A web-based decision support system to support occupational therapy services in promoting active ageing

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ABSTRACT

Background: Dealing with the consequences of Thailand's ageing population is a significant challenge. The growing usage of Information and Communication Technology (ICT) has the potential to support healthy and active ageing.

Objective: This study aimed to develop a web-based Decision Support System (DSS) and evaluate its usability.

Materials and methods: Research and Development (R&D) was a study design. It was divided into two phases: the development of the web-based DSS and its usability.

Results: The web-based DSS was designed under the requirements of the users and comprised seven components: 1) the login page; 2) the main page; 3) the register page; 4) active ageing measurement; 5) decision-making for older people; 6) the Occupational Therapy (OT) recommendations system; and 7) exporting information. A System Usability Score (SUS) of 80.41 in the usability test showed that the web-based DSS was very user-friendly and had excellent efficacy, efficiency, and satisfaction.

Conclusion: The web-based DSS effectively enhanced ageing for older people.

Introduction

The world's population is ageing rapidly. The active ageing framework of the World Health Organization (WHO)[1] has been adapted as a global strategy in ageing policies, practices, and research to respond to the ageing population. It emphasizes the connections between good health, participation, and security of older people's lives. Thailand has become a wholly aged society since 2023, when at least 20% of the population is 60 years or older.[2] Health promotion to promote a healthy life and encourage active ageing in older individuals can be an effective strategy to reduce the cost of care.[3] The active ageing policy should be adopted and modified according to each country as the government's key. Thus, the Thai government adopted the original three components of WHO into four main components: health, social participation, security, and an enabling environment. These complex and various components impact older individuals' participation in everyday occupations.[4] It is crucial to find solutions for various ageing concerns so that older people can maintain independence and lead healthy lives.

OT services address all aspects of ageing, from wellness strategies to rehabilitation.[5] The effectiveness of health promotion within the scope of occupational therapy

improves occupational performance and quality of life and decreases health care utilization for community-dwelling.[6] The current trend in healthcare and health profession education is the increasing use of ICT to promote various health behaviors.[7] ICT may be a key enabler for digital tools supporting the health and social care sectors. Improved quality of life, health, and well-being can help to prevent or delay frailty concerns.[8] The profession of occupational therapy uses a wide range of ICTs,[9] including advanced technologies such as robotics, artificial intelligence (AI), the Internet of Things (IoT), three-dimensional printing, virtual reality, and autonomous vehicles. Additionally, adaptive equipment, electronic wheelchairs, splints, and lifelike prosthetics are employed to assist clients in achieving independent living.[10-13]

Occupational therapists use theoretical conceptual practice frameworks to guide intervention decision-making and direct their thinking in occupational therapy practice. In practice, conceptual frameworks are the core concepts of occupational therapy thinking. They are not only to guide therapists in conducting the assessment but also to help them make better intervention decisions. The Person-Environment-Occupation (PEO) model is a valuable practice for all age groups. It focuses on the client's environment and occupation, which impact the performance of everyday occupations.[14] This model identifies the interaction between people, environment, and occupation. People engage in occupations throughout their lives, such as activities, tasks, and roles. The connection between people, environment, and occupation helps to understand the quality of occupational performance (i.e., function), which results in the intersection of each component of the PEO model.[15] Therefore, this model is efficient and comprehensive for application in research, as it encompasses a wide range of factors that impact individuals. Moreover, it is also related to the WHO's Active Aging, which focuses on older people's abilities to participate in social activities involving the active engagement of older people. Active aging is not new for OT, but OT practitioners should adopt and implement it more effectively.[16] However, since most of the OT role primarily focuses on disability or rehabilitation, there is still a need to emphasize health promotion among older people. The challenges of OT services include adopting a new

approach to provide OT services for the ageing population. The challenges of OT services involve adopting a new approach to provide OT services for the ageing population. The development of the DSS in medical science has the potential to help clinicians and occupational therapists make decisions when choosing the most appropriate intervention.[17] Furthermore, developing the DSS for OT service was to evaluate the clients' eye-hand coordination. The system was designed to reduce the burden and cost of having a qualified expert present at any evaluation or training session.

