ส่วนราชการ มหาวิทยาลัยเทคโนโลยีราชมงคลตะวันออก เขตพื้นที่จักรพงษภูวนารถ โทร. ๐ ๒๖๙๒ ๒๓๖๐

ที่ อว ๐๖๕๑.๒๐๘(๑)/๑๖๐๔   **วันที่** ๑๓ กรกฎาคม ๒๕๖๖

เรื่อง ขอส่งแบบอนุมัติรางวัลแก่นักวิจัยที่มีผลงานวิจัยตีพิมพ์ในวารสารวิชาการระดับชาติและระดับนานาชาติ

เรียน ประธานคณะอนุกรรมการบริหารกองทุนมหาวิทยาลัยเทคโนโลยีราชมงคลตะวันออก

         ด้วย คณะบริหารธุรกิจและเทคโนโลยีสารสนเทศ มหาวิทยาลัยเทคโนโลยีราชมงคลตะวันออก มีความประสงค์ขออนุมัติรางวัลแก่นักวิจัยที่มีผลงานวิจัยตีพิมพ์ในวารสาร/บทความวิชาการระดับชาติ และระดับนานาชาติ จำนวน ๑ ราย ได้แก่ รายผู้ช่วยศาสตราจารย์เสาวคนธ์ หนูขาว ที่มีบทความวิจัยตีพิมพ์ ประเภทบทความการประชุมวิชาการ วันที่ ๓๐ มิถุนายน ๒๕๖๖ (ระดับนานาชาติ) นั้น

         ในการนี้ คณะบริหารธุรกิจและเทคโนโลยีสารสนเทศ ขอนำส่งเอกสารเพื่อขออนุมัติรางวัล แก่นักวิจัยที่มีผลงานวิจัยตีพิมพ์ในวารสาร/บทความวิชาการระดับชาติและระดับนานาชาติ ตามเอกสาร ที่แนบพร้อมนี้

ลำดับ	ชื่อบทความวิจัย	ชื่อ - นามสกุล นักวิจัย	ระดับบทความ	จำนวนเงิน
๑	Application Development for Contributing Employment Opportunities for Elderiy Workers in an Aging Society : User-Centric Design (UCD)	ผู้ช่วยศาสตราจารย์เสาวคนธ์ หนูขาว ผู้ช่วยศาสตราจารย์วีระชาติ มัตติทานนท์	ระดับนานาชาติ	๓,๐๐๐

         จึงเรียนมาเพื่อโปรดพิจารณา

(นางสาวละอองศรี เหนี่ยงแจ่ม)
คณบดีคณะบริหารธุรกิจและเทคโนโลยีสารสนเทศ
มหาวิทยาลัยเทคโนโลยีราชมงคลตะวันออก

แบบขออนุมัติรางวัลแก่นักวิจัยที่มีผลงานวิจัยตีพิมพ์ในวารสารวิชาการ
ระดับชาติและระดับนานาชาติ 1604

ชื่อการประชุมวิชาการ/วารสารวิชาการ   International Conference on Business, Informatics, and Management (ICBIM2023)

ชื่อบทความ (ไทย)   ....---...........

ชื่อบทความ (อังกฤษ)   Application Development for Contributing Employment Opportunities for Elderly Workers in an Aging Society: User-Centric Design (UCD)

ประเภทบทความ   ☑ การประชุมวิชาการ   วันที่จัดการประชุม 30 มิถุนายน 2566

                นำเสนอใน session International (Informatics)   เวลา 13.00-15.-30 น. วันที่ 30 มิถุนายน 2566

            ☐ เทคนิคการรายงานวารสารปริทัศน์

            ☐ วารสารวิชาการที่ปรากฏในฐานข้อมูล

                ☐ TCI 1   ☐ TCI 2   ☐ SCOPUS (Q1,2) ☐ SCOPUS (Q3,4) ☐ ISI

            ☐ อนุสิทธิบัตร   เลขที่อนุสิทธิบัตร_____

            ☐ สิทธิบัตร   เลขที่สิทธิบัตร_____

ระดับบทความ   ☐ ระดับชาติ   ☑ ระดับนานาชาติ

ตีพิมพ์เผยแพร่ หน้า __81-95__ Vol. ____ No. _____ ปี พ.ศ. ____

Link URL .... http://incbim.org/ ....

ลำดับที่	ชื่อผู้แต่ง / ผู้ร่วมแต่ง	จำนวนเงิน (บาท)	ลายมือชื่อ
1	ผศ.เสาวคนธ์ หนูขาว	3,000	*(ลายเซ็น)*
2	ผศ.วีระชาติ มัตติทานนท์		*(ลายเซ็น)*
	รวมเป็นเงิน(ตัวหนังสือ) (..........สามพันบาทถ้วน..........)	3,000	

_____ ผู้ยื่นเรื่อง
(ผู้ช่วยศาสตราจารย์เสาวคนธ์ หนูขาว)
วันที่ __13_/_ก.ค._/ 66___

_____ หัวหน้าสาขาวิชา
(ผู้ช่วยศาสตราจารย์เสาวคนธ์ หนูขาว)
วันที่ __13_/_ก.ค._/ 66___

_____ รองคณบดีฝ่ายวิชาการฯ
(ดร.สุมาลี สมนึก)
วันที่ __13_/_ก.ค._/ 66___

_____ คณบดี
(น.ส.ละอองศรี เหนี่ยงแจ่ม)
วันที่ 13 กรกฎาคม 66

ผู้อำนวยการสถาบันวิจัยและพัฒนา (เลขานุการคณะกรรมการ)	ผลการพิจารณาของอธิการบดี/ผู้รับมอบอำนาจ (ประธานคณะกรรมการ)
	☐ อนุมัติ ☐ ไม่อนุมัติ
_____ ( ) วันที่ ____ / ____ / ____ ตามมติที่ประชุม ครั้งที่........../...............	_____ ( ) วันที่ ____ / ____ / ____

หลักฐานแนบ   1. สำเนาหน้าปก และบทความที่ได้ตีพิมพ์และเผยแพร่ในการประชุม/วารสาร   ฉบับสมบูรณ์

               2. Proceedings การประชุม (Hard Copy และ/หรือ CD)

               3. หลักฐานที่มีค่า ISI Impact Factor หรือการจัดอยู่ในควอไทล์ (กรณีเป็นวารสาร)

<u>หมายเหตุ</u>   1. กรณีที่มีผู้วิจัยมากกว่า 1 คน ให้ผู้ที่ยื่นขอรับรางวัล นำรางวัลไปจัดสรรในกลุ่มผู้วิจัยเอง คณะกรรมการจะไม่รับผิดชอบกรณีการจัดสรรรางวัลในกลุ่มผู้วิจัย

NCBIM & ICBIM 2023

Proceedings of 2023 The 6th *National Conference on Business, Informatics, and Management*
& The 6th *International Conference on Business, Informatics, and Management*

"Beyond Optimizing - Scaling - Pioneering - Sustaining"

KMITL Business School,
King Mongkut's Institute of Technology Ladkrabang
Bangkok, Thailand

Proceedings of The 6th National Conference on Business, Informatics and Management & The 6th International Conference on Business, Informatics and Management

Theme "Beyond Optimizing - Scaling - Pioneering - Sustaining"

30 June 2023

Venue: KMITL Business School, King Mongkut's Institute of Technology Ladkrabang

Message From Dean

KMITL Business School, King Mongkut's Institute of Technology Ladkrabang, Bangkok, Thailand, proudly host "The 6th International Conference on Business, Informatics, and Management & The 6th National Conference on Business, Informatics, and Management". This academic event takes place on June 30, 2023, under the theme of "Beyond Optimizing - Scaling - Pioneering - Sustaining". Our aim is to provide a platform for academic scientists, researchers, and scholars to exchange valuable insights and experiences related to this theme. Through this conference, we hope to foster research collaboration, enhance academic productivity, and strengthen research communities.
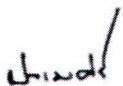
We are delighted to announce that we have received a total of 41 paper submissions, out of which 37 papers have been accepted for presentation and publication in the Proceedings. This remarkable collection includes a diverse range of contributions, comprising 17 international papers and 20 national papers.

