Decision Support System for Determined Recomendations Lecturer Teaching Handbook using Fuzzy

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Abstract

Textbook or teaching manuals book have many kind of such material and content of the same though. The textbook on the market make the teachers confused in choosing an appropriate textbook, it make the teachers sometimes choose the wrong textbook and the suitability the content of the material it's not in the same content. In the fact the content from a same book can be different. Textbook is one factor that can influence teachers to choose the book for refrency.

By using fuzzy in this application, the recommendations value of teaching guidebook based on the results of the calculation in the settlement with the fuzzy and the discovery of the book can be recommended after the process of calculating the value of the matrix preference normalization and order exist on the object of research.
Keywords : fuzzy, decision support system.

Introduction

Regarding decision-making is essentially a form of election of various alternative actions that might be chosen, which process a particular mechanism, in hopes of generating a best decision. Formulation decision method is a way to develop logical relationships into a mathematical method, which describes the relations between the relevant factors, so the decision should be taken gradually, systematically, consistently and cultivated in every step from the beginning has to include and consider a variety of factors. (Nana Julianto, 2012: p1)

In principle, decision support systems, just as a support system for decision-making, not replace it. Including decision-making which is used to select the manual teaching Lecturers appropriate, and appropriate to the instructional materials to be delivered.

Textbook or handbook has a lot of visual and content even in the same material. Textbooks are issued by the market makes teachers confused in selecting appropriate textbooks, teachers sometimes choose the wrong textbook and the suitability of the content of the material does not cause eye instructional books to be delivered did not fit the concept, let alone the fact that the current textbook on materials the same can be different contents.

One of the teachers choose textbooks of which is because it is the need for a reference book for teaching. In order for teachers is not wrong in buying a textbook, there should be criteria in this syllabus components should be considered as very influential on a syllabus learning. All of that might not matter if the teacher does have a lot of money, but for what it has plenty of textbooks when only a few books even one book can cover everything in accordance with the concept of teaching materials and lecturer. From the results of the study showed that some textbooks from various publishers still contains many errors and misconceptions as well as the need for alternative conceptions. (Adisendjaja, 2003: p2)

Literatur Review

Decision Support Systems

Understanding decision support system proposed by Michael S. Scott Morton and Peter GW Keen, Information Systems Management in the book states that the decision support system is a system that is aimed at producing information on a problem that must be made by the manager. Decision support system is an information system that is intended to assist management in solving his problems. The definition is more specific information-producing system intended to solve a specific problem to be solved by managers at various levels. (McLeod, 1998: p348)

Types of Decision

The types of decisions by Herbert A. Simon in the book entitled Management Information System which is a decision to be on a continuum (continuum) with programmed decisions at one end and unprogrammed

decisions on the other end. Programmatic decisions backwardly "repetitive and routine, to the extent of up to a definite procedure has been made to address them so that the decision is not treated de novo (as new) each time this has happened." The decision is not programmed to be new, unstructured, and rarely consistent. There is no reliable method to deal with this problem because it has never existed before, or because of the nature and the structure does not exactly look or complicated, or because it is so important that it requires special treatment".
Simon explained that the two enis the decision is only the ends of the black and white of the continuum (continuum), and that in the real world most of the gray. But both decisions are important because each memerlkan different techniques. (McLeod, 1998: p348)

fuzzy logic
In fuzzy logic theory to explain the history, definitions and basic terminology, theory of operation of the fuzzy sets, membership function parameters and formulations (membershipfunction, MF) as well as the configuration and design of fuzzy logic systems. The theory of fuzzy logic was first proposed by Lotfi A. Zadeh in 1965, the which is a computational approach in decision-making According to the human way of thinking is the which allows for uncertainty and Showed a graded logic. As performed by Humans in making decisions, understanding - understanding that is in the human mind in terms of quality rather than quantity. (Kulkarni, 2001: p10)
According to Sri Kusumadewi, fuzzy logic is one of the components forming SoftComputing. Basic fuzzy logic is fuzzy set theory. In fuzzy set theory, the role of the degree of membership as a determinant of the presence of elements in a set is very important. Membership value or degree of membership or membership function of the main attributes of the fuzzy logic reasoning. (Kusumadewi, 2006: p38) In many ways, fuzzy logic is used as a way to map the problem of inputs leading to the expected output.
Design System
Use Case Diagaram

