A Personalized Webpage Reconstructor Based on Concept Lattice and Association Rules

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Abstract

meanings of specifc part of the retrieved webpage easily. They need to spend a lot of time in fnding more references

Keywords:

1 Introduction

based teaching materials are in hypertext form. It is diffcult to remember what you have read before when you surfng

2 Definitions of Analyzing and Reconstructing Webpages

2.1 Association Rules & Frequent Itemset

h

H h h h

support **confidence** **association rule**

$X \rightarrow Y$ $X\ Y \subset H$ $X \cap Y$

X Y

X

X

X X

X Y

$X \rightarrow Y$ $X \cup Y$

Similar to the support, the association rule's confdence Y

X

confdence($X \rightarrow Y$ Y X $X \cup Y$ X

minimal support $minsup$
minimal confidence $minconf$

frequent

only care those association rules whose confdence values

minimum confdence called a confdent association rule:

$$\text{confdence}(X \rightarrow Y) \geq minconf$$

X

specifc transaction, then we have certain probability which $minconf$ to fnd the items in Y

2.2 Keyword Association

Nelson associates hypertext in a multiple and fexible

independent hierarchical (no-fat) structures, which are so-

S s s s s

m k_i
keyword set can be defned as

K k k k k_m

O
C **M** **I**
V

S s s s s s s

s **CMV** s

s	s
	OCIV
	CMV
	OCIV
	OCMV
	OCMIV
	CMI

minsup
C
V, CV
O, M, I, OC, OV, CM, CI, OCV
OI, MV, IV, OCI, OIV, CMV, CIV, OCIV

2.3 Knowledge Structure

∪

O M I OC OV CM CI OCV

H

knowledge structure

Q can be defned as [3][9-10]:

Q H). (9)

Q

H ∪ **O C M I V**

associated knowledge H_k

k H_O

O H_O **O OC OM OV**

union intersection difference OP Union Intersection Difference **learning path** *C*

Q H

Q ⊆) [9]. Moreover, the learning path *C*

Ø ∪

of fnite domain *Q* *m*

⊂ *k* ⊂ *k k* ⊂ ⊂ *k k* k_m *Q*

⊂ ⊂ ⊂

⊂∪

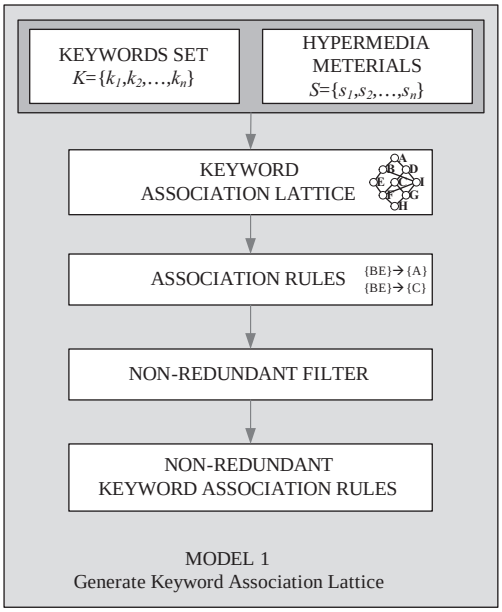
3 Core Processes of the Agent

software agent to provide users enriched modifed webpage for they reading and learning. Teachers only need to fll up

K *k k*

k_m *S* *s s* s_n

be elaborated by a non-redundant flter. At the end of this

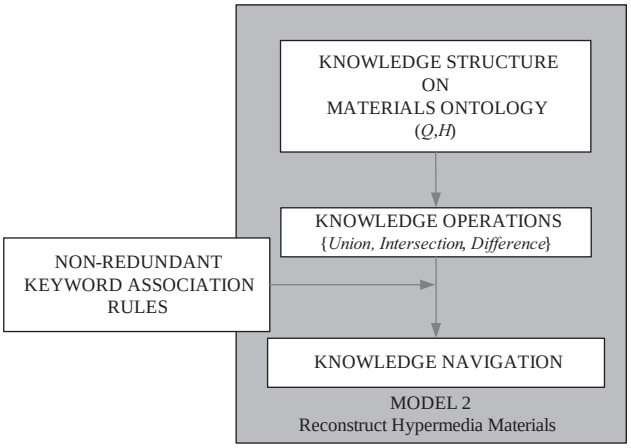


Q H *m*

∪ ∪ *a b c d* *H* *a*

a b *b c* *a b c* ∪

H r OP op_1 op_2 op_r



3.1 Formal Concept Analysis (FCA)

[16][19]. FCA can be seen as a **conceptual clustering technique** **formal context** in FCA is defined as:

$$O \; A \; R$$

O A $R \subseteq O \times A$

R

O s s s s s s

A **O C M I V**

s

s s s

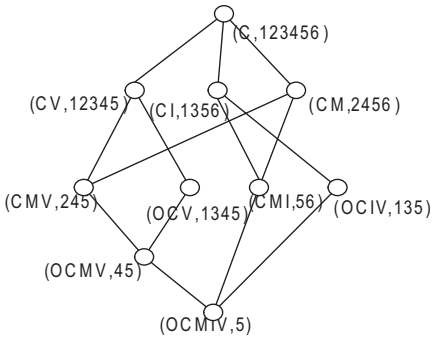
s s s s

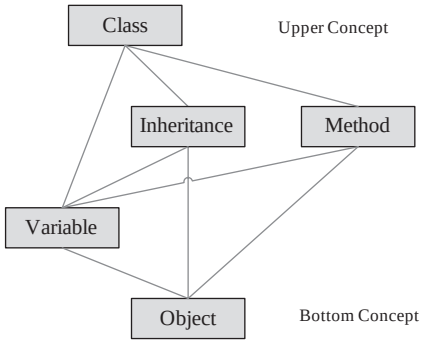
s s s s

s s s s s

R

	s	s	s	s	s	s
O						
C						
M						
I						
V						

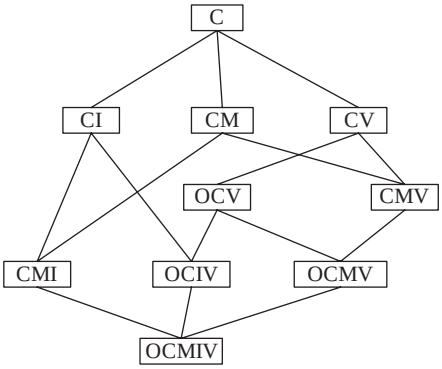




3.2 Rule Generation from KAL

H

With the KAL the confident rules (cf. Equation [5]) can



C
V CV
O OC OV OCV

O → CV
OC → V
C → OV
OV → C
V → OC
CV → O

(3) to filter the confident association rules out based on the minimal confidence threshold. For examples, when the minimum confidence threshold is setting to 100%, the following three rules are filtered out:

O → CV
OC → V
OV → C

4 Prototype System and Testing

Figure 6 shows the operation flows of K-Navi step by

the document structures and predefined Java programming

and, finally shows it on Ken's web browser (as step 7 shows).

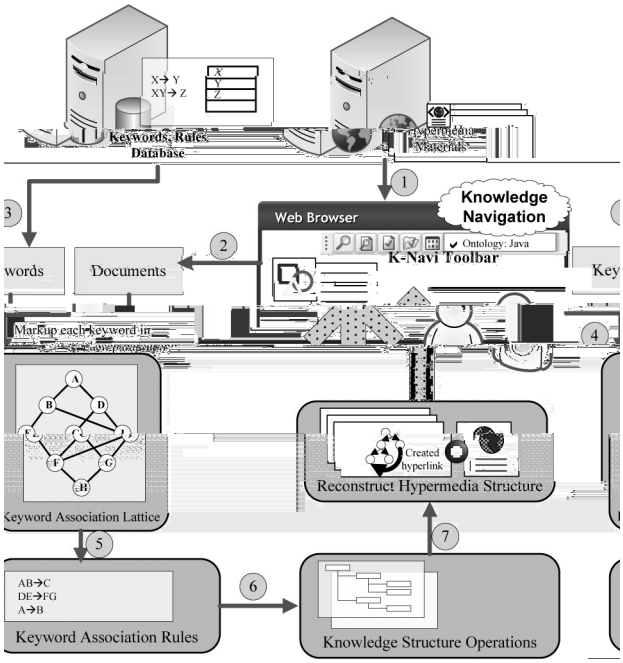
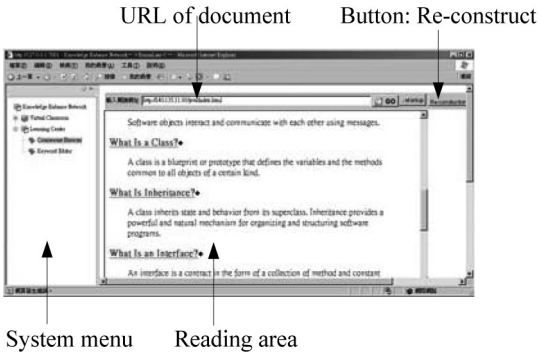