On behalf of the main organizer, I would like to express my gratitude to our co-organizers, comprising 9 esteemed institutions, namely:

- Srinakarinwirot University
- Mahidol University, Kanchanaburi Campus
- Burapa University
- Silpakorn University
- Rajamangala University of Technology Thanyaburi
- Kanchanaburi Rajabhat University
- Panyapiwat Institute of Management
- Rangsit University
- Vongchavalitkul University

I would also like to extend my appreciation to all the presenters for their valuable contributions and the organizing teams for their relentless efforts and dedication. Last but not least, I extend my gratitude to the attentive audiences who have taken the time to join us and make this conference a fruitful and memorable event.

Thank you all for making this event a fruitful and memorable event.

(Assistant Professor Dr. Poramate Asawaruangpipop)

Acting Dean of King Mongkut's Institute of Technology Ladkrabang Business School

The 6th National Conference on Business, Informatics and Management &
The 6th International Conference on Business, Informatics and Management

A

Message From Conference Chair

Dear colleagues,

It is my great pleasure to warmly welcome you to The 6th National Conference on Business, Informatics, and Management & The 6th International Conference on Business, Informatics, and Management hosted by the KMITL Business School, King Mongkut's Institute of Technology Ladkrabang, together with our academic partners. The conference will be held on 30 June 2023.

The conference theme is "Beyond Optimizing - Scaling - Pioneering - Sustaining" which reflects the context of Globalization of Business, Informatics, and Management amid today's rapidly changing and highly volatile environment. According to the theme of this conference, all researchers will exchange knowledge, experience, and research findings in their fields. We sincerely hope that this conference will be a turning point in creating a new dimension in the industrial business for Thailand and the world.

The conference committee, our academic partners and I look forward to welcoming you to the 6th National Conference on Business, Informatics, and Management & the 6th International Conference on Business, Informatics, and Management in the coming June 2023. Best regards,

Associate Professor Dr Singha Chaveesuk
Conference Chair

The 6th National Conference on Business, Informatics and Management &
The 6th International Conference on Business, Informatics and Management

B

Message From Conference Chair

The 6th National Conference on Business, Informatics and Management & The 6th International Conference on Business, Informatics and Management, under the theme 'Beyond Optimizing – Scaling – Pioneering – Sustaining,' will be held on 30 June 2023, at the KMITL Business School, King Mongkut's Institute of Technology Ladkrabang. This conference is considered a significant platform for students, academics, and researchers, both nationally and internationally, to exchange knowledge and experiences in various fields, disseminate research findings and foster collaborative networking.

On behalf of the organizing committee, we have great hopes that this conference will be successful and beneficial for the development of academic and research endeavors.

Associate Professor Dr Montajula Suvattanadilok

Conference Chair

Message From Conference Chair

Since we have recovered from the Covid-19 crisis, we all recognise that sustainability is crucial in retaining our society and economic system. When ecosystems are built up with the concern of sustainability, the society and economic system will achieve an excellent point: increasing people's wealth.

Research and education are the ways that help to find out solutions, causes and effects of sustainability. Hence, high-impact pioneer research, optimal education process, the balanced scale of economics, and sustained wealth of stakeholders, will shed light on how we can go beyond our history and then open a new window to see the great opportunity of our life.

Welcome all scholars to the National and International Conference on Business, Informatics and Management - 2023, where we can connect to give and share in challenges beyond Optimising - Scaling - Pioneering – Sustaining.

W. Buach

Associate Professor Dr Wonlop Writthym Buachoom
Conference Chair

The 6th National Conference on Business, Informatics and Management &
The 6th International Conference on Business, Informatics and Management

D

National and International Academic Conference in collaboration with 10 institutions

Year 2023

(The 6th National Conference on Business, Informatics, and Management & The 6th International Conference on Business, Informatics, and Management)

Theme: "Beyond Optimizing - Scaling - Pioneering - Sustaining"

Conference Objectives

The 6th International Conference on Business, Informatics, and Management& The 6th National Conference on Business, Informatics, and Management (NCBIM&ICBIM 2023) are interdisciplinary conferences that aim to bring together leading academic scientists, researchers, and scholars to exchange and share their experiences and research results about all aspects of Business, Informatics, and Management. It also provides the premier interdisciplinary forum for researchers, practitioners, and educators to present and discuss the most recent innovations, trends, concerns, practical challenges encountered, and the solutions adopted in the field of Business, Informatics, and Management. NCBIM&ICBIM 2023 "Beyond Optimizing - Scaling - Pioneering - Sustaining" scheduled on 30 June 2023.

Call for Contributions

All honorable authors are kindly encouraged to contribute to and help shape the conference through submissions of their research abstracts and papers. Also, high-quality research contributions describing original and unpublished results of conceptual, constructive, empirical, experimental, or theoretical work in all areas of Business, Informatics, and Management are cordially invited for presentation at the conference. The conference solicits contributions of abstracts and papers that address themes and topics of the conference, including figures, tables, and references to novel research material. Topics of interest for submission include, but are not limited to:

Business	Informatics	Management
- Accounting	- Artificial Intelligence	- Logistics and supply chain management
- Business Administration	- Business strategy and information systems	- Human Resource Management
- Business Education	- Data Mining	- Tourism Management
- Business Policy and Strategy	- Digital Forensics	- Modern Marketing Management
- E-Commerce	- Management Information Systems	- Technical Innovation and Management
- Economics	- Information security	- E-Commerce and corporate Infomationization
- Electronic Commerce	- Information systems planning and management	- Modern Quality Management
- Entrepreneurship	- Adoption of information technology in organizations	- Knowledge Management
- Financial and Banking	- Human factors in information systems	- Innovation Management
- Health Care Administration	- Knowledge acquisition, expert systems	- Operation Management
- Human Resource	- Systems analysis and design methods	- Strategic Management
- Information System and Technology	- Object-oriented enterprise modeling	- Supply Chain Management
- International Business	- Knowledge based systems to support database design	- Total Quality Management
- Management and Organization Behavior	- Automated mediation in group support systems	
- Management Education	- Distributed information systems, electronic commerce	
- Management Information System	- Software copyright infringements	
- Managerial Consultation	- Accounting and Financial Information System	
- Marketing	- Internet Technology	
- Manufacturing Engineering	- Auditing and IT Governance	
- Operations Management		
- Organizational Development and Change		
- Non-Profit Sector Management		
- Research Methods		
- Social Issues in Management		
- Technology and Innovation		
- Web Technology and Management		

The 6th National Conference on Business, Informatics and Management &
The 6th International Conference on Business, Informatics and Management