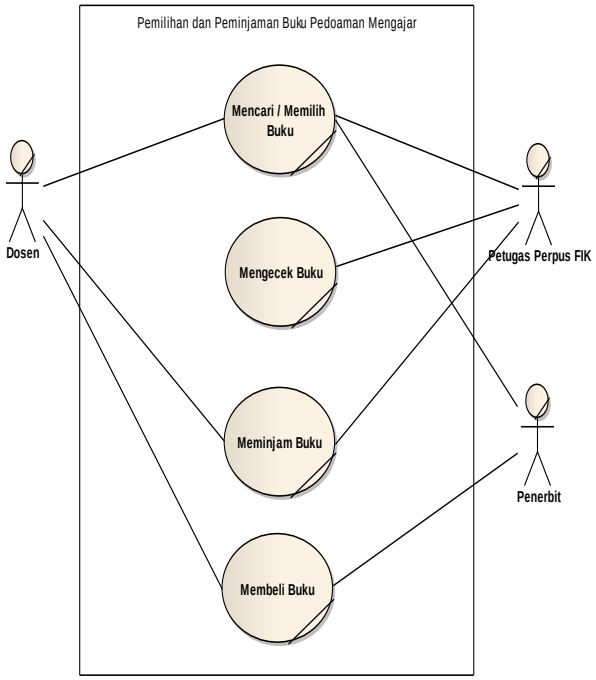


Fig 1. Use case book

b. *Activity* Diagram

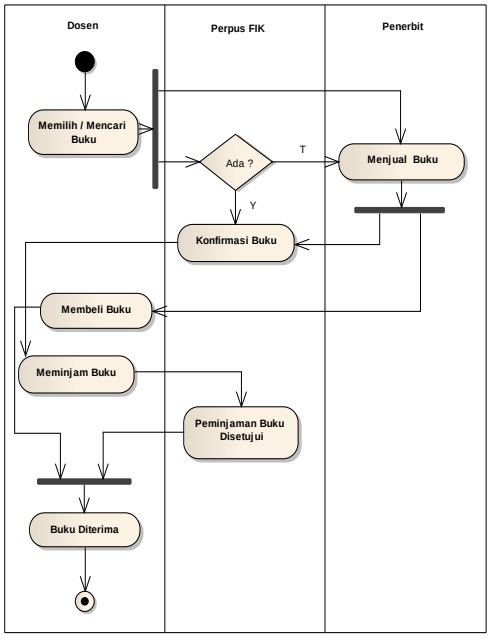


fig 2 *Activity* Diagram Sistem Berjalan

1. *Use Case* User Registrasion

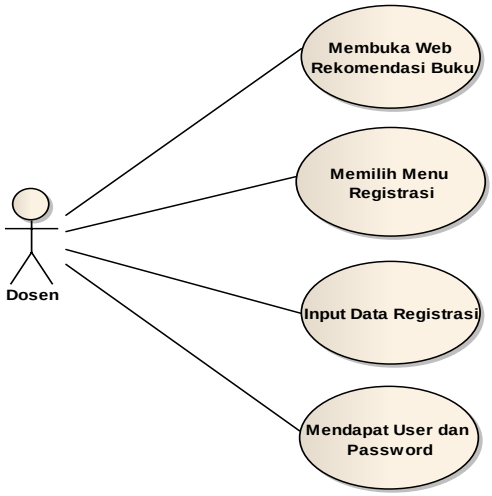


Fig 4. User Registrasitration

