



اَبُو سَيِّدِي تَكْوَلُ لِي مَا اَنَا
UNIVERSITI
TEKNOLOGI
MARA



PROCEEDINGS OF JOHOR INTERNATIONAL INNOVATION INVENTION COMPETITION AND SYMPOSIUM 2024 (JIIICaS 2024)



*"Flourish and Nurturing Sustainable
Innovation for a Prosperous Nation"*

Editorial Board

Editors

NUR INTAN SYAFINAZ AHAMD

DR. HAJAH NORBAITI TUKIMAN

DR. NUR IDAYU ALIMON

AHMAD KHUDZAIRI KHALID

DR. MOHAMAD FAIZAL AB JABAL

DR. WAN MUNIRAH WAN MOHAMAD

DR. NUR SYAMILAH ARIFFIN

AZYAN YUSRA KAPI@KAHBI

NURHAZIRAH MOHAMAD YUNOS

NORZARINA JOHARI

AISHAH MAHAT

AZRINA SUHAIMI

HARSHIDA HASMY

DR. NG SET FOONG

FOO FONG YENG

Copyright © 2024 Universiti Teknologi MARA Cawangan Johor, Kampus Pasir Gudang, Jalan Purnama, Bandar Seri Alam, 81750 Masai Johor.

All extended abstracts published in this e-book have not been subject to JIIICaS2024 peer review or check. The authors are responsible for the contents of their extended abstracts and warrant that their extended abstract is original, has not been previously published, and has not been simultaneously submitted elsewhere. The views expressed in the abstracts in this publication are those of the individual authors and are not necessarily shared by the editor.

All rights reserved. No part of this publication may be reproduced in any form or by electronic or mechanical means, including information storage and retrieval systems, or transmitted in any form or by any means, without the prior permission in writing from the Course Coordinator of College of Computing, Informatics and Mathematics, Universiti Teknologi MARA Cawangan Johor, Kampus Pasir Gudang.

e ISBN: 978-967-0033-25-9



**Published in Malaysia by
Universiti Teknologi MARA Cawangan Johor
Kampus Pasir Gudang
81750 Masai**



Preface

In the name of Allah, the Almighty who gives us the enlightenment, the truth, the knowledge and with regards to Prophet Muhammad (peace be upon him) for guiding us to the straight path. We thank to Allah for giving us guidance and strength to write this e-book.

This e-book compiles the extended abstracts that submitted to Johor International Innovation Invention Competition and Symposium 2024 (JIIICaS2024), where JIIICaS2024 is a virtual platform for all creative minds to share and present their invention and innovation. Each abstract gives a brief background on the innovation or project.

We hope that this e-book will help the readers to get to know the innovation done by the students and get some ideas to develop future innovation products.

Foreword Rector



Assalamualaikum warahmatullahi Wabarakatuh,
Salam Sejahtera, Salam Malaysia MADANI and
Salam UiTM Dihatiku.

In the name of Allah, the Most Gracious, the Most
Merciful.

It is a great honor to welcome you to the Johor
International Innovation, Invention, Competition, and
Symposium 2024 (JIIICaS 2024). This event

connects various disciplines, focusing on education and engaging educators,
students, researchers, and innovators from all walks of life.

Innovation is not just about ideas; it demands perseverance, creativity, and
determination to turn those ideas into reality. The remarkable projects
showcased today highlight the dedication and spirit of all participants.
Initiatives like this not only explore new technologies but also cultivate skills
and leadership among our youth. At Universiti Teknologi MARA (UiTM) Johor
Branch, we are fully committed to fostering a dynamic culture of innovation,
promoting the commercialization of new products, and encouraging
meaningful collaborations with industry and society.

As we celebrate this event, I would like to extend my heartfelt gratitude to all
sponsors, judges, the College of Computing, Informatics and Mathematics,
UiTM Pasir Gudang Campus as the event organizer, as well as to the
researchers and participants for their hard work in making this event a
success. Let us continue striving for innovation and excellence. May the
ideas presented today inspire us and lay the groundwork for future
achievements.

Thank you.

