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



*“Flourish and Nurturing Sustainable
Innovation for a Prosperous Nation”*

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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)
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(A-SS082) BA:THUB: INTENDED DESIGN OF UNINTENDED BEHAVIOUR

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ABSTRACT

The acronym Ba: Thub refers to Baby Basin: The Unintended Behaviour Design Concept. The innovation project is inspired by the study of unintended human behavior (UHB). For instance, some individuals use the washbasin as a "baby bathtub" device to bathe their babies. According to previous studies, designers and researchers tend to pay less attention to UHBs compared to intended behaviors. This situation arises because humans find it challenging to predict and control UHBs in specific contexts. According to our research, factors such as psychological, environmental, economic, and product characteristics trigger the use of washbasins for baby bathing. Additionally, the problems often encountered by users, such as at R&R areas, hotels, malls, and hospitals, do not provide baby-friendly facilities and do not support the function of bathing babies when the user is outside of their home. According to our research findings, unintended use of a product begins when the user is in a complex situation, needs an immediate solution, and then interacts with the surrounding object to complete their tasks. However, psychologists agree that UHB has great value and potential in the field of product design. The project aims to (i) introduce the concept of 'Unintended Behavioural Design' (UBD) to designers who produce user products, and (ii) visualize the usability of the concept to develop new product designs. The method applied in this project involves four phases: ideation, concept development, digital draughting, and the modeling process. The UBD concept enhances designers' design thinking parameters by leveraging consumers, the sanitaryware industry, the tourism sector, and human well-being. The findings of this innovative product prototype unequivocally provide comfort to users and reduce the risk to their babies when using Ba: Thub.

Keywords: Unintended behaviour, Unintended Behaviour Design, Wash basin, Design thinking, Product design

1.0 INTRODUCTION

Every day, people interact and communicate with various kinds of products for different purposes. For example, people creatively use reversible chairs to hang plastic waste or, manipulated a bottle to separate egg yolks. The unintended uses of product were not designed by designers; rather, they were involuntary inventions that gave human life meaning and freedom from problems (Norman, 1988). Through investigation in systematic literature, UHB occurs due to several major factors, such as psychological, environmental, economic, and product characteristics (Hassan, Z. et al., 2022). Suri (Suri, 2005) has created a term "thoughtless act" of everyday activities that refers to unintended use of product. Understanding human interpretation, observing human

behaviour, and exploring experience can lead to better ideas and valuable solutions to people needs. Previous study was conducted, which user's attention was drawn to certain unintentional behaviours through survey (see Figure 1). During the survey, respondent selected five representations of UHB, one of it is "bathe babies using a wash basin". Wash basin originally is designed to be used for washing hands and faces. However, it is used not only as an intended function but also outside of its original context (Hassan, Z. et al., 2023). This is considered an everyday phenomenon in which non-designers are accidentally involved in the process of creating new functions through new ways of using existing products (Kim, S. et al., 2021). According to our findings, factors contributing to the behaviour include impractical portable baby bathtub for a vacation activity, unfriendly wash basin in baby's public area, consideration of back pain for mothers during their confinement period, cost saving, time concern, easier way to complete the task, social influences, personal experiences, and product affordances. The investigation was continued empirically involved thirty designers in product design through several stages: Verbal protocol, Design protocol, and Design syntactic analysis. Research locations are being carried out around Kuala Lumpur, Selangor, Negeri Sembilan, Kedah, Perak, and Penang, which ethically conducted. Based on the research findings, a design development model called Unintended Behavioural Design (UBD) concept was developed (Hassan, Z. et al., 2024). Thus, this project is designed to expose and test the concept of UBD based on the results of the research carried out. Therefore, to visualise the concept of UBD, we transform the idea of UHB into a prototype form.



Figure 1. Example of unintended use of product in everyday contexts

2.0 OBJECTIVE

The first goal of the innovation project was to introduce the concept of UBD, which was developed from early research discoveries. It will expose the industrial product designers, particularly those involved in user product design. The second objective is to convey the idea of innovation to the public by visualising the UBD concept in the development of new product designs. Both objectives are achieved through prototype development strategies, as mentioned in the methodology section.

3.0 METHODOLOGY

The project employs four-phase activities: ideation, concept development, digital draft, and modelling process. The first phase entails selecting ideas based on the protocol design activities carried out during the initial research. For this project, several UBDs proposed by the designers have been evaluated and selected as design representatives. The second phase involves the development of product concepts that involve defining the final form, material determination, technical components, and presentation. For phase three, digital design involves using the AutoCAD application to create two dimensions and three dimensions views. The final step is to translate the

2D design into 3D form using the 3D printer application (Flash forge Adventurer 4). The project was also collaborated with several companies to develop the prototypes.

4.0 RESULTS

The innovation aims to test the UBD concept's applicability in design development. The project's impact will (i) increase the potential for designing products through the UHB concept, (ii) reduce the risk of misuse of existing products, and (iii) provide comfort and opportunities for users to use products based on their daily needs. The innovation's uniqueness lies in its ability to enhance a new function without compromising the product's original purpose, while also incorporating improved safety features, ergonomics, and baby-friendly materials. Designers and product design experts inspired the novel features of this product during the protocol design session that was conducted at the beginning of the research. Therefore, we consider this finding to be highly reliable after careful consideration by those involved throughout the research and development of the design.

5.0 CONCLUSION

The design research has become familiar with the phenomenon of everyday design, which has gained acceptance in the design arena through various definitions of design concepts. Adjustments, exposures, and guidelines for UBD need to be introduced and expanded to product design practitioners so that this effort benefits all parties. Through the Ba:Thub prototype, designers benefit from UBD's design concept. It also opens opportunities for the sanitaryware industry to expand product production variations. Finally, through the introduction of this innovation, it benefits users in meeting their needs without risk.

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