



Design and Development of A WeChat Mini Program for assisting Chinese Tourists in identifying Thai Vegetables

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Abstract

Background and Aims: This study aims to bridge the gap in knowledge about Thai vegetables among Chinese tourists visiting Thailand. Through a combination of questionnaires and literature reviews, the researcher identified a lack of familiarity with Thai vegetables among Chinese tourists, potentially influenced by regional cultural differences and eating habits. To address this issue, the study proposes the development of a WeChat mini program as an educational tool to assist Chinese tourists in identifying and understanding Thai vegetables.

Materials and Methods: Data was collected through questionnaires administered to Chinese tourists to determine their level of knowledge and familiarity with Thai vegetables. The findings were complemented by a comprehensive literature review on the types, nutritional values, and promotion status of Thai vegetables in the Chinese market.

The questionnaire survey revealed specific Thai vegetables that were unfamiliar to Chinese tourists. This information was then incorporated into a database to develop the "Identifying Thai Vegetables" WeChat mini program.

Results: The "Identifying Thai Vegetables" WeChat mini program is a well-designed and effective tool that facilitates the identification of Thai vegetables and enhances users' understanding of Thai cuisine and culture. By continuously innovating and expanding its features, the mini program has the potential to become an indispensable resource for individuals interested in exploring the rich culinary landscape of Thailand, promoting awareness and increasing the consumption of Thai vegetables among Chinese tourists.

Conclusion: The mini program features a bilingual interface in both Chinese and Thai, facilitating accurate identification and comprehensive information retrieval. By leveraging machine learning and image recognition technologies, the mini program allows users to upload or take photos of vegetables, which are then analyzed to provide names, descriptions, and pronunciation guides in both languages. This tool aims to bridge the language barrier and enhance the culinary experience for Chinese residents and tourists in Thailand, contributing to a deeper appreciation and knowledge of local produce.

Keywords: Chinese tourists; Thai vegetable; WeChat Mini-program; Cultural understanding; Culinary tourism; Identification tool.

Introduction

The number of tourists entering Thailand from January 1 to June 25, 2023 reached 12.46 million, an increase of 539% over the same period last year. The top five countries with the highest number of tourists to Thailand are Malaysia with 1.98 million, China with 1.38 million, Russia with 784,000, South Korea with 741,000 and India with 732,000 (Bangkok Post). The number of foreign tourists entering Thailand in the second half of 2023 will continue to maintain a good trend and exceed the number of other tourists entering Thailand in the first half of the year. According to a report released by the Kailai Research Center of Thailand on the 7 th, Foreign tourist arrivals are projected to reach 28.5 million in 2023 (Li & Huang, 2023).

Chinese tourists often express an appreciation for Thai cuisine and actively seek to sample various Thai dishes during their travels in Thailand. However, linguistic challenges frequently arise when they attempt to pronounce food-related vocabulary, given the inherent difficulties of the Thai language. Thai cuisine incorporates a wide variety of vegetables, yet Chinese tourists may struggle to correctly identify or name these vegetables. This challenge extends to grocery stores and supermarkets, where unfamiliar vegetables can pose identification difficulties in terms of type, variety, or nomenclature. In multicultural settings, these language barriers can further complicate the recognition and understanding of specific vegetables. Consequently, there is a need for a dedicated mini program





to assist Chinese tourists in efficiently and accurately identifying Thai vegetables, thus enhancing their overall culinary experience and reducing communication hurdles (Tang, 2021).

Chinese tourists exhibit varying degrees of unfamiliarity with Thai vegetables, with specific vegetables standing out as the least familiar. Research indicates that many Chinese tourists lack awareness and knowledge of a wide array of Thai vegetables due to cultural and linguistic barriers. Among the least familiar vegetables are Sunflower seedlings, Eryngium, and Thai pepper, which have been identified through surveys and data collection efforts. These findings underscore the need for educational initiatives and tools, such as the development of educational mini-programs, to enhance Chinese tourists' understanding and recognition of Thai vegetables during their travels in Thailand.

Therefore, researcher can summarize the investigation and study the extent to which Chinese people do not know about Thai vegetables, as well as the names of vegetables they do not understand.

Objectives

1.To study the Thai words for vegetables that are difficult for Chinese people in Thailand to understand.

2.To design and development a mini program in WeChat for assisting Chinese tourists in identifying Thai vegetables.

Literature Review

1. Thai Vegetables

Kinds of Thai vegetables classified by season

An understanding of Thailand's context reveals that its emphasis on contemporary culinary culture is the result of a unique history of decolonization, Buddhist beliefs, the role of royalty, and national economic planning. It then introduces the four basic ingredients of Thai cuisine, basic cooking techniques, and how ordinary Thais construct their diet through a combination of dishes of different qualities. These qualities further elaborate on three concepts: element, elegance, and vitality. The dining sequence and the way people interact during the meal are introduced in more detail.(Seubsman et al, 2013)

Investigated Thai eating habits, changes, preferences, and acculturation in the United States. Through this paper, I can learn how to conduct questionnaire research, how to select research groups, changes in diet, and preference for vegetables. In this paper, it is shown that acculturation is significantly positively correlated with the consumption and preference of some local foods and significantly negatively correlated with the consumption and preference of some native foods.(Sukalakamala & Brittin, 2006)

2. Chinese-Thai Language

Thai language system

According to Nadeau & Nadeau (2017), alphabet and phonemes Thai uses the Thai alphabet, which contains 44 consonants and 15 vowel phonemes, some of which may not exist in other languages and therefore require additional learning and practice.

