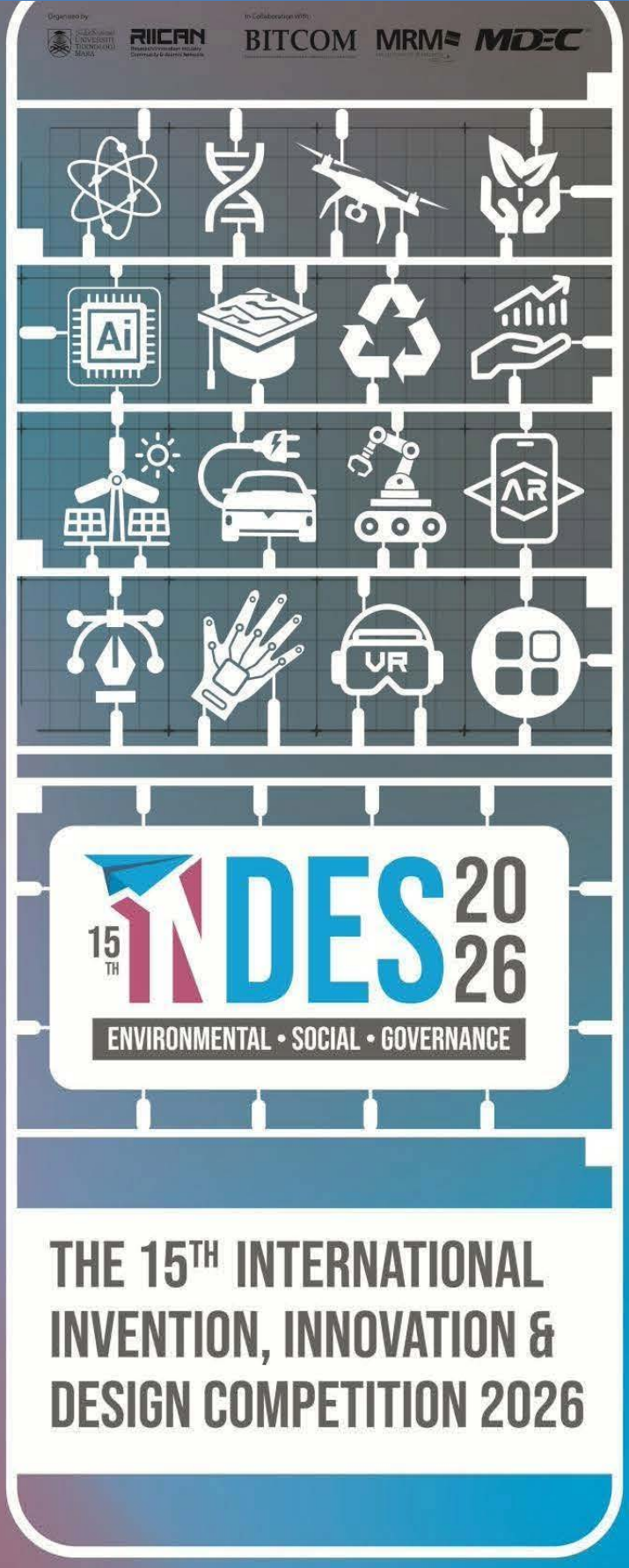

E-BOOK OF

EXTENDED ABSTRACT

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THE 15th INTERNATIONAL
INVENTION, INNOVATION &
DESIGN COMPETITION 2026

Organized by:
Office of Research, Industry,
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TOMA.AI: TURNING WORDS INTO SOLUTIONS

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ABSTRACT

TOMA.Ai is a web-based application developed to address challenges in daily meal planning, particularly among individuals with limited cooking ideas, restricted ingredients, and specific dietary needs. The platform utilises a prompt-driven approach to generate personalised recipe recommendations based on user inputs such as available ingredients, dietary goals, and cooking objectives. Designed to align with Malaysian taste preferences, TOMA.Ai ensures that all suggested recipes comply with halal requirements. The system caters to diverse user groups, including housewives experiencing menu fatigue, students with limited resources, and individuals preparing meals for large-scale events. Additionally, TOMA.Ai demonstrates high relevance during periods such as during the month of Ramadan, where structured and varied menu planning is essential. The application enhances efficiency in decision-making, reduces food waste, and improves overall cooking experience by offering practical, culturally relevant solutions. This innovation highlights strong potential in advancing smart cooking technologies within the Malaysian food ecosystem.