Associate Professor Dr. Saunah Zainon
Rector
Universiti Teknologi MARA (UiTM)
Johor Branch

(A-SS038) THE SMART BACKPACK

Inessa Adelin Binti Rosdi Yani¹, Zainul Rafique Bin Norzaini¹, Wan Uzma Zainal Bin Wan Mohamad¹, Nik Yasira Ayuni Binti Nik Zahari¹, Nur Najwa Maisarah Binti Mohamad¹, Nur Dalila Binti Adenan¹

¹Universiti Teknologi Mara Cawangan Terengganu, Kampus Dungun, Sura Hujung
23000, Dungun, Terengganu

2023802748@student.uitm.edu.my

ABSTRACT

Smart backpacks are an innovative development in travel gear because they combine modern technology with useful features to make traveling more enjoyable. At its foundation, sustainability is important, and an integrated solar panel uses clean energy to power electronics on the go. This cuts down on reliance on traditional power sources and is in line with environmental awareness. The ability to charge wirelessly makes traveling even easier by letting you get power without having to deal with lines or adapters. Safety and usefulness are improved by built-in LED lights that provide illumination for trips at night and improve visibility when there isn't much light. A smart organization system makes the best use of storage space and ease of entry, reducing clutter and making it easier to find things. Bluetooth connection makes the backpack more useful by letting it work seamlessly with smartphones and other smart devices, which makes tracking and remote access easier. In essence, the smart backpack is the perfect example of innovation, sustainability, and connection, and it promises a more enjoyable and efficient trip.

Keywords: Smart Backpack, Sustainability, Solar Power, Wireless Charging, Bluetooth Connectivity

1.0 INTRODUCTION

Introducing the smart backpack: a revolution in travel gear that seamlessly blends modern technology with practicality. With a focus on sustainability, its integrated solar panel powers electronics on the go, reducing reliance on traditional energy sources. Wireless charging enhances convenience, while built-in LED lights improve safety during night travels. An intuitive organization system minimizes clutter, and Bluetooth connectivity adds seamless integration with smartphones. In essence, the smart backpack embodies innovation, sustainability, and connectivity for an enhanced travel experience.

2.0 OBJECTIVES

The Smart Backpack is designed with a strong emphasis on sustainability and environmental responsibility, integrating several features that highlight the company's commitment to minimizing environmental impact throughout the product's lifespan.

One of the key eco-friendly elements is the incorporation of solar panels, which harness solar energy to charge devices. This feature not only promotes energy efficiency but also aligns with broader efforts to reduce reliance on conventional power sources and lower fossil fuel dependency. By adopting such a design strategy, the

Smart Backpack not only raises awareness about environmental issues but also meets the growing consumer demand for more sustainable product choices.

Safety and visibility are paramount in the Smart Backpack's design, addressing the need for enhanced user protection. The integration of LED lights significantly improves visibility in low-light conditions or complete darkness, making users more noticeable to other road users, cyclists, pedestrians, and drivers. This feature plays a crucial role in reducing the risk of accidents or collisions, thereby enhancing overall safety and well-being.

Organization and security are also key priorities in the Smart Backpack. The advanced smart organization system utilizes RFID tags or smart sensors, allowing users to track and manage their belongings more efficiently. This system reduces the likelihood of lost or forgotten items, providing users with greater peace of mind. Additionally, Bluetooth connectivity enables various services, such as inventory management, GPS tracking, and anti-theft alarms, further enhancing the security and convenience for users.

Moreover, the Smart Backpack's use of solar energy for charging devices exemplifies a commitment to energy conservation and reduced environmental impact. By relying on solar power instead of traditional electricity, the backpack supports sustainable living initiatives and helps decrease dependency on fossil fuels. This approach not only conserves energy but also contributes to broader environmental conservation efforts.

In summary, the Smart Backpack is designed to promote eco-friendly practices, enhance user safety, ensure efficient organization and security of personal items, and support energy conservation. These features collectively reflect the company's dedication to sustainability and user well-being, catering to the needs of environmentally conscious consumers.

3.0 METHODOLOGY

The Smart Backpack is an innovative product that meets the demands of modern, environmentally conscious customers with multiple functions capable of solving everyday problems.

The Smart Backpack incorporates a high-efficiency solar panel seamlessly integrated into its exterior. This solar panel collects solar energy during the day and converts it into usable electrical power, stored in a built-in battery. This stored energy can later be used to charge electronic devices such as portable speakers, tablets, cell phones, and cameras while on the move. The solar panel is designed to be weather-resistant and durable, ensuring reliable operation in various outdoor conditions.

