LooperWise: A Web Application to Improve Caddy Program Operations

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ABSTRACT

Working through the inefficiencies in the caddy program at Westmoreland Country Club (WCC), which led to excessive wait times and operational challenges, highlighted a significant need for an upgrade. To tackle this, I developed a management system called LooperWise, utilizing web technologies and database management to streamline scheduling, pairing, and ticket processes. The proposed solution employs a modular architecture, integrating with existing golf software for real-time data and optimizing caddy-member matchups through detailed profiles. This will improve upon the initial deployment of LooperWise, which demonstrated the application's promise in operational efficiency, reducing wait times for caddies and managerial workload significantly. In the future, the implementation of the enhanced requirements and design is set to be executed, followed by rigorous testing across multiple dimensions. This process will undergo many iterations, throughout the software development lifecycle, based on identified issues and real-life adaptations necessary for the successful launch of LooperWise.

1. INTRODUCTION

The WWC Caddy Program has been alive for over 100 years. Yet, even through the several management changes, the club's operations, especially the caddy assignment process, has remained largely unchanged. Working ten summers here, I got familiar with the shortcomings of the program.

The caddy scheduling was unpredictable, dependent on daily turnout and spontaneous member playtimes, leading to either excessive wait times for caddies or a shortage impacting service quality. Event scheduling was also disorganized, relying on manual sign-up sheets and individual phone calls for coordination. The process of pairing caddies with members was outdated, relying on handwritten notes on tee sheets and carbon-copy paper tickets for each pairing, which were prone to errors, loss, and damage. They also complicate the payment and accountability process. The payment system was insecure and prone to discrepancies and potential fraud, with manual cash exchanges and delayed record-keeping. Caddy performance feedback was also rarely collected, leaving the manager with limited insights into employee performance and member satisfaction.

As a computer science student, I recognized the opportunity to address these inefficiencies with LooperWise to streamline caddy scheduling, pairing, ticketing, and payment processes, enhancing operational efficiency and satisfaction for both caddies and members.

2. RELATED WORKS

In the summer of 2022, I embarked on developing a custom automated system for caddy-pairing at my club, drawing from personal experiences and operational challenges. During this journey, I discovered that my initiative was not solitary; similar endeavors had been previously undertaken. Ryan Bartels, a college student with a six-year tenure in caddying, noticed the same issues I had been running into, stating, "I'd show up and find out there was an outing so they're not taking any caddies. Sometimes things get lost in translation." Bartels crafted the circuitsApp, a solution aimed at facilitating direct caddy requests by members for specific tee times, as highlighted in an interview with golfDom news (Jones, 2017). However, this model, with its direct credit card payment feature, clashed with the traditional operations at Westmoreland, where bookings are managed through the pro shop and financial transactions are tied to member IDs. Moreover, Bartels' app overlooked the importance of tailored caddy-member matches, a crucial aspect of the service experience at our club, making it less suited for WCC.

Another innovative solution later emerged from an individual with a blend of golfing experience and computer science expertise (Fosters, 2022). This collaboration led to the creation of TheCaddieMaster web application, a platform aimed at unifying elements of caddy management into a coherent system. By integrating features like manual entry or syncing with golf booking software, TheCaddieMaster promised a more organized approach to scheduling and communication, resonating with the needs of Westmoreland. While the app excels in planning and coordination, it falls short in areas crucial to our club's operations, such as accommodating spontaneous play and tracking financial transactions and caddy performance. Additionally, the security framework of TheCaddieMaster, though robust, does not fully align with the exclusive employment practices at our club

4. PROCESS DESIGN

LooperWise began as an exploratory project in web development aimed at streamlining the caddy-member pairing process at golf clubs. Starting with basic web technologies, the project has evolved to propose a sophisticated, modular web application designed to enhance operational efficiency and user experience. This following section outlines the envisioned process design, detailing the transition from initial concepts to a comprehensive solution.

4.1. EXPLORATION

The initial iteration of LooperWise, developed using basic web technologies like HTML, CSS, and PHP on a XAMPP server, laid the foundational groundwork despite its limitations. The simple interface comprised basic functionalities such as login and sign-up pages, using text files for data

storage due to the absence of a database. This rudimentary approach highlighted the challenges in data management and scalability, eventually leading to the integration of mySQL for improved data handling and JavaScript for dynamic content, setting the stage for future enhancements. Overall, this first attempt's design was built on the go, and thus it lacked structure, resulting in what computer scientists refer to as "spaghetti code".

4.2. PROPOSAL

The refined strategy for LooperWise envisions a modular architecture, breaking down the application into three core components: scheduling, pairing, and ticketing. This approach promotes independence and specificity in functionalities while allowing seamless interaction through APIs. The scheduling module adapts to both live and planned events, integrating with GolfDigest TeeSheet Software for real-time data and managing caddy availability efficiently.