Tone: Thai is a tonal language, meaning that the meaning of a word can change depending on the tone of its pronunciation. Thai has five different tones, and correct pronunciation is crucial to understanding meaning.

Complex grammar: The grammatical structure of Thai is quite different from that of some Western languages such as English. For example, there is usually no explicit verb conjugation between the subject and the predicate, but is expressed through word order and auxiliary words.

Different writing system: The Thai alphabet is different from the Latin alphabet, which means that learners need to master a new alphabet to read and write Thai.

Cultural and social factors: Thailand's cultural and social habits are different from those of many Western countries, so understanding and correctly applying proper etiquette and respect is part of learning Thai.

Chinese and Thai translation



As a new form of application, WeChat mini program has the characteristics of no need for separate installation and a good user experience. Also, it provides a new platform and innovation space for mobile learning. Mobile learning has also begun to be widely accepted by the public, and many people, especially young people, are more willing to choose mobile learning. (Xu & Bao, 2017). Learning freedom, but also more independence, in the background of supporting the traditional classroom to improve the interest in learning while improving the efficiency of learning. There are various learning program and public accounts on the market, but most of them are about English learning or various kinds of exam guidance. As a non-universal language, the use of Thai is relatively narrow. Most of the existing public accounts or mini program related to Thai or Thailand push articles related to Thai tourism, cuisine, folk culture, current politics, etc... At the same time, there are relatively few articles about systematic learning of Thai. Therefore, to learn the basic knowledge of Thai in a better and more comprehensive way, this team develops and designs based on the actual learning of Thai A WeChat mini program called "Taikuai", compared with some existing public accounts," Taikuai "WeChat mini program adds a lot of basic knowledge of Thai language on the basis of the original public number. The WeChat mini program uses text combined with video, audio, figures, and other ways to present the content vividly, adding learning fun for learners.

3. UX/UI design (UI/UX)

UX/UI

The application's user interface should be user-friendly, allowing users to easily upload images, view recognition results, and get more information. User interfaces should be designed to consider the needs and skill levels of different users.

Research on User experience design of food mini programs based on users' social characteristics. In the design and research of food mini programs, too much attention is paid to the development of their functionality. Still, the design of social functions is not studied from the perspective of users. At the strategic level, the social features of user topic commonality, relaxed atmosphere and emotional proximity suggest the psychological needs of users. At the scope level, the user's social behavior reflects the user's usage habits. By studying the interaction design of the structural layer, the interface layout of the framework layer and the visual design of the presentation layer of the specific social module in the typical food mini programs, the design principles of the social function of the food mini programs are summarized, which provides evaluation criteria for analyzing and evaluating the social module design in the food mini programs, and provides a theoretical basis for improving the social experience of users.

The visual design of food application puts forward the visual design strategy of food mini programs based on regional cultural experience. From the three aspects of regional characteristics of visual style, cultural image of visual ICONS and hierarchical content of visual information, it discusses how to make the visual design of food applications not only spread regional and food culture but also meet the needs of food mini programs Users' aesthetic needs, functional needs and emotional needs

In the design of a vegetable recognition application, the choice of color scheme significantly impacts user experience and the application's usability. According to the research by Wang & Li (2019), green is identified as the most appropriate primary color. This choice is based not only on green's natural association with vegetables, which intuitively communicates the application's purpose but also on its visually soothing and relaxing effect, enhancing user comfort and satisfaction. Additionally, green, as a color symbolizing health and positivity, fosters user trust and affinity towards the application. Therefore, selecting green as the primary color in the design of a vegetable recognition application is the optimal choice, considering both user experience and functionality.

Wiwatkitbhuwadol, (2023).The article titled “The Art of Entrepreneurship: Navigating Success through Design for Business” investigates the crucial role that design principles play in entrepreneurial success. By examining the strategic integration of design into business ventures, the research underscores how design serves as a compass for entrepreneurs, guiding them toward innovative solutions and resilient foundations.





Methodology

This study employs a combination of questionnaire surveys and literature reviews. The questionnaire survey targeted Chinese tourists in Thailand through an online platform to assess their familiarity with Thai vegetables. The literature review examined relevant sources to identify types, nutritional values, and Chinese perceptions of Thai vegetables.

Step 1: Initially, vegetables were sourced from three locations: Big C, Foodland, and Huai Khwang Market. These three supermarkets are the most frequented and representative supermarkets by Chinese people. This step ensured comprehensive coverage of market options and provided foundational data for subsequent questionnaire design.

Step 2: Forty Chinese volunteers residing near Bangkok's Huai Khwang District and with over 7 days of residency in Thailand were selected. Researcher compiled vegetable photos into a reference document and queried participants with three questions:

1. Do you know this kind of vegetable? (The answer is, know or don't know.)
2. If you know, can you read the pronounce of that vegetable? (The answer is, can you pronounce it or not?) The real answer will be devised by (1) Know vegetables and pronounce them. And (2) Know vegetables but can't pronounce them.
3. Don't know them so can't pronounce them

Based on the outcomes, a refined questionnaire was developed and redistributed to the volunteers to yield final results. Using the "Questionnaire Star" platform, the survey was distributed efficiently. This platform allows for real-time notifications upon receiving responses and integrates data seamlessly for analysis. This capability not only ensures timely updates but also facilitates comprehensive data collection and management, enhancing the overall effectiveness of the research process.

