Enhancing MECCA* for Movement Inspired Story-Telling (MIST): Conceptualization and Realization of an MPEG-7 based Story-Telling Environment

* Movie E-learning Combination and Categorization Application

Marc Spaniol
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Joint research with Nalin Sharda, Victoria University, Melbourne, Australia
Agenda

• Research setting & focus
  - Media-centric community IS development
  - MECCA: Media exploration, learning & teaching

• Creative/Artistic community processes
  - Non-linear digital story-telling
  - Movement Oriented Design (MOD)

• Movement Inspired Story-Telling (MIST)
  - Metadata management in non-linear digital story-telling
  - Story-telling with MPEG-7

• Conclusions

• Outlook
Motivation

• What do users want to have when they employ IS?
  - Financial and/or strategic benefit
  - Tools to play around

• What is MPEG-7 currently used for?
  - Management of “boring” multimedia contents
  - Specialized (mostly research oriented) information systems

• What are other application scenarios for MPEG-7?
  - Organizational memories
  - Creative/Artistic community processes

⇒ Non-linear MM Story-Telling!
Research setting & focus

- Collaborative research center  
  „Media and cultural Communication“  
  Universities: Aachen, Bochum, Bonn and Cologne since 1999

- Interdisciplinary project composition:
  - German language studies  - Linguists  
  - Psychologists  - Musicology  
  - Film studies  - History  
  - Ethnology  - Computer Science

⇒ Research on impact of media in IS development
MECCA

Movie E-learning Combination and Categorization Application

• Media exploration in MECCA via:
  - Ontology driven Media screenings („Semantic zapping“)
  - Relationships between media („Hypermedia graphs“)
  - Combinable and annotatable multimedia artifacts („Media collections“)

Java / JMF
eXist XML-DB
central FTP-Server for media
Media-centric learning/teaching

- Media exploration and corpus extensions possible
- Continuous discourses
- Media-centric tasks
- Creation of tasks possible for all community members
- Collaboration with others via hypermedia documents
Media-centric community IS development

• Combining discursive and non-discourse functioning by means of information systems
  - Comment, review and discourse support
  - Structuring and classifying media artifacts
  - Individual and community collections
  - Domain specific context sets
  - E-Learning with hypermedia documents

• Central repository for anytime & anywhere access

• Multimedia metadata compliance

⇒ Media-centric community IS
  - MECCA: MM screenings
  - MEDINA: Collaborative MM repositories
  - MARS: Electroacoustic music annotation

How to support creative/artistic community processes?

Non-linear MM Story-Telling!
Non-linear multimedia story-telling

“Digital Storytelling uses digital media to create media-rich stories to tell, share and to preserve. Digital stories derive their power through weaving images, music, narrative and voice together, thereby giving deep dimension and vivid color to characters, situations, and insights.”

Digital Storytelling Association
(http://dsaweb.org)

- Tell: Experiencing & Navigating MM stories
- Share: Web-based collaboration
- Preserve: DB driven storage of contents
Movement Oriented Design (MOD)

• Motivation
  - Decomposition of a problem into (sub-) problems ("Author’s intention")

• Structure
  - Story
  - (Composed) Story Units
  - Atomic elements (Movements)
  - Decomposition of stories into: Begin, Middle, End (BME)
    ⇒ Recursions possible!

• Aim
  - Satisfying the recipient’s "Emotional Movement"
Movement Inspired Story-Telling (MIST)

- Combining
  - MOD structure
  - Non-linear navigation paths
  - Digital media

- Community-based story creation & consumption
  - Central story server (eXist-DB)
  - Media sharing via FTP
  - Java clients
Metadata management in non-linear digital story-telling

- Problem hierarchy
- MOD
  - Story
  - Composed Story Units (CSU)
  - Story Units (SU)
  - Movements (M)
- Media linked with Movements
  - “Agents of Action“
  - “Places”
  - “Objects”
  - “Time”

Plot

Story-Board

Contents
Story-Telling with MPEG-7 (I)

- **Story**
  - Problem hierarchy
  - Solutions “connected” with media

- **MOD structure**
  - Begin, Middle, End elements
  - Non-linear transitions
  - Movements linked with media

- **Media**
  - Key elements in the story perception
  - Semantic “high-level” annotation (conversion to DC available)
Story-Telling with MPEG-7 (II)

Audiovisual features (MPEG-7)

Title (DC)
Subject/Keywords (DC)
Description (DC)
Date (DC)
Identifier (DC)
Source (DC)
Language (DC)
Relation (DC)
Coverage (DC)
Rights (DC)

"Media"

"Classification Scheme"

"Places"
SemanticPlaceType

"Objects"
ObjectType

"Time"
SemanticTimeType

"Agents of Action"
AgentObjectType

Type (DