Original Research Article

Elevating Customer Experience: An Empirical Study on Computer Chair Selection in Furniture Retail

ABSTRACT

Aims: The objective of this study is to develop and construct a decision support system utilizing the simple additive weighting method to aid in the selection of a computer chair. Subsequently, user satisfaction with the created decision support system for computer chair selection will be assessed.
Study design: This research is motivated by the challenges frequently encountered in the furniture industry, as uncovered through interviews with the proprietor of a furniture store..
Place and Duration of Study: Department of Informatics, Universitas Multimedia Nusantara, between January 2023 and July 2023.
Methodology: Problem identification with the furniture owner is the initial step in this research. A literature review is then conducted to gather information about the research's theory. Design and analysis are then conducted based on the findings of the literature review. Subsequently, an application is developed, followed by testing and comparison. Finally, evaluation and documentation are completed to draw conclusions from this research.
Results: The research study employed the EUCS technique to obtain conclusions, and a questionnaire was administered to assess user satisfaction with the system being investigated. The result obtained suggests a satisfaction rate of 80.47%. Based on the findings acquired, it can be deduced that the execution of the development of the decision support system for the selection of computer chairs was efficiently carried out.
Conclusion: Based on the outcomes of the user satisfaction test utilising the EUCS questionnaire, it can be inferred that the design of the decision assistance system for selecting computer chairs is deemed acceptable and effectively utilized by users.

Keywords: Computer Chairs, Decision Support Systems, EUCS, Simple Additive Weighting

1. INTRODUCTION

In an era characterized by rapid technological progress, there is a discernible trend towards digitization, whereby tasks traditionally performed manually or in non-digital formats are gradually being transformed into digital processes[1]. Undoubtedly, as a result of this transformation, a significant portion of the populace now relies on computers as mediators for their routine activities, encompassing education, commerce, and professional endeavors. The activity involves not only the utilization of computers, but also the incorporation of supplementary elements such computer tables, computer chairs, and other supporting items [2].

For individuals who do not engage in prolonged computer usage, the aforementioned factors may not hold significant importance. However, for those who partake in extended computer-related activities, such auxiliary elements play a crucial role in enhancing concentration and

comfort [3]. In a scientific study titled "The Relationship between the Ergonomics Level of Chairs and Students' Concentration Levels in Schools: A Nationwide Study," Suryani et al. assert that the degree of ergonomics in chairs plays a crucial role in preventing decreased attention levels among students across the country. The Slah District in Kulon Progo, Yogyakarta, asserts that various activities such as attending school, college, playing games, and working necessitate concentration and comfort while sitting in front of a computer for extended periods [4], [5]. The ability to maintain focus and comfort is closely tied to the quality of the computer chair utilized during these activities [6].

A preliminary survey was done on January 25, 2011, involving 105 students from Higher State High School 1 Lower Country. Through the administration of questionnaires, it was shown that a significant proportion, specifically 60% of the students, expressed discomfort with studying in classrooms that had been previously utilized. According to the data provided in the study, a significant proportion of participants reported experiencing various physical and mental symptoms during their academic activities. Specifically, 72.38% of respondents reported feeling sleepy during lessons, while 52.38% experienced dizziness. Furthermore, a substantial 91.42% of participants reported being unable to concentrate effectively while studying. Additionally, a considerable 82.85% reported feeling tired and fainting, while 38.09% experienced pain in their back and thighs. Moreover, 12.38% of respondents reported experiencing pain in their arms, while 22.85% reported pain in their neck and shoulders. Furthermore, 16.19% reported having stiff hands, and 28.57% reported feeling anxious. Additionally, 21.90% reported experiencing numbness in their legs, while 7.62% reported feeling a sense of heaviness. Lastly, 24.76% reported feeling unbalanced when transitioning from a seated to a standing position after an extended period of sitting.

Selecting an ergonomic computer chair for engaging in various activities is crucial due to the individual variations in activities and their durations. Making an incorrect choice in computer chairs can significantly impact an individual's concentration, comfort, and overall health when engaging in prolonged computer-related tasks [7], [8].