Step 3: Building on findings from the initial phases, a mini-program was developed to enhance understanding and recognition of Thai vegetables among users.

The questionnaire has obtained the informed consent of all participants, ensuring that they are fully aware of the purpose of the study, the procedure and any potential risks or benefits involved. In addition, measures are taken to protect the confidentiality of participants, such as the anonymization of data, where personal identifiers are removed or replaced with codes to prevent information from being traced back to individual participants.

Results

researcher employed a series of systematic steps to assess the knowledge level of Chinese tourists regarding Thai vegetables and to propose strategies for enhancing awareness of these vegetables in the Thailand market.

Researcher collected vegetable information through fieldwork at three locations: 1. Big C, 2. Foodland, and 3. Huai Khwang Market, photographing all varieties of Thai vegetables. A total of 73 kinds of vegetables were identified, and their names are listed in Table 1.1. This step aimed to ensure comprehensive coverage of available options in the market, laying the groundwork for subsequent questionnaire design.

Table 1 Results of the vegetable survey

Red oak	Eoaplan	Cowpea
Basil	Grcen Pepper	Fennel
Eryngium	Prickly Cucumbe	Corn Shoot
Lemongrass	Spinach	Asparagus
Winged Bean	Celery	Green Pricklyash
Spearmin	Cobbao	Yellow Radish
Ocimum	Cauliflowe	Bean curd with yellow skin





Red oak	Eoaplan	Cowpea
Chayote	Cabbage	Greengroccry
Sunflower Seedling	Greenonion	Coriande
Galangal	Spicy Mille	Green Eggplant
Lemon Leaf	Lettuce	Water Spinach
Radish	Small Cucumbe	Zucchini
Butternut Squash	Longbean	Coprinus
Thai Pepper	Red Pepper	Luffa
Sophora Flowe	Green Pepper	Mushroom
white Radish	Tomato	Onion
Purplecabbag	White Mushroom	Small Eggplant
Potato	Manioo	Caulifowo
Needle Mushroom	Corn	Carrot
Lemon	Okra	Btter Melon
Fresh Ginge	Waxgourd	Bamboo Shoot
Shallo	Purple Onion	Garlie
Pumpkin	Cucumber	Agaric
Sweet Potato	Radish	Bean Curd
Bean Sprout		

Through the early simple inquiry, researcher got a total of 16 kinds of vegetables with an error rate of less than 50%, which are: Basil, Eryngium, Lemongrass, Winged bean, Spearmint, Ocimum, Chayote, Sunflower seedling, Galangal, Lemon leaf, Thai pepper, Sophora flower, White mushroom, Manioc, Yard long bean, Acacia pennat. Based on this data, the researcher determined the main contents of the questionnaire and focused on these 16 Thai vegetables. The questionnaire design includes several aspects: first, we asked the participants about the basic information; second, researcher included the pictures of these 16 kinds of vegetables in the questionnaire, provided some descriptions of these vegetables, and once again asked the volunteers about their familiarity with these vegetables in detail.

In order to ensure the accuracy and effectiveness of the questionnaire design, researcher have carried out many discussions and modifications and invited some professionals to review. Finally, researcher determined the final version of the questionnaire and produced both electronic and paper versions to facilitate our follow-up investigation.

Finally, through the questionnaire survey, the results are shown in Table 1.2:

Table 2 About the results of the questionnaire

vegetable	Know vegetables and pronouce it		Know vegetables but can't pronouce it		Don't know vegetable so can't pronouce it	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Sunflower seeding	6	15	29	72.5	5	12.5
Eryngium	18	45	7	17.5	1	37.5
Thai paper	18	45	19	47.5	3	7.5



vegetable	Know vegetables and pronouce it		Know vegetables but can't pronouce it		Don't know vegetable so can't pronouce it	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Ocimum	20	50	9	22.5	11	27.5
Sophora flower	20	50	8	20	12	30
Lemom leaf	21	52.5	14	35	5	12.5
Galangal	24	60	12	30	4	10
Acacia pennata	24	60	13	32.5	3	7.5
Winged bean	26	65	7	17.5	7	17.5
Lemongrass	29	72.5	4	10	7	17.5
Yard long bean	29	72.5	11	27.5	0	0
Basil	22	82.5	5	12.5	2	5
Spearmint	33	82.5	4	10	3	7.5
Chayote	35	87.5	2	5	3	7.5
White mushroom	36	90	4	10	0	0
Manioc	38	95	2	5	0	0

Through this questionnaire survey, the researcher came to the conclusion that there were three kinds of vegetables unknown to Chinese people living in Thailand: Sunflower seedling, Eryngium and Thai pepper. Researcher would add these three kinds of vegetables into the database.

After defining the design scheme and theoretical support, researcher started the development work of the mini-program. Researcher starts from the front-end interface design and determines the interface layout of the mini-program according to the theory studied in chapter. Then start building the back-end database. The information and pictures of three kinds of vegetables were entered into the database. Finally, the test is carried out, and the accuracy is as high as 98%.

technical implementation mini-program, and adopt mainstream development frameworks and tools to ensure the stability and performance of mini-program.

