

e - Proceedings



Proceeding for International Undergraduates Get Together 2024 (IUGeT 2024)

"Undergraduates' Digital Engagement Towards Global Ingenuity"



Co-organiser:

INSPIRED 2024. Office of Research, Industrial Linkages, Community & Alumni (PJIMA), UiTM Perak Branch

Bauchemic (Malaysia) Sdn Bhd

Universitas Sebelas Maret

Universitas Tridinanti (UNANTI)

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Power Port: An Eco-Friendly Multifunction Space

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ABSTRACT

The Power Port is an eco-friendly, multifunctional space designed with sustainability. It provides a dedicated area where students can recharge their smartphones and tablets using solar-powered USB ports while seated using on material that durable, weather-resistant chairs made from aluminium and recycled plastic. The space includes a wash hand area that utilizes rainwater harvesting, promoting water conservation. Its open-air, green design offers shade without enclosing the space, allowing for natural ventilation and a connection to nature. The Power Port also enhances the aesthetic appeal of its surroundings while prioritizing sustainability. The materials used, such as recycled plastic, eco-friendly wood composites, bamboo charcoal fibre boards, and thermally modified wood, are selected for their low environmental impact. This design reflects a commitment to durability and environmental consciousness, making the Power Port both a functional and sustainable solution for student spaces.

KEYWORDS: Space, eco-friendly, multifunction, modern, sustainability

DESIGN DESCRIPTION

Based on the given proposed location, which is a high-traffic area frequently used by students, the Power Port is strategically positioned to offer maximum convenience. This location ensures that students who find themselves with a low or depleted phone battery while walking across campus have quick and easy access to a charging point. In situations where immediate communication or access to digital resources is essential, the Power Port serves as a reliable and accessible solution, supporting students in staying connected and prepared during their daily activities. The construction is built using sustainable materials with low environmental impact, including recycled plastic, thermally modified wood, bamboo charcoal fiberboard, and eco-friendly composites. These choices ensure the design is durable and environmentally conscious, aligning with the theme of sustainability while providing a functional and aesthetically pleasing space for users and students. This innovative space offers seating equipped with USB charging ports, allowing students to conveniently recharge their smartphones or tablets while sitting and enjoying the outdoor environment. The design emphasizes sustainability through the use of low-impact materials like recycled plastic, aluminium, eco-friendly wood composites, and bamboo charcoal fibre boards. Additionally, the Power Port incorporates a rainwater harvesting system for a wash area to promote water conservation. However, functionality and durability are the key aspects of the design. Weather-resistant materials ensure the longevity of the seating and structural components, making the Power Port suitable for various climates. Its open-air design allows for natural ventilation, providing a comfortable environment without the need for artificial climate control. The user-friendly layout features accessible charging points and an integrated wash area, enhancing both hygiene and convenience. Natural materials and an open design enhance the space's aesthetic appeal, making it inviting and harmonious with its surroundings. The Power Port is ideal for university campuses but can also be implemented in public spaces like parks and



recreational areas. By reducing the carbon footprint through sustainable material choices and promoting water conservation, the Power Port stands as a model of innovation and environmental stewardship.

THE POWER PORT SYSTEM



Figure 1: shows how the Power Port works as an eco-friendly multifunctional space

This system integrates sustainable elements, featuring a solar panel for power, rainwater collection with filtration, and a storage system for water. It includes a hand wash area and channels for water outflow. Additionally, a charging station and seating area are all supported by a central column with wiring.

NOVELTY AND UNIQUENESS

The design introduces an innovative solution by combining renewable energy with water collection and public utility features. The integration of solar power panels and a rainwater harvesting system with a wash hand area, charging station, and seating area has special qualities. This multifunctional structure is not only aesthetically pleasing but also environmentally friendly, offering sustainable solutions for campus or public outdoor areas. The design stands out by addressing both energy and water conservation needs while providing essential public services in a single compact structure.

BENEFITS TO MANKIND

This design gives significant benefits by promoting sustainability and environmental conservation. The solar power panel reduces dependence on non-renewable energy sources, while the rainwater harvesting system helps in water conservation. The inclusion of a public hand wash area and charging station provide necessities in public areas. Additionally, this design fosters community or student engagement by creating functional spaces that encourage social interaction and hygiene, contributing to public health and well-being.



COMMERCIAL POTENTIAL

The design has substantial commercial potential, especially in campus areas, public parks, urban areas, and regions with sustainability initiatives. The growing demand for eco-friendly and multifunctional public infrastructure can drive market acceptance nowadays. It is versatility combining water conservation and renewable energy with necessary public utilities gives it a competitive edge. The component design allows for scalability, making it suitable for various environments outdoor. With appropriate business models focusing on partnerships with municipalities or environmental organizations, this design can be commercially viable. This design can be made commercially feasible with the right business models, which would centre on joint ventures with environmental organizations or municipalities. Furthermore, it indirectly will make the integration of sustainable technologies attract government incentives and regulatory support.

CONCLUSION

In conclusion, the Power Port is a design that can represent a significant advancement in sustainable infrastructure by integrating solar energy, rainwater harvesting, and public utilities into a single structure. The innovative combination of these elements addresses both environmental and societal needs, offering a practical solution for enhancing public spaces. The multifunctionality and eco-friendly nature of the design highlight its potential to improve our living, promote sustainability, and contribute to public health. Moving onward to the future, expanding its application in diverse settings and exploring additional features could further enhance its impact and commercial success.

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