F

Business	Informatics	Management
	- Information Quality and Strategy	
	- Decision Support System	
	- Information Systems Management	
	- E-Commerce	
	- Information Technology Management	
	- IT Education and Society	
	- Knowledge Management	
	- Enterprise Information Systems-ERP	
	- Public Policy Management	
	- Engineering and Software Development	
	- Project Management	
	- Free software	
	- IT and IS Security	
	- Information and Communication Technology	
	- Communication	
	- IT and IS Innovation	
	- Telecommunication	

Lead Host

- King Mongkut's Institute of Technology Ladkrabang Business School (KBS)

- King Mongkut Institute of Technology Ladkrabang, Thailand

Co-Host

- Mahidol University, Kanchanaburi Campus, Thailand

- Srinakharinwirot University, Thailand

- Silapakorn University, Thailand

- Burapha University, Thailand

- Kanchanaburi Rajabhat University, Thailand

- Rajamangala University of Technology Thanyaburi, Thailand

- Panyapiwat Institute of Management, Thailand

- Rangsit University, Thailand

- Vongchavalitkul University, Thailand

Organizer

- King Mongkut's Institute of Technology Ladkrabang Business School (KBS)

The 6th National Conference on Business, Informatics and Management &
The 6th International Conference on Business, Informatics and Management

H

Important Dates

Full Paper Submission 1st & 2nd Round	Now – 31 May 2023
Notification of Paper Acceptance	13 June 2023
Camera-Ready Paper Submission	20 June 2023
Conference Dates	30 June 2023

Venue

KMITL Business School, King Mongkut's Institute of Technology Ladkrabang

Paper Submission

Submission of an abstract or article implies that the work described has not been published previously (except as part of a published lecture or academic thesis), that it is not under consideration for publication elsewhere, that its publication is approved by all authors and tacitly or explicitly by the authorities responsible where the work was carried out, and that, if accepted, the abstract or article will not be published elsewhere in the same form without the written consent of the publisher. The editors reserve the right to edit or otherwise alter all contributions, but authors will receive proofs for approval before publication.

Copyrights for articles are retained by the authors, with the first publication rights granted to the publisher. The publisher is not responsible for subsequent uses of the work. It is the author's responsibility to bring an infringement action if so desired by the author.

The publisher has a zero-tolerance plagiarism policy. All submissions will be checked by editors before being sent to reviewers.

Authors permit the publisher to archive them in databases and indexes such as Google Scholar.

Manuscripts should be prepared in Microsoft Word format and submitted via the conference's website (http://incbim.org/). If you have any questions, please contact the editor.

Paper Selection and Publication Process

1. Upon receipt of a submission, the editor sends an e-mail of confirmation to the submission's author within one to three working days. If you fail to receive this confirmation, your submission e-mail may have been missed.

2. Peer review. We use a double-blind system for peer review; both reviewers' and authors' identities remain anonymous. The paper will be reviewed by at least two experts: one editorial board member and at least one external reviewer. The review process may take two to three weeks.

3. Notification of the result of review by e-mail.

4. If the submission is accepted, the authors revise the paper.

5. After publication, the corresponding author will receive one set of the Conference Abstract Book free of charge. If you want to keep printed proceedings, please contact the editor before making an order.

General Requirements

1. Language: Submissions in both Thai (National Conference) and English (International Conference) are welcomed.

2. Length: Each paper is limited to 12 pages normally (including all figures, tables, and references), additional pages will be charged.

Proceedings

All papers submitted in the conference will undergo rigid double-blind peer review process. Only excellent papers that will pass the review process will be accepted and published in the conference proceedings (with ISBN) as one volume.

Registration

Registration fee of presenter included

- Electronic Proceedings
- Electronic presenter certificate

Registration Fee: Free

http://incbim.org/

- Call for paper
- Paper Submission Guidelines
- Submission System

For more information

contact us:

King Mongkut's Institute of Technology Ladkrabang Business School (KBS)

Website   : http://incbim.org/

E-mail   : incbim@kmitl.ac.th

Facebook   : https://www.facebook.com/NCBIM.ICBIM/

AGENDA

National and International Academic Conference in collaboration with 10 institutions

Year 2023

(The 6th National Conference on Business, Informatics, and Management &

The 6th International Conference on Business, Informatics, and Management)

Theme: "Beyond Optimizing - Scaling - Pioneering - Sustaining"

Venue: KMITL Business School, King Mongkut's Institute of Technology Ladkrabang

30 June 2023

Event conducted by : Dr.Vasu Keerativutisest

Time	Activities/Meeting Rooms
09.00 – 09.30	Registration at 1st floor, KMITL Business School
09.30 – 09.50	- Report and introduction of collaborative network among 10 Institutions • Business Administration Program, Mahidol University, Kanchanaburi Campus • Faculty of Social Business Administration, Srinakharinwirot University • Faculty of Information and Communication Technology, Silpakorn University • Burapha Business School, Faculty of Business Administration, Burapha University • Faculty of Business Administration, Rajamangala University of Technology Thanyaburi • Faculty of Management Sciences, Kanchanaburi Rajabhat University • Faculty of Business Administration, Panyapiwat Institute of Management • Faculty of Business Administration, Rangsit University • Faculty of Business Administration, Vongchavalitkul University • KMITL Business School, King Mongkut's Institute of Technology Ladkrabang

Time	Activities/Meeting Rooms
09.50 – 10.00	- Report by: Assoc. Prof. Dr.Singha Chaveesuk, Acting Deputy Dean of KMITL Business School Academic and Research Department, King Mongkut's Institute of Technology Ladkrabang - Opening Speech by: Asst. Prof. Dr.Poramate Asawaruangpipop Acting Dean of KMITL Business School King Mongkut's Institute of Technology Ladkrabang
10.00 – 10.35	Keynote Speech and Special Lecture on "**Adjustment of commercial business, import, export, production and service**" By Keynote speaker Mr.Aswin Techajareonvikul **Chief Executive Officer and President at BigC Supercenter Public Company Limited and Berli Jucker Public Company Limited**
10.35 – 11.35	Keynote Speech and Special Lecture on "**Guidelines for Business Operations ESG**" By Keynote speaker **Professor Pakkapong Poungsuk, Ph.D.** **Executive Vice President for Student Affairs and Alumni Relations**
11.35 – 13.00	Lunch Break at 1ˢᵗ floor, KMITL Business School; Room 102 and 103
13.00 – 15.30	Oral Presentation and Poster Presentation, with qualified presenters (commentators) providing feedback on the research presentation "There are a total of 6 presentation rooms" at the 2ⁿᵈ floor, KMITL Business School แบบ Poster Presentation 1ˢᵗ floor, KMITL Business School **Paper Number (24)** : The Influence of Online Customer Experience on Online Purchase Intention-The Mediating Role of Customer Trust : A Conceptual Framework **Presented by** : Ludan Yu and Chatchai Chatpunyakul **Paper Number (30)** : การศึกษาปัจจัยสู่ความสำเร็จอย่างยั่งยืนของธุรกิจกาแฟของวิสาหกิจขนาดกลาง ขนาดย่อมและรายย่อย (MSME): การวิเคราะห์กรอบแนวคิดในประเทศไทย **Presented by** : ณัฏฐณิชา คงแก้ว,วอนชนก ไชยสุนทร และสิงหะ ฉวีสุข

Time	Activities/Meeting Rooms

	แบบ Oral Presentation
	
	Paper(English) International Conference (INCBIM 2023)
	
	ROOM A #202
	Moderator: 1. Dr.Penpattra Tantaworranart
	        Panyapiwat Institute of Management
	       2. Assoc.Prof.Dr.Sudaporn Sawmong
	        King Mongkut's Institute of Technology Ladkrabang
	
	Paper Number (12) : A PDPA One Year Compliance Review: Privacy Notice / Privacy Policy in Leading Mobile Apps used in Thailand
	Presented by : Nantika Prinyapol and Mayuree Srikulwong.
	