Development and implementation

After defining the design scheme and theoretical support, we formed an interdisciplinary development team and started the development work of the mini program. Team members include front-end and back-end development engineers, UI/UX designers, data analysts, and content editors. They have rich working experience and have completed the development of many programs. The development team starts from the front-end interface design and determines the interface layout of the mini program according to the theory studied in chapter. Then start building the back-end database. The information and figures of three species of vegetables were entered into the database. Finally, the test is carried out, and the accuracy is as high as 98%.

Content

Clear Instructions and Simplicity

When designing the mini program, prioritizing a simple and user-friendly interface is essential. Clear instructions must guide users on how to use the program effectively. This includes ensuring that form fields are intuitive and easy to fill out. The goal is to minimize user effort and reduce cognitive



load, enabling users to quickly understand how to interact with the application without requiring extensive explanations or a steep learning curve.

Visual Hierarchy and Navigation

Achieving a clear and consistent navigation structure is crucial for user satisfaction. Users should be able to easily find the information they need, with important elements prominently displayed. A visual hierarchy in buttons and backgrounds can effectively direct users' attention to key features and actions, enhancing usability and user engagement.

UX/UI Design

Color Scheme and Visual Appeal

The mini program's color scheme should primarily consist of green and white. As Wang & Li (2019) study on nutrition software design, green represents vegetables and promotes a relaxed user experience. This color choice not only aligns with the nature of vegetables and health but also creates a visually appealing and calming interface. The use of white as a complementary color enhances readability and provides a clean, minimalist look.

Responsive Design

Ensuring the mini program is responsive is crucial for accommodating various screen sizes and devices. A responsive design adapts to different screens, providing a consistent and optimal user experience whether on a smartphone, tablet, or desktop. This adaptability is achieved through fluid grids, flexible images, and CSS media queries, ensuring the mini program functions well across all platforms.

Functionality

Conceptual Framework and Prototyping

Creating a conceptual framework is the first step in outlining the basic structure and layout of the mini program. This framework serves as a blueprint, detailing the arrangement of content and interactive elements. Developing interactive prototypes based on this framework allows for the simulation of the user experience. Prototyping is a critical phase where user feedback can be gathered and incorporated, enabling designers to make informed adjustments before the final development stage.

Development and Iteration

The development phase involves bringing the conceptual framework and prototypes to life using agile development practices. Agile methodology supports iterative development, allowing for quick iterations and continuous improvement based on user feedback. This approach ensures that the mini program evolves in response to user needs and preferences, enhancing its functionality and overall user satisfaction.

According to these theories, the design direction of mini program is determined.

The name of the mini program is "泰香了 (Tai Xiang le) ".

Please ask a professional team to write a mini program and complete the entire process of the mini program.



The draft design of mini program.

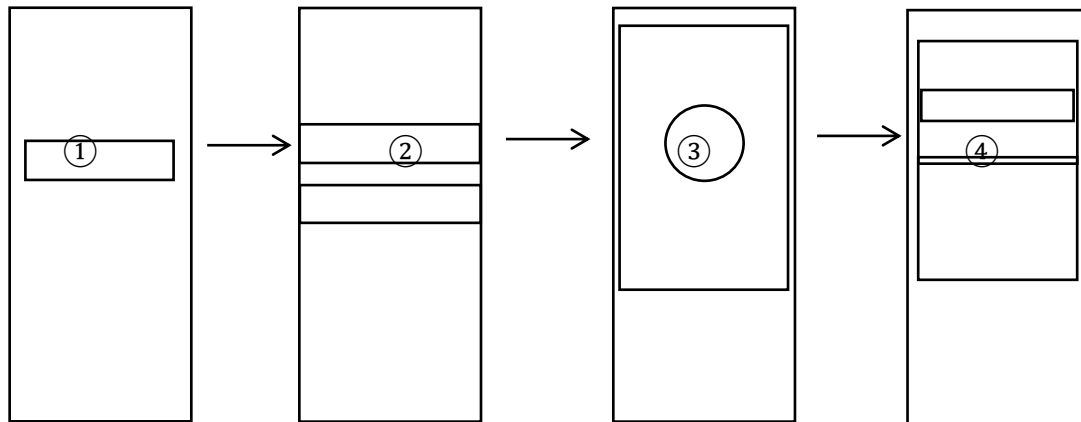


Figure 1 The draft of design of mini program main interface (End to end)

1. Interface 1: Main Interface

Overview: This is the primary interface that users encounter when they open the mini program.

Elements: Identify Vegetables Button: A prominently placed button labeled "Identify Vegetables," designed to be easily noticeable and clickable.

Desktop Image: A visually appealing background image relevant to vegetables, enhancing the aesthetic appeal of the interface.

2. Interface 2: Vegetable Image Selection

Overview: This interface allows users to choose how they want to provide the image of the vegetable they wish to identify.

Options:

1. Take a Photo: An option that activates the device's camera, allowing users to take a new photo of the vegetable.

2. Choose a Photo from the Gallery: An option that opens the device's photo gallery, enabling users to select an existing photo of the vegetable.

3. Cancel An option to exit the selection process and return to the main interface.

3. Interface 3: Photo Capture

Overview: This interface is displayed when users choose to take a new photo of a vegetable.

Elements:

Camera Viewfinder: A live display of what the camera is capturing, allowing users to position the vegetable correctly.

Capture Button: A button that users press to take the photo, prominently placed for ease of use.

4. Interface 4: Final Result

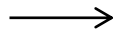
Overview: This interface presents the results after the vegetable image has been processed and identified.

