deliverables planned, created, and refined before moving to the next phase. Milestone 1 involved the team charter and user stories, Milestone 2 focused on breaking down those stories into functional requirements, and Milestone 3 produced the technical design document. Finally, Milestone 4 introduced formal acceptance testing. This process allowed consistent alignment between planning and execution, even without real-time team collaboration.

One area where Agile really helped was adjusting scope mid-project. Early in the development, some Trello cards were too vague or didn't reflect real interface needs. As wireframes were created, the cards were updated with clearer labels and subtasks, mimicking how Agile teams revise their understanding through iteration. As Highsmith (2009) explains, "Agile methods give us the ability to react to change rather than struggle against it" (p. 6), which reflects exactly how this project evolved.

Future improvements could include bringing stakeholders into the loop earlier, even in simulated form. For example, assigning "client" roles to reviewers or using online surveys to gather reactions to wireframes would add realism and provide more grounded feedback. Agile projects thrive on frequent communication and course corrections. According to Deemer et al. (2012), Agile teams must be "customer-focused" but also able to balance "business objectives and technical constraints" (p. 17). This requires careful prioritization of stakeholder input.

Stakeholder prioritization is critical, especially when needs conflict. In this project, customers were prioritized because they directly interact with the self-checkout system and affect sales flow. However, in a real-world deployment, store attendants and managers would be equally important stakeholders. Attendants need quick access to overrides, while managers may care more about system uptime and data analytics. These competing needs would be ranked using a combination of business value, user impact, and feasibility. Applying techniques like MoSCoW prioritization (Must have, Should have, Could have, Won't have) could be useful for future projects when evaluating features from various stakeholder viewpoints.

Ultimately, the Agile methodology provided a flexible, transparent framework to guide each stage of this solo project. It allowed for adaptability, visual progress tracking, and continuous improvement—all key elements in successful software development.

References

Deemer, P., Benefield, G., Larman, C., & Vodde, B. (2012). *The Scrum Primer* (Version 2.0). Scrum Training Institute. http://www.scrumprimer.org/

Highsmith, J. (2009). *Agile project management: Creating innovative products* (2nd ed.). Addison-Wesley Professional.

Krug, S. (2014). *Don't make me think, revisited: A common sense approach to web usability* (3rd ed.). New Riders.