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E-PROCEEDING

EXTENDED ABSTRACT

UiTM *di hatiku*

اوسها تقوى موليا

E-PROCEEDING

EXTENDED ABSTRACT



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Welcome Message RECTOR, UITM KEDAH BRANCH

Assalamualaikum warahmatullahi wabarakatuh,

First and foremost, I would like to extend my deepest appreciation to the organising committee of i-SPIKE 2025 for their steadfast dedication and commitment in making this prestigious event a reality. My heartfelt congratulations to the committee for their tireless efforts in ensuring that i-SPIKE continues to grow as a meaningful and impactful platform for academics, researchers, students, and industry players worldwide.

The theme for this year, “Empowering Minds: Bridging Innovation, Knowledge and Education for a Sustainable Future,” is both timely and significant. It reflects our shared responsibility to not only embrace creativity and technological advancement, but also to ensure that innovation directly contributes to sustainable development, equitable education, and the well-being of future generations.

i-SPIKE 2025 provides a dynamic platform for showcasing innovations that address real-world challenges while opening new avenues for collaboration, engagement, and inclusivity. By bridging knowledge, innovation, and education, this symposium strengthens our collective capacity to design solutions that empower communities and inspire positive change.

I am truly impressed by the diversity and calibre of participants in this year’s event. The projects and ideas presented highlight the extraordinary creativity and determination of our innovators. I am confident that the insights and solutions shared here will pave the way for continuous advancement in teaching, learning, and innovation.

It is my sincere hope that you will find i-SPIKE 2025 an enriching experience, one that sparks new ideas, builds lasting collaborations, and strengthens our shared vision for a sustainable future. To all participants, I wish you every success, and to the winners, my warmest congratulations.

Once again, I thank the organising committee, partners, and contributors for their invaluable support. May i-SPIKE 2025 continue to inspire and empower minds for many years to come.

Professor Dr. Roshima Haji Said
Acting Rector
Universiti Teknologi MARA (UiTM) Kedah Branch

Welcome Message (i-SPIKE 2025 CHAIR)

It is my great pleasure to welcome you to the 4th International Exhibition & Symposium on Productivity, Innovation, Knowledge, and Education 2025 (i-SPIKE 2025). This year's theme, "Empowering Minds: Bridging Innovation, Knowledge, and Education for a Sustainable Future," reflects our collective commitment to advancing innovation and fostering meaningful collaboration across academia, industry, and communities.

i-SPIKE 2025 provides a platform for scholars, researchers, students, and practitioners from diverse fields to showcase their ideas, share knowledge, and inspire new solutions to global challenges. We extend our sincere appreciation to all participants and contributors whose efforts and dedication have made this symposium possible.

We hope that this e-proceedings serves not only as a record of the innovations presented but also as a valuable resource that continues to inspire long after the event.

Thank you.

Dr Junaida Ismail
Chair

4th International Exhibition & Symposium on Productivity, Innovation,
Knowledge, and Education 2025 (i-SPIKE 2025)

PREFACE

The 4th International Exhibition & Symposium on Productivity, Innovation, Knowledge, and Education (i-SPIKE 2025) marks yet another milestone in our ongoing commitment to fostering innovation, creativity, and collaboration across disciplines. Guided by this year's theme, "Empowering Minds: Bridging Innovation, Knowledge and Education for a Sustainable Future," the event provides a dynamic platform for students, educators, researchers, and professionals to share their ideas, showcase their innovations, and engage in meaningful knowledge exchange.

This year, we are pleased to report that i-SPIKE 2025 received approximately 50 initial submissions, with more than 35 projects successfully advancing to final presentation and exhibition. These projects reflect a rich diversity of innovation, ranging from educational technologies, digital applications, and gamified learning tools to sustainable materials, cultural heritage preservation, and community-focused solutions. Collectively, they embody the spirit of bridging innovation and education to address pressing societal and global challenges.