In a recent interview, Victorian Jaya, proprietor of a furniture company established in 2002 called Father Samuel, shared insights into the range of furniture items available for sale, including chairs, tables, and other enduring pieces. Frequently, clients encounter difficulties and lack information when faced with the task of selecting computer chairs. These challenges arise from a lack of understanding regarding the various criteria and supporting aspects that should be considered during the decision-making process [9], [10]. These considerations include pricing, seat width, seat height, and backrest height.In order to address the challenges associated with assisting customers in selecting computer seats that align with their specific needs and preferences, the implementation of a decision support system (DSS) for seat selection is deemed necessary. This DSS will utilize the simple additive weighting method to facilitate the decision-making process.

The rationale behind employing the saw approach is in its widespread recognition and extensive application within the context of decision making involving several attributes. (MADM). The MADM (Multiple Attribute Decision Making) approach is employed to identify the most optimal choices from a set of alternatives based on specific criteria [11], [12]. Additionally, it should be noted that this particular approach is highly appropriate for conducting calculations on a smaller scale. The primary objective of this research endeavor is to assess the degree of user satisfaction pertaining to the computer seat decision assistance system [13], [14]. Once the aforementioned objective is attained, it is anticipated that the developed system will be instrumental in benefiting society, particularly individuals lacking proficiency in identifying computer chairs that align with their requirements and preferences. The preference or referral to clients seeking to purchase a computer seat may

be based on specific criteria. It is anticipated that the provision of a comfortable seating arrangement will prove beneficial, particularly for individuals engaged in prolonged computer-based tasks.

2. MATERIAL AND METHODS

The first phase of this study involved problem identification. During this phase, the problem was identified as the challenges faced by the community in selecting computer chairs that meet their specific requirements. This was accomplished through interviews with Mr. Samuel, a furniture shop owner, as well as a survey conducted via Google form to gather insights on the difficulties encountered when choosing computer chairs.

The subsequent phase entails doing a needs analysis, wherein an examination is conducted to identify the specific requirements necessary for the design and production of a decision support system aimed at facilitating the selection of computer seats. During this phase, the determination of system specifications, including the selection of software and hardware components, is undertaken. Subsequently, a comprehensive examination of literature is conducted, encompassing the essential knowledge pertaining to decision support systems as well as the many methodologies employed in such systems. The objective is to identify the most suitable approach that aligns with the available data and prevailing challenges. During this process, the criteria including the computer chair were also examined. Following the establishment of these criteria, interviews were undertaken with individuals involved in the furniture industry. The purpose of these interviews was to ascertain the key factors that significantly impact the selection process of a high-quality computer chair, taking into consideration the specific requirements of the interviewees.

The subsequent phase involves the design of the system, during which the operational mechanisms and functionalities of the system are determined and analyzed. The design include the identification of the input to be received by the system, the process of computation, and the generation of the output to be produced by the system. Subsequently, the advancement of the system is initiated, wherein the decision support system is programmed in accordance with the identified difficulties, requirements, and designs.

The subsequent phase entails process evaluation and testing, which is conducted once the system or its components have reached a usable state. During this phase, the system undergoes repairs to address any issues that have arisen, and enhancements to certain features are implemented if deemed required. The concluding phase of this research entails documentation, specifically encompassing the recording of the generated apps and the outcomes of user approval.

This study encompassed a systematic approach to system design, which involved multiple steps such as the development of Data Flow Diagrams (DFDs), flowcharts, establishment of table relations, production of data tables, and generation of mockups [15].

The Data Flow Diagram (DFD) is a graphical representation that illustrates the movement of data within an organization. It utilizes specific symbols to indicate the transfer of data that takes place within the operations of a business system [16]. The system consists of two Data Flow Diagrams, specifically referred to as level 0 and level 1. The level 0 Data Flow Diagram (DFD) illustrates the interactions between the system and the two roles that are currently accessible. The diagram presented in Figure 1 illustrates the transmission and reception of data by the two roles.

