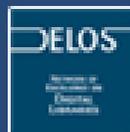# A new interaction evaluation framework for digital libraries

G. Tsakonas, S. Kapidakis, C. Papatheodorou

{gtsak, sarantos, papatheodor} @ionio.gr

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laboratory on digital libraries
and electronic publishing

Ionian University
Dept. of Archive & Library
Sciences

DELOS Network of Excellence on Digital Libraries

Presentation structure

Description of the interaction
- Components

-- Relationships

Interaction attributes

Requirements for the evaluation
- Who
-- What
--- Where
---- When
----- How

Conclusions

Description of the interaction

Components

- User

-- Content

--- System

System

Content

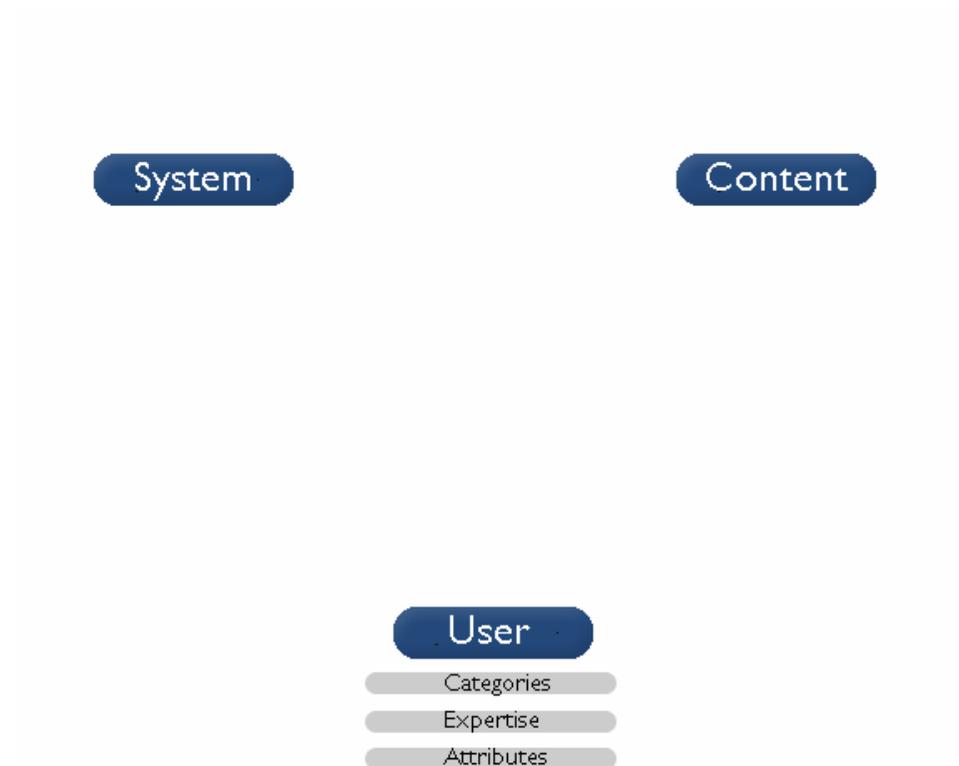User

User

- Categories

-- Expertise

--- Attributes

System

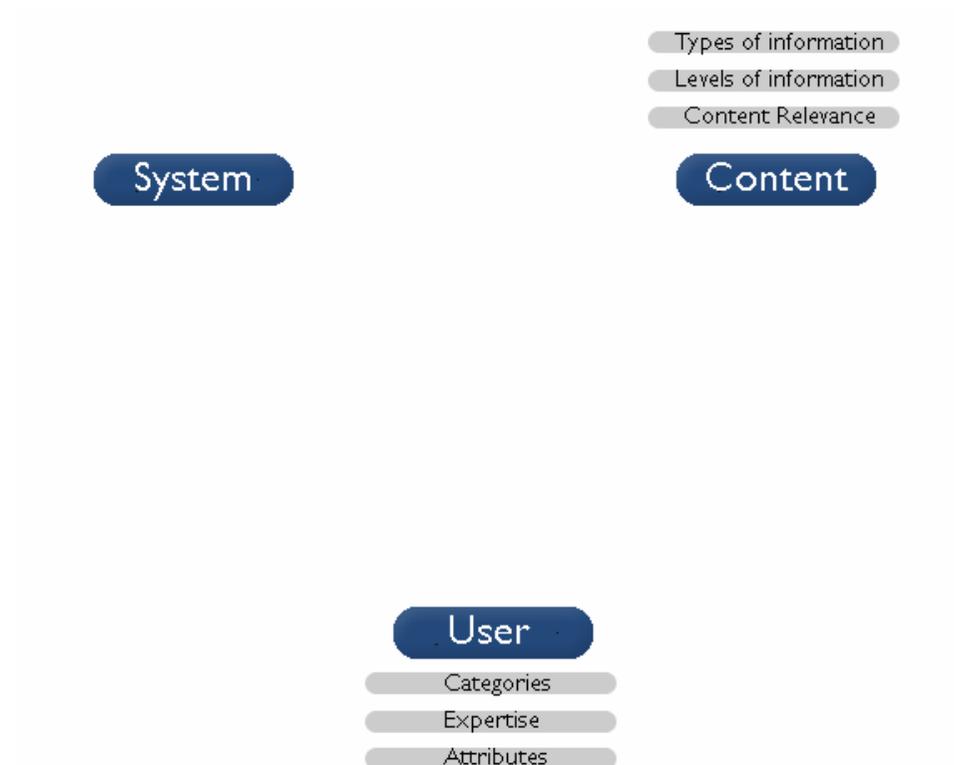Content

User

Categories
Expertise
Attributes

Content

- Types

-- Level

--- Content relevance

System

- Interface

-- Basic functionalities