Figure 6 The Workflow of K-Navi

keyword editor *system menu*

than to use predefined keywords. After that, the learners can *reading area*



re-construct

a modified webpage as Figure 9(b) shows with the proposed

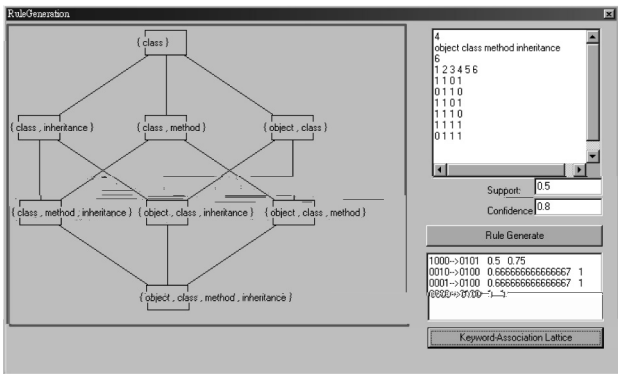
→
→
→

s_4 *object*
method

Table 4 Contents of Hypermedia Materials with Specific Keywords

s	*subclass*
s	*class* ____ can define ____
s	____. In such situations, you can define a ____
s	
s	
s	____: A function defined in a ____ ____. Unless specified otherwise, a ____

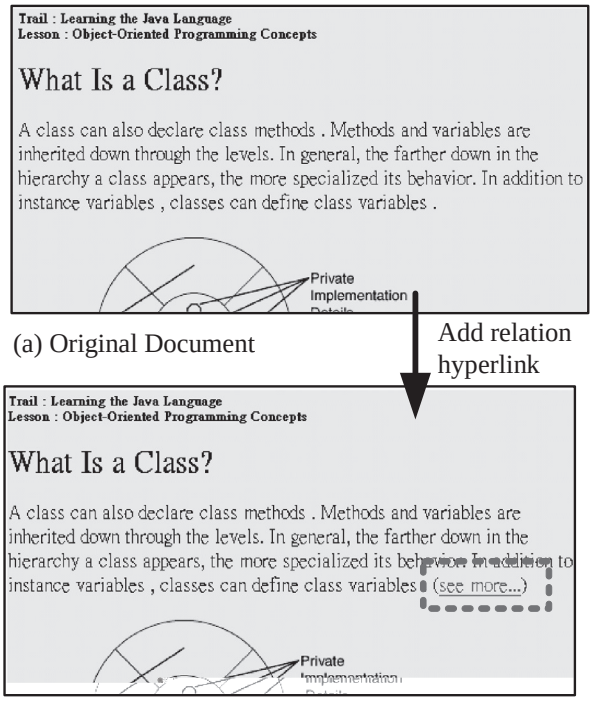
	Method	*Inheritance*
s		
s		
s		
s		
s		
s		



	Con f dence
→	
Ø →	
Ø →	
Ø →	
→	
→	
→	
Ø →	
→	
→	
→	
Ø →	
→	
→	
Ø →	
Ø →	

s *class*

s 's hyperlink at appropriate place as Figure 9



(a) Original Document

(b) A new hyperlink has been inserted

Figure 9 K-Navi Reconstructs a Webpage Automatically from

5 Conclusion

keyword editor

now is to allow users adding and modifying the prede f ned

Acknowledgements

Council Research Grant NSC-99-2511-S-451-005-. We

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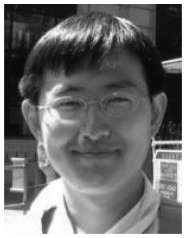
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