We sincerely thank all participants, reviewers, and committee members for their invaluable contributions in making i-SPIKE 2025 a success. It is our hope that this e-proceedings will not only serve as a record of the ideas and innovations presented, but also as an inspiration for future collaborations and advancements in the pursuit of sustainable knowledge and innovation.

Assoc. Prof. Dr. Azlyn Ahmad Zawawi
Editor-in-Chief, i-SPIKE 2025 Proceedings

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CATEGORY 2
SS (ACADEMIC)

The application of Design Thinking : Case study i-ROOM BHEA

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EXTENDED ABSTRACT

This project explores the application of Innovation Tools call as a “Design Thinking” in producing the i-ROOM BHEA as one of innovation project for Bahagian Hal Ehwal Universiti Teknologi MARA (UiTM) Kedah. Design Thinking has emerged as a human-centered and iterative methodology for effective problem-solving across diverse fields, including business, education, and community development. It emphasizes empathy, creativity, and collaboration in generating innovative solutions that align with user needs. The process typically follows five key stages: (1) *Empathize*, which explores users’ experiences and contexts through interviews, observations, and journey mapping; (2) *Define*, where insights are synthesized into clear problem statements; (3) *Ideate*, which encourages creative idea generation through brainstorming, and mind mapping techniques; (4) *Prototype*, involving the development of tangible models such as sketches or digital mock-ups; and (5) *Test*, which evaluates prototypes through user feedback and usability assessments. Importantly, the process is iterative, with each stage informing the next to refine and improve potential solutions. By shifting from linear problem-solving approaches to a cyclical, user-focused model, Design Thinking enhances creativity, mitigates risks through early testing, and fosters solutions that are both practical and sustainable. Its adoption provides organizations and educators with a structured yet flexible framework to address complex challenges effectively, yet can transform the Bahagian Hal Ehwal Akademik procedure more engaging, inclusive and unique.

Keywords: Bahagian Hal Ehwal Akademik, Design Thinking, i-ROOM, Innovation Tools

INTRODUCTION

Design Thinking has gained prominence as a human-centered approach for tackling complex challenges across business, education, and community sectors. Unlike linear problem-solving methods, Design Thinking emphasizes empathy, creativity, and iteration to create solutions that are both innovative and practical (Brown, 2009; Liedtka & Ogilvie, 2011). This paper discusses the application of Design Thinking in the development of the i-Room system for Bahagian Hal Ehwal Akademik (BHEA), Universiti Teknologi MARA (UiTM). The i-Room system was initiated to address recurring inefficiencies in managing lecturers' office rooms and booking processes among the lecturer, which were previously handled manually and prone to errors such as double bookings and lack of transparency. By aligning each stage of Design Thinking with the i-Room system development, this section highlights how a user-centered framework can enhance innovation in higher education administration.

Design Thinking tools also focuses on to understand the user needs, reframing problems, and generating innovative solutions through iterative prototyping and testing (Brown, 2009; Plattner et al., 2011). In higher education, where administrative efficiency and user satisfaction are crucial, this methodology offers significant potential. The i-Room system project illustrates how Design Thinking can address the practical challenges of managing room bookings in an academic setting.

APPLYING DESIGN THINKING IN THE DEVELOPMENT OF THE I-ROOM PROJECT BHEA

The i-ROOM BHEA project applied the five stages of Design Thinking such as (Liedtka & Ogilvie, 2011; IDEO.org, 2015):

1. **Empathize**
2. **Define**
3. **Ideate**
4. **Prototype**
5. **Test**

(1) Empathize

The first step in Design Thinking involves understanding user needs through direct engagement and contextual inquiry. In the case of i-Room BHEA, most of the lecturers were consulted to capture their pain points. According to the informal discussions with the lecturers and also based on the direct observation of existing booking practices revealed several issues such as time wasted due to manual booking, overlapping reservations creating dissatisfaction among lecturers and lack of centralized and transparent access to booking logs.