Occupational therapists and other healthcare providers develop the DSS to evaluate and determine the most appropriate intervention. In Israel, the DSS not only helped occupational therapists with their service delivery but also made it easier for architects, accessibility specialists, and rehabilitation professionals to evaluate facility accessibility.[18] The DSS, a computerized audit tool, was created by combining an information system and decision support to investigate and analyze the accessibility of services for older people and people with disabilities. It significantly impacts clinicians and occupational therapists because it improves the overall outcome for their clients.[21-25] This study utilizes the DSS to improve service delivery and promote healthy lifestyles to enhance successful ageing among older people.

This study aimed to develop the web-based DSS as a novel solution to promote health and wellness for older people by combining the active ageing concept and the OT concept.

Materials and methods

This study was Research and Development (R&D). The web-based DSS was based on the active ageing concept. It consisted of two phases. The first phase was to develop the web-based DSS. The second phase was to evaluate the usability of the web-based DSS for promoting active ageing. Each phase of the study is described in detail as follows:

Phase I: *The development of the web-based DSS.*

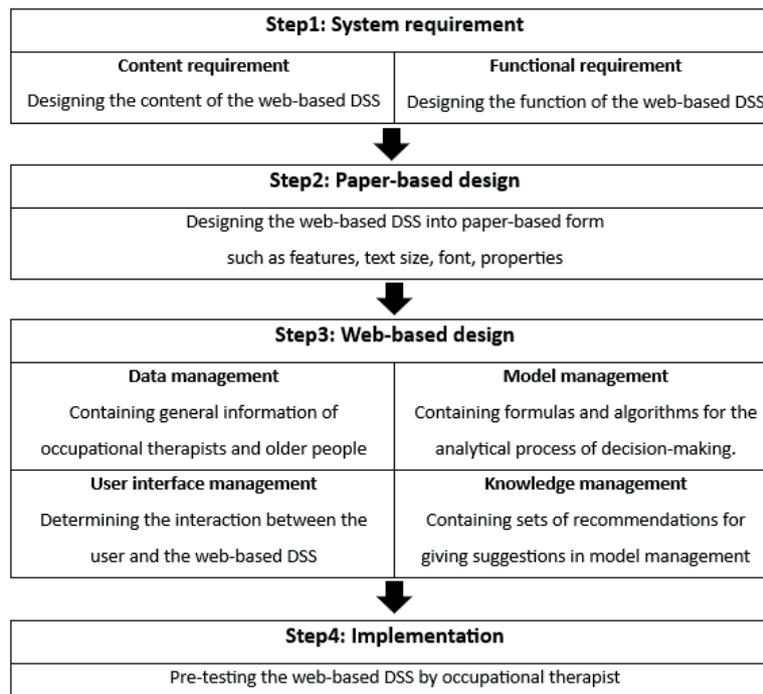Four stages were involved in developing the web-based DSS (Figure 1).

Figure 1. *The developmental process of the web-based DSS.*

Step 1: *System requirement*

The first phase of DSS development was formulating the system requirements. The researcher determined a list of user requirements to analyze and design the web-based DSS, including a working system or conditions that the user requires. Formulating the system requirements for the web-based DSS involved determining both the content requirements and the functional requirements.

Step 2: *Paper-based design*

During this phase, the researcher developed a paper-based decision support system (DSS) that complies with the users' functional and content specifications. The paper-based design followed the user-centered interaction design.[26]

Step 3: *Web-based design*

Software engineers are responsible for designing and developing web-based DSS under the specifications of the paper-based version of DSS. The system could be accessed through the Internet. Data management, model management, user interface management, and knowledge management are components of the framework of the web-based DSS (Figure 2).
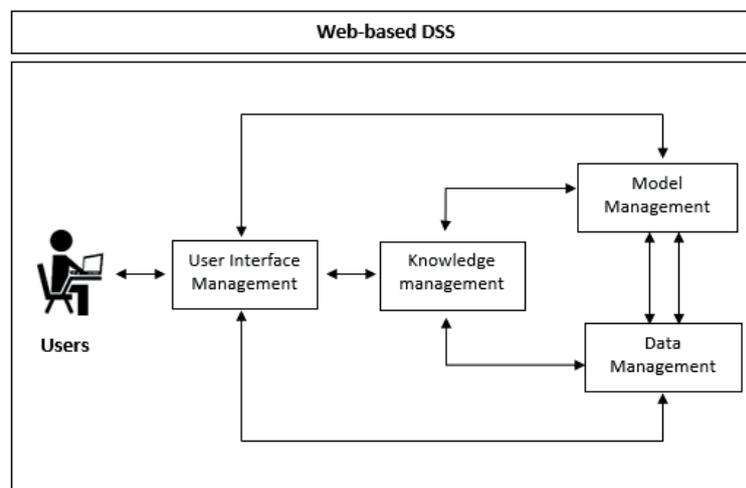

