

Thesis Project Portfolio

Navigating Real-World Software Development at WillowTree

(Technical Report)

**Examining Remote-First Processes And Practices On The Operational Efficiency And Employee
Integration In Small Technology Companies Post-Covid-19**

(STS Research Paper)

An Undergraduate Thesis

Presented to the Faculty of the School of Engineering and Applied Science

University of Virginia • Charlottesville, Virginia

In Fulfillment of the Requirements for the Degree

Bachelor of Science, School of Engineering

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Spring, 2024

Department of Computer Science

Navigating Real-World Software Development at WillowTree

CS4991 Capstone Report, 2023

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ABSTRACT

During my internship at WillowTree, discussions with coworkers highlighted an opportunity to enhance the company's onboarding process. In response, I led the development of an Android application designed as an AR scavenger hunt around the office, where newcomers search for objects based on generated hints. The app was built using Kotlin, Jetpack Compose, and GitHub, and was poised to leverage machine learning for hint generation and Augmented Reality for interactive onboarding. While real-time results were not obtained because the project was not complete at the end of our internship, hypothetically, the application would offer newcomers an interactive introduction, fostering both familiarity with the office and team camaraderie. For future iterations, enhancements could include introducing gamification elements, incorporating authentication and data saving mechanisms, scaling the application for use across multiple office locations geographically, and refining the AI-generated prompts for a more immersive experience.

1. INTRODUCTION

WillowTree is a cutting-edge software development consultancy that places considerable emphasis on its onboarding processes to ensure new hires integrate seamlessly into its vibrant culture and professional environment. Over time, the onboarding process had grown fragmented, leaving spaces for potential improvement. The traditional onboarding, though comprehensive, lacked the element of interactivity that could potentially foster a stronger bond between newcomers and the company culture.

During discussions with several team members, it became evident that enhancing this experience could benefit both the company and its new members. Additionally, providing interns with a real-world project like this one, would serve as a dual-purpose initiative—offering practical experience for interns and potentially creating a valuable tool for the company. This led to the conceptualization of an Android application that could potentially revolutionize the onboarding experience at WillowTree.

2. RELATED WORKS

Three recent studies explore augmented reality (AR), gamification, and artificial intelligence (AI) within corporate and software development environments.

2.1 Integration of Augmented Reality in Software Development: Ohri, et al. (2017) explored the potential of AR in improving the software development process, particularly focusing on the onboarding of new hires. Through an exploratory framework, they aim to enhance the workflow process using AR by creating navigation components similar to a GPS, guiding software teams through digitally enhanced working conditions. Their investigation reveals a gap in the existing literature regarding the intersection of AR with software engineering disciplines for onboarding purposes, and they present a preliminary model proposing AR as a tool for process improvement in software development.

2.2 Key Elements of Gamification in Corporate Training: Wang, et al. (2021) delve into the concept of gamification in corporate training. Utilizing the Delphi method, they

identified 12 key elements of effective gamification, categorized into six design principles: integration with training goals, rapid feedback, team competition, clear rules, goal-oriented challenges, and freedom to fail. The study underscores the importance of aligning gamification design with educational objectives and balancing game mechanics with design principles, thereby offering practical insights for the development of training gamification.

2.3 Enhancing Digital Employee Experience with Artificial Intelligence:

Zel and Kongar (2020) highlighted the transformative potential of AI in designing an enhanced digital employee experience amidst the growing trend of digitalization and remote work. They discuss various AI applications like chatbots and virtual assistants in recruitment, career development, and employee engagement. The study outlines considerations for organizational implementation of these AI tools, shedding light on potential benefits and concerns. Through this discourse, they contribute to the understanding of how AI can be leveraged in HR to meet evolving employee expectations in a digital work landscape.

3. PROJECT DESIGN

The project design for the AR scavenger hunt mobile application is rooted in the goal of transforming WillowTree's onboarding process into an engaging, interactive experience that leverages cutting-edge technology.

3.1 Design Objectives

The core aim was to streamline WillowTree's onboarding process by introducing a gamified app that not only made the process engaging but also informative for new hires. This initiative also served as a practical project for interns to gain real-world experience. The anticipation was to foster a lively and interactive onboarding experience that would resonate well with the new hires, making their initiation into the company's culture a memorable venture.