Keywords: Smart Cooking, Meal Planning, Halal Food, Food Technology, AI Recommendation

1. INTRODUCTION

The advancement of digital technology and artificial intelligence (AI) has significantly transformed how people address daily challenges. Currently, AI applications are widely employed to streamline tasks and provide timely, tailored recommendations for users (Dwivedi et al., 2021). In the context of food and lifestyle, AI technology is gaining prominence as a tool for helping users select meals and plan daily menus.

Many students and households struggle to determine how to use the ingredients they have at home, which can lead to unnecessary purchases and food waste. The Food and Agriculture Organisation (FAO) reported that food waste exerts substantial impacts on the global economy and environment.

In response to these challenges, TOMA.Ai was developed as an AI-powered cooking assistant that generates recipe recommendations based on user-provided ingredients. The application assists users in meal planning, decreasing food waste, and promoting more efficient food consumption practices. Furthermore, TOMA.Ai advances Sustainable Development Goals (SDGs), specifically SDG 2 (Zero Hunger), SDG 3 (Good Health and Well-being), and SDG 9 (Industry, Innovation, and Infrastructure).

2. METHODOLOGY

2.1 Phase 1: Problem identification

This phase focused on identifying common problems users encounter during daily meal preparation. Some of the main issues included a lack of cooking ideas, time limitations, and food wastage. Information was collected through observations, online trend reviews, and early user feedback.

2.2 Phase 2: Concept design

During this stage, the foundational concept and system architecture of TOMA.Ai were developed. The design process encompassed interface design, user flow, and ingredient input methods, with a primary focus on ensuring the application remains accessible and user-friendly. Once the design was finalised, attention shifted to the recipe recommendation process.

2.3 Phase 3: System development

In the third step, a prompt-based system was implemented to deliver recipe recommendations. Users enter available ingredients or specify the type of meal they want, and the system processes this information to suggest suitable recipes using a halal recipe database aligned with Malaysian food preferences. The recommendations can be adjusted for serving size and specific user needs. Following the development of this core functionality, prototype testing was initiated.



Figure 1 TOMA.Ai application.

2.4 Phase 4: Implementation strategy

The final phase involved user testing and evaluation of the TOMA.Ai application. User feedback was solicited to assess satisfaction, usability, and system performance. This stage also focused on identifying directions for future development and opportunities for application expansion. The insights gained set the stage for analysing the findings.

3. FINDINGS

The results indicate that TOMA.Ai facilitated more rapid and efficient identification of suitable recipes based on available ingredients. Users reported positive assessments regarding the application's simplicity and the relevance of its recipe suggestions. Moreover, the application contributed to food waste reduction by enabling users to utilise ingredients more effectively. TOMA.Ai was also perceived as beneficial for enhancing users' confidence in cooking and improving meal planning efficiency.

4. CONCLUSION

TOMA.Ai is a practical digital solution in food technology that integrates intelligent recommendation features that take cultural and dietary requirements into account. The application addresses common

challenges, including limited meal ideas, ingredient constraints, and the necessity for halal-compliant recipe options.

By enhancing efficiency, reducing food waste, and improving user satisfaction, TOMA.Ai demonstrates significant potential for broader adoption and future advancement. Prospective developments may include mobile app integration, more sophisticated AI-driven personalisation, and an expanded recipe database to accommodate a broader range of users and culinary preferences.

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