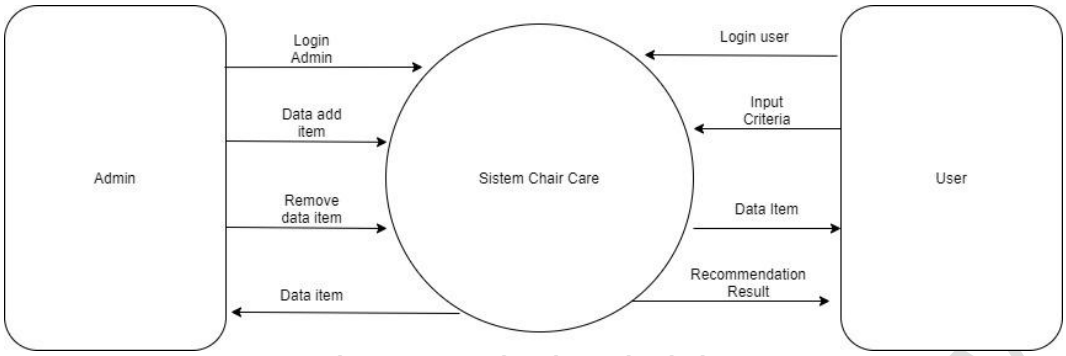

Figure 1. DFD level 0 web Chair Care

At the first level of the Data Flow Diagram (DFD), there are four processes included. These processes are logging in, adding items, entering criteria, and displaying the results of suggestions or the results of the Simple Additive Weighting (SAW) calculation. During the item addition procedure, the administrator will upload item data to be included into the database. This data will include various attributes such as the brand, width, seat height, backrest height, price, URL, and a photo of the item. The data item flow facilitates the transmission of item data to both the administrator and the user, enabling them to access the available data items. Furthermore, the item data is directed towards the final score table, where it is utilized in the computation of the Simple Additive Weighting (SAW) method.

The subsequent step is inputting the criteria, wherein the user will proceed to enter the criteria in accordance with their preferences. The criteria data will be inputted into the criteria table and afterwards transferred to the final score table for utilization in the SAW (simple additive weighting) computation.

The final stage involves presenting the recommendation outcomes. During this stage, the system retrieves the data previously computed in the final score table and sequentially displays it to the user. The order of presentation is determined by the highest values obtained from the Simple Additive Weighting (SAW) calculations, in accordance with the user's specified preference criteria, as depicted in Figure 2.

