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# PROCEEDINGS OF JOHOR INTERNATIONAL INNOVATION INVENTION COMPETITION AND SYMPOSIUM 2024 (JIICaS 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)**  
**Johor Branch**

## **(A-ST050) KATA 3 in 1 POCKET TRANSLATOR DEVICE: REVOLUTIONISING COMMUNICATION AND BRIDGING LANGUAGE BARRIERS**

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### **ABSTRACT**

The rapid globalisation of the modern world has intensified the need for effective communication across language barriers. As people travel, work, and engage in cross-cultural interactions, understanding and being understood becomes crucial for success. The innovation of the KATA pocket translator device has emerged as a transformative solution, offering a compact and accessible tool to bridge diverse languages and cultures. KATA Pocket translator device, powered by advanced language processing technologies, revolutionises how individuals navigate linguistic differences. Designed to be a 3 in 1 smart device, KATA seamlessly integrates real-time translation capabilities for verbal interactions—where users can converse directly with the device—and text translation facilitated through its intuitive scanner or capture function. Moreover, it serves as a reliable dictionary, allowing users to access definitions of specific words swiftly. Its features include two built-in microphones with noise cancellation technology, a pen scanner and camera for accurate text translation, and online translation supporting 40 languages and 70 accents. This comprehensive functionality empowers users to communicate effortlessly, transcending the limitations imposed by their native language. From travellers to professionals conducting international business, the demand for reliable pocket translators reflects the universal need to overcome language barriers. For Muslim travellers, KATA is a valuable tool that allows them to scrutinise food ingredients in foreign languages through its scanner feature, helping them adhere to religious principles. The KATA pocket translator device thus revolutionises communication and travel experiences, empowering users to connect, explore, and engage with the world meaningfully.

Keywords: KATA Pocket Translator, Language Barriers, Real-Time Translation

### **1.0 INTRODUCTION**

In today's rapidly globalising world, the need for effective communication across language barriers has become more critical than ever. As people travel, work, and engage in cross-cultural interactions, the ability to understand and be understood is essential for success. Language barriers can hinder personal and professional growth, leading to missed opportunities and misunderstandings. For instance, studies indicate that patients and families facing language barriers receive significantly less communication from healthcare teams than from English-speaking families, which can adversely affect health outcomes and patient satisfaction (Pocketalk, 2021).

In 2021, developments in pocket translators, such as the Pocketalk device, highlighted their growing capabilities. It became the first HIPAA-compliant device designed for healthcare professionals, allowing for seamless communication between caregivers and patients who speak different languages. It supports translations in 82 languages,

offers audio readouts, and includes features like text translation via a camera (Pocketalk, 2021). This translator device is particularly beneficial in dynamic environments such as tourism, where real-time communication is crucial.

Hence, the KATA pocket translator device has emerged as a transformative solution in response to this pressing need. Offering a compact and accessible tool to bridge diverse languages, this device has significantly transformed communication across linguistic barriers.

## 2.0 PRODUCT OBJECTIVES

The KATA pocket translator device aims to facilitate seamless communication across diverse languages and cultures, addressing the need for effective language translation. It empowers users by providing a compact, user-friendly tool with real-time verbal and text translation capabilities. Additionally, KATA enhances the travel experience for Muslim users by enabling them to scrutinise food ingredients in foreign languages, supporting adherence to dietary and religious principles. The device seeks to bridge language barriers and improve personal and professional interactions worldwide. Furthermore, according to a report, the global language translation device market is expected to reach a valuation of USD 3,166.2 million by 2032, growing at a compound annual growth rate (CAGR) of 10.4% from 2023 to 2032. This growth is driven by the increasing demand for seamless international communication across various sectors, including travel, healthcare, and business (The Brainy Insights, 2024).

## 3.0 INNOVATION AND DESIGN

KATA will be the first translator device to offer a comprehensive suite of translation capabilities produced in Brunei. The device is powered by advanced language processing technologies, revolutionising how individuals navigate linguistic differences. Designed to be a 3-in-1 smart device, KATA seamlessly integrates real-time translation capabilities for verbal and text interactions facilitated through its built-in microphone, intuitive scanner, and capture function, as shown in Figure 1. Moreover, it serves as a reliable dictionary, allowing users to access definitions of specific words swiftly. This multi-functionality is achieved through sophisticated hardware and software integration to ensure accuracy and user-friendliness.



Figure 1. KATA Pocket Translator Illustration Design

The KATA pocket translator also boasts several other advanced features, including water resistance, a rectangular shape, a touchscreen interface, and multiple connectivity options such as Bluetooth and Wi-Fi. It is chargeable, enhancing its portability and convenience for users on the go. Furthermore, KATA can translate languages from both soft and hard copies and voice inputs. It can also translate languages used by disabled individuals, enabling communication with those who use alternative forms of language.

### 3.1 Key Innovative Features

The KATA pocket translator device boasts a range of features designed to enhance user experience and functionality, as summarised in Table 1.

**Table 1. KATA Pocket Translator Device Key Innovative Features**

Key Features		Description
1.	Noise Cancellation	It is equipped with two built-in microphones with noise-cancellation technology. These microphones provide clear and accurate real-time translation during conversations.
2.	Voice Input Translation	Translates spoken language, enabling real-time verbal communication between speakers of different languages.
3.	Text Translation	The device includes a pen scanner and camera for accurate text translation, allowing users to translate written content quickly and efficiently.
4.	Dictionary Function	Users can access definitions and meanings of specific words, making KATA a comprehensive language tool.
5.	Multilingual Support	Online translation capabilities support 40 languages and 70 accents, ensuring broad applicability.
6.	User-Centric Design	The device is compact and portable, designed to be easily carried and used in various settings, from business meetings to travel adventures.
7.	Water Resistance	Designed to withstand exposure to water, ensuring durability and functionality in various environments.
8.	Rectangular Shape	Sleek and practical design, making the device easy to handle and carry.
9.	Touchscreen Interface	Intuitive and user-friendly touchscreen for easy navigation and operation.
10.	Bluetooth / Wi-Fi	Multiple connectivity options for seamless data transfer and communication.
11.	Chargeable	Equipped with rechargeable batteries, providing portability and convenience for users on the go
12.	Soft and Hard Copy Translation	Able to translate text from both digital documents and printed materials, offering versatility in translation tasks.

### 3.2 Product Novelty and SDG Alignment

KATA will be the first translator device to provide a complete set of translation features, making it a groundbreaking innovation in the field. It combines real-time verbal translation, text translation through capturing and scanning, and a quick dictionary

function in one compact device. With built-in microphones and advanced noise-cancellation technology, KATA ensures precise and accurate verbal translations during direct conversations. Its integrated camera and pen scanner enable users to capture and translate written text from various sources. For instance, Muslim travellers can use KATA to check ingredients written in foreign languages to ensure they adhere to dietary restrictions.

Given that, this innovation aligns with the United Nations Sustainable Development Goals (SDGs), particularly SDG 4 (Quality Education) and SDG 9 (Industry, Innovation, and Infrastructure). It facilitates access to education and information for non-native speakers, promoting inclusive and equitable quality education (United Nations, 2022; Planbox, n.d). It fosters greater understanding and collaboration across cultures, contributing to innovation and improved global connectivity. Through these capabilities, KATA empowers individuals to engage more fully in a globalised world, supporting sustainable development and inclusive growth.

#### 4.0 PRODUCT SIGNIFICANCE AND USER PERCEPTIONS

To assess the significance and user perception of the KATA pocket translator device, a pilot study survey was conducted using Google Forms. The survey sampled 55 participants who actively travelled or studied abroad to assess the perceived necessity and potential impact of the KATA pocket translator on users' communication experiences. Participants were asked to rate the necessity of the device, identify the most helpful feature, and indicate their likelihood of recommending the device to others. The results were then tabulated and analysed using IBM SPSS to provide an overview of the data. Frequency distributions, percentages, and cumulative percentages were calculated.

##### 4.1 Product Necessity Rating

The data in Table 2 indicate a strong positive reception of the KATA pocket translator device among the participants. 61.8% of respondents found the device necessary, highlighting the critical need for practical communication tools in diverse languages. These reflect a significant demand for the KATA pocket translator device, particularly in environments where language barriers can impede personal and professional interactions. Moreover, only 10.9% of respondents deemed it moderately necessary, suggesting that while most users recognise its importance, a smaller segment finds it less critical but still useful.

**Table 2. Product Necessity Rating**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Necessary	34	61.8	61.8	61.8
	Necessary	15	27.3	27.3	89.1
	Moderately Necessary	6	10.9	10.9	100.0
	Total	55	100.0	100.0	

#### 4.2 Feature Preference

When examining the key features of the KATA pocket translator, the Text Translation by capturing or pen scanning feature emerged as the most favoured, chosen by 54.5% of participants. This preference indicates the high value placed on accurately and efficiently translating written content, which is essential for users of foreign languages in documents, signs, ingredients, and menus. The KATA translator's functionality aligns with the growing demand for reliable translation tools that facilitate communication across language barriers, making it an asset for travellers and professionals.

**Table 3. Innovative Feature Preference**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Real-Time Verbal Translation	10	18.2	18.2	18.2
	Text Translation	30	54.5	54.5	72.7
	Dictionary Function	6	10.9	10.9	83.6
	User-Centric Design	9	16.4	16.4	100.0
	Total	55	100.0	100.0	

#### 4.3 Likelihood of Recommendation

The willingness to recommend the KATA pocket translator's innovation to others is notably high, as shown in Table 4, with 69.1% of participants indicating they are very likely to recommend the device. This solid inclination to recommend suggests high user satisfaction and confidence in the device's capabilities. It reflects that users find the device necessary and trust its performance and utility enough to advocate for it among peers.

**Table 4. Likelihood of Recommendation**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Likely	38	69.1	69.1	69.1
	Likely	17	30.9	30.9	100.0
	Total	55	100.0	100.0	

### 5.0 ACHIEVEMENT OF IDEA

Even though the KATA pocket translator device is still developing as a research-based innovation, the concept for this product was awarded second place in the Halal Product Innovation Competition 3.0, organised by the Halalan Thayyiban Research Centre at Universiti Islam Sultan Sharif Ali. This recognition emphasised the innovation's potential to bridge language barriers, particularly aiding Muslim travellers to inspect food ingredients in foreign languages, thus supporting adherence to dietary and

religious principles. The promising research demonstrates the device's potential to ensure compliance with Halal requirements.

## 6.0 CONCLUSION

The KATA 3 in 1 pocket translator device is the first innovation to offer comprehensive translation capabilities, namely real-time verbal translation for direct conversations, text translation through capturing and scanning, and a quick dictionary function. In summary, pocket translator devices represent a significant innovation in overcoming language barriers, with substantial benefits in various fields. This approach addresses various communication needs, making it a versatile tool for all users. Besides, the strong endorsement from survey results highlights KATA's promise to enhance global connectivity and improve overall communication efficacy. As such, the innovation of KATA facilitates personal and professional interactions and has the potential to revolutionise how people navigate linguistic differences, especially in bridging gaps and fostering more meaningful global interactions.

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