	Paper Number (15) : Service Quality Factors Affecting Efficiency of Private Transportation Enhancement in Mueang, Nakhon Ratchasima
	Presented by : Warayu Sirinon, Thamonwan Pomsanam and Kornpreeya Jaisamran
	
	Paper Number (3) : The Integrative Factor Model Explores the Direct Impact of E-Commerce on Consumers' Purchasing Decision
	Presented by : Panwadee Lerdloompheephan.
	
	Paper Number (40) : Business Opportunities for Halal-Certified Restaurants: A Case Study of Muslim Tourists in Bangkok, Thailand
	Presented by : Waranpong Boonsiritomachai.
	
	Paper Number (18) : Exploring the Key Components of Customer Loyalty towards Huawei Mate50 with Harmony Operating System in China
	Presented by : Jintao Guo and Nuttawut Rojniruttikul.
	
	Paper Number (19) : Exploring The Adoption Of Online Learning Technology In Thailand's Higher Education Institutions In The New Normal Context
	Presented by : Nuttawut Rojniruttikul.
	
	ROOM B #203
	Moderator: 1. Assoc.Prof.Dr.Wirat Krasachat
	        2. Dr.Bilal Khalid
	        King Mongkut's Institute of Technology Ladkrabang

Time	Activities/Meeting Rooms
	Paper Number (36) : Antecedents of Tourist Satisfaction at Universal Studios Theme Park in Beijing **Presented by** : Hao Chen and Nuttawut Rojniruttikul. **Paper Number (38) :** A Comprehensive Framework for Understanding Customer Decision-Making in Durian Chip Purchases **Presented by** : Chusak Chaowarot and Nuttawut Rojniruttikul. **Paper Number (8) :** The Model Of Mice Technological Innovation That Influences The Adoption Intention Of Thai Mice Operators **Presented by** : Vithaya Sintharapantorn, Amnuay Sangnoree and Thapong Teerawatananond. **Paper Number (16) :** Application Development for Contributing Employment Opportunities for Elderly Workers in an Aging Society: User-Centric Design (UCD) **Presented by** : Saowakhon Nookhao and Werachart Muttitanon. **Paper Number (21) :** Confirmatory Factor Analysis to The Purchase Intention Of Rapid Covid-19 Antigen Test Kit Of Online Customers **Presented by** : Pawit Yuangngoen, Woranat Sangmanee, Wawmayura Chamsuk and Samart Deebhijarn **Paper Number (11) :** Factors affecting purchase intention of beauty products: a user-generated content characteristics perspective. **Presented by** : Yunhong Liu, Singha Chaveesuk and Vasu Keerativutisest **ROOM C #204** Moderator: 1. Assoc.Prof.Dr.Nuttawut Rojniruttikul 2. Dr.Nayika Kamales **King Mongkut's Institute of Technology Ladkrabang** **Paper Number (9) :** Casual Factors Influencing MICE Operators' Adoption Intention of Technological Innovation in Thailand : The Literature Review **Presented by** : Vithaya Sintharapantorn, Amnuay Sangnoree and Thapong Teerawatananond. **Paper Number (39)** : Determinants of Visitor Satisfaction at Shanghai Disneyland **Presented by** : Jing Tian and Nuttawut Rojniruttikul.

The 6th National Conference on Business, Informatics and Management &
The 6th International Conference on Business, Informatics and Management

N

List of Contents

The 6th National Conference on Business, Informatics and Management &
The 6th International Conference on Business, Informatics and Management

T

Application Development for Contributing Employment Opportunities for Elderly Workers in an Aging Society: User-Centric Design (UCD)

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Abstract

Many countries around the world have already entered an aging society. The government must plan and allocate a higher premium budget for the elderly. However, many elderly people still have the potential to work, have knowledge, and have experience working. The adoption of digital technology will help the elderly to seek jobs and create employment opportunities for elderly workers so that they can be self-reliant and reduce the poverty rate. The objectives of this research are: 1) to study the requirements of the elderly in using applications to seek jobs; and 2) to design and develop a prototype of an application employing the elderly with a user-centered design approach. This study was conducted in two phases. The first phase studies the requirements of the elderly to use applications to seek jobs by conducting focus group interviews with the nine elderly participants. The second phase is to develop applications for hiring elderly workers with a user-centric design (UCD) approach and operate in research and development form according to the software development life cycle (SDLC) concept. Usage satisfaction evaluation with thirty early elderly users selected by purposive sampling.

The study found that applications used for job seeking by the elderly should have the following basic characteristics: perceived ease of use, perceived usefulness, compatibility, and suitable for the elderly. The application was developed in the form of a mobile application. Users consist of three roles: employers, elderly workers, and administrators. The evaluation of user satisfaction was at the highest level ($\bar{x}$=4.53, SD=0.67).

Keywords: Elderly, Elderly workers, Aging society, User-centric design, Application

Introduction

Countries around the world are facing a phenomenon of population structure change, i.e., the proportion of the population aged 60 years and over is more than 10% of the total population, causing an aging society. In 2016, it was found that 12.5% of the world's population is elderly (929 million people out of a total population of 7,433 million people). As for the ASEAN Community, there are three countries that have already entered an aging society: Singapore, Thailand, and Vietnam, with an aging population representing 18.7 percent, 16.5 percent, and 10.7 percent, respectively (Department of Older Persons,

Ministry of Social Development and Human Security, 2019) As for Thailand, it has entered an aging society since 2005 and will enter a super-aged society in 2021; that is, there will be an aging population of more than 20 percent, causing the government to plan Establish various policies in both industries for social welfare, including the allocation of budgets for caring for the elderly; this has continuously increased. In 2018, it was found that the government had allocated a higher premium budget for the elderly of 66,359,650,800 baht (Department of Older Persons, Ministry of Social Development and Human Security, 2019).

Most of Thailand's aging population was in the early elderly group (age between 60 and 69 years old), at 57.4 percent (National Statistical Office, 2017). This group of elderly people is still healthy, can be self-reliant, has the potential to work, has knowledge, and has experience in developing the organization and the country, but it is necessary to retire and become unemployed. However, many countries have recognized the importance of the elderly, such as the essence of the ASEAN Declaration on the Elderly in Brunei Darussalam (2010), which promotes the quality of life of the elderly by creating conditions conducive to self-reliance and the ability to work economically, encouraging the elderly to have a stable income, be active, and be healthy by reducing the poverty rate among the elderly. Thailand has formulated a strategy to promote, develop, and support the elderly with work potential and earning income, including establishing policies and laws that encourage agencies to employ senior citizens aged 60 years and over by granting various rights to that agency, such as corporate income tax deductions in The 2nd National Elderly Plan (2002-2021) (Department of Older Persons, Ministry of Social Development and Human Security, 2019).