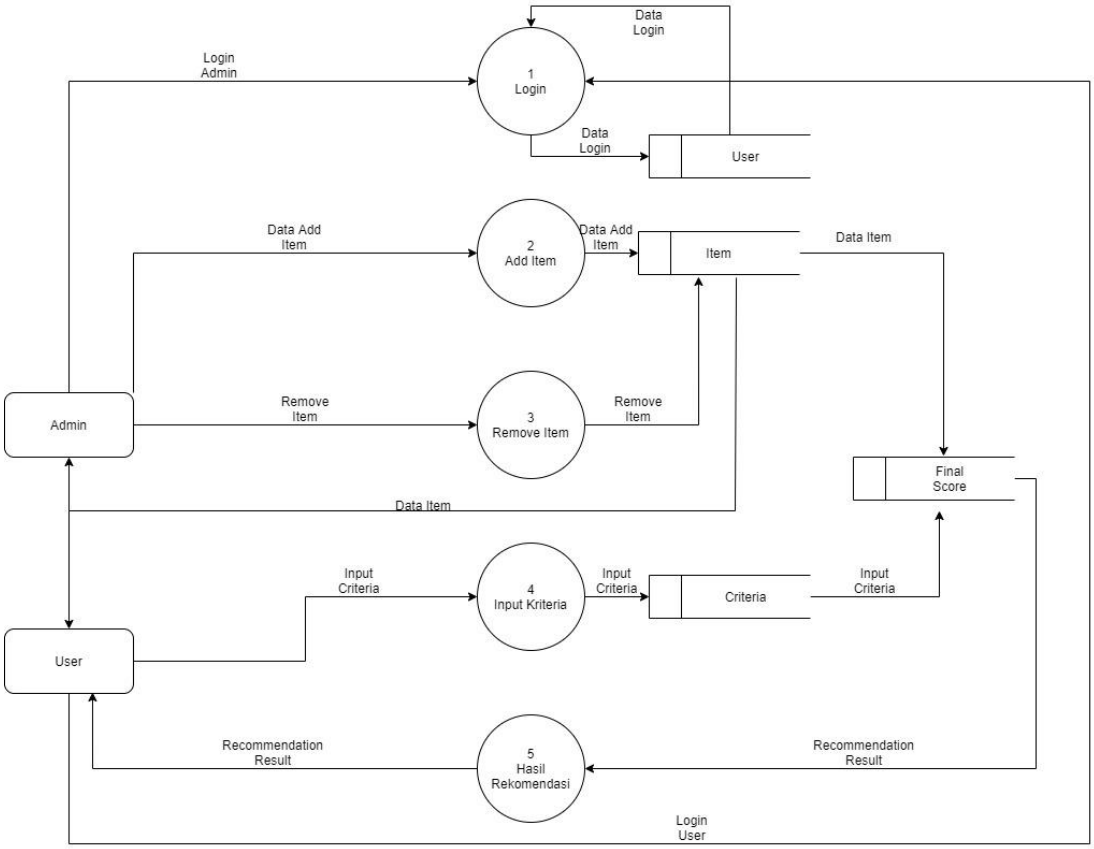

Figure 2. DFDlevel1webChairCare

The initial step undertaken by the administrator when accessing the website involves the presentation of the home view. The administrator will have the ability to access the Chair Care website by providing their email and password on the designated page. In the event that the email or password submitted is inaccurate, a notification will be displayed indicating the incorrectness of the email or password.

During the authentication procedure, the system will also verify the role associated with the user's data. The Chair Care website encompasses two distinct roles, specifically the administrative role and the user role. If the role possessed by the user corresponds to the user role identified in the database, then the user is granted access to the dashboard page based on their role, namely the administrator position in this instance.

Upon accessing the "add item" page, users will be presented with a form that includes fields for entering the brand, width, seat height, backrest height, price, URL, and photo of the item. Once the administrator completes the form and selects the "add" button, the entered data will be recorded in the item table database. This data will then be displayed on the preceding dashboard page. In the event that the administrator decides against adding any data, they have the option to return to the dashboard page. The graphic presented in Figure 3 depicts the administrative flowchart.