Sections:

1. Detailed Image: The top section displays a clearer and more detailed version of the captured vegetable photo, ensuring users can see the vegetable.

2. Vegetable Names: The middle section shows the Chinese and Thai names of the identified vegetable, providing users with bilingual information.

3. Vegetable Information: The bottom section includes comprehensive details about the vegetable, such as nutritional information, common culinary uses, and any other relevant data.



Identification button

Figure 2 Mini program main interface

This is the home page (figure 2) of the mini program, the user can see the identification button on the interface, click the button to take photos and identify vegetables.

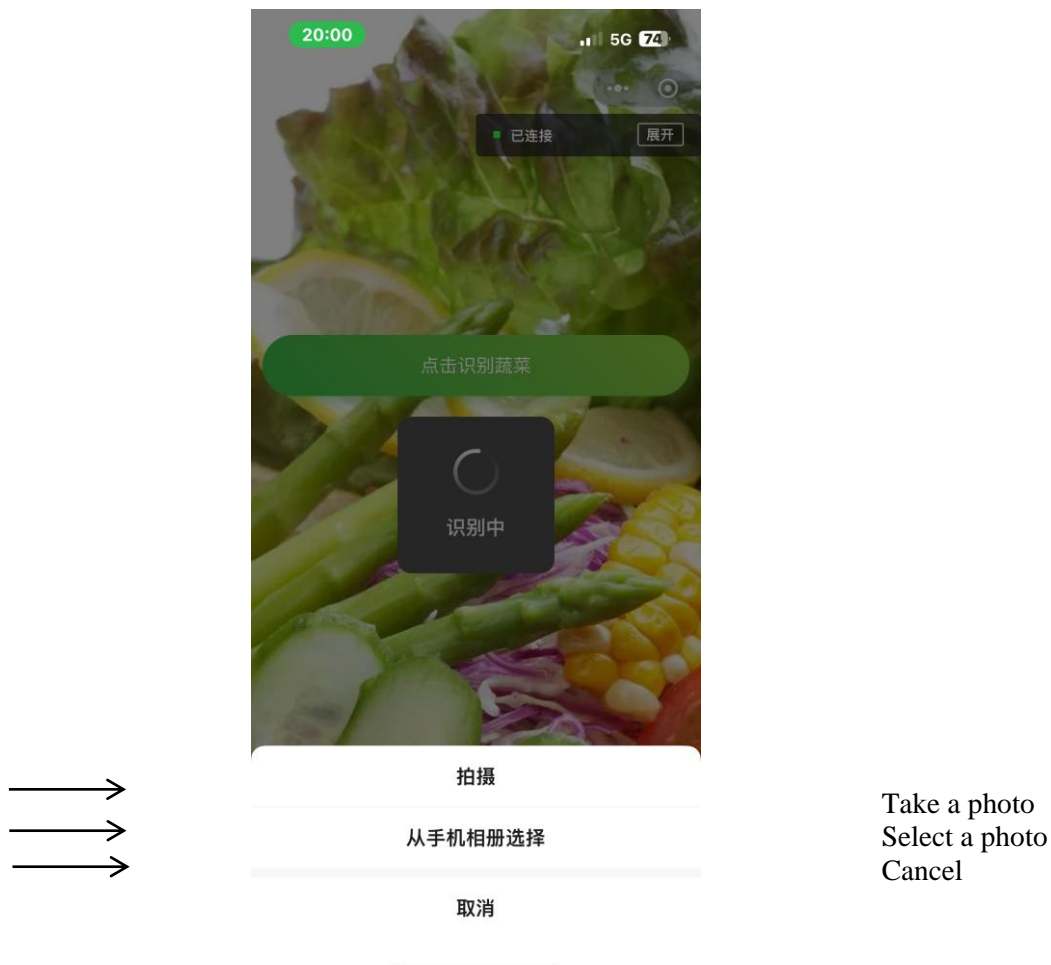


Figure 3 Mini program select photo interface

Click the button to choose whether to take a photo using the camera or select an existing photo from your device for identification purposes. This step initiates the process of capturing and analyzing images to accurately identify the subject matter, enhancing user interaction and functionality within the application.



Figure 4 Mini program photo interface



Figure 5 The mini program is identifying

This figure (Figure 4) depicts the vegetable shooting interface, where users can utilize their device's camera to capture images of vegetables. This interface serves as the initial step in the identification process, enabling users to acquire clear and detailed photographs for subsequent analysis within the application.

This figure (Figure 5) illustrates the mini program's process of recognizing information, showcasing its efficient operation. Users experience rapid results, typically within one to three seconds, demonstrating the program's quick response time and usability. This swift turnaround enhances user satisfaction by providing timely and accurate information, thereby optimizing the overall user experience of the mini program.