--- Complemental functionalities

Complemental Functionalities

Basic Functionalities

Interface

System

Types of information

Levels of information

Content Relevance

Content

User

Categories

Expertise

Attributes

Description of the interaction

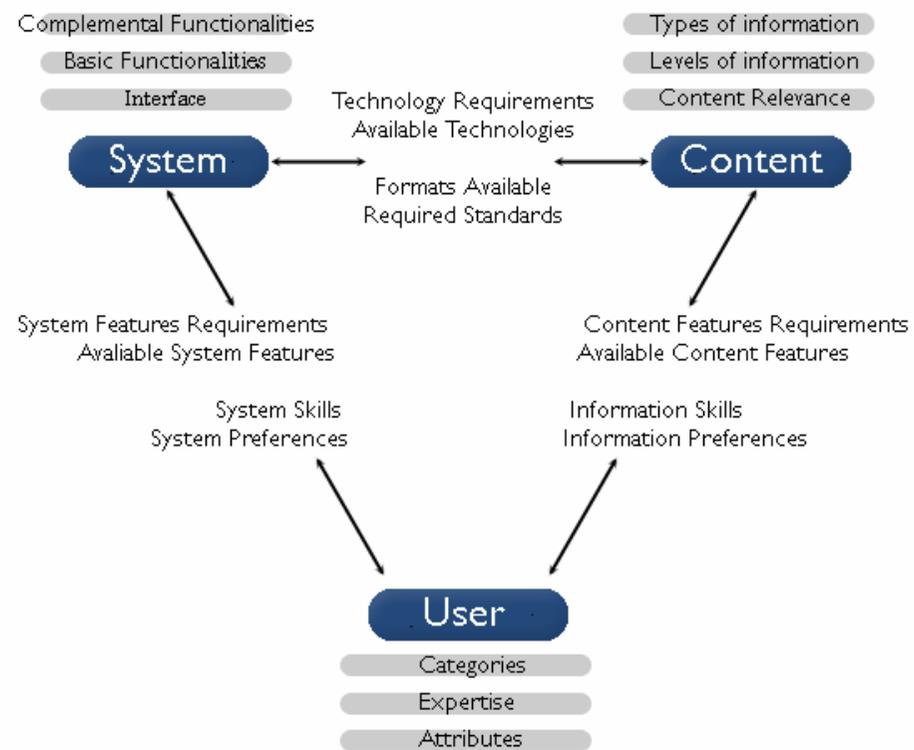## Relationships

- User

Skills and preferences (system and information)

-- Content

Required and available features

--- System

Required and available features

Interaction attributes

- Control

-- Shift management

--- Lucidity

Control

- Consistency

-- Error restriction

--- Familiarization

---- User awareness

Shift management

- Information shifts

-- System shifts

--- Flexibility

---- Serendipity

Lucidity

- Visibility

--

Affordances

Requirements

- Who

-- What

--- Where

---- When

----- How

Requirements

- Environment dictates requirements
e.g. existence of laboratory facilities

-- Requirements dictate methods
e.g. laboratory facilities lead to controlled observation