2. *Use Case* User Login

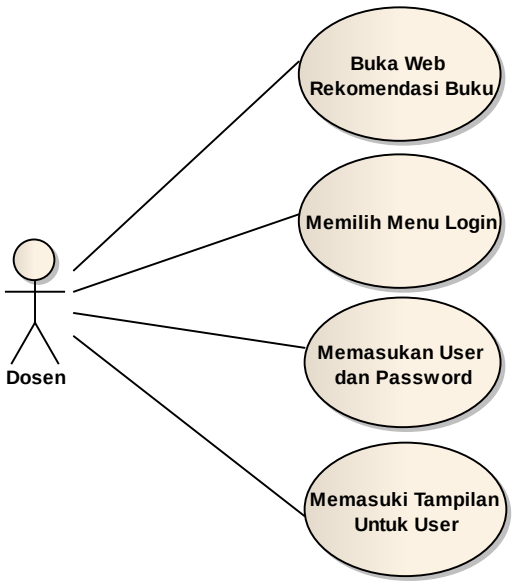


Fig 5. Login

3. *Use Case* admin login

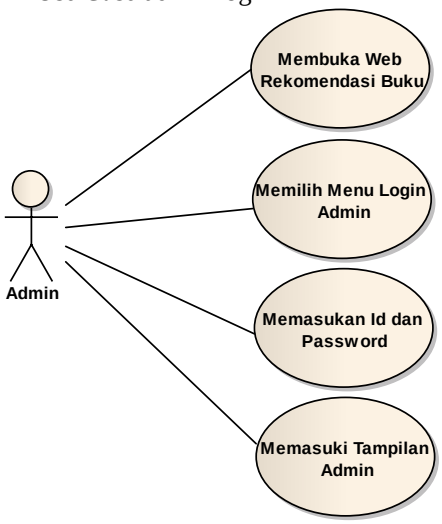


Fig 6. Admin Login

4. *Use Case* Diagram Cari Rekomendasi Buku

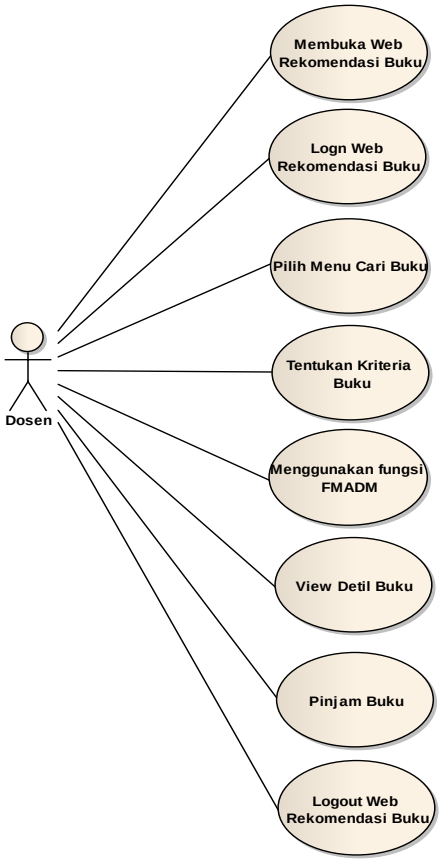
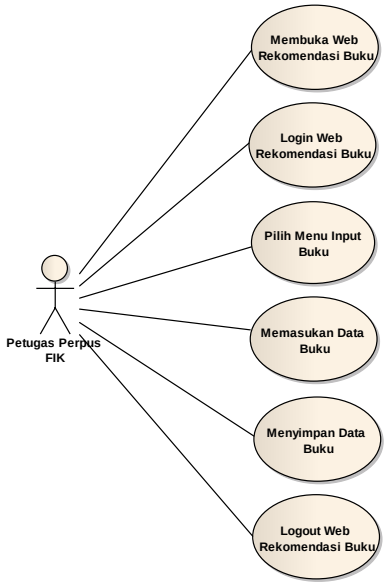