From the above importance, this study therefore came up with a proposal about using digital technology as a tool to support and assist the elderly in finding a source of work to generate income for themselves and support the country's economy in the aging society era. The developed application will be an electronic channel that gathers companies that want to hire elderly workers to facilitate job announcements for the elderly. They can search for jobs and apply for jobs easily, quickly, and efficiently by developing applications to meet the requirements of users by using the user-centric design (UCD) approach (Uma & Suseela, 2015) and allowing the elderly to participate in the design.

Research Objectives

    1. To study the requirements of the elderly in using applications to seek jobs.

    2. To design and develop a prototype of an application employing the elderly with a user-centric design approach.

Literature Review

1. User-centric design (UCD)

User-centric design is a guideline for various product or service designs currently used in software development, including UI/UX design with a focus on the user and the user's point of view. Therefore, the user will be involved in the design process and evaluate the design together. A user-centric methodology (UCD) consists of 4 phases, namely, Phase 1: Background and Conceptualization; Phase 2: Alpha Testing; Phase 3: Software Development; and Phase 4: Field Testing (Johnston, Nguye, & Wolpin, 2009)

2. Technology Acceptance of the elderly

The Technology Acceptance Model (Davis, 1989) describes an individual's acceptance of technology use as a behavior or action that is directly influenced by their attitude towards usage. It also indirectly influenced the perceived ease of use and perceived benefits of the system. Users will show behavior in any form, depending on their attitude towards usage. If users have a positive attitude towards information systems, it will result in behaviors that accept the use of information systems (Figure 1). For elderly people, technology is accepted when they perceive its usefulness—that it can enhance their lifestyle, increase quality of life, reduce the cost of living, or be perceived as ease of use. Because although it is a useful technology, if it is difficult to use, the elderly will not use it (Holden, R. J., & Karsh, B. T.,2010).

Characteristics of innovation are also an important component in technology acceptance, as the elderly are an age group with declining physical and cognitive abilities. A relative advantage is the perception that innovation is better and more useful than traditional methods, and compatibility is how innovative users feel they are compatible with their lifestyles. When comparing the use of traditional services with receiving up-to-date information that meets the needs of users. These two innovative characteristics are therefore important for the elderly to consider when accepting the use of technology. Both features are contained in the Diffusion of Innovation Theory (Rogers, 1995).

3. User interface design for elderly

User interface refers to the image or design that appears so that users can use or communicate with electronic devices. It can be an image or symbol of any device or program command. The interface design for the elderly should be designed with large fonts, easy-to-read and clear color, concise language, easy to understand, and easy to click and remember (Adiseshiah, 2018; Anagnostou, 2020).
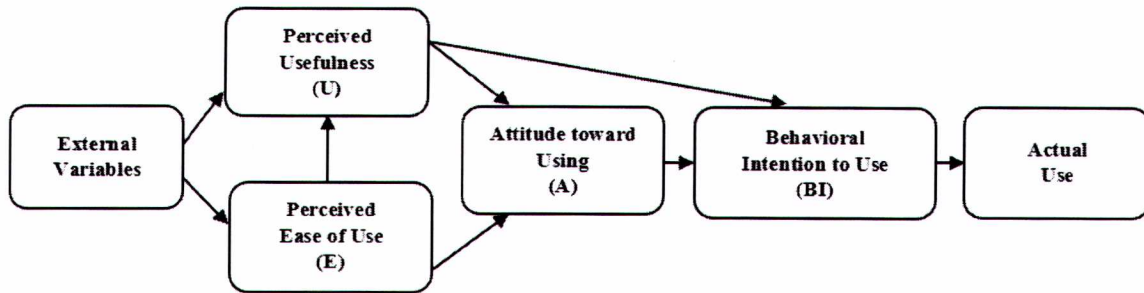
Figure 1 The Technology Acceptance Model (Davis, F. D., 1989)

Research Methodology

This study was conducted in two phases:

1. Phase 1: Studies the requirements of the elderly to use applications to seek jobs by focus group interviews.

   1.1 The sample group is the elderly, to obtain answers that meet various research objectives from groups of people with similar characteristics. The conversation took about 40-50 minutes. The sample group was divided into 9 people, divided into 3 groups, consisting of

   - Group 1: Three elderly (61-69 years old), who retired from government agencies.
   - Group 2: Three elderly (61-69 years old), who retired from private companies.
   - Group 3: Three elderly (61-69 years old), who retired from freelance.

   1.2 The interview was conducted using questions in the form of semi-structured open-ended questions to explore elderly adoption of technology. The interview form was developed and adapted from the Technology Acceptance Model (TAM) (Davis, 1989) and Diffusion of Innovation Theory (Rogers, 1995). Examples of questions are:

   - *Do you think early elderly people (60 to 69 years old) can still work?*
   - *Do you want to work and earn money?*
   - *Do you want the application to help you find a job?*
   - *Do you think finding a job through a smartphone is useful for you? Explain why. If you think it's not useful, explain why.*
   - *For you, is usability important for using an application? Let's explain what usability should look like.*
   - *Do you think graphic design that benefits the elderly is a key factor in their acceptance of technology? Why? If this is not important, please explain why.*

   1.3 Classify, sort, analyze, and summarize the data from group interviews and form inductive conclusions.

2. Phase 2: Information system development operates in a research and development model by developing applications for hiring elderly workers with a user-centric design approach. According to the System Development Life Cycle: SDLC concept (Kushwaha & Misra, 2006), it consists of 7 steps: problem definition, analysis, design, development, testing, installation, and maintenance. In this study, the focus is on the design and development of an information system prototype. Then, it is covered in steps 1–5 only.

2.1 Problem definition: Entering an aging society has resulted in significant costs for the government in managing and caring for the elderly. In fact, many elderly people have the potential to work and support themselves. In addition, many businesses want to hire elderly people. Digital technology should be used as a tool for creating opportunities for the elderly and businesses.

2.2 System analysis: In this study, user-centric design was used to design the system by using the conclusions from the focus group interviews of first phase to analyze and design the system to respond to the requirements of users by developing an employment platform for elderly workers. An employment platform is an intermediary in gathering various agencies that want to employ the elderly and has publicized the recruitment process, which will increase convenience and increase the chances of finding employment for elderly workers. The developed platform covers users in three roles: 1) employer, 2) elderly worker, and 3) administrator. It is presented with a use-case diagram, as shown in Figure 2.
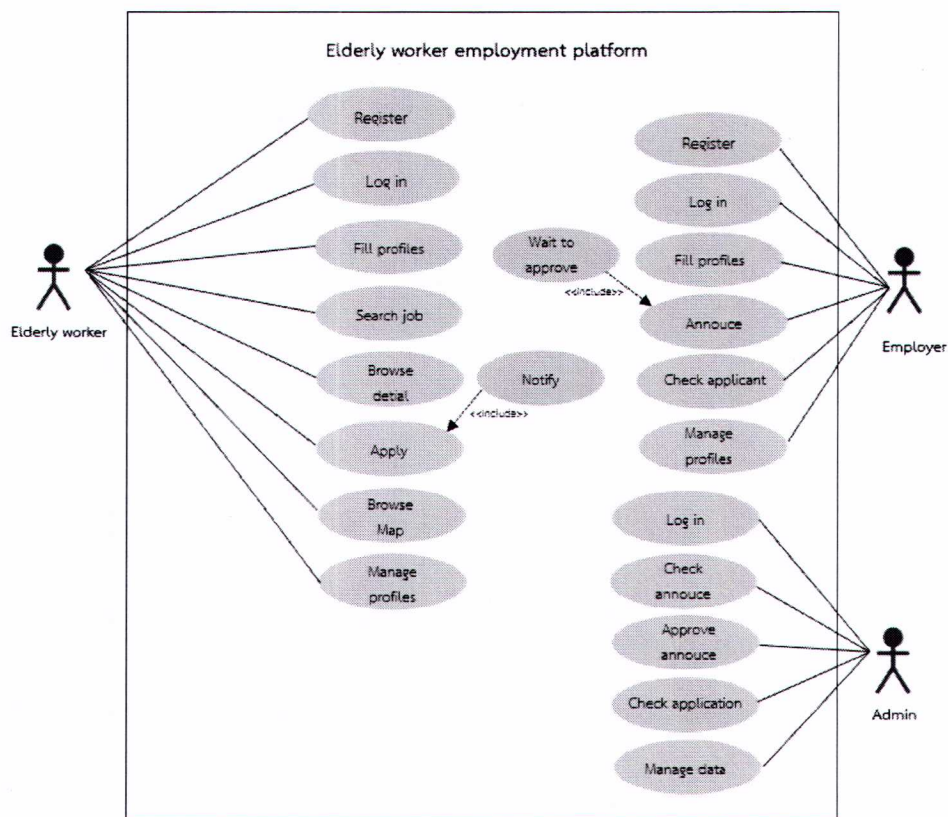