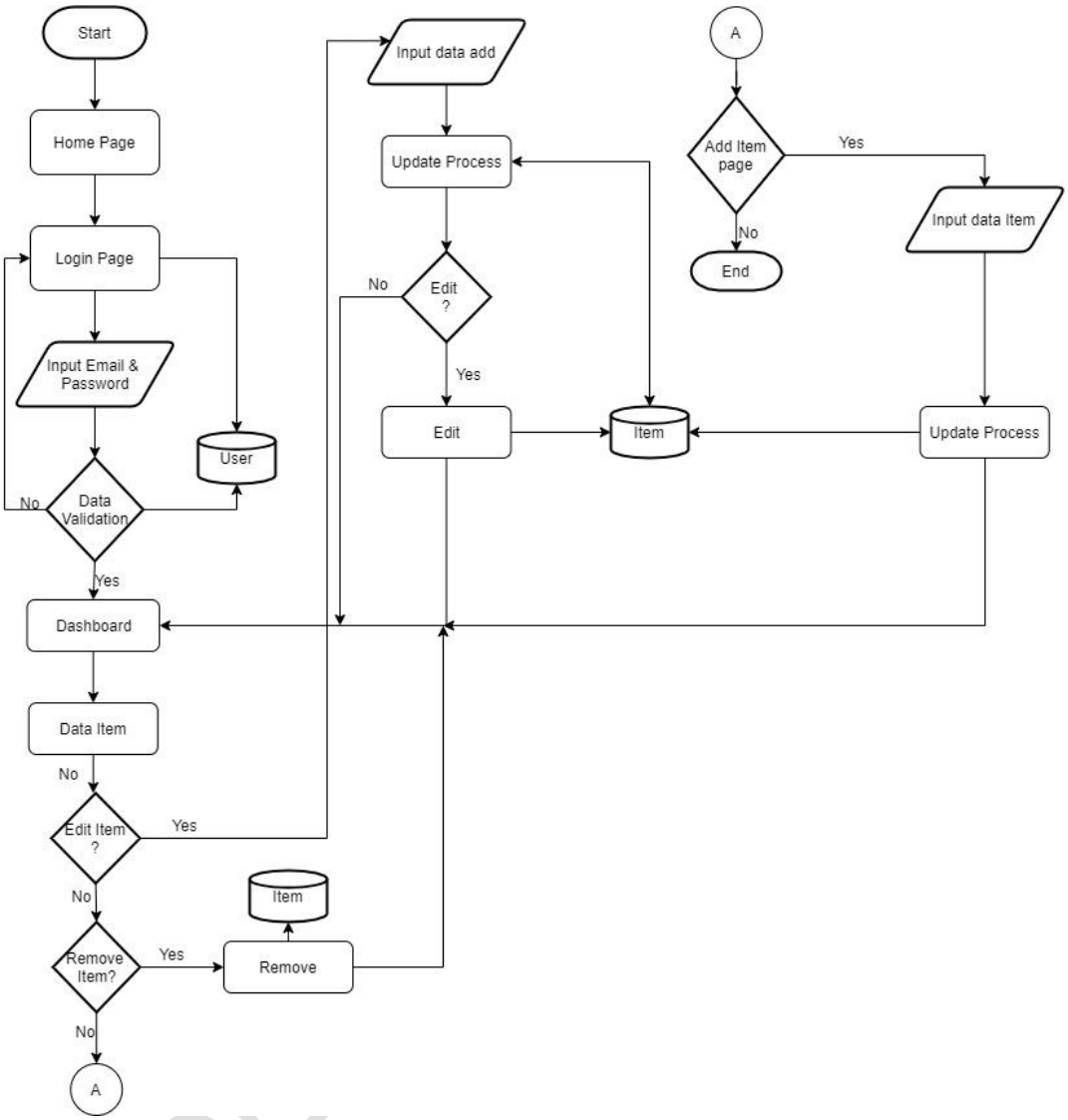

Figure 3.FlowchartAdmin for adding and editing dataset and criteria

On the user's end, the initial step entails the identical process as that of the administrator's end, which involves signing in and afterwards validating the login credentials. Upon successful authentication, the user gains access to the user dashboard page. The recommendation page will provide a dropdown form that includes criteria for selecting an item based on the user's preferences. Once the user completes the form and initiates the result button, the data will be subjected to computation utilizing the Simple Additive Weighting (SAW) technique. This approach aims to ascertain the things that align with the criteria specified by the user. The webpage will present item information that aligns with the user's specified criteria, determined by the utilization of the Simple Additive Weighting (SAW) technique. Additionally, users will have the ability to access comprehensive data pertaining to the selected item. As depicted in Figure 4.

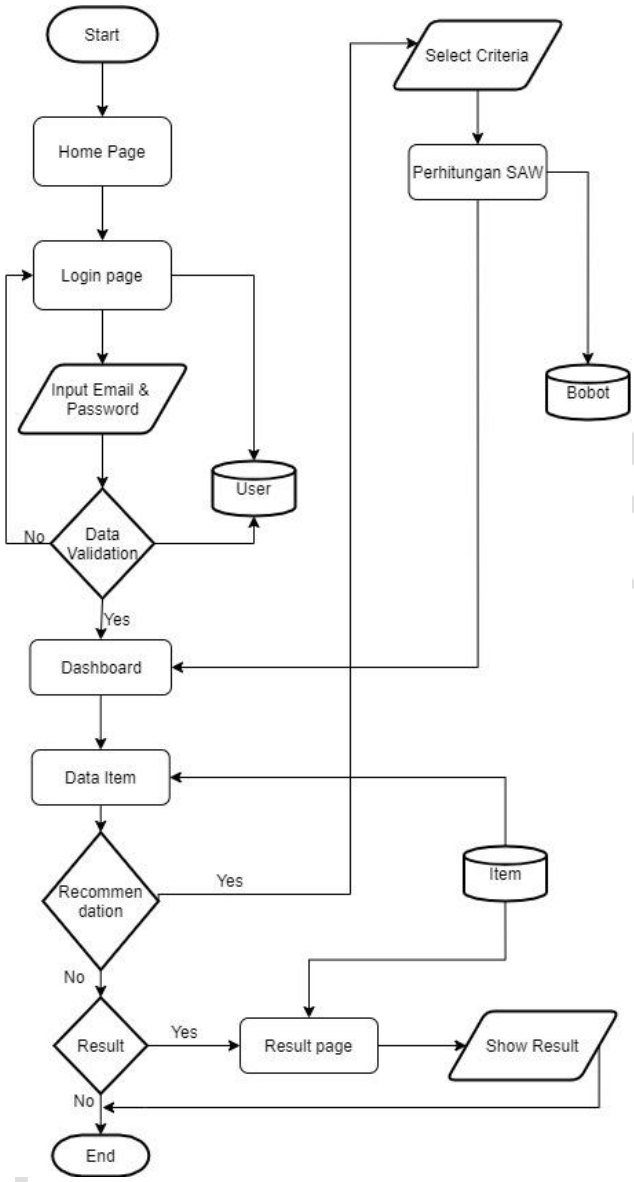

Figure 4.FlowchartUser Decision Support for Computer Chair

3. RESULTS AND DISCUSSION

After the completion of the design phase, the subsequent step involves the practical implementation of the designed flowcharts and data flow diagrams into a functional application. The following perspectives provide an analysis of the outcomes resulting from the execution of the concept. On the administrative page, upon successful authentication, the administrator is able to input and modify data pertaining to computer chairs using the integrated program, as depicted in Figure 5.