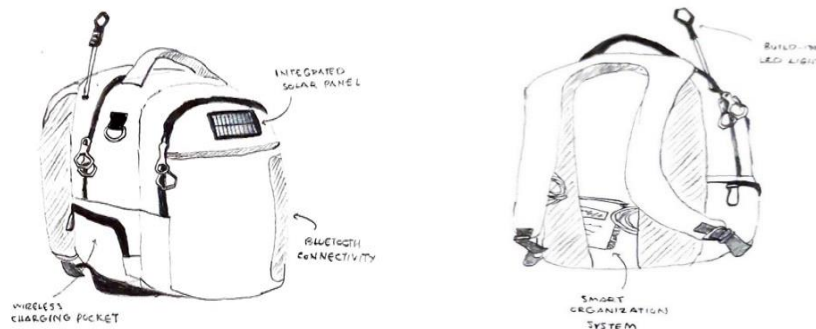
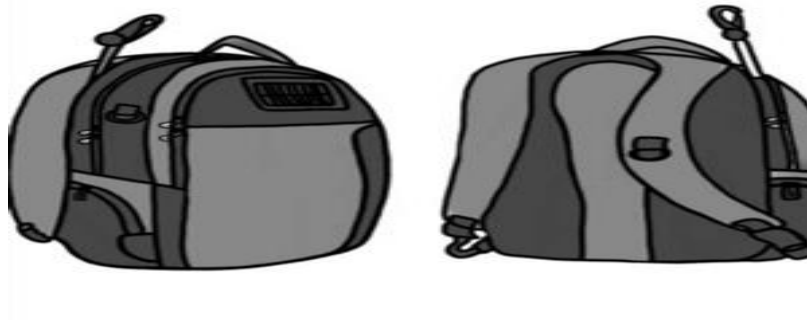
In addition to the solar panel, the Smart Backpack features a specialized wireless charging pocket. This pocket allows users to charge their devices, such as smartphones and wireless earbuds, without the need for cables or adapters. By simply placing their devices into this pocket, users can enjoy the convenience of wireless charging, eliminating the hassle of tangled cords and enabling them to stay connected and fully charged while traveling.

To enhance visibility and safety, the Smart Backpack is equipped with built-in LED lights. These lights improve the visibility of the user in low-light or nighttime conditions, making them more noticeable to other road users, cyclists, pedestrians, and drivers. The LED lights are designed for long-lasting durability and energy-efficient operation, ensuring consistent illumination when it is most needed.

The Smart Backpack also includes an advanced smart organization system to facilitate better management and tracking of items. Interior compartments are equipped with RFID tags or smart sensors connected to a smartphone app. This app allows users to easily locate specific items within the bag, reducing the likelihood of lost or forgotten belongings. The organization system enhances efficiency and saves time by enabling users to find and retrieve items quickly.

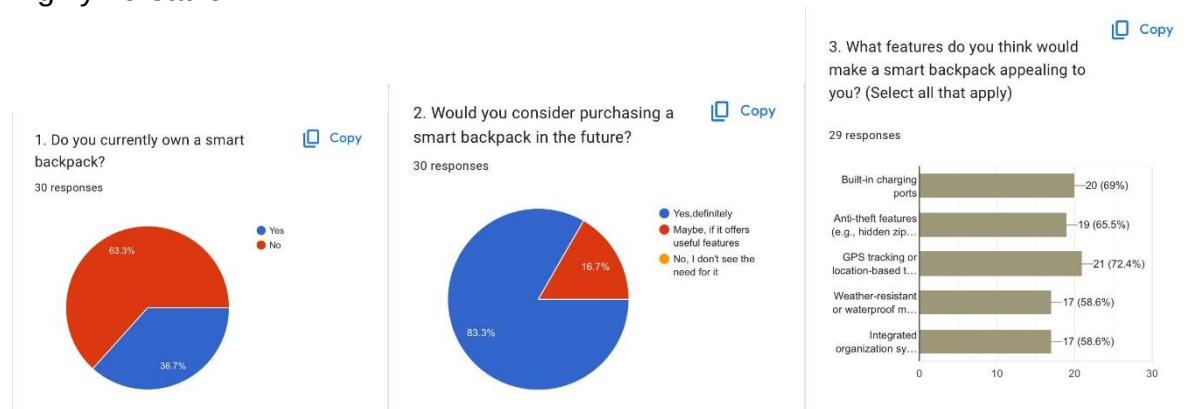
Furthermore, the Smart Backpack is equipped with Bluetooth connectivity, enabling seamless communication with a mobile application. This app provides several services, including inventory management, anti-theft alerts, and GPS tracking. Users can manage the contents of their backpack, remotely track its location, and receive notifications in case of theft or unauthorized access. Bluetooth connectivity offers users added security and peace of mind, ensuring their valuables are protected while they are on the go.