Figure 2. *Conceptual view of the web-based DSS system.*

Based on the active aging conceptual framework of the WHO was determined by studying components of the Active Ageing Index (AAI) indicator. It is a flexible tool that can apply the domains under the concept of active ageing to reflect the potential of older persons to the specific circumstances and purposes in their contexts. In Thailand, the National Institute on Ageing (NSO)[27] refined the initial formulation (health, participation, and security) further by adding a fourth component to enable an environment for active ageing as the fourth component. Therefore, the researcher determined the indicators in four elements related to a paradigm shift for achieving active aging in Thailand. Then, the PEO model was integrated into sets of recommendations (Figure 3).

We determined it by studying components of the AAI indicator, which is based on the WHO's active ageing conceptual framework. The AAI is a flexible tool that can apply the domains under the concept of active ageing, reflecting the potential of older persons to specific circumstances and purposes in their contexts.
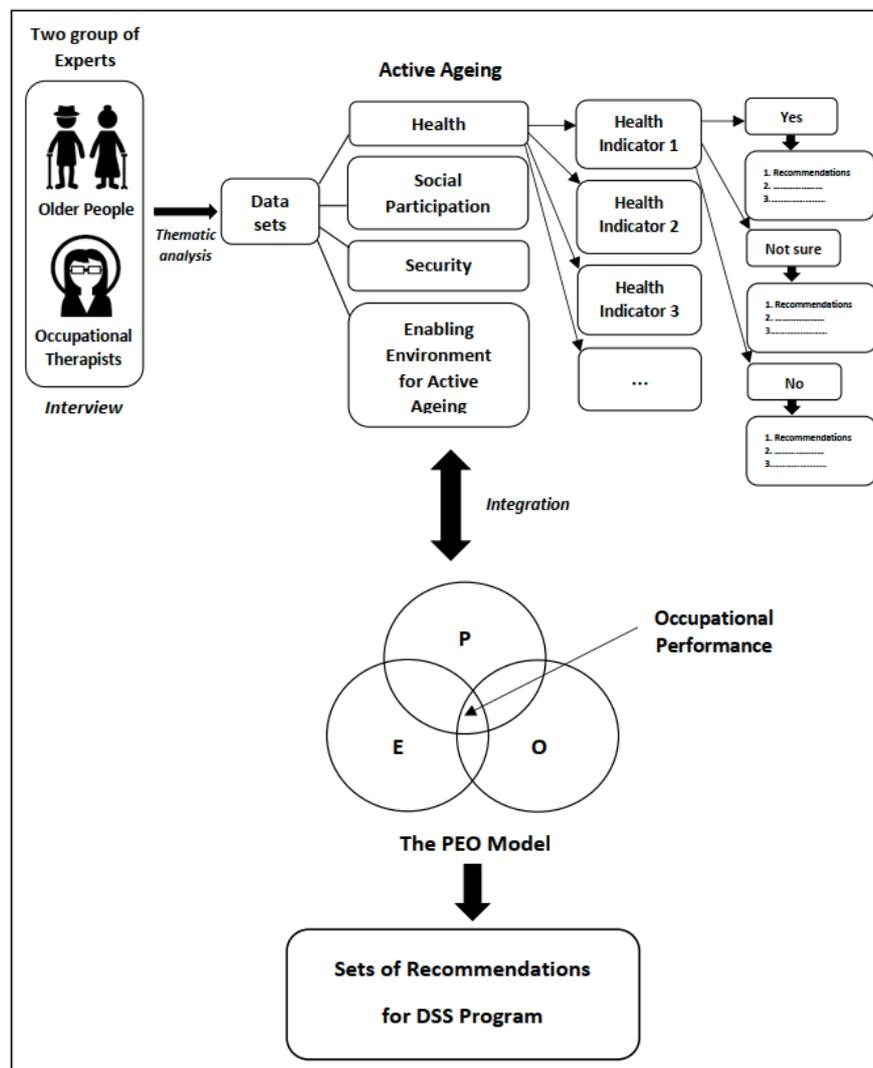

Figure 3. The development process of recommendations.

