i-SPiKE 2023

INTERNATIONAL EXHIBITION & SYMPOSIUM ON PRODUCTIVITY, INNOVATION, KNOWLEDGE & EDUCATION

"Optimizing Innovation in Knowledge, Education and Design"

EXTENDED ABSTRACT

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Assalamualaikum warahmatullahi wabarakatuh,

First and foremost, I would like to express my gratitude to the organizing committee of i-Spike 2023 for their tremendous efforts in bringing this online competition a reality . I must extend my congratulations to the committee for successfully delivering on their promise to make i-Spike 2023 a meaningful event for academics worldwide.

The theme for this event, 'Optimizing Innovation in Knowledge, Education, and Design,' is both timely and highly relevant in today's world, especially at the tertiary level. Innovation plays a central role in our daily lives, offering new solutions for products, processes, and services By adopting a strategic approach to 'Optimizing Innovation in Knowledge, Education, and Design,' we have the potential to enhance support for learners and educators, while also expanding opportunities for learner engagement, interactivity, and access to education.

I am awed by the magnitude and multitude of participants in this competition. I am also confident that all the innovations presented have provided valuable insights into the significance of innovative and advanced teaching materials in promoting sustainable development for the betterment of teaching and learning. Hopefully, this will mark the beginning of a long series of i-Spike events in the future.

It is also my hope that you find i-Spike 2023 to be an excellent platform for learning, sharing, and collaboration. Once again, I want to thank all the committee members of i-Spike 2023 for their hard work in making this event a reality I would also like to extend my congratulations to all the winners, and I hope that each of you will successfully achieve your intended goals through your participation in this competition.

Professor Dr. Roshima Haji Said
RECTOR
UiTM KEDAH BRANCH

WELCOME MESSAGE (i-SPiKE 2023 CHAIR)

We are looking forward to welcoming you to the 3rd International Exhibition & Symposium on Productivity, Innovation, Knowledge, and Education 2023 (i-SPiKE 2023). Your presence here is a clear, crystal-clear testimony to the importance you place on the research and innovation arena. The theme of this year's Innovation is "*Optimizing Innovation in Knowledge, Education, & Design*". We believe that the presentations by the distinguished innovators will contribute immensely to a deeper understanding of the current issues in relation to the theme.

i-SPiKE 2023 offers a platform for nurturing the next generation of innovators and fostering cutting-edge innovations at the crossroads of collaboration, creativity, and enthusiasm. We enthusiastically welcome junior and young inventors from schools and universities, as well as local and foreign academicians and industry professionals, to showcase their innovative products and engage in knowledge sharing. All submissions have been rigorously evaluated by expert juries comprising professionals from both industry and academia.

On behalf of the conference organisers, I would like to extend our sincere thanks for your participation, and we hope you enjoy the event. A special note of appreciation goes out to all the committee members of i-SPiKE 2023; your dedication and hard work are greatly appreciated.

Dr. Junaida Ismail
Chair
3rdInternational Exhibition & Symposium Productivity, Innovation, Knowledge, and Education 2023 (i-SPiKE 2023)

SURFSPHERE: ALL-IN-ONE PLATFORM FOR SURFING COMPETITION

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ABSTRACT

In light of the logistical complexities associated with the growing popularity of the UT Surfing Cup, this project introduces SurfSphere—a web-based Surfing Competition System aimed at optimising operations for organisers, judges, and surfers. The current manual systems for competition organisation are fraught with inefficiencies, ranging from inconsistent registration data to cumbersome scoring processes. SurfSphere, developed through an agile methodology, seeks to overcome these challenges by automating key procedures and ensuring user-friendly interface design. The system underwent a preliminary trial involving key stakeholders. Results indicated a high level of user-friendliness, efficient scoring by judges, robust data integrity, and system responsiveness. While the feedback is promising, it is acknowledged that further large-scale, real-time testing is essential for more conclusive validation. SurfSphere not only holds the potential to significantly reduce operational inefficiencies but also enhances event management, supports fair competition, and fosters community engagement. Future developments will focus on interface optimisation, exhaustive testing, and potential integration with other digital platforms.

Keywords: Surfing Competition Management, Agile Development Framework, User Interface Design, Usability Testing

INTRODUCTION

The UT Surfing Cup, established in 2020 in Pulau Kapas, Marang, Terengganu, is an annual event featuring two categories of surfing: shortboard and longboard. As the event has grown in popularity, so have the logistical complexities, amplifying the need for a more sophisticated management system. To address this, we introduce **SurfSphere** – a web-based Surfing Competition System designed to serve three key stakeholders: organisers (administrators), judges and surfers. SurfSphere offers a unified platform that simplifies surfers' registration, streamlines operational management for organisers, and facilitates a more efficient scoring process for judges.

PROBLEM STATEMENT

The organisation and management of surfing competitions have faced significant challenges due to their manual and unstructured operational procedures. The absence of an online registration system, along with disorganised registration lists from multiple sources, has resulted in inconsistent data entries, errors, and data duplication. Traditional methods for

organising competition fixtures have also proven to be cumbersome and time-consuming. Judges have encountered difficulties in efficiently scoring and monitoring participants, which has adversely impacted the competition's overall fairness and effectiveness. Additionally, existing solutions tailored for surfing competitions are either limited in scope or prohibitively expensive.

OBJECTIVES

1. Investigate the limitations of the current manual system and suggest procedures that can be effectively automated.
2. Develop an efficient, user-friendly web-based surfing competition management system.
3. Apply heuristic usability principles for an aesthetic and functional interface design.