In summary, the Smart Backpack's methodology revolves around integrating cutting-edge technology to enhance functionality, convenience, and safety. The incorporation of a high-efficiency solar panel, wireless charging pocket, built-in LED lights, smart organization system, and Bluetooth connectivity collectively ensures that users can stay organized, secure, and connected in an eco-friendly manner.

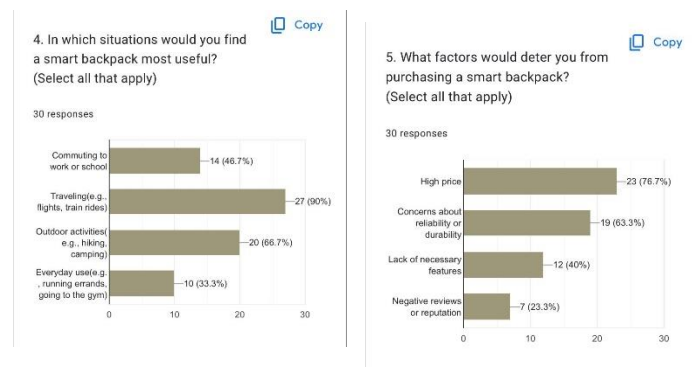


4.0 RESULTS

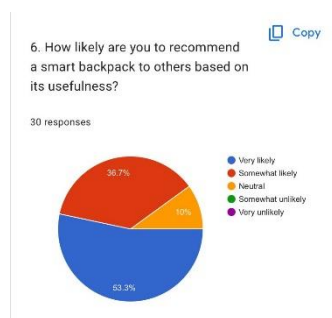
Based on a survey that has been conducted among students and the public, a majority of respondents, with 63.3%, currently owning one and 83.3% expressing definite interest in purchasing in the future, with an additional 16.7% considering it if the features are appealing. This keen interest is fuelled by features like built-in charging ports (69%), anti-theft measures (65.5%), GPS tracking (72.4%), weather resistance (58.6%). These features cater to various needs, making smart backpack highly versatile.



Smart backpacks are deemed most useful for traveling (90%) and outdoor activities (66.7%), with a smaller percentage seeing them as essential for everyday use (33.3%). However, potential buyers are deterred by factors such as high prices (76.7%), concerns about reliability (63.3%), lack of necessary features (40%), and negative reviews (23.3%).



Despite these concerns, 53.3% are very likely and 36.7% somewhat likely to recommend smart backpacks based on their perceived usefulness, with only 10% remaining neutral.



This indicates a positive user experience and satisfaction with the utility provided by smart backpacks. Addressing affordability and reliability concerns while continuing to innovate on features could further drive adoption in the future.

5.0 CONCLUSION

In conclusion, smart backpacks blend modern technology with practicality, focusing on sustainability, convenience, safety, and connectivity. Survey results show a strong consumer interest, despite challenges such as pricing and reliability concerns. Overall, smart backpacks promise to redefine travel with innovation and efficiency.

REFERENCES

Blogger, G. (2024, May 17). *Nordace Siena Smart Backpack Review – Is it worth buying?* Be My Travel Muse. <https://www.bemytravelmuse.com/nordace-siena-smart-backpack-review/>

Cavanaugh, R. (2021, July 25). *The 4 best smart backpacks*. Inverse. <https://www.inverse.com/culture/best-smart-backpacks>

How to choose a smart backpack. (n.d.). Standard Luggage Co. <https://www.standardluggage.com/pages/best-smart-backpack#:~:text=Smart%20backpacks%20usually%20have%20USB,no%20matter%20where%20you%20go>

Nordace_Admin. (2024, May 6). *Nordace Siena - Smart Backpack - Nordace*. Nordace. <https://nordace.com/en/product/nordace-siena-smart-backpack/>

Tuffery, A. (n.d.). *8 stylish smart backpacks for a quick travel upgrade*. BBC Science Focus Magazine. <https://www.sciencefocus.com/buyers-guides/smart-backpacks>