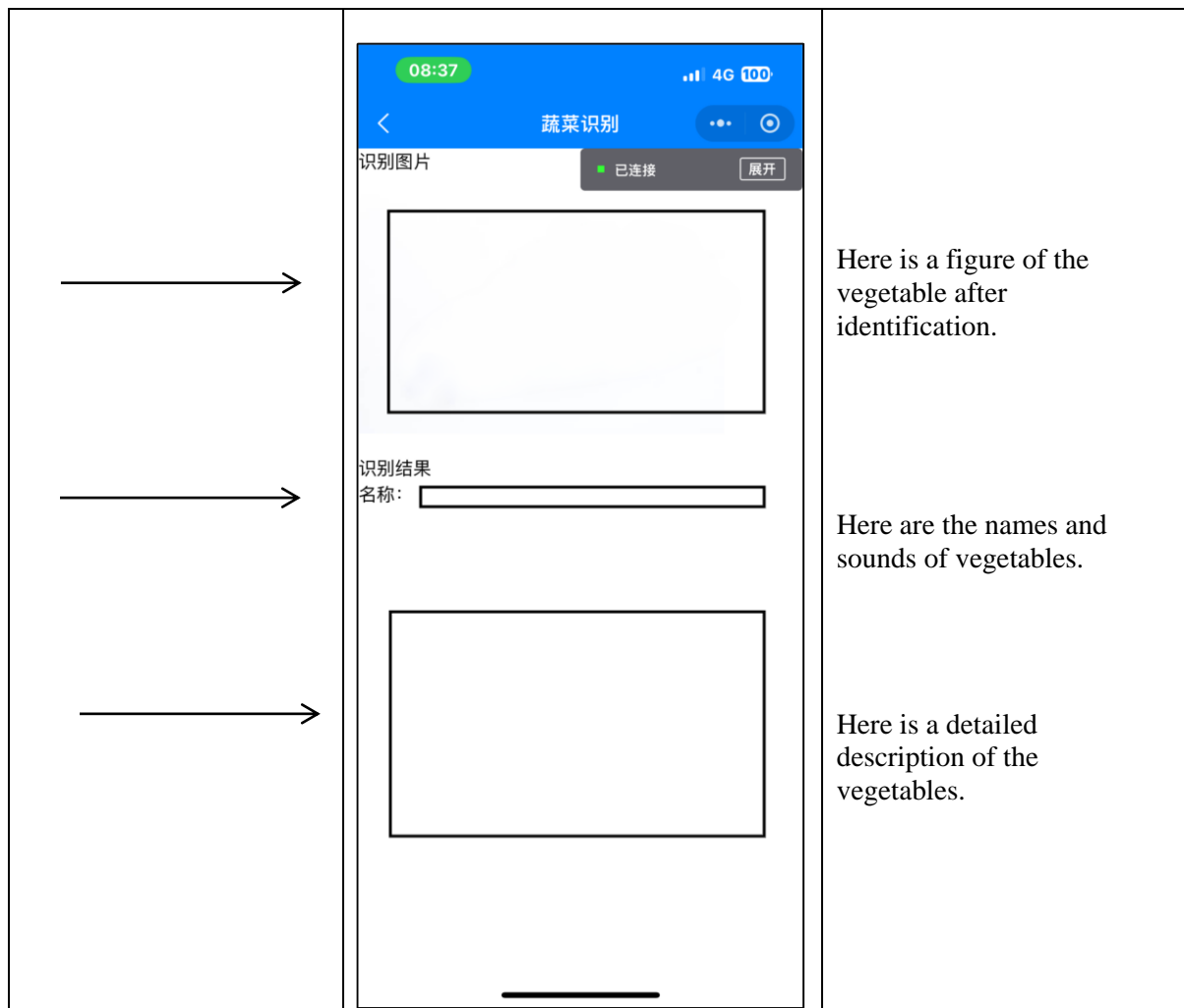


Figure 6 The result of the mini program

The final output presents the identified Chinese and Thai names of the vegetables along with their pronunciation, accompanied by a detailed description of each vegetable.

Following the initial stages, three vegetable species were identified as unfamiliar to Chinese users: Sunflower seedling, Eryngium, and Thai pepper. Information regarding these three vegetable species was added to the database of the mini program, enabling customers to access these processes and results.

1.Eryngium

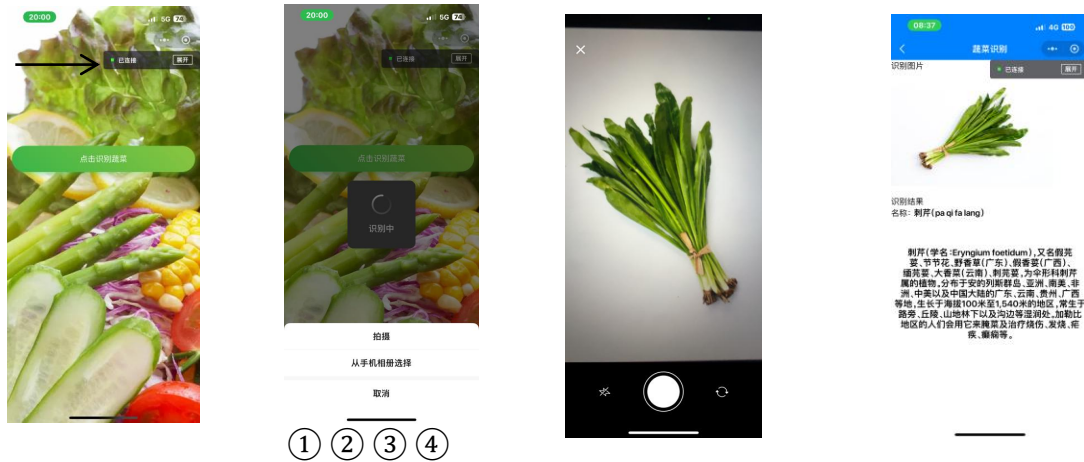


Figure 7 The process of

identifying Eryngium

Figure 7 shows the researcher using the mini program scan the Eryngium, and can follow steps 1 to 4 to get the results that include a figure, name and detailed description of the Eryngium.