In this study, the AAI was measured using a previously developed measure.[28.] The psychometric property achieved good internal consistency overall, as demonstrated by Cronbach's alpha of 0.77 and a test-retest reliability rating of 0.89, which led to the construction of a set of recommendations. It comprised 12 indicators and 25 questions about health, social participation, security, and an enabling environment for active ageing. The scoring system utilized three Likert scales to facilitate easy decision-making for older individuals. Each scale item has 3 categories: yes, not sure, and no, with scale values ranging from 1 to 3. The formula for calculating each active ageing dimension follows Saengprachaksakula.[29] Each active ageing dimension (health, community participation, security, and enabling an environment) received a weighted score. After that, the AAI was categorized into three levels: low, moderate, and high, based on the Human Development Index of the United Nations Development Programme (UNDP).[30] Therefore, expert recommendations will be given for each possible response choice. We conducted in-depth interviews to extract tacit knowledge, adhering to the interview guideline that listed questions of active ageing measurement (12 indicators and 25 items). The experts

comprised 2 groups of 9 healthy older individuals aged 60 years and above who had demonstrated successful and healthy aging, as detailed below. absence of chronic disease and freedom from disability; participating in social activities at least once per month, such as being a member of a club or group, helping other people, or being a volunteer in the community; representing elite Thai older people who are accepted in society,[31] and 8 occupational therapists who have practical experience in the senior field or have worked in the geriatric field for five years or more. The researcher used a note-taker and voice recorder to record the interview. Each interview session with the key informants ranged from 30 to 45 minutes. The researcher ensured the strict confidentiality of the interview data. The researcher acknowledged the confidentiality of the interview data and proceeded with the recording of the data. The data gathered from the interview were checked for credibility by using the review triangulation technique. After that, they were analyzed and interpreted by using thematic analysis.[32,33] After conducting a thematic analysis, the researcher used the PEO model to incorporate the data into the OT framework. Subsequently, sets of recommendations were examined for their content validity using the IOC.

This evaluation of recommendation content was checked by 5 experts, who were occupational therapists and had 5 years or more practical experience in the geriatric field. Five experts, each with at least 5 years of practical experience in geriatrics, thoroughly examined the contents of the recommendations. Afterward, the researcher adjusted by following the experts' suggestions and comments. At last, the final version of the recommendations was completed. After formulating the recommendations, the DSS was constructed, and its implementation was carried out.

Step 4: Implementation.

Pre-testing the web-based DSS was part of this method. Five subjects participated in this step. The participants were selected using purposive sampling, following 2 criteria: they had to be occupational therapists with a minimum of 5 years of experience in working with the elderly, and they were not involved in the system development process of this study. The web-based DSS demonstrated how to use it for 20 minutes and then allowed occupational therapists to use it independently. One OT was evaluated on this system using one older individual as the subject. Subsequently, feedback regarding the system's features and functionalities was gathered. The engineering team improved the web-based DSS system based on user suggestions for usability issues, limitations, or additional aspects. Five occupational therapists tested the upgraded version of the web-based DSS system again to confirm its readiness for use, marking the completion of its final version.

Phase II: *Testing the usability of the web-based DSS*

To evaluate the readiness and compliance of the web-based DSS with user requirements and expectations.

According to Nielsen's recommendation for usability testing, a minimum of 20 users qualifies as statistically significant to identify usability defects with the product.[34] Consequently, the study's sample comprised 30 occupational therapists. The study used purposive sampling to select OTs who met the following criteria: having at least five years of professional experience working with geriatrics and not participating in this study's system development process. Each OT used the web-based DSS for 10 clients. There were 300 clients in total. Subsequently, the OTs evaluated usability using the SUS questionnaire. The researcher presented a demonstration of how to use the DSS system. The participants then spent a week testing the system with older people. The SUS was used to evaluate the system's usability, which covered three facets such as effectiveness (the ability of the user to complete the relevant tasks with output quality), efficiency (the level of resources used for performing the tasks), and satisfaction (subjective reaction to using the system from the users). The SUS comprises a 10-item scale rated on a 5-point Likert scale: 1 = strongly disagree, 2 = somewhat disagree, 3 = neither agree nor disagree, 4 = somewhat agree, and 5= strongly agree. The SUS score calculation converted all 10 items' values into a range of 0 to 4. Subtract the score from 5 (5-X) for items 2, 4, 6, 8, and 10, and subtract 1 from the score (X-1) for items 1, 3, 5, 7, and 9. The scores from even and odd-numbered questions were summed up. We then multiplied the total scores by 2.5 to scale the result from 0 to 100. Scores above 70 were "very good," and scores below 50 were "very weak." The data from the system usability questionnaires was summarized to adjust the system with software engineering, including suggestions and comments about problems of use, limitations, or other factors. Then, the data was analyzed using descriptive statistics such as frequency, percentage, mean, and standard score.