3.2 Technical Framework

The technical backbone of this project was carefully chosen to ensure smooth development

and eventual deployment. Kotlin was the primary language used with Jetpack Compose simplifying the UI development with its declarative design. GitHub fostered collaborative coding and version control. Project management was streamlined with Jira, ensuring timely tracking of tasks and sprints. The futuristic touch was the incorporation of Google Cloud ML Kit for machine learning potentials, paired with an augmented reality UI developed using the native camera, laying down a solid foundation for a technologically advanced onboarding experience.

3.3 Gamification Strategy

The gamification aspect was crafted around a scavenger hunt theme, providing a playful yet educational platform for new hires. Through earning points, utilizing hints, and the option to skip challenging tasks, the app aimed to create an engaging bonding experience. This strategy not only made the exploration of the office an entertaining task but also encouraged interaction between new hires and existing employees. The scavenger hunt theme was envisioned to break the ice and foster a community-centric atmosphere within the organization.

3.4 Future Enhancements

The project was designed with a vision for future expansions. The proposed enhancements include integrating an authentication system to save scores on individual profiles, setting up a leaderboard to create a healthy competitive environment, and extending the app's availability across all office locations on a national scale. Additionally, the introduction of dynamic objects and prompts, coupled with a refined machine learning algorithm for accurate object identification, was proposed to elevate the app's interactive and engaging nature. These enhancements were aimed at ensuring the app remains a relevant and effective tool for onboarding, even as the company evolves.

The meticulous design of this project underscores a successful blend of technological innovation and human-centric objectives. This strategic approach is anticipated to significantly uplift the onboarding process at WillowTree, morphing it into an insightful experience for

every new hire, and establishing a positive first impression of the organizational culture.

4. ANTICIPATED RESULTS

The AR scavenger hunt application, designed to revamp the onboarding process at WillowTree, is anticipated to achieve multiple positive outcomes after extensive internal alpha and beta testing.

- The app's gamified scavenger hunt is designed to make onboarding interactive, fostering a positive first impression of the company culture.
- New hires will quickly learn the office layout, potentially reducing the time needed to adjust to the new environment.
- By encouraging participation in the scavenger hunt, the app aims to promote team bonding and facilitate relationship building among staff.
- Interns gain valuable hands-on experience in software development, contributing to an operational tool within the company.
- The app demonstrates WillowTree's commitment to innovation by integrating AR and ML into the onboarding experience.
- Future enhancements are planned to expand the app's reach and functionality, ensuring its longevity and adaptability.
- A leaderboard and profile system will provide data to continually refine the onboarding process.
- A unique onboarding experience aims to improve morale and job satisfaction, key to talent retention.

These anticipated outcomes underline the potential benefits of the AR scavenger hunt application, suggesting a promising direction toward achieving a more interactive and engaging onboarding process at WillowTree. Thus, the project holds the prospect of setting a new standard for onboarding, not only within the organization but possibly inspiring similar innovations in the broader tech industry.

5. CONCLUSION

This project represents a significant stride in reimagining the onboarding experience at WillowTree. By integrating augmented reality and gamification, the mobile application not only addresses the need for an engaging introduction to the company's culture but also showcases the potential for modern technology to enhance traditional processes. The application is designed to strike a balance between educational objectives and playful interaction, aiming to yield benefits such as increased engagement, rapid familiarization with the office environment, enhanced team camaraderie, and enriched internship experiences. The anticipation of these outcomes underscores the project's importance and its potential value to both the new hires and the organization.

6. FUTURE WORK

Moving forward, the development team will prioritize the integration of Generative AI to create dynamic scavenger hunt prompts, ensuring a fresh and engaging experience with each playthrough. This advanced feature is expected to continuously renew the application's appeal by providing tailored challenges that adapt to the user's interaction patterns. Another critical step is the establishment of a user profile system, which will allow individuals to save their scores and track their progress over time. This personalization will cater to a sense of achievement and ongoing engagement.

To foster a competitive spirit and community within the workplace, the introduction of a leaderboard is planned, enabling coworkers to engage in friendly competition by comparing scores. This element is anticipated to enhance team camaraderie and motivate continuous interaction with the app.

Finally, the scalability of the application is of paramount importance. The aim is to extend its availability across various WillowTree office locations, promoting a unified onboarding experience throughout the company. Each of these features and steps is instrumental in not only completing the project but also in expanding its scope to provide a comprehensive,

enjoyable, and innovative onboarding solution for new hires and the company alike.

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