1. Sunflower seedling

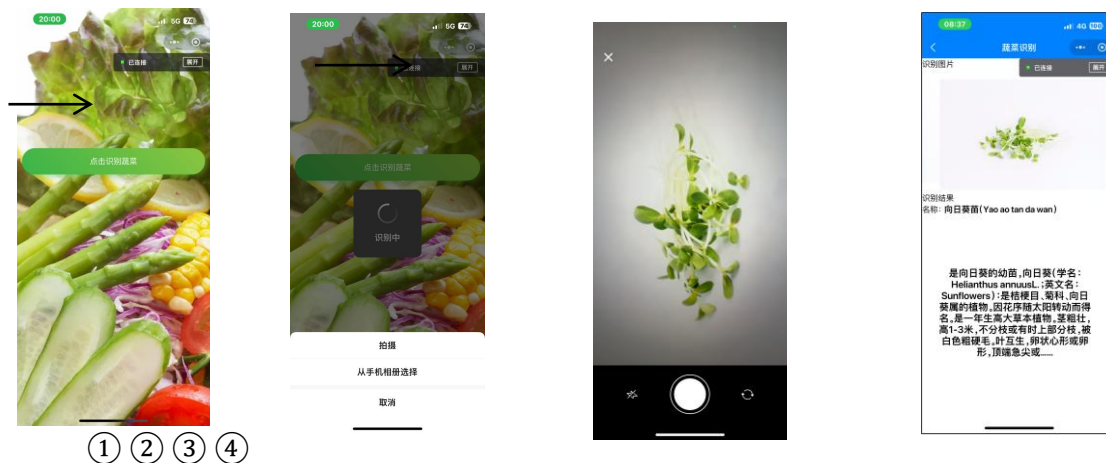


Figure 8 The process of identifying Sunflower seedling

Figure 8 shows the researcher using the mini program scan the Sunflower seedling, and can follow steps 1 to 4 get the results that include a figure, name and detailed description of the Sunflower seedling.

2. Thai pepper

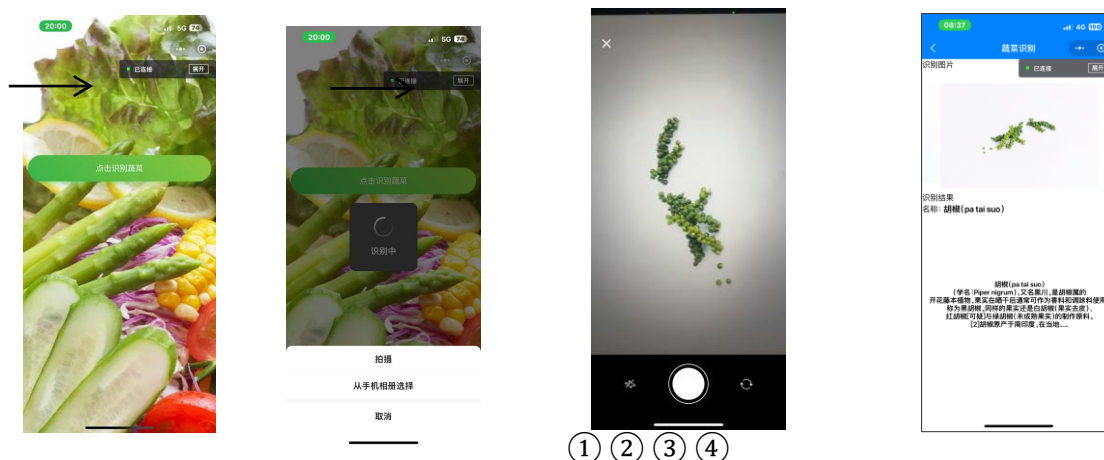


Figure 9 The process of identifying thai pepper

Figure 9 depicts the researcher using the mini program to scan a Thai pepper, following steps 1 to 4 to obtain results that include an image, name, and detailed description of the Thai pepper.

Conclusions

Researcher obtained vegetable information from self-collection at 3 places: 1. Big C, 2. Foodland, and 3. Huai Khwang Market to collect data and take photos of all Thai vegetables. 73 species in total. Then, 40 Chinese people who have lived in Bangkok for more than 7 days were selected to conduct a simple inquiry in the early stage, and the data needed to be made into a questionnaire survey was obtained. These 40 respondent were then sent questionnaires to fill out. The conclusion is that there are three vegetables that are unknown to Chinese living in Bangkok: Sunflower seedling, Eryngium and Thai pepper.

Researcher follow the data set up a design team, and a team of experienced software designers began to write mini program. And enter the result into the database. mini program interface is simple and clear, easy to operate. The user can easily operate the mini program, after identifying the user can get the figure, name and detailed description of the vegetable they want. The information and figures of three species of vegetables were entered into the database. Finally, the test is carried out, and the accuracy is as high as 98%.

Materials and Methods: Data was collected through questionnaires administered to Chinese tourists to determine their level of knowledge and familiarity with Thai vegetables. The findings were complemented by a comprehensive literature review on the types, nutritional values, and promotion status of Thai vegetables in the Chinese market.