Results
The web-based DSS

The system requirement is comprised of content requirements and functional requirements. The content requirements of the web-based DSS proposed three parts: occupational therapist information, older people, and recommendations. The functional requirement for using the web-based DSS with clients is that the users must create their accounts and log in with their username and password for privacy and security.

In addition, the system can record clients' data, calculate the AAI, analyze the client's data according to the PEO model, and generate OT recommendations for active ageing. Lastly, a system could export summarized reports on paper by printing them or emailing them. In addition, they requested video tutorials on how to use the system.

We designed the paper-based DSS based on user perspectives and system requirements. Once we developed the contents and functions of the web-based DSS, we logically mapped the flow chart of the web-based DSS process, as shown in Figure 4.
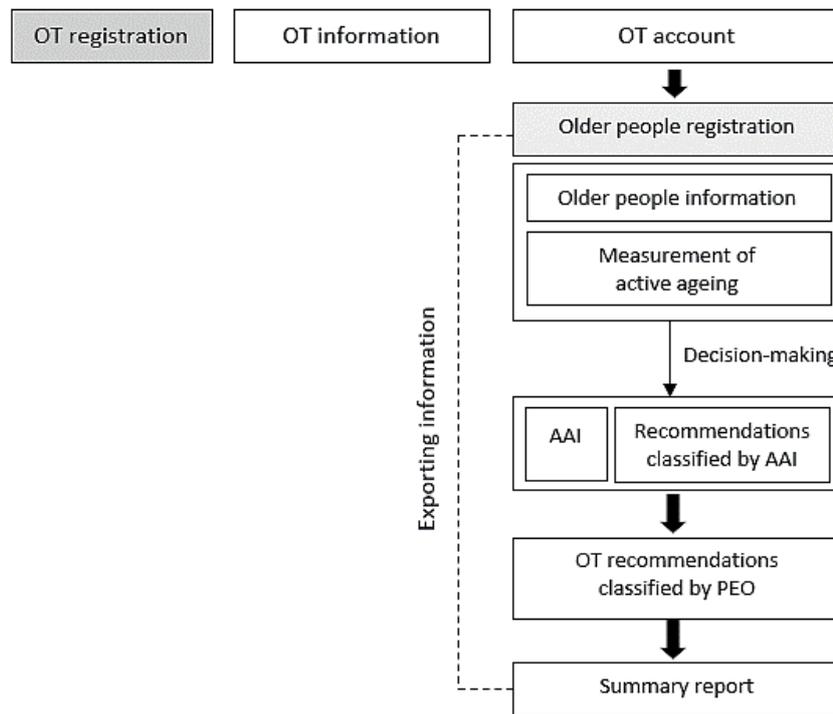
Figure 4. Logical connection of the web-based DSS.

The OT recommendations system comprises seven functional design components, including the login page, main page, register page, active ageing measurement, decision-making for older people, OT recommendations system, and information exporting. Then, the paper-based design was drafted to develop the web-based DSS by software engineering. The next step involved converting the paper-based DSS into a web-based version. Software engineer designed the web-based DSS and operated its features and functions. The system operated on the cloud, delivering Decision Support (DS) logic through a web browser to a computer, smartphone, or tablet through the Internet. The structure of the web-based DSS developed in this study consisted of 4 components: data, model, user interface, and knowledge management. The data management component consisted of a database, Database Management Subsystem (DBMS), query facility, and data directory. The database contained data from 2 sources: internal system data (OT suggestions) and external user data (occupational therapists and older people information). The DBMS formed a section for creating, accessing, and updating the database. Regarding the query facility, this section measured data accuracy and validity. The data directory contained all the data in the database, which provided the information needed by the users.

