

# Effects of the Variety of Document Retrieval Methods on Interactive Information Access

-- An Experiment in the NTCIR-9 VisEx Task --

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## Research Question

How do different document retrieval methods provided by an information access environment influence the results and process of interactive information access?

## An Experiment in VisEx

Comparing the **baseline system** provided by the organizers with our experimental **UTLIS system**

**The baseline system**

only provides a common keyword-based retrieval method.

**The UTLIS system**

provides two retrieval methods in addition to keyword-based retrieval.

- **Narrowing-down** of obtained documents by specifying related place names and publication dates
- **Similarity-based retrieval**

## Data Analysis

### Report Analysis

No apparent difference between the baseline and the UTLIS system in the quantity of contents in the reports. The introduction of two additional document retrieval methods to the baseline did not make a large difference in retrieved articles.

Similarity to the baseline in terms of Retrieved Articles

		1	2	3	4	Avg
Event	Grid	0.48	0.28	0.50	0.57	0.46
	TM2011	0.44	0.41	0.70	0.75	0.57
	UTLIS	0.54	0.28	0.67	0.67	0.54
Trend	Grid	0.76	0.60	0.20	0.70	0.56
	UTLIS	0.72	0.66	0.38	0.79	0.64

Cosine measures between sets of articles collected and referred to in the reports

### Log Record Analysis

No significant difference between the baseline and the UTLIS system in time periods spent for result list examination, editing and so on.

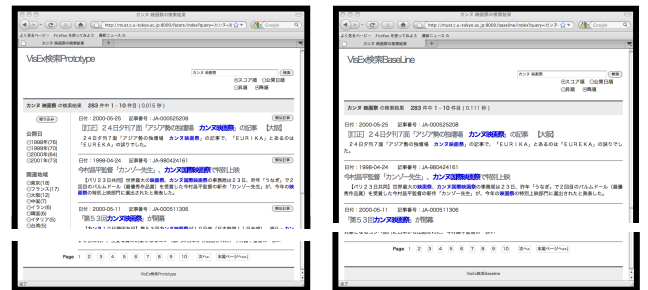
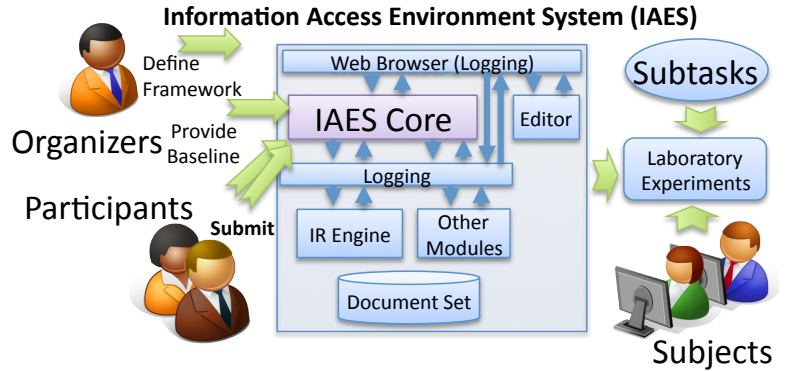
The distributions of retrieval related actions show large differences.

The number of times of keyword-based retrieval and page moves are much smaller for the UTLIS system than for the baseline.

In the UTLIS system, narrowing-down is used in both subtasks, while similarity-based retrieval is used mainly for the event collection subtask.

## Summary

- The additional document retrieval methods of narrowing-down and similarity-based retrieval were used as alternatives to keyword-based retrieval and sequential examination of result list pages.
- The functions were well accepted, but had little influence on the quantity and quality of information obtained.
- Narrowing-down supports a kind of systematic search in which the user sequentially checks articles obtained by keyword-based searches, according to the related place or date. It also encourage users to conduct such systematic searches.



## UTLIS System and Baseline System

### Questionnaire Analysis

The UTLIS system is clearly evaluated more highly than the baseline, suggesting that the additional methods were well accepted.

Evaluations of the Systems

		Usability	Functionality	Efficiency
Event	Baseline	5.8	4.0	4.0
	UTLIS	5.8	4.2	5.2
Trend	Baseline	4.0	3.4	3.2
	UTLIS	5.0	4.0	4.8

The averages for all the subjects on a seven-point Likert-type scale

Comparison of the Number of Retrieval Related Actions

Keyword-based Retrieval										Page Movement																	
		1			2			3			4					1			2			3			4		
		min	max	med	min	max	med	min	max	med	min	max	med			min	max	med	min	max	med	min	max	med	min	max	med
Event	Baseline	4	24	5	22	37	34	1	35	12	5	17	15	Event	Baseline	13	33	20	14	104	43	49	101	72	11	52	37
	UTLIS	1	5	4	2	10	9	1	7	4	1	8	1		UTLIS	0	26	6	0	62	36	14	125	39	10	39	17
Trend	Baseline	6	17	8	1	14	2	2	29	13	10	40	24	Trend	Baseline	1	25	5	1	54	3	4	46	13	2	109	17
	UTLIS	4	21	8	1	15	11	1	10	2	8	17	11		UTLIS	1	7	2	3	17	7	0	45	8	6	68	14

The Number of Retrieval Related Actions of the UTLIS Users

Narrowing-down Retrieval												Similarity-based Retrieval															
		1			2			3			4					1			2			3			4		
		min	max	med	min	max	med	min	max	med	min	max	med			min	max	med	min	max	med	min	max	med	min	max	med
Event	UTLIS	1	14	3	2	24	12	0	31	15	0	18	7	Event	UTLIS	2	22	9	5	12	8	1	8	5	1	9	6
	Trend	0	13	9	0	37	12	1	26	16	0	21	17		Trend	0	8	0	0	4	0	0	1	0	0	4	0