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
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3rdInternational Exhibition & Symposium Productivity, Innovation, Knowledge, and Education 2023 (i-SPiKE 2023)

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ABSTRACT
AdaptCare is an innovative smartwatch designed to cater to the specific needs of individuals with disabilities, with a particular emphasis on supporting the independence of mute and deaf individuals. This innovation focuses on care-oriented features aimed at effectively managing the well-being and health of disabled users. AdaptCare smartwatch integrates cutting-edge features and user-friendly design elements to enhance independence and facilitate communication for the deaf and mute community. The innovation aims to create a user-friendly interface with clear instructions, utilize eco-friendly materials to minimize environmental impact, and offer diverse functions to enhance independence. This study focuses on the application's ability to locate users, as well as managing their physical and mental well-being. The AdaptCare smartwatch is exclusively designed for mute and deaf individuals, taking into account their unique requirements and preferences. The smartwatch incorporates functionalities such as real-time transcription, visual notifications, and instant messaging capabilities, empowering deaf and mute individuals to communicate more efficiently and participate actively in various aspects of life. The findings underscore the significance of this innovation in creating a more equitable and inclusive society that values diversity and equal opportunities for all. Also, the smartwatch promotes inclusivity and raises awareness about the unique needs and capabilities of deaf and mute individuals, fostering empathy and understanding in society.

Keywords: AdaptCare, smartwatch, deaf and mute individuals, disabilities, enhanced independence.

INTRODUCTION

In recent years, technology is embedded and has become a part of our lives. This has a positive impact on society and most people gain their benefit from it. The most recent technology that has been introduced is Artificial Intelligence. People with disabilities, especially deaf and mute (DnM) can efficiently integrate with the help of Artificial Intelligence (AI). According to the World Health Organization (WHO), 5% of people worldwide are deaf and mute (Vaidya et al., 2020). Deaf and mute people usually rely on lip-reading or sign language in order for them to communicate. To solve these problems, there have been several innovations developed and one of them is smartwatch. The implementation of this innovation is quite challenging but it evolves day by day, especially in terms of design, capabilities, and the features itself. For example, when a normal person tries to speak with deaf and mute person, the user needs to give an input speech into the smartwatch system. Then, the system will generate the speech input and extracts it into various situations and keywords from the speech itself. Through the context, it will be shown to a deaf and mute user through certain visual images, vibrations and alert. The smartwatch can also detect the user by sending a signal where it is located at the bottom of the watch to alert them that there is a notification coming. This smartwatch aims to reflect the watch's care-focused features, assisting users with disabilities in managing their well-being and health. Thus, to promote independence and provide necessary assistance to individuals with disabilities in different aspects of their lives.

OBJECTIVE

First objective of AdaptCare smartwatch is mute and deaf people gain freedom with AdaptCare. AdaptCare smartwatches will need particular functionality for these users. Smartwatches with visual indications, vibration warnings, and other assistive technologies will aid communication and health management.

Secondly, create and incorporate comprehensive privacy and security safeguards into the smartwatch's AdaptCare feature to secure users' location data from unauthorized access, abuse, or infringement while delivering emergency and personal safety capabilities. Encryption, secure authentication, and strict access controls protect essential location data.

AdaptCare's ultimate objective is impaired traveler accessibility. Deaf and mute people can utilize the smartwatch's basic instructions. AdaptCare is self-service. User-friendly AdaptCare lets handicapped people accomplish everyday activities and socialize.

NOVELTY AND UNIQUENESS

With the advancement of technology, smartwatches gained popularity as an alternative to smartphones. Some smartwatches cater specifically to the needs of deaf and mute individuals, like our product, AdaptCare smartwatch. This unique product promotes independence and communication among disabled users. It also utilizes vibrating alerts and visual notifications, making it more convenient for the deaf, hard-of-hearing, and mute individual. Additionally,

our product, AdaptCare Smartwatch facilitates effective communication through sign language video calling, enabling seamless interaction with others. Thus, the watch was designed with energy efficiency in mind, featuring a low-power display and sensor to conserve battery life while at the same time reducing the environmental impact. Hence, it can help to lessen the energy production such as solid waste disposal.