--- Methods dictate metrics
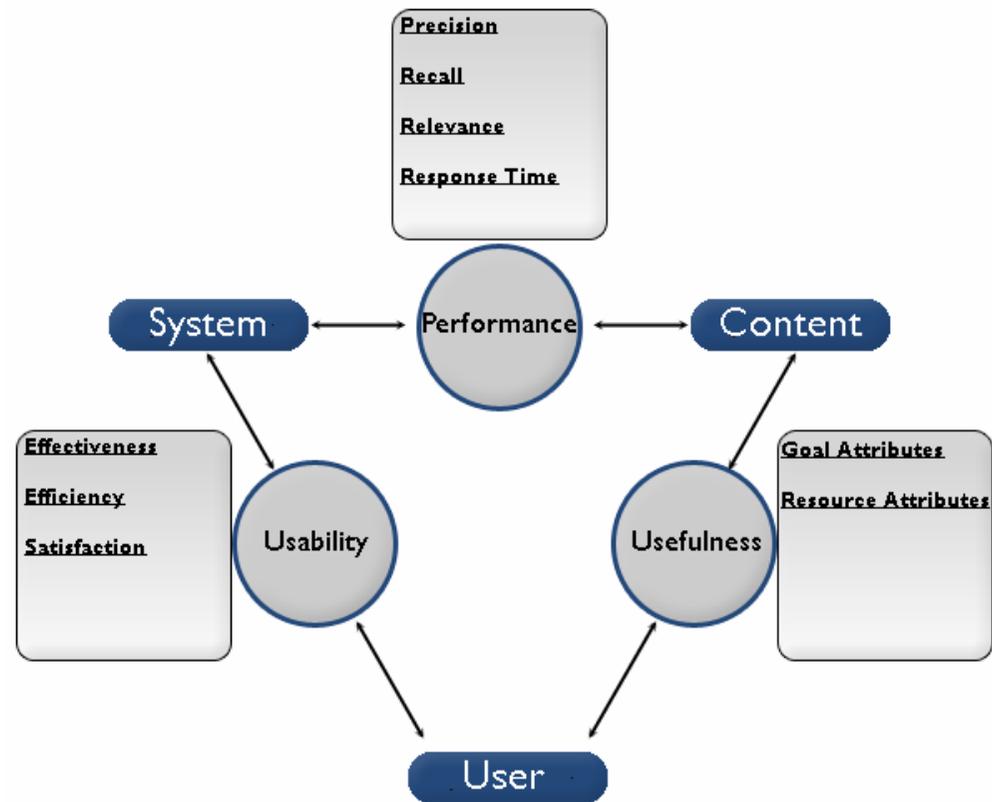e.g. observation leads to usability criteria

Who

- Developers

-- Users

--- Experts

What

- Usability

-- Usefulness

--- Performance

Usability	Effectiveness How effective can the user be?	User performance	Rates of accomplished tasks, rates of abandoned tasks, rates of serendipitous accomplishment of tasks
		Error generation	How many errors generated, types of errors, severity of errors, recovery time
	Efficiency How efficiently the user can accomplish his tasks?	Completion time	Completion time per task, use of support functionalities, e.g. FAQs, number of accomplished in a certain session
		Support requests	Number of questions, types of questions according to task.
		Task completion context	Time available, resources available.
	Satisfaction Does the interface and the IR mechanisms are satisfying the user?	Aesthetic comfort	Aesthetic appropriateness, visibility of interface.
		Readability	Opinions about writing style, clearness of texts, fonts contrast.

Usefulness	**Goal attributes** What attributes has the information need that affects the information retrieval and use?	**Relevance**	Topical relevance, situational relevance, appropriateness to the information need.
		Utility	Importance of the task to the information need, consequences of non accomplishment
		Complexity	Number of sub-tasks, order of execution, dictation of specific resources.
	Resource attributes Do the resources acquire quality attributes that attach to the information need?	**Currency**	User judgments of the timeliness of the resource. Suitability with the task.
		Level of information	Number of level choices, e.g. surrogating formats, number of chosen levels.
		Reliability	User judgments of the reliability of the authoring/publishing/ recommending agent.
		Format	User judgments about the format and the suitability to the task.

Performance	**Precision**	Division of the number of relevant documents by the number of those retrieved.
	Recall	Division of the number of relevant documents retrieved by the number of relevant documents
	Relevance	Similarity between the query term(s) and the documents.
	Response time	Time needed to perform a query and to present the results to the user.

Where

- Controlled environment
  - laboratories
-- User's real environment
  - observations
  -- systematic recording

When

- Formative
during the design

-- Summative
after the design

But most of all

--- Iterative

How

Method(s)		Criterion
Comparative analysis	➤	Resources attributes Usability
User studies	➤	User attributes (age, sex, role, skills, preferences).
Transaction log analysis	➤	User attributes (activity). Usability.
User scenarios/ Cognitive walkthroughs	➤	Goal attributes User effectiveness. User efficiency.
Questionnaires and surveys	➤	Goal attributes. Resource attributes. User satisfaction
Personal interviews and focus groups	➤	Goal attributes. Resource attributes. User satisfaction.
Expert participation methods - heuristic evaluation - formal usability testing - standards compatibility check	➤	Usability (effectiveness, efficiency, satisfaction).
Other user participation methods - critical incident reports - virtual reference	➤	Usability (effectiveness, efficiency, satisfaction). Resource attributes (currency, level, format etc)

Conclusions

- Invest of resources on sustainable user centered policy

-- Cooperation with other organizations, e.g. with laboratories

--- Participation in research programs

---- Testbed creation and experimentation