Figure 1: discussion with the lecturer who involved with the process of manual booking

(1) Define

Based on the empathy phase, the problem was reframed from a purely technical challenge to a human-centered one. The design team formulated the following problem statement: *“Lecturers and administrative staff require a transparent and efficient room-booking system that saves time, minimizes conflicts, and enhances user satisfaction.”* Rather than merely digitizing the process, the project aimed to create a system that was modular, scalable, and adaptable to various organizational contexts beyond BHEA.



Figure 2: Evidence of the problem occurs

(1) Ideate

Brainstorming sessions with the NiCE group and BHEA staff generated multiple ideas. Among the concepts discussed were:

- A centralized online booking system is accessible via multiple devices.
- Automated conflict detection to prevent double-bookings.
- Transparent digital logs for administrators.
- A customizable module design for replication across faculties.

Tools such as mind mapping and storyboarding were used to visualize workflows and user onboarding journeys. This creative exploration broadened the scope of possible solutions while ensuring alignment with user needs.



Figure 3: Brainstorming with the NiCE group, lecturer and BHEA staff who involved with the process of manual booking

(2) Prototype

The initial prototype of i-Room was developed with basic digital booking functions, user login features, and administrative oversight. Paper-based sketches and digital mock-ups preceded the working prototype to ensure usability. Early models were tested internally, and adjustments were made to enhance user-friendliness. For instance, the interface was simplified to minimize training requirements, and modular features were built in to support scalability.



Figure 3: 1st phase of prototype i-room

The development of the I-Room system, prototyping was carried out progressively to ensure that user needs were addressed in a practical and scalable manner. The first prototype (Prototype 1) involved the use of a Google Form, which was designed to capture initial booking requests and simulate the basic functions of a digital reservation system. This early version provided valuable insights into user behavior and administrative requirements prior to the conceptualization of the full I-Room system. Building on this, a second prototype (Prototype 2) was developed using QR code technology to modernize the registration process for lecturers. This version not only simplified and streamlined user interaction but also accelerated the application process for office room allocation. These iterative prototypes enabled the project team to refine system features step by step, ensuring that the final I-Room design was grounded in real user experiences and responsive to administrative challenges.



Figure 4: 1st phase of prototype i-room

(1) Test

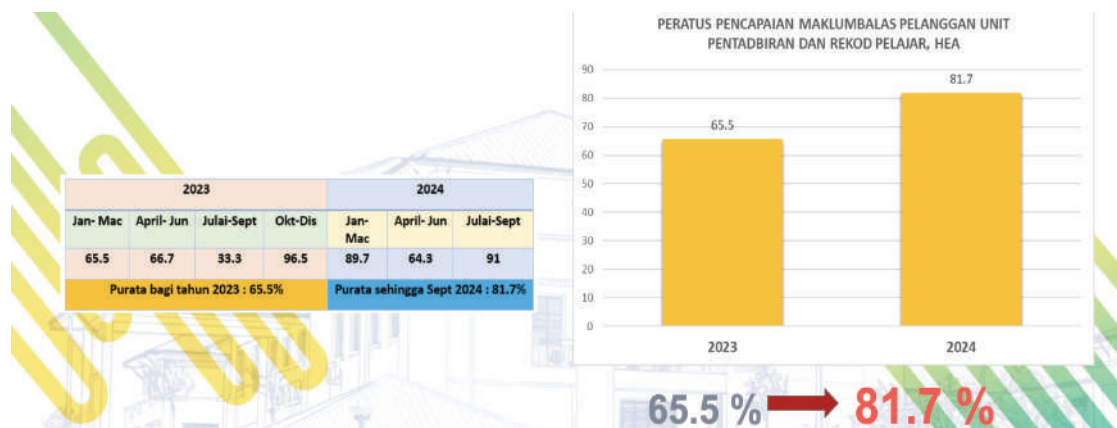
The prototype was piloted with selected lecturers and administrative staff. Feedback highlighted positive impacts such as reduced booking conflicts, improved efficiency, and greater transparency. However, users also identified areas for improvement, such as the need for clearer onboarding manuals and more intuitive navigation. In response, the development team refined the interface and created comprehensive user guides. This iterative testing process ensured that the system evolved in line with actual user experiences.