4.2.1. SETUP OVERHEAD

To transition the managerial knowledge into a structured format, all relevant caddy and member information will be entered into the LooperWise mySQL database. This one-time effort aims to simplify future operations, enhancing efficiency and organization.

4.2.2. SCHEDULING

This module addresses the dynamics of scheduling by distinguishing between live and planned events. Live events require a flexible approach with real-time updates from the GolfDigest TeeSheet Software, while planned events allow for more structured scheduling. The aim is to balance caddy availability with demand, minimizing wait times and ensuring efficient service delivery.

4.2.2.1. LIVE EVENTS

Live events demand adaptability, with a system to manage on-the-fly reservations and caddy standby. The challenge lies in maintaining an optimal balance of available caddies, supported by real-time data and communication channels for caddies to indicate their presence and availability.

4.2.2.2. PLANNED EVENTS

For planned events, the scheduling module provides a more predictable framework, allowing for advanced bookings and optimized caddy allocations. Instead of writing a list on paper, the manager would be able to get a list of available caddies prior to the actual event. This ensures a smoother operation and better use of resources.

4.2.3. PAIRING

The pairing module focuses on matching caddies with members based on compatibility, utilizing a comprehensive database of preferences and skills. An interactive environment supports the manager in making informed decisions, with features to highlight potential issues, create drafts, and allow adjustments on the fly.

4.2.4. TICKETING

The ticketing module streamlines the assignment process, ensuring accurate and timely information flow from the pairing

module. This reduces the manual transition for managers and speeds up the efficiency of operations by moving to paperless.

When a caddy comes to be compensated for their work, the manager pulls up their profile of signed tickets, hands them the cash and then marks it as paid on the site. All of the paid out tickets will be kept for the accounting team to look over.

4.2.6. IMPLEMENTATION PLAN

The design would be a structured approach to development, employing Agile methodologies and version control via GitHub for collaboration. The backend will be powered by Django, with a mySQL database, while the frontend will leverage React.js and Redux for a dynamic user experience. Security measures, including HTTPS and JSON Web Tokens, ensure data integrity and privacy. The modular design, complemented by clear data modeling, sets the foundation for a scalable and maintainable application that aligns with the real-world demands of golf club management.

5. RESULTS

The initial LooperWise prototype significantly outperformed expectations, captivating stakeholders and securing support for its development, particularly noteworthy given Westmoreland's conservative nature. This shift led to a pivotal approval from the board after demonstrating the prototype's capabilities, setting the stage for advanced, full-scale development aimed at enhancing operational efficiencies across the board.

The deployment of LooperWise promises to revolutionize the caddy program, optimizing key aspects across its three modules to significantly reduce waiting times—potentially saving caddies 2-8 hours daily—and streamline managerial tasks, which could cut down the manager's scheduling-related work from 4 hours to just 30 minutes weekly, thereby boosting overall program productivity and satisfaction. Furthermore, the application will refine the ticket management system by reducing manual entries and errors, potentially saving 40-80 minutes daily and decreasing paper waste by 120-240 tickets weekly, alongside enhancing the payout process to save the manager 30 minutes daily and the accounting team approximately 20 hours monthly in ticket processing, thereby improving financial accuracy and operational sustainability.

6. CONCLUSION

The development of LooperWise for Westmoreland Country Club has provided a practical solution to the long-standing inefficiencies in the club's caddy management system, offering improvements in scheduling, pairing, and ticket management. This project, rooted in a combination of personal caddying experience and academic learning, showcases the application of web technologies to streamline existing processes, leading to large gains in operational efficiency and user satisfaction. While the system's introduction marks a step forward in addressing operational challenges at the club, it also reflects the ongoing journey of learning and application in the

realm of technology, underscoring the potential for continuous improvement in even the most traditional of settings

7. FUTURE WORK

Thus far, I have done one complete iteration of the software development life cycle (requirements, design, implementation, testing), outlined in the exploration section. In this second iteration, I have laid out the improved requirements and design. My next steps are to implement my plan described in the process design section. Once completed, I will need to test my web application thoroughly via unit, integration, functional, performance, and security testing. I expect to find faults/errors and reiterate through the development stages until it is ready for beta testing. Once reliable to test out in real life settings, I expect my design to change slightly in order to adapt to unanticipated nuances of the spontaneous caddy program.

The future of LooperWise is bright given the strong interest from the WCC board, robust process design, and the operational efficiencies it offers. Moving forward, there is still much to do until Westmoreland can leave their traditional methods behind, entrusting LooperWise to track and facilitate all caddy-member pairings and subsequent financial records.

REFERENCES

Fosters, J. (2022, July 7). *About*. The Caddie Master. https://www.thecaddiemaster.net/about/

Jones, S. (2017, July 20). *New app makes scheduling and paying caddies easier*. Golfdom. https://www.golfdom.com/new-app-makes-scheduling-and-paying-caddies-easier/