Figure 2 Use case diagram

The 6th National Conference on Business, Informatics and Management &
The 6th International Conference on Business, Informatics and Management

85

2.3 System design

2.3.1 System architecture consists of two main parts: one is the back-end for administrators, which can be either a web application or a mobile application; the other is the front-end for employers and elderly workers to use mobile applications and to store data on the cloud with Firebase, as shown in Figure 3.
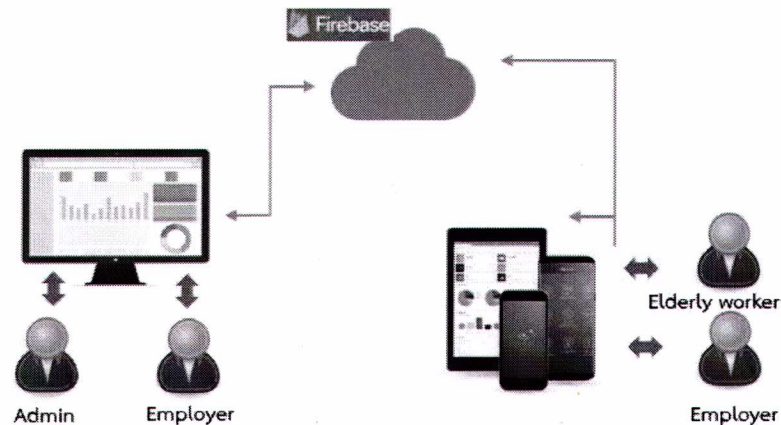

Figure 3 System architecture

2.3.2 Design a database to develop an application to create employment opportunities for the elderly in the form of a non-structured database (NoSQL), using Jason files (.json) to store 7 files. It consists of: 1) Aging workforce file is used to store personal information about elderly workers; 2) company file is used to collect employment company information; 3) job announcement file is used to collect information about recruitment news; 4) application file is used to collect job application data; 5) chat file is used to collect conversation information about recruitment; 6) log file is used to collect correction data in the system of administrators; and 7) reportproblem file is used to collect notifications of system problems from users. A sample JSON files are shown in Figure 4.
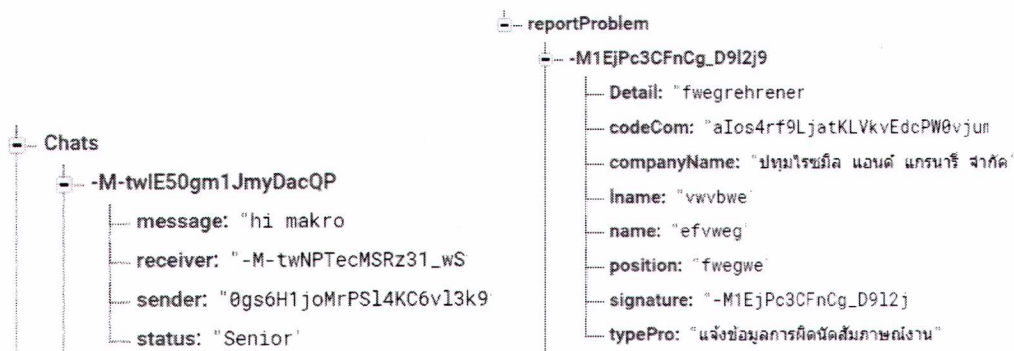

Figure 4 JSON file

The 6ᵗʰ National Conference on Business, Informatics and Management &
The 6ᵗʰ International Conference on Business, Informatics and Management

86

2.4 System development: The employment platform for elderly workers developed for elderly users is easy-to-use and user-friendly for elderly users. The development tools consist of Visual Studio code, Android Studio, Android SDK, Sublime Text 3, Java scripting, Adobe Photoshop, smartphones, and database management with Firebase Cloud.

2.5 System testing consists of performance testing and evaluation of system usage satisfaction.

2.5.1 Performance testing is conducted by five mobile application development experts. The testing is divided into the following three areas: functional requirement test, functional test, and usability testing. It was found that the overall system performance evaluation result was very high ($\bar{x}$= 4.40, S. D.=0.47) (Table 1)

Table 1: The performance test results

Performance Test Items	$\bar{x}$	S.D.	Level
functional requirement test	4.60	0.55	Highest
functional test	4.40	0.55	High
usability testing	4.20	0.45	High
Total	4.40	0.47	High

2.5.2 Evaluation of system usage satisfaction

- The sample group was 30 early elderly users selected by purposive sampling method. Among them are nine elderly people who provided the requirements for application development in the first phase of the study.

- The data collection tools consisted of 1) a mobile application, which developed in phase 2 and and 2) a satisfaction evaluation form, which were developed from the requirements given by the elderly in the first phase, which were characteristics conducive to the use of the elderly, i.e., ease of use, usefulness, compatibility, and graphic design suitable for the elderly. (Ease of use and usefulness, which are factors in the TAM (Davis, F. D., 1989), while compatibility is a factor in the diffusion of innovation theory (Rogers, E. M., 1995).

- Data collect process as follows: 1) introduce and demonstrate the use of the mobile application for elderly employment to the sample group; 2) allow the sample group to learn and try using the mobile application; and 3) provide the sample group assessment of usage satisfaction, which covers four characteristics: ease of use, usefulness, compatibility, and graphic design.

- The data analysis was conducted using descriptive statistics, consisting of the mean ($\bar{x}$) and standard deviation (S.D.). Interpreting mean is in accordance with the criteria of Best and Kahn Best, J. W. and Kahn, J. V. (1989) as follows:

The 6th National Conference on Business, Informatics and Management &
The 6th International Conference on Business, Informatics and Management

87

Scores between 4.50 and 5.00 are in the highest level.

Scores between 3.50 and 4.49 are in the higher level.

Scores between 2.50 and 3.49 are in the moderate level.

Scores between 1.50 and 2.49 are in the low level.

Scores between 1.00 and 1.49 are in the very low level.

Research Findings

1. The results of the requirements of the elderly in using applications to seek jobs.

Nine participants took part in the focus group interviews. most were 61–65 years old (77.7%), female (66.6%), married (55.5%), and everyone had a smartphone (100.0%).