METHODS

The product is easy and convenient to our user as they need to use the smartwatch only. One of the methods that can be used to foster innovative technology by allowing the deaf and mute people to customize the face recognition to display any specific information or notification that are reliable. Thus, it allows the user to customize the font size, text to speech or speech to text to make the device easier for them. It consists of two easy communications where they can receive notification and messaging. It allows the user to stay updated without using their smartphone. Next, the watch is also equipped with a wide range of sensors that can track their health whereby they can turn on the health tracker to track their heart rate, and physical activity. Additionally, there will be a camera and microphone features in the smartwatch and by using this, they can easily answer it by using a face recognition or swipe up by using their palm. Other than that, the smartwatch also features a sign language interpreter. Deaf and mute individuals can use a video relay service (VRS). This video relay service can be supported through their mobile phone and the smartwatch can act as a display from the video call, while the smartphone will allow the interpreter to relay the sign language communication between deaf and mute individuals and the caller. Lastly, our product is advanced whereby it has the ability to transcribe any spoken words from a third party into text or display it during the video call. This feature is particularly useful for deaf and mute individuals who rely on written text for communication. By using this, the smartwatch will display real-time transcriptions or captions of the conversation, allowing them to read and respond accordingly by using written text as well.

PRODUCT COMMERCIALIZATION

For AdaptCare to be successful on the market, it needs to be commercialized. Market research helps identify deaf and mute consumers' requirements, preferences, and ready to adopt new technology. This product is developed in hopes to meet the needs of the target market. After product development, the attention switches to production, supply chain, component procurement, manufacturer alliances, and quality control. Digital initiatives, targeted advertising, collaborations, and industry events help promote AdaptCare. Distribution and sales channels must be created with shops, e-commerce platforms, or specialized assistive technology providers to guarantee wide availability. Reaching target audiences requires user-friendly distribution platforms. Commercialization is not complete without thorough customer support channels, user guides, online tutorials, and fast problem resolution to guarantee a good user experience. Individuals who are deaf or mute are given special attention and care to meet their specific requirements. The long-term viability of it depends on continuous improvement and upgrades. For the product to remain relevant and competitive in the market, customer input must be gathered and incorporated into software upgrades, feature additions, and problem-solving efforts

IMPACTS

Impact refers to how something impacts the economy, environment, or society. Its introduction and adoption affects these parts. It assesses the good or negative impacts of an action, invention, or event. Impact analysis helps make smart decisions and plans by understanding a change or intervention's significance and impacts. It also shows how the AdaptCare smartwatch improves accessibility, independence, and quality of life for deaf and mute people while considering employment opportunities, market growth, paper waste reduction, energy efficiency, and social inclusivity and empathy.

Economic Impact

AdaptCare has significant economic implications, particularly in job creation and market expansion. The development, manufacturing, and distribution of this innovation require skilled professionals in technology, design, research, and customer support, contributing to job growth and overall economic activity. Moreover, by addressing the specific needs of deaf and mute individuals, AdaptCare opens up a new market segment and drives innovation and competition in the technology industry. This leads to increased economic activity, as companies strive to enhance the features and functionalities of AdaptCare. Additionally, by empowering individuals with improved communication, navigation, and access to information, AdaptCare enables greater participation in education, employment, and commerce, resulting in economic benefits for individuals and society as a whole.

Environmental Impact

In terms of the environmental impact, AdaptCare smartwatch can be designed using eco-friendly and recyclable materials, promoting sustainability throughout the product's life cycle. This includes using responsibly sourced components and minimizing the use of hazardous substances. By prioritizing material conservation, this smartwatch can have a reduced environmental footprint. Also, if it is designed with energy-efficient components and optimized power management, it can also contribute to reducing energy consumption. By ensuring that the device maximizes battery life and minimizes energy usage, it can have a positive environmental effect compared to traditional assistive devices. Its digital interface enables features like real-time transcription and instant messaging, reducing the reliance on printed materials and promoting digital accessibility.

Society Impact

The innovation of AdaptCare smartwatch for deaf and mute individuals has a transformative societal impact. By providing features such as real-time transcription, visual notifications, and instant messaging capabilities, this smartwatch enhances accessibility and communication for this community. It empowers deaf and mute individuals to participate more fully in social interactions, education, employment, and various aspects of life. This, in turn, can lead to increased confidence, self-reliance, and overall well-being. This increased accessibility and inclusion contribute to a more equitable society that values diversity and provides equal opportunities for all. This smartwatch not only improves the independence and overall quality of life for deaf and mute individuals but also raises awareness about their unique needs, fostering empathy and understanding in the broader community.

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