The questionnaire survey revealed specific Thai vegetables that were unfamiliar to Chinese tourists. This information was then incorporated into a database to develop the "Identifying Thai Vegetables" WeChat mini program.

The mini program have also played an important role in promoting cultural exchanges between China and Thailand. By introducing the history, culture and traditional uses of Thai vegetables, users not only learn how to identify and use these vegetables but also gain a deeper understanding of Thailand's food culture. This cross-cultural learning and exchange helps to enhance tourists' sense of identity and belonging to Thai culture and enhance their travel experience. Finally, the mini program has also achieved some success in promoting Thai vegetables.

Discussion

From a technical implementation perspective, the core function of the mini program is grounded in image recognition technology. According to the literature "VegNet: Dataset of Vegetable Quality Images for Machine Learning Applications" (Suryawanshi et al, 2022), machine learning and deep learning techniques have demonstrated promising results in classification and object detection tasks. A crucial prerequisite for developing accurate and reliable machine learning models in real-time



environments is a clean dataset. This study leverages these techniques and integrates them into a mini program. Researcher captured independent photos of various vegetables and incorporated them into the mini program's database. While this technique generally performs well, there is still room for improvement in terms of accuracy and stability. By continuously optimizing the algorithms and augmenting the training dataset, recognition accuracy can be progressively enhanced. User experience is a critical metric for evaluating the success of mini program. Feedback indicates that most users are satisfied with the interface design and functional settings of the mini program, underscoring its practical utility and user-friendliness. And the implementation of small program operation is simple, four steps can complete all operations and get the corresponding results.

Users report that the operational steps are simple and the overall user experience is positive. The importance of design knowledge is highlighted in the literature "Knowledge and Information in Nutrition Software Design" (Karanikolas, 2014). The mini program for vegetable identification employs green in its design to convey a healthy and positive concept to users. Simplifying the operational process and enhancing the user interface are also key directions for future improvements. From a cultural perspective, the mini program has positively contributed to promoting cultural exchanges between China and Thailand. By incorporating the historical and cultural background of Thai vegetables, users can learn not only how to identify and use these vegetables but also gain a deeper understanding of Thai food culture. This cross-cultural learning and communication enhance users' sense of identity and belonging to Thai culture. However, to further expand its cultural impact, it is essential to include more information about the diversity and richness of Thai food culture in the content.

In this article "The Art of Entrepreneurship: Navigating Success through Design for Business," Natthawat Wiwatkitbhuwadol emphasizes two key points: User-Centric Design in Entrepreneurship and Market Relevance and Design. These principles have been instrumental in the successful design of a WeChat mini program aimed at assisting Chinese expatriates in Bangkok.

By focusing on user needs, a survey of Chinese tourists who have lived in Bangkok for more than seven days was conducted. The survey revealed a significant demand for a convenient and readily accessible tool to help them identify unfamiliar Thai vegetables, thereby easing their daily lives abroad. In response, a WeChat mini program was developed to meet this need, leveraging user-centric design principles to ensure it was intuitive and effective.

Additionally, the design strategy was tailored to align with market needs. The research team conducted extensive interviews and found that even long-term Chinese residents in Bangkok struggle with identifying and using various Thai vegetables due to unfamiliarity with their names and culinary uses. This insight guided the creation of the mini program, ensuring it addressed a specific and relevant market need.

Recommendation

Following the above conclusions and discussions, we propose the following suggestions to further enhance the function and impact of identifying Thai vegetable.

1. Multi-language support: Develop multi-language versions of mini program to meet the needs of users in different countries and regions. In addition to Chinese and Thai, priority can be given to adding international languages such as English, Japanese, and Korean to improve the internationalization level of mini program.

2. Expand the vegetable database: Constantly update and expand the vegetable database to cover more local and seasonal vegetables. It is possible to cooperate with local agricultural institutions and experts to obtain the latest information on vegetable types and keep the database up-to-date. 4. Improve user experience: Simplify the operation process of mini program, optimize the user interface design, and make it more friendly and easy to use. Through user testing and feedback, the function Settings and interface layout of the mini program can be continuously improved to enhance user satisfaction.

3. Establish feedback mechanism: Establish user feedback mechanism to collect and analyze the problems and suggestions encountered by users in the process of use in a timely manner. Through





regular user research and data analysis, understand the needs of users, and constantly improve and perfect the mini program.

4. Enhancing the database with additional photos from various angles can significantly improve the comprehensiveness of the database and the accuracy of the mini program. By incorporating a diverse set of images, the recognition algorithms can better identify vegetables under different conditions and perspectives, leading to more reliable and accurate results. This improvement will enhance the user experience and increase the overall effectiveness of the vegetable recognition mini program.

Design and development of a WeChat mini program for assisting Chinese tourists in identifying Thai vegetables. This paper examines the development of a mini program designed to aid Chinese residents in Thailand in identifying unfamiliar vegetables, thereby enhancing their daily convenience. By leveraging technological innovation and user-centric design, the Thai Vegetable Identification mini program offers practical and efficient tools for Chinese tourists, significantly improving their culinary experiences and cultural integration in Thailand. Despite existing limitations in technology and application, ongoing optimization and enhancements are expected to amplify the mini program's impact, fostering Sino-Thai cultural exchanges and contributing to economic development. It is anticipated that with the incorporation of the proposed suggestions, the Thai Vegetable Identification mini program will continue to evolve, ultimately serving as a successful model for global dissemination and application.

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