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THE 13TH INTERNATIONAL INNOVATION, INVENTION & DESIGN COMPETITION 2024

EXTENDED ABSTRACTS

e-BOOK

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AN ECO-FRIENDLY DESIGN CONCEPT IN URBAN AGRICULTURE FOR CAFÉ: CULTIVA

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ABSTRACT

This innovative cafe-based product addresses the issue of food waste by repurposing discarded items. Existing studies highlight the increase in landfill waste. It employs observation and design processes during the research of innovation. The product efficiently composts leftovers within a cafe environment notorious for food wastage, producing nutrient-rich fertilizer for plants, which suits the objective of this study. Its strategic location capitalizes on the surplus food available. Additionally, the product's unique hanging design optimizes space utilization, making it a discreet yet impactful solution for sustainable waste management. By transforming food scraps into valuable resources, this composting solution not only benefits the café's environmental footprint but also promotes a circular economy by fostering the reuse of organic waste in a visually unobtrusive manner.

Keywords: café, compost, hydroponic

1. INTRODUCTION

Urban agriculture is the activity of planting, developing, and producing food and other agricultural products in an urban or metropolitan setting. It entails cultivating food and rearing animals in locations commonly associated with cities, such as roofs, vacant lots, community gardens, and even interior facilities like greenhouses and vertical farms. In Malaysia, there are still many people who do not know or are aware of the importance of urban agriculture and its benefits.

In Malaysian cafes, integrating hydroponic systems not only offers fresh produce but also serves as an educational tool to combat food waste. By showcasing the process from seed to plate, cafes can educate customers on sustainable food production methods. They can highlight the importance of reducing food waste by growing produce onsite, minimizing transportation emissions, and utilizing compost from food scraps to nourish the hydroponic system. Customers witnessing this process firsthand are more likely to appreciate the environmental impact of their food choices and may be inspired to adopt similar practices at home, thereby fostering a culture of sustainability beyond the cafe walls.

The objective of this innovation is to design environmentally friendly smart farming products for the public in café to give awareness and educate people about food waste, composting, and hydroponic systems.

2. METHODOLOGY

This innovation implements the design process as below:

Table 1 Design Process

PHASE	DESCRIPTION	RESULT AND IMAGE
1) Observation	<p>In the research phase, an observation was conducted on the issue. From the needs analysis, valid issues were highlighted as a basis for the survey.</p> <p>We conducted some research at Cafés using Google form, for customers to answer to find more details about urban agriculture awareness.</p>	
2) Sketches	<p>Sketching ideas to find a form that is relevant to the research, followed by the next steps of Idea Development and Design Development sketches.</p>	<p>1) Ideation</p> <p>2) Idea Development</p> <p>3) Design Development</p>
3) Mock-up	<p>A mockup based on the Design Development sketches was chosen. PVC board was used to make this mockup.</p>	
4) Usability test	<p>Consumers tested out the mockup to optimize the user experience by evaluating how easily users can interact with the product, and to validate design decisions.</p>	

3. FINDINGS

The final design, called *Cultiva*, used the criteria that have been finalized through the above processes. 3D print was used to make the final model and finished with spray paint. It is eco-friendly and recyclable, focusing on raising awareness about food waste and environmental impact among café workers and customers. Compost serves as a solution to mitigate the food waste problem in restaurants, thus the reason for the integration of a composting system into the product design. Moreover, it is attractive to customers because young people love to post appealing products on social media. These posts can further extend the awareness in the community, even those who do not frequent the cafés.



Figure 1 Final Design of Cultiva

3. CONCLUSION

To summarize, this cafe-based composting solution efficiently repurposes discarded items, generating nutrient-rich fertilizer from leftovers to tackle food waste. Its strategic placement within cafes maximizes surplus food usage, while its space-saving design ensures practicality. Promoting a circular economy stands as a pivotal step toward cafe sustainability. As a result, *Cultiva* is designed to give awareness to the community about food waste.

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