The interview results were as follows:

1.1 Most elderly people share their current work experience; they are still able to work, physically prepared to work, and want to earn money to support themselves. The problem, however, is that they do not know which employer needs the elderly people.

1.2 Most of the elderly who participated in focus groups shared their experience of using applications they use in their daily lives, which are often used in the form of mobile applications rather than through the website.

1.3 Eight of the nine elderly people (88.9%) agreed that it would be extremely helpful to seek a job through the application because it would let people know which companies need elderly workers without having to apply in person, wasting time and money, and choosing examples of work conversations that match their abilities. Dialogue examples are as follows:

"I think it would be great if I could find a job through a mobile application

like shopping. I usually shop at Shopee". (Participant 1, Group 1)

"If I have a job to apply for, just like shopping on my phone, I can choose

the firm or job I want to work for". (Participant 2, Group 3)

1.4 Eight of the nine elderly people (88.9%) agreed that the job application must be easy to use, easy to learn, and not take long time to study. A dialogue example is as follows:

"I wanted an application that was easy to use. Teach for a while, and then I

can continue myself". (Participant 2, Group 2)

1.5 All elderly people (100.0%) agreed that the application must display clear and colorful images and text. A dialogue example is as follows:

"My eyes cannot see clearly. It should be designed to make the big body,

clearly visible, and big buttons." (Participant 1, Group 3)

1.6 Seven of the nine elderly people (77.7%) agreed that the job application must be compatible with today's lifestyle and should be more useful than now. A dialogue example is as follows:

"Design the job seeking application to work like we apply ourselves." (Participant

3, Group 2).

From the focus group interviews, it was found that the elderly prefers to use technology in the form of mobile applications, which must be an application that is conducive to the use of the elderly: ease of use, perceived usefulness, technology that fits and is in accordance with their lifestyle, and a graphic design suitable for the elderly. Therefore, the interview results will be used as the key requirement for mobile application development in the second phase of this study (Figure 5).
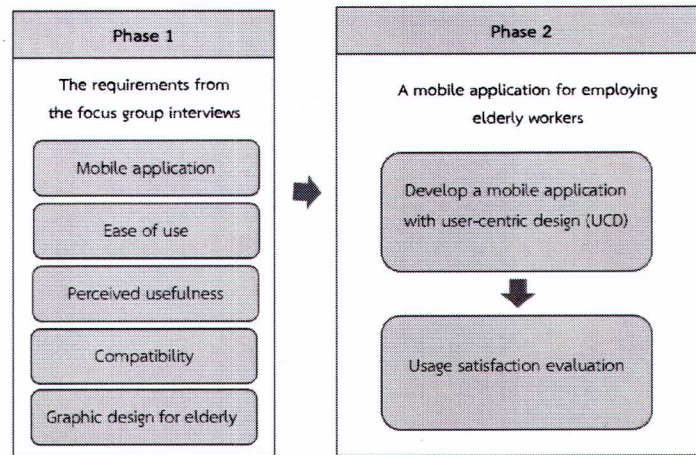
Phase 1	Phase 2
The requirements from the focus group interviews	A mobile application for employing elderly workers
Mobile application	Develop a mobile application with user-centric design (UCD)
Ease of use	
Perceived usefulness	
Compatibility	Usage satisfaction evaluation
Graphic design for elderly	

Figure 5 Research method

2. Results of the development of an employment platform for elderly workers

2.1 The results of developing a back-end system for administrators are summarized as follows: Administrators are required to register by entering their email, password, confirm password, and admin password to create an account for logging in. The administrator main screen includes five menus: company, seniors, jobs, log system, and reports. If the employer announces the recruitment, the system will set it to "pending approval" and notify the administrator to check the data. If the data is correct, the administrator will change the status to "approved". On the other hand, if the data is incorrect, the administrator will change the status to "disapproved". Employers will receive notifications through registered email. In addition, administrators can edit and delete information about employers, elderly workers, and recruitment announcements. Administrators can also receive problem reports from employers through the 'reports' menu, such as system usage issues or missed interview issues. It can also view the administrator's history, such as dates, admin, activity, tables, and targets, through the logging system screen. As shown in figure 6.
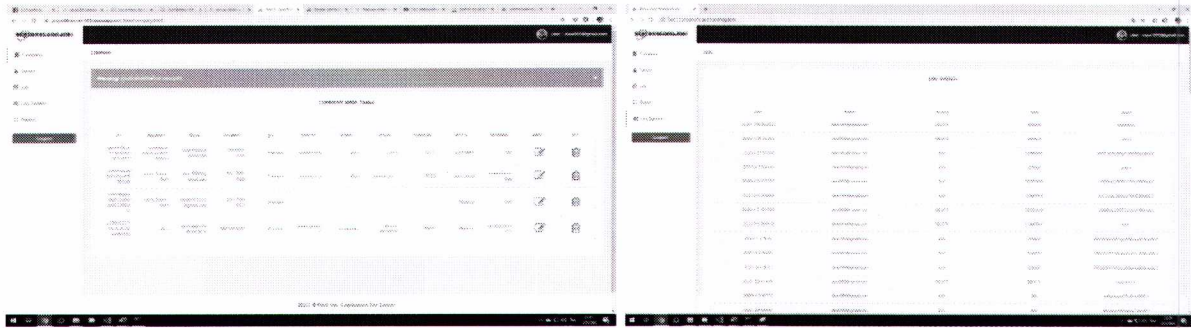
The 6th National Conference on Business, Informatics and Management &
The 6th International Conference on Business, Informatics and Management