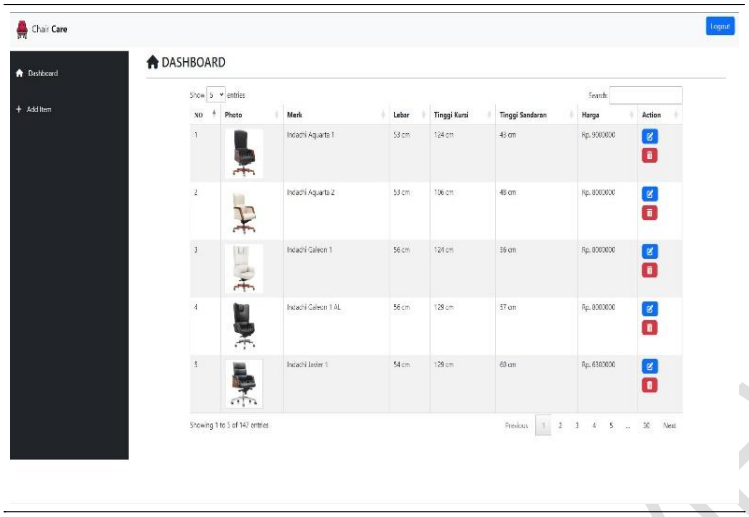

Figure 5. Admin Dashboard Page Image

The user is able to input the desired criteria for the computer chair on their respective page, as illustrated in Figure 6. Subsequently, the recommendations generated through the utilization of the SAW algorithm will be presented to the user, as depicted in Figure 7.

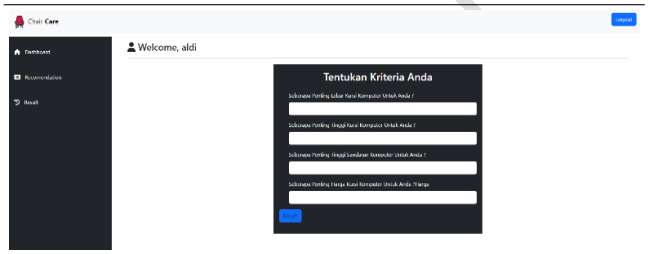

Figure 6.Input Form Criteria for choosing a computer chair

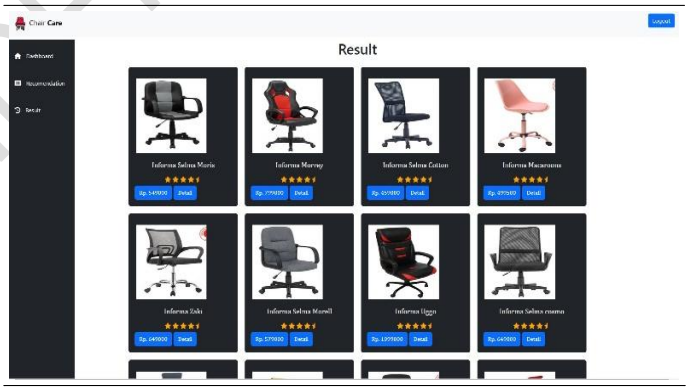

Figure 7. Image of the recommendation results for choosing a computer chair using the SAW algorithm

The chair care decision support system for computer chair selection employs the simple additive weighting approach, also known as the chair care method. This system utilizes a

MySQL database. The SAW method employed in this system involves multiple stages, including the acquisition of user criteria values, the determination of user criteria weights, the identification of maximum and minimum values, the computation of the SAW score, and the storage of the resulting SAW calculations.

The purpose of the scenario test procedure is to validate or re-evaluate the computation process performed by the system. The testing procedure is comparing the SAW calculation outcomes produced by the system with the manually derived calculation results obtained through Excel, which have been conducted on 34 separate occasions involving diverse individuals. The simple additive weighting formula is employed in this calculation.
Table 1 represents a dataset containing product trial data that will be utilized in the ongoing trial procedure. The dataset included in this study consisted of 10 product data points, each containing information on four criteria for each product: seat width, seat height, backrest height, and seat price.