The operational model management building process involved adding sets of recommendations to form a suggestion system model. The if-then rules were used for the analytical method of decision-making problems. The recommendations were designed based on individual active ageing levels, high, moderate, and low, and issues related to PEO model components. Then, to build a user interface style of the web-based DSS, 3 types were developed for this study: menu interface, point-and-click graphical interface, and question-and-answer interface. The user interface was completed to control interactions with computerized information systems. The final step involved offering suitable recommendations and using knowledge management to address issues. The older people's information and the summary of active ageing levels were encoded as if-then rules, and the sets of recommendations were represented to match active ageing levels and the problems of older people. The final web-based DSS system was divided into seven parts, as shown in Table 1.

Table 1. The DSS system to support occupational therapy services in promoting active aging.

DSS system	Specification
1. Login page	The first page appears for the user. For the first access, the user (OT) needs to log in by filling in the username and password. New users must create a new account to keep security of data collection.
2. Main page	This page will appear when the user logs in. There are two parts: log in and a video tutorial.
3. Register page	The purpose of the registration page is to allow OT to sign up new clients. Personal information can fill in such as name, age, gender, etc. When the personal information of each older person is filled out completely, the name of the client will appear on the registration information menu. On the registration information menu, users can view and edit individual information by clicking on the list.
4. Active ageing measurement	In this section are questions to measure the active ageing level of older people. One question at a time from each page will show until all 25 questions are answered.
5. Decision-making for older people	This section gives the overall results of the interpretation of the AAI and the brief description. Data is processed so that recommendations are chosen based on information that has already been received.
6. OT recommendations system	The integration between the PEO model and the active ageing of WHO is displayed by the recommendation system under the logical if-then. It consisted of a summary of information on older people and OT recommendations.
7. Exporting information	Three options are available to users for exporting the data. 1) an overview of older people information and specific suggestions for older people 2) the summarized list of recommendations under the PEO component, 3) the details of recommendations.

5 occupational therapists implemented the web-based DSS with older people to pre-test the system. After trialing the web-based DSS, users gave feedback on its contents and functions. For instance, the OT recommendation system suggested enlarging font and image sizes and altering the font's color. The final web-based DSS was completed.

Usability of the web-based DSS

A total number of 30 occupational therapists participated in the tests, of which the majority were female (66.67%) and aged about 30-40 years. Most of them worked at the practitioner level (66.67%) and had experience in geriatrics for five years or more, as shown in Table 2.

Table 2. Characteristics of the participants.

Variables	Frequency (N=30)	Percent (%)
Gender		
Male	10	33.33
Female	20	66.67
Age (yrs)		
25-30	7	23.33
30-40	21	70.00
>40	2	6.67
Category of Position		
Professional Level	4	13.33
Practitioner Level	20	66.67
Government Employees	1	3.33
Permanent Employees	3	10.00
Temporary Employees	2	6.67
Work experience (yrs)		
5-10	21	70.00
>10	9	30.00

The SUS score of the DSS was 80.41 (SD = 8.76), which indicated excellent usability.[35] The median rating of partially agree was provided for the positively worded SUS question "I thought the system was easy to use" because the median rating was 4.5, which could not be rated as agree. Therefore, a median rating of "strongly disagree" was not found in this study. The median rating of partially disagree was provided for the negatively worded SUS question, "I thought that I would need the support of a technical person to be able to use this system," the median rating was 1.5 and could not rate as disagree. The responses to SUS questions are shown in Table 3.

Table 3. Responses to SUS questions.

Question*	Median	±SD	SUS scores ±SD
1. I thought that I would like to use this system frequently	4	4.13±0.73	
2. I found the system unnecessarily complex	2	2.16±0.75	
3. I thought the system was easy to use	4.5	4.4±0.67	
4. I thought that I would need the support of a technical person to be able to use this system	1.5	1.5±0.50	
5. I found that the various functions in this system were well integrated	4	4.30±0.47	80.41±8.76
6. I thought there was too much inconsistency in this system	2	1.70±0.75	
7. I would imagine that most people would learn to use this system very quickly	4	4.27±0.52	
8. I found the system very cumbersome to use	2	1.60±0.62	
9. I felt very confident using this system	4	4.13±0.59	
10. I needed to learn a lot of things before I could get going with this system	2	2.13±0.81	

Note: 5=strongly agree, 4=agree, 3=neutral, 2=disagree, 1=strongly disagree, *questions 2, 4, 6, 8, and 10 are negative, the scores must be inverted before computing the SUS.