89

Figure 6 Results of the development for the administrator

    2.2 The results of developing a front-end system for employers are summarized as follows: The main screen of the application includes three buttons: find job, find worker, and register. To access, the employer must register by filling in the company name, contact name, email, and password. When accessing the system for the first time, employers must fill in company details, such as business type, company details, company image, address, phone number, email, Facebook fanpage, latitude, longitude, and welfare. Employers can recruitment annouces to elderly workers and indicate recruitment details. Then, the administrator will check the recruitment status. If approved, the recruitment annouce will appear on the application page for the elderly to apply for a job. When elderly worker apply, employers can check the applicant's quality and chat with them, as shown in Figure 7.
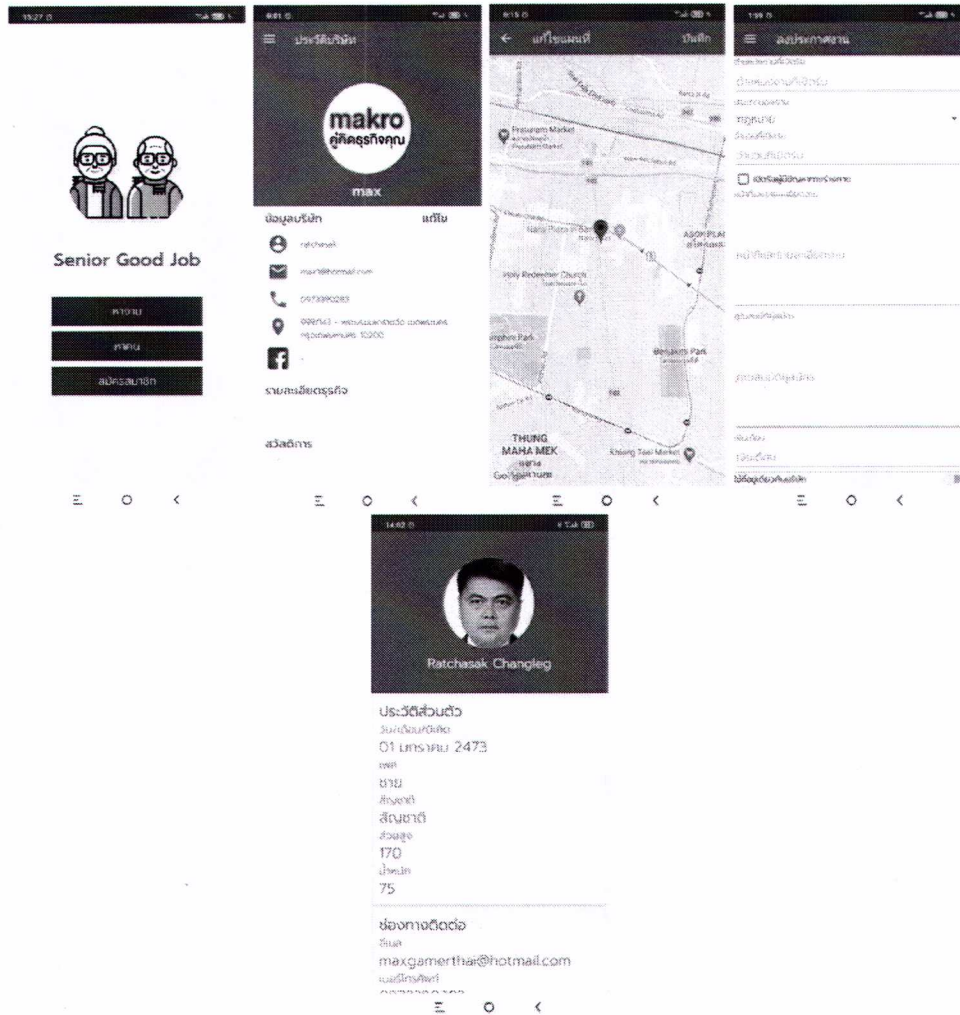
Figure 7 Mobile application for the employer

2.3 The results of developing a front-end system for elderly workers are summarized as follows: Before using the application, elderly workers must register for membership. Access to the system, the elderly worker must be verified through email and a password. The main page of the application consists of four buttons: News, Job Search, My Job, and Me. The job search application will display all job buttons and be open to people with physical disabilities. There is also a button to separate job types (technical, sales, personnel, legal, administrative, academic, and consulting). Each position will provide detailed information based on the company's recruitment. There will be a map to navigate to the company. Elderly workers can click on the apply button or the chat button to learn more information. as shown in Figure 8.

The 6th National Conference on Business, Informatics and Management &
The 6th International Conference on Business, Informatics and Management

91

Figure 8 Mobile application for the elderly worker

2.4 Evaluation of system usage satisfaction: The application performance test was conducted by 30 elderly people (61-69 years old) using purposive sampling methods. It was found that the elderly had the highest satisfaction with the application based on ease of use ($\bar{x}$=4.68, SD=0.58), followed by usefulness ($\bar{x}$=4.58, SD=0.62), graphic design ($\bar{x}$=4.44, SD =0.74), and compatibility ($\bar{x}$=4.40, SD=0.73). It can be shown in Table 2.

Table 2 Evaluation of system usage satisfaction

Performance Test Items	$\bar{x}$	S.D.	Level
Ease of use	4.68	0.58	Highest
Usefulness	4.58	0.62	Highest
Graphic design for elderly	4.44	0.74	High
Compatibility	4.40	0.73	High
Total	4.53	0.67	Highest

Conclusion and Discussion

1. This study can summarize the results based on the following research objectives:

1.1 The elderlys want to design and develop job-seeking applications based on the elderly, which need to have such characteristics as follows: be easy to use, be a useful innovation, design graphics suitable for the elderly, and have innovation compatible with lifestyle.

1.2 The elderly worker employment application is a platform that brings companies looking to hire elderly workers together, which is beneficial to elderly workers in searching for jobs and applying for jobs. Users consist of three roles: employers, elderly workers, and administrators. Application design and development using the user-centric design (UCD) method. The results of the usage satisfaction evaluation showed that the elderly had the overall satisfaction with mobile application at the highest level ($\bar{x}$=4.53, SD=0.67).

2. This study can discuss the results based on the following research objectives as follows:

The employment application for elderly workers is developed by users and has three roles: employer, elderly worker, and administrator. It is developed in the form of mobile applications to cope with the changing behavior of the elderly. In other words, the elderlys are increasingly using mobile phones and surfing the Internet, which is consistent with the findings of the National Statistical Office (National statistical office, 2022). This is also an innovation that helps elderly people become independent, healthy, and promotes effective work. According to research by Helbostad et al. (Helbostad et al, 2017) and Boateng et al. (Boateng et al, 2018), mobile applications are a technology that encourages confidence and makes the elderly more active and healthier.

The design and development are using the user-centric design (UCD) method, with elderly users involved in the design. Data collection by focus group discussion is consistent with Mendes et al. (Mendes et al., 2022), who collected user feedback by focus group discussion for use in the design and development of tourism applications. It is also in accordance with Koumpouros (Koumpouros, 2022), which has designed a mobile health application (mHealth) called "Pain App" with a user-centric methodology that allows physicians, behavioral scientists, and patients to co-design several features included in Pain App. The results of the focus group discussion in this study show that the applications that the elderly want to develop have the characteristics of considering the use of the elderly because their physical functions, especially their visual and memory abilities, are declining. Therefore, the

developed application should be easy to use and uncomplicated, and the image or text should be designed to be clearly visible. The usage mode must be compatible with today's lifestyle, and more importantly, it must be more innovative than the traditional methods.

The development results of this elderly employment application are consistent with the needs of the elderly, that is, the application can be easily used, such as applying for a job through the application for the elderly, which can be easily completed with only three clicks. The result is consistent with Holden & Karsh (Holden, R. J., & Karsh, B. T.,2010), who mentioned that the simple, easy-to-use, and not complicated application will make it more acceptable to the elderly.

The developed application makes users perceive its usefulness as an innovation that can increase employment opportunities for elderly workers. The application can improve the work efficiency and lifestyle, as well as the compatibility with the current lifestyle, such as the company route recommendation function and chat function, because now people are used to opening maps and chatting through chat. This is consistent with the results of Xie & Or (Xie, Z. & Or, C. K., 2021) finding that mobile health with usefulness features influences the intention to use among the elderly. It is also in accordance with Moore and Benbasat (Moore & Benbasat, 1991) stated that innovation characteristics that make it compatible with lifestyles will make people accept the use of innovation, thereby increasing the diffusion of innovation. In addition, the application also provides a design that takes the use of the elderly into account, such as having large buttons, clear colors, and using icons with good communication, which is consistent with Adiseshiah (Adiseshiah, E.G., 2018) and Anagnostou (Anagnostou, 2020), which shows that the user experience design for the elderly must consider readability, use contrasting colors, use icons that can convey meaning, and be clear and easy to understand.

Suggestions

1. The research results can be used for the development of other applications for the elderly.

2. The research results can be applied to other target groups, such as the development of an employment application for disabled workers.

3. The next study should add other characteristics to the application, such as connecting to social media (Facebook, Line), and uploading documents used for employment.

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The 6th National Conference on Business, Informatics and Management &
The 6th International Conference on Business, Informatics and Management

94

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