Fig 7. Search book

5. *Use Case* input book



Gambar 3.7 Use Case input book

Interface Design

a. Input book

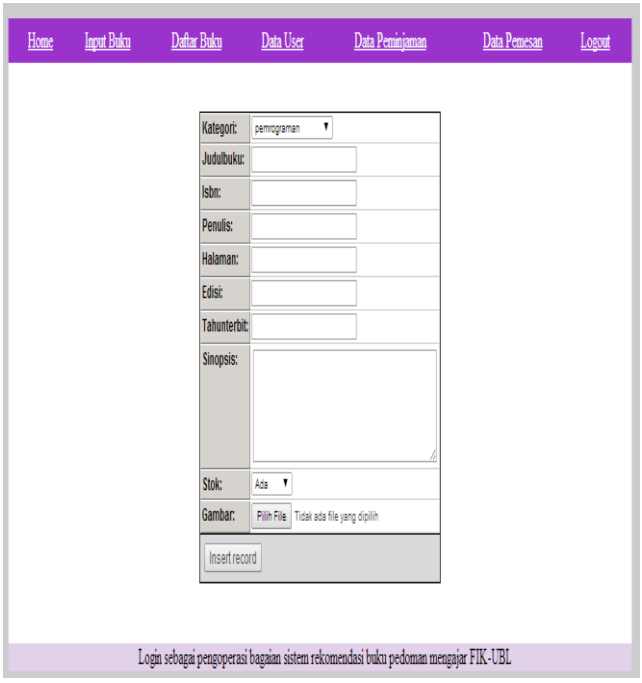


Fig 8. Input book

b. Book table

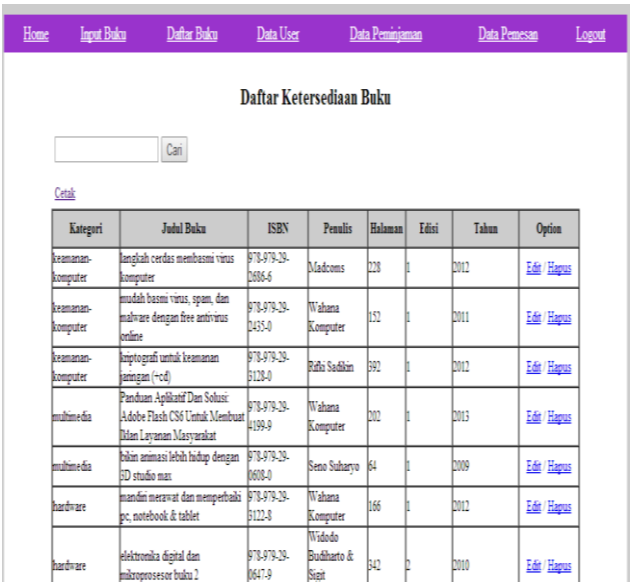
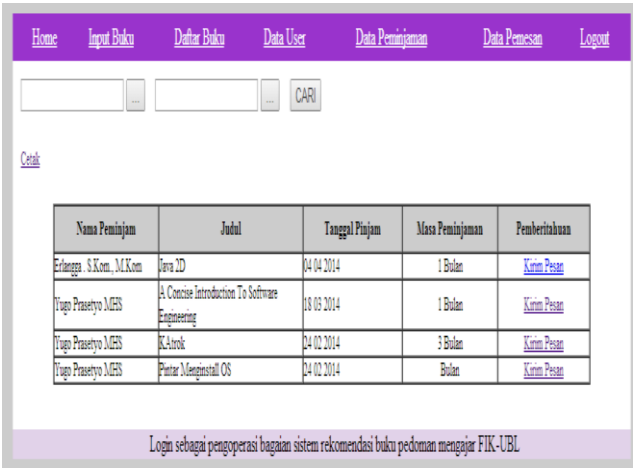