Discussion

The web-based DSS was developed as a tool to support OT services for older people. It is an innovation that can calculate the active ageing level before making decisions in selecting the recommendations, according to information on older people and their level of active ageing. The web-based DSS provides customized support for each client. OT can fill data into the program and then offer recommendations that arise from the integration of the OT concept (PEO) and the active ageing of the WHO framework. This study is growing as the focus shifts from rehabilitation to health promotion, and it has been recognized that there is an opportunity to offer additional services in this area.[37] Occupational therapists need to embrace the concept of occupation for health to adjust their approach towards promoting active ageing. Technology has become increasingly popular in occupational therapy, particularly concerning active ageing and its impact on the mental well-being of older individuals.[38] Although technology has improved convenience in life, there is still a lack of research on how to use new technologies to improve the health of older people. This study draws inspiration from the global strategy for digital health, which aims to integrate technology into occupational therapy practices to improve health and promote active ageing among older people. Zaalen *et al*.[39] mentioned that implementing technology in healthcare delivery to older people is an essential key factor in helping healthcare providers supply services efficiently to their clients.

The results of this study indicate that a web-based DSS to enhance active ageing is readily available for use.

Evaluation of the effectiveness of web-based DSS on the web is very challenging. According to previous research, web-based DSSs are helpful tools that give users various options for improving clinical practice.[40,41] It was used to analyze data and then provide feedback to the users to assist them in solving problems and making decisions.[42] This study developed a web-based DSS as an innovative approach to enhance the health and well-being of older individuals. The web-based DSS integrates the principles of active ageing and occupational therapy. The process is comparable to creating multi-domain solutions that aid in identifying deterioration in different domains early.[43] In this research, we implemented the web-based DSS to measure older people's activity levels and provide precise advice. The development of the web-based DSS followed the emergence of technology in occupational therapy, which enables occupational therapists to create new ways of assessing and providing intervention services for their clients.[7]

In occupational therapy research studies, the web-based DSS has been used as an expert to select, recommend, evaluate, and guide appropriate solutions for clients. For instance, the web-based DSS plays a crucial role in the process of choosing and prescribing assistive technologies,[19,20] in the evaluation of the functional capabilities of the disabled user and selecting an appropriate combination of assistive devices,[22] and in the assessment of access to facilities by architects, accessibility experts, occupational therapists, and rehabilitation experts.[18] Therefore, this study used the web-based DSS as an occupational therapy tool to effectively serve older

people, providing them with specific recommendations in health promotion rather than rehabilitation. Furthermore, it was a cutting-edge piece of equipment that helped occupational therapists effectively serve their clients in occupational therapy.

In this study, we used the systems development life cycle (SDLC) to develop the web-based DSS, tailoring it to the user's needs, including system and usability requirements. In information systems development, we use SDLC to create applications and programming that align with user requirements.[44] The system requirement was the first step of system development and was used to determine a list of user needs for analyzing and designing the DSS.[45] The requirements in this study were developed from the perspective of occupational therapists, who were interviewed as users about the system's requirements for developing its content and functionality. The Sagel study demonstrated the importance of identifying user requirements.[46] Therefore, users identified a set of functions and capabilities to meet their needs. After determining the system requirement, the system was designed in paper-based form. This step defined the system's functions and features and the relationships among its components according to the system requirement. Paper prototyping proved to be an effective tool for exploring design possibilities while developing the system. It also served as a core activity in the design process, providing screenshots that aid in determining how the design or product should appear. The paper-based design of the system provided a low-cost prototype. An example of application development for hearing aids demonstrates how the initial paper-based prototype of this app contributed to its improvement.[47] In addition, Liu *et al.* created paper-based electronic interfaces for use in a watery environment, offering a simple and efficient way to create customized digital prototypes.[48] Following the paper-based design, the system development process adhered to the requirements and design phases. In this study, the cloud-hosted the web-based DSS, and a web browser delivered the DS logic to a computer, smartphone, or tablet through the Internet. In this study, the web-based DSS structure consisted of four components: data, model, user interface, and knowledge management, similar to the study by Oz.[41] The sets of recommendations are based on the knowledge and experience of experts, specifically occupational therapists and older individuals with high levels of active aging. They are prepared for practical application in the real world. The database integrates other sources, such as academic literature and research, to enhance a comprehensive set of recommendations. The four components worked in conjunction to provide recommendations from occupational therapists to older people. As users, the occupational therapists completed older people's profiles, including their information. The occupational therapists then evaluated the older people for active ageing and processed and collected their active aging levels for data management. We used the if-then rules to assess the active ageing of older people at three levels. The web-based DSS provided appropriate