Figure 5: pilot test i-Room was success

OUTCOME AND IMPACT OF THE I-ROOM PROJECT BHEA

Through the Design Thinking framework, the i-Room project moved beyond a technical solution to deliver a **human-centered innovation**. The system successfully addressed core issues of inefficiency and dissatisfaction while offering broader institutional benefits, including, improved time management for lecturers, increased efficiency and transparency in administrative processes and adaptability to other faculties and organizational units.



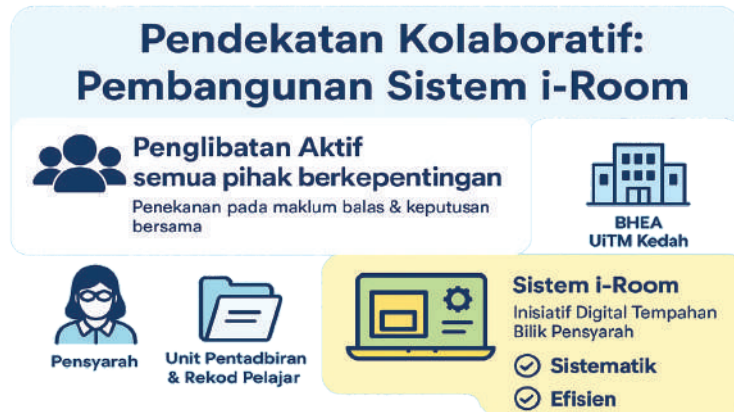


Figure 6: Staff reflection and customer feedback increase

FINDINGS AND DISCUSSION

The iterative process ensured that i-Room addressed user frustrations while aligning with organizational needs. The system reduced booking conflicts, saved time, and enhanced transparency. Importantly, its modular design offers replication potential across faculties, making it a scalable innovation (Kelley & Kelley, 2013).

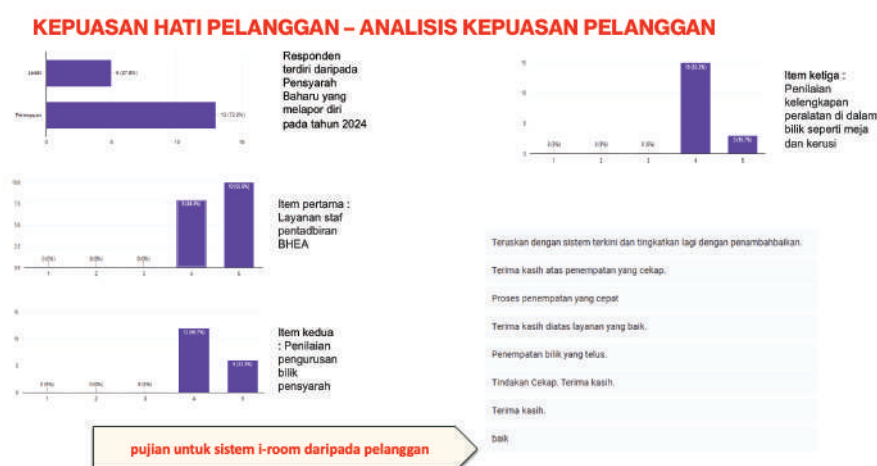


Figure 7: Staff satisfaction using the i-Room BHEA

CONCLUSION

The application of Design Thinking in the I-Room project illustrates the value of a user-centered methodology in higher education innovation. By focusing on empathy, reframing problems, and iterating through prototypes and testing, the project team was able to design a solution that is not only technically functional but also aligned with the lived experiences of its users. This case underscores the potential of Design Thinking as a catalyst for effective and sustainable problem-solving in academic administration.

ACKNOWLEDGEMENT

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