Table 1. Table of Computer Chair Product Trial Data

Brand	Seat Width	Seat Height	Backrest Height	Price
Vernon1AL	57	125	55	Rp.3.060.000
Capitol1	56	115	51	Rp.2.780.000
Lexton1	56	115	53	Rp.2.700.000
Mustang	65	129	75	Rp.2.508.000
PolkaGT1A	55	94	50	Rp.1.386.000
ViraHT0A	60	102	52	Rp.1.452.000
Lomo	55	84	58	Rp.799.000
Lucas	62	121,5	51,5	Rp.1.199.000
Zenia	59	92	49	Rp.699.000
CoralChair	50	94	44	Rp.899.000

This study conducted a user satisfaction test with the objective of assessing the ratings provided by those utilizing the system. At this juncture, the user will be extended an invitation to initiate their interaction with the system. Subsequently, they will be presented with a form encompassing ten inquiries pertaining to their subjective experiences and perspectives when engaging with this system. The subsequent query is an illustrative instance of an inquiry that will be posed to the user. The data pertaining to the question in this study is presented in Table 2.

Table2. Table of User Satisfaction Questions

No	Criteria	Question list
P1	Content	Is the use of the computer chair selection decision support system in accordance with the wishes of the user?
P2		Does this system provide clear information?
P3	Accuracy	Does this decision support system provide precise and accurate information?

P4		Can this system run according to the user's wishes on each page?
P5	Format	Does the display of the computer chair selection decision support system make it easy for users?
P6		Does this computer chair selection decision support system have an attractive appearance?
P7	Ease of use	Is this decision support system easy to use on any device?
P8		Is this decision support system easy for users to understand and use?
P9	Timeliness	Does this decision support system have good performance?
P10		Does this decision support system help users shorten the time in choosing a computer chair?

Table 2 is a table of questions that will be asked to determine user acceptance of the system created using the EUCS method. After a list of questions was made, the questionnaire was distributed to 34 respondents, to see the results of user acceptance of the application that was built, and the results of the questionnaire can be seen in Table 3.

Table3.EUCS Questionnaire Table

Question list	Answer				
	VNA	NA	N	A	VA
Is the use of the computer chair selection decision support system in accordance with the wishes of the user?	13	17	4	0	0
Does this system provide clear information?	9	23	2	0	0
Does this decision support system provide precise and accurate information?	15	13	6	0	0
Can this system run according to the user's wishes on each page?	12	15	7	0	0
Does the display of the computer chair selection decision support system make it easy for users?	11	18	3	2	0
Does this computer chair selection decision support system have an attractive appearance?	3	21	7	3	0
Is this decision support system easy to use on any device?	5	23	3	2	0
Is this decision support system easy for users to understand and use?	8	17	8	1	0
Does this decision support system have good performance?	5	20	7	0	0

Does this decision support system help users shorten the time in choosing a computer chair?	11	17	5	0	0

Based on the findings obtained from the conducted calculations on each of the established criteria, an evaluation was performed to ascertain the efficacy of the developed system. Specifically, in relation to the initial criterion of content, the assessment results indicate that 13 respondents strongly agreed, 17 respondents agreed, and 2 respondents remained neutral in response to the first question. Regarding the second question pertaining to the content criteria, denoted as Q2, the outcomes of the assessment indicated that 9 participants expressed a strong agreement, 23 participants expressed agreement, and 2 participants remained neutral. The final computation of the decision support system for selecting computer chairs yielded a user acceptance rate of 80.47% for the recommendation system. Based on the acquired results, it can be concluded that the system under investigation is deemed acceptable and suitable for users as a decision support system in the context of picking computer seats, utilizing the basic additive weighting method.

4. CONCLUSION

The findings of the conducted research, when compared with prior studies, indicate that the variations primarily pertain to the determination of criterion weight. In earlier studies, the criteria weights were derived directly from the user-selected criteria values. However, in this research, the criteria weights were obtained by recalculating the user-selected criteria values to determine the appropriate weights. The findings of this study indicate that the development and implementation of a decision support system for selecting computer chairs, utilising the basic additive weighting method, has been effectively created and constructed. The efficacy of the SAW method and the accuracy of the system calculation outputs have been substantiated by the conducted trial process. Furthermore, according to the outcomes of user satisfaction assessments conducted using the EUCS questionnaire and its stated criteria, the average score attained in this decision support system for selecting computer chairs is 80.47%. Based on the obtained results, it can be inferred that the design of the decision support system for the selection of computer chairs is deemed acceptable and effectively utilised by users.

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