recommendations tailored to the active ageing level of older individuals. Therefore, the web-based DSS could be considered the intelligence system utilized to support and enhance decision-making activities. The web-based DSS was developed and designed based on user requirements to meet user needs better. However, before being used in clinical practice, the DSS must be evaluated to ensure its validity and efficiency.[49]

The final web-based DSS was installed to give recommendations to older people. It was similar to that in a previous study by Palumbo *et al.*, which used qualitative methods to obtain a voluntary self-report from users who used the system provided.[41] The interaction between the user and technology in this study was significant for supporting web-based DSS implementation.[51] The usability of the DSS system during the testing phase in this study was evaluated to ensure that users could operate it efficiently. The outcome gave the user a clue about the crucial aspects they must consider before approval or rejection. This study selected The SUS for usability testing because it is utilized frequently. It is an often-used questionnaire that measures usability.[52] This helpful tool is available in paper-based and online forms. It found excellent results (the SUS score was 80.41). It was explained that SUS above 80.3 represented excellent usability.[53] Therefore, usability testing helps developers determine whether the system's development aligns with user needs, indicating the system's success and user acceptance.

The result of usability testing reflects how the users felt about the web-based DSS, its effectiveness and efficiency, and whether they were satisfied. Regarding the degree of consistency in the system, the highest score in the SUS questionnaire was for Item 3 (Mean=4.4, SD=0.67). Users stated that they did not need the support of a technical person to use the system (Item 4: Mean=1.5, SD=0.50). Most question items required the users to answer before progressing to the next section. If an item of information was not entered, a reminder was displayed, following the principle of constraints and feedback, to help the user understand the process.[54] Consistency and simplicity in using the DSS were also expressed in items relating to the ease of learning the system; in Item 7 ($\bar{X}$=4.27, SD=0.52), users indicated that they could learn to use the system very quickly. In Item 5 ($\bar{X}$=4.30, SD=0.47), they stated that the various functions in this system were well integrated. In addition, in Item 2 ($\bar{X}$=2.16, SD=0.75), the users stated that the system was unnecessarily complex. In Item 10, they said that operating the system did not require much prerequisite knowledge or preparation and indicated that it was easy for novice users to learn about its use. All SUS reflections showed that users had a satisfactory experience using the web-based DSS tool. The functionality and features of the web-based DSS were designed and developed with a focus on matching reliability and validity with the needs of the users. Therefore, the web-based DSS was created to meet user needs and make decisions to provide services effectively for older people.

Limitations and suggestions

This study has some limitations. The maintenance step requires continuous operation to meet the users' needs. Additionally, the post-implementation review used the maintenance process to monitor, evaluate, and modify the system as needed. However, the web-based DSS was designed for occupational therapists who are users to provide services for older people. Therefore, we limited the target users to only occupational therapists. The web-based DSS is a tool for occupational therapists to offer recommendations for older people.

Moreover, the system allows for the import of recommendations that meet the needs of specific older people in various formats, such as email and printing. Occupational therapists must consider and select a suitable form for older people, as some of them have limitations, particularly those who are illiterate. To maximize the benefits of the recommendations, the therapist may need to give guidance to family members who can help older people maintain a high quality of life and active ageing. Furthermore, the recommendations extracted knowledge from expert experiences. Therefore, these recommendations were representative of expert suggestions that were integrated through comprehensive knowledge.

Conflict of interest

The authors declared no potential conflicts of interest regarding the research, authorship, and/or publication of this article.

Ethics approval

The Faculty of Associate Medical Sciences Ethics Committee, Chiang Mai University, approved this study (number: AMSEC63EX040).

Acknowledgements

Supplementary data link

https://dss.ot-localhealth.com/. The web-based Decision Support System (DSS) is accessible through this link. After creating a new account, the new user can use a web-based system.

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