Part II – Creativity
This document should be considered within the SampLe infrastructure.

A Short Description

These is a set of concepts that contribute to creativity (and make the concept “creativity” concrete).
This set of concepts arises from the analysis of the way people come to a creative act. Each creative act is preceded by forming pre-inventive structures, examples of which are the concepts from the set.

The problem: how to realize these set of concepts within SampLe framework?

A Problem

Attempting to provide an author of multimedia presentation with more (the most) appropriate material can affect the author's ability of being creative.
Creativity often appears when different kinds of information are available, where an author can get irrelevant information together with relevant information. Unexpected results can trigger a new idea to appear.

Thus the problem is:
How to support creativity in the context of semi-automatic presentation generation process?

Motivation

Creativity support is still poorly investigated ([8], [11], [12]).
In order to facilitate creativity computer systems can:

- provide an environment and functionality (most of the systems do): concentrates more on interface issues (the emphasis is on facilitating non-creative tasks in order to give a chance for a creative idea to appear)
- support knowledge gathering, integration and thus idea generation (i want to address this aspect): concentrates more on the supporting processes (the emphasis is on stimulating creativity)

Connection with the previous work

Internally creativity support builds on processes operating with meta-data. Thus ideas and techniques developed in the Part I – Discourse ontology will develop even further. The work will describe and implement new techniques facilitating author's work in complex multimedia environments.

The Approach

1 definition(s): creativity (literature) + related work (theories and practices)

2 Which concepts support creativity?

2a creativity is supported by a set of concepts (see below)

2b describe where each concept is coming from

3 how to support realization of these concepts within a computer system (i. e. SampLe)?

3a how to express these concepts within a computer system?

3b which concepts should be supported in which tasks (when to prefer one

to another, combination of concepts)?

3c how to map: creative concept – annotations (+ supporting mechanisms)?

Theoretical Basis

1. It is possible to enhance creativity within a system because "constraints ... make creativity possible. ... The ascription of creativity always involves tacit or explicit reference to some specific generative system" [11, p.79]. But "This is not to deny that in the context of background constraints, randomness can sometimes contribute to creativity" [11, Ch 9].
2. Why is this a feasible idea: because "...the capacity for a creative thought is the rule rather than exception in human cognitive functioning" [12, p.189].
3. Why realization of these concepts will stimulate creative acts? - "Preinventive structures are internal precursors to the final externalized product of a creative act" [12, p.192]. Thus, if a system produces preinventive structures it should facilitate a creative act. "Examples of preinventive structures include symbolic visual patterns and diagrams, representations of three-dimensional objects and forms, mental blends of basic concepts, exemplars of novel or hypothetical categories, mental models representing physical or conceptual systems, and verbal combinations that give rise to new associations and insights. Which type of preinventive structure is more appropriate would depend on the nature of the task or problem."
4. There are a number of processes that are crucial for creativity. If a system leads a user towards such a process it can trigger a creative act as well. The examples of such processes are: extending concepts, recently activated knowledge (by analogy), conceptual combination, creative imagery [12, Ch.10].

To be extended with the description of existing mechanisms for realization of some of the concepts, specified below.

The Method

Scope: initially concentrate on the content selection part

Concepts which contribute to creativity (descriptions are not refined recently with regard to the new literature read, this was just the initial sketch):

contrast

Source: design principles [9],[12]

Definition: to contrast two items means to represent them in the way that highlights differences between them. On the conceptual level contrast is the notion of opposite. If 2 items have as different as possible values for attributes belonging to the one measurement they are considered being the opposite.

How to introduce in the system: derived from domain relations (add the notion of "opposite",+?)

Example:
the most representative "De Stijl" painting vs. the list representative one (the

one that violates the major principles of the movement)

Relation to creativity:
might give ideas in what direction an author wants to develop a story line (e.g. show different stylistic principles within the movement rather than just giving a story about the movement)

Used in task(s):
- exploration for selecting a topic
- building a presentation structure (a plot)
- material selection (building a story)

analogy

Source: the paper about scientific discoveries [3], [12], [11]

Definition: analogy is the ability to reflect previously known models to the new situations

How to introduce in the system: comes from a more global picture (looking through different presentations already created within the system)

Relation to creativity:
analogy is the basics of scientific thinking, scientific thinking is creative, thus analogy is the core of creativity:

Used in task(s):
- preparation stage (an author decides what kind of presentation (s)he would like to build), it should be possible to mark up the media items the author liked and might want to use as a material for his/her presentation. Then these items should appear at the appropriate sections during the material selection task
- building a presentation structure (the system could show various presentation structures for this topic and this genre)

association

Source:

Definition: Webster: something (as a feeling or recollection) associated in the mind with a particular person or thing <the thought of her childhood home always carried an *association* of loving warmth>
Synonyms connotation, hint, implication, overtone, suggestion, undertone
Related Word image, picture, vision; appearance, fantasy, illusion, mirage

A thought about one thing leads to a thought about something else.

How to introduce in the system:

Relation to creativity:

Used in task(s):
- building a presentation structure
- material collection

alternative

Source: [8] existing system for creativity support provide alternatives

Definition: alternative relationships can occur between media items or between different contents for one section within the presentation (both are called items further). Alternative can be defined as an ability of 2 or more items being interchangeable on the conceptual (their content) or media (different modalities) levels. Alternative is a choice not between random items but between the items appropriate for the particular situation (context = specific topic, specific presentation structure, [specific section]).

Summary: alternative is a relationship of interchangeability representing an appropriate choice.

How to introduce in the system:
media type: text vs. audio (to add “alt” relationship?)
discourse type: description vs. quote (what discourse concepts are analogical?)
domain: section: “De Stijl members and their works”:
talk about their styles vs. their roles within De Stijl
(different extension mechanisms or alternatives at the conceptual level: style – alt – role)

Relation to creativity: G.Wallas's creative process, preparation stage (creativity requires knowledge, providing alternatives can improve the situation where an author lacks knowledge)

Used in task(s):
- [building a presentation structure]
- material selection

combination

Source: [1] Definition of creativity:
“A simple definition of creativity is the action of combining previously uncombined elements”

Definition: combination is an act of creating new groups of items (grouping). Grouping is based on the particular attribute (or value). Then new (creative) combination means that an author found an attribute (value) that was never used before for grouping. The new grouping can violate previously set rules.

Example: apply a rarely used combination of modalities (rule violation) which particularly suits the case (attribute).

How to introduce in the system:

Relation to creativity: from the definition

Used in task(s):
material selection

interrelations

Source: [1] Definition of creativity:
"Another way of looking at creativity is as playing with the way things are interrelated"

Definition: introducing new relations within the set and between sets

Example:
- adding new relationships: painting – part (missing in the ontology)
- adding new relationships (missing in the annotations)
- without actually adding new relationships in a database place items in the presentation to show new relationships

How to introduce in the system:

Relation to creativity: from the definition

Used in task(s):
material selection

A Scenario

to be added soon

Evaluation

1 Conduct a test in which one group of users builds a presentation with SampLe without creativity support and another group builds a presentation with creativity support. Collect feed-back.

2 Count the amount of cases when users picked up the material (combinations, etc) suggested by the system and cases when they did not.

3 Ask a different group of people to judge (without telling them which presentations were built with which prototype) which presentations they find more creative (interesting, engaging etc.)

Contribution Is Expected In Fields

1 Creativity support in computer systems

2 Author support in complex multimedia environments

3 Discovery of new models and processes for meta-data manipulation

Literature List

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