METHODOLOGY

The development of SurfSphere is a multifaceted endeavour that involves not just software engineering, but also the intricacies of user interface (UI) design. To address these complexities, an agile development framework is employed, which facilitates rapid iterations and accommodates stakeholder feedback efficiently. The primary stages of development are outlined as follows:

- *Preliminary Research and Needs Assessment*: During this initial phase, comprehensive interviews are conducted with a diverse group of stakeholders, including competition organisers, participants, and judges. The primary goal is to ascertain their specific needs and requirements. The insights gleaned from these conversations inform the system's scope and guide the development of its functional specifications.

- *User Interface Design*: Before diving into the backend development, a dedicated stage for UI design is executed. Wireframes and mockups are created to envisage the layout and user experience. User journeys are mapped out, and feedback is actively sought from potential users to refine the design. This ensures a user-centric approach and enhances overall system usability.

- *System Design and Architecture*: Informed by the preliminary research and UI design, a high-level system architecture is constructed. This encompasses various modules, including participant registration and a participant categorisation algorithm. Unified Modelling Language (UML) diagrams serve as a conceptual framework, illustrating the system components and their interrelationships.

- *Technology Selection*: The choice of technology is pivotal to the project's success. For this system, HTML, CSS, and PHP are utilised for frontend and backend development, whilst MySQL is employed for database management.

- *Agile Development Sprints*: Following the agile methodology, the project is broken down into several sprints. Each sprint focuses on a particular set of features or modules and culminates in a comprehensive testing phase. This includes both unit tests and user-acceptance tests to validate the system’s robustness and usability.

- *Deployment and Evaluation*: Upon the completion of development, a prototype is deployed on a local server for preliminary evaluation. Feedback is gathered from the users to identify areas for future enhancements and refinements.

RESULTS

SurfSphere underwent a limited test involving representatives from the competition organiser, a panel of judges, and a few experienced surfers. The trial focused on key aspects of system functionality and usability:

- *Ease of Use*: Feedback from all involved parties indicated that the system was generally intuitive, scoring an average user-friendliness rating of 4 out of 5.

- *Scoring Efficiency*: Judges reported that they were able to input scores with relative ease, although they suggested some interface improvements for smoother operation.

- *Data Integrity*: No significant errors were found in the registration and scoring data, confirming the system's preliminary robustness.

- *System Responsiveness*: Users noted that the system responded quickly to inputs, with no reported instances of lag or freezing.

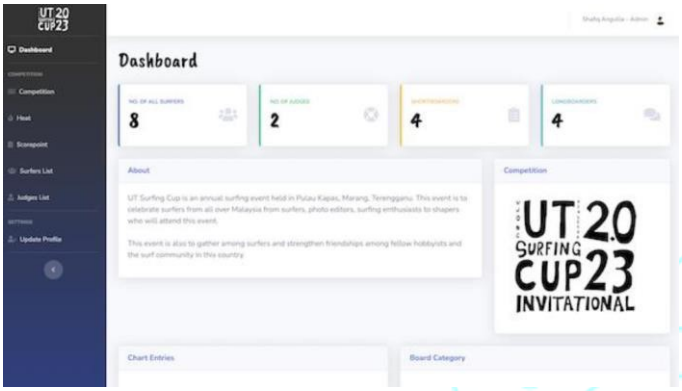

Figure 1. Snapshot of SurfSphere's Dashboard

DISCUSSION

The trial, albeit limited in scale, has provided valuable insights into SurfSphere's strengths and potential areas for improvement.

- *Ease of Use*: The high rating for user-friendliness is a strong indicator that the system's interface is on the right track. However, specific feedback will be scrutinised to identify areas for further improvement.

- *Scoring Efficiency*: Judges' feedback was generally positive, but they did make suggestions for enhancing the interface. This feedback is particularly valuable given that judges are critical users of the system. Their suggestions will be prioritised in the next development cycle.

- *Data Integrity*: The absence of significant data errors is encouraging and speaks to the system's underlying robustness. However, more exhaustive tests are needed to confirm this, particularly under the stress of real-time, large-scale data handling.

- *System Responsiveness*: The positive comments about system responsiveness are promising, although it should be noted that the system was not tested under competition-level stress, which would involve more users and simultaneous operations.

Overall, SurfSphere has shown considerable potential, with generally positive feedback from a small but highly relevant group of testers. Given that this was a closed, small-scale trial, it is essential to exercise caution in generalising these results. The next steps will involve refining the system based on this feedback and gradually scaling up the tests to include a larger number of users and more diverse operating conditions.

IMPACT ON SOCIETY AND COMMERCIALISATION PROSPECTS

SurfSphere's seminal contribution lies in its transformative approach to managing surfing competitions, offering a plethora of advantages that range from enhanced management efficiency and ensured scoring fairness and transparency to marked reductions in administrative costs. Additionally, its eco-friendly design minimises paper consumption, whilst its global digital reach fosters an interconnected surfing community and elevates the profile of competitive surfing. On the commercialisation front, SurfSphere's robust and adaptable architecture offers the potential for cross-sport applicability, extending its utility beyond surfing to other competitions with similar logistical requirements. Additionally, its platform can serve as a marketplace for surfing paraphernalia, thereby opening new revenue streams through potential partnerships with manufacturers and retailers. In essence, SurfSphere not only revolutionises the operational aspects of surfing competitions but also presents a versatile business model with multiple avenues for revenue generation.

CONCLUSION

The development and initial testing of the Surfing Competition System have shown significant promise in tackling operational inefficiencies and enhancing user experience. While the trial was limited, the positive feedback forms a robust foundation for future refinements. Looking ahead, additional work will focus on more exhaustive real-time tests, further interface optimisation, and possible integration with other digital platforms to enrich user engagement. The system is well-positioned to revolutionise competitive surfing, offering greater fairness, efficiency, and community engagement.

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