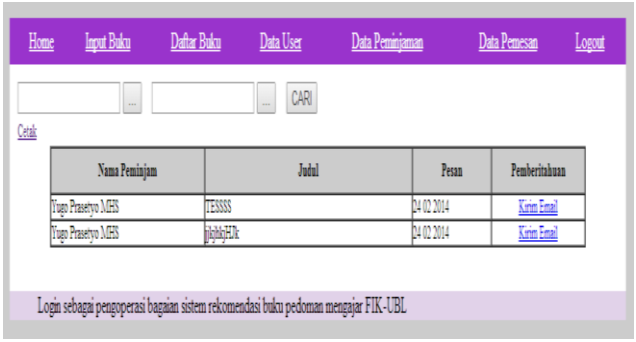
Fig 9. Book table

c. Borrow a book



Gambar 4.8 Tampilan Data Peminjaman

d. Tampilan Data Pemesan



Determination of criteria

a. C1 = Page Books.
b. C2 = Keyword Books.

while domains and weights of each criterion can be described as follows:

No	Variabel	Domain	Value
1	Page	Extremely Thin <100 Thin 100-150 Medium 150-300 Thick 300-500 Very thickness> 500	0.1 0.25 0.5 0.75 0.9
2	*Keyword*	Slightly 1-5 Medium 6-10 Many 10-15	0.1 0.5 0.9

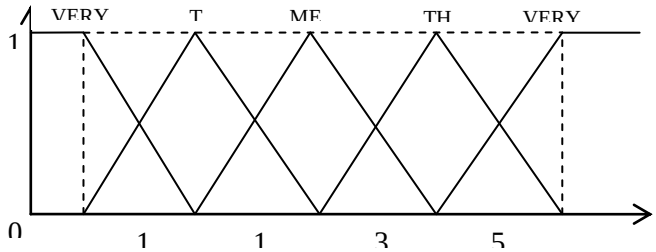
Shaping Membership Function

Of predetermined criteria, then the next stage is to establish the membership function of rating the suitability of each alternative on each criterion. There are two fuzzy variables which are the criteria for book recommendations, and the following is the case the user has to enter the keyword of "fuzzy" search guidebook on teaching in the system that have been mad

Code	Book Title	Page	Keyword	Edition	Publication Year	ISBN
1	Lengkap Belajar Logika *Fuzzy*	400	5	1	2006	31412
2	*Fuzzy* Inference System	200	10	1	2005	63566
3	*Fuzzy* Tsukamoto, sugeno, dan mamdani	1007	8	1	2000	53422
4	Perhitungan *Fuzzy* Lengkap	129	9	1	2004	54543
5	Logika *Fuzzy* Tahani					43
6	*Fuzzy* MADM	399	28	1	2004	52362
7	*Fuzzy for Decision*	1000	2	1	2006	45466
8	Penggunaan Ilmu Logika	876	5	1	2006	62666
9	Sistem Pendukung Keputusan	946	11	1	2005	21456
10	Keputusan Sistem Informasi	177	10	1	2007	52464

Book Page

1. On the criteria page of the book consists of five sets, namely: VERY THIN, THIN, MEDIUM, THICK, and VERY THICK..



2. Membership Function

a) Set VERY THIN:

$$\mu SANGATTHIN\ (x) = \begin{cases} \frac{x}{100}; & 0 \le x \le 100 \\ \frac{225-x}{125}; & 100 \le x \le 150 \\ 0; & x \ge 150 \end{cases}$$

b) Set THIN:

$$\mu THIN(x) = \begin{cases} 0; & x \le 100 \ atau \ x \ge 300 \\ \frac{x-100}{50}; & 100 \le x \le 150 \\ \frac{300-x}{150}; & 150 \le x \le 300 \end{cases}$$

c) Set MEDIUM:

$$\mu_{MEDIUM}(x) = \begin{cases} 0; & x \le 150 \ atau \ x \ge 500 \\ \frac{x-150}{150}; & 150 \le x \le 300 \\ \frac{500-x}{200}; & 300 \le x \le 500 \end{cases}$$

d) Set THICK:

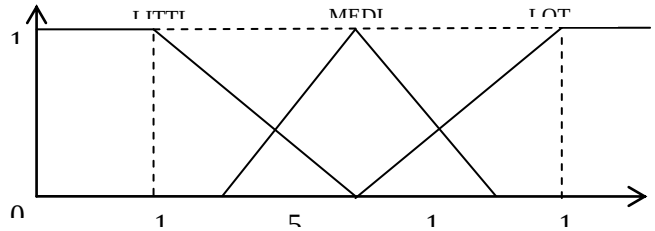
$$\mu_{THICK}(x) = \begin{cases} 0; & x \le 300 \\ \frac{x-300}{200}; & 300 \le x \le 500 \\ \frac{550-x}{50} & 500 \le x \le 550 \end{cases}$$

e) Set VERY THICK:

$$\mu_{THICK}(x) = \begin{cases} 0; & x \le 500 \\ \frac{x-500}{50}; & 500 \le x \le 550 \\ 1; & x \ge 550 \end{cases}$$

a. *Keyword* book

1. In the keyword criteria consists of three sets, namely: LITTLE, MEDIUM, and LOT.



Membership functions for each of the criteria set percentage of the keyword given as follows:

a) Set LITTLE:

$$\mu LITTLE(x) = \begin{cases} 1; & x \le 1 \\ \frac{8-x}{7}; & 1 \le x \le 8 \\ 0; & x \ge 8 \end{cases}$$

b) Set MEDIUM:

$$\mu_{MEDIUM}(x) = \begin{cases} 0; & x \le 5 \ atau \ x \ge 11 \\ \frac{x-5}{3}; & 5 \le x \le 8 \\ \frac{11-x}{3}; & 8 \le x \le 11 \end{cases}$$

c) Set LOT:

$$\mu_{LOT}(x) = \begin{cases} 0; & x \le 8 \\ \frac{x-8}{7}; & 8 \le x \le 15 \\ 1; & x \ge 15 \end{cases}$$

Formation Table Match

From the measurement data compatibility rating as already given above, the next step is to establish compatibility table and table matches a given weight, as follows:

Code	Title	Page	Keyword
1	Lengkap Belajar Logika *Fuzzy*	THICK	LITTLE
2	*Fuzzy* Inference System	THIN	MEDIUM
3	*Fuzzy* Tsukamoto, sugeno, dan mamdani	VERY THICK	MEDIUM
4	Perhitungan *Fuzzy* Lengkap	VERY THIN	MEDIUM
5	Logika *Fuzzy* Tahani	THIN	LOT
6	*Fuzzy* MADM	MEDIUM	LOT
7	*Fuzzy for Decision*	VERY THICK	LITTLE
8	Penggunaan Ilmu Logika	VERY THICK	LITTLE
9	Sistem Pendukung Keputusan	VERY THICK	LOT
10	Keputusan Sistem Informasi	THIN	MEDIUM

From the above calculation, the order of the recommended books from the high to low order is Book 9, Book 5, Book 6, Book 3, Book 2 and Book 10 and Book 4, Book 7 and book 8, and the last book is Book 1 .

Conclusion

Based on test results, conducted on the system show that decision support systems for lecturers teaching guidebook recommendation has been going well and according to user

needs. By using Fuzzy method in this application, the value of teaching handbook recommendations based on the results of the calculation of the settlement with the fuzzy and could find books recommended after the process of calculating the value of the preference matrix normalization and sequence object of this study is on the order of highest to low is Book 9, Book 5, Book 6, Book 3, Book 2 and Book 10, and Book 4, Book 7 and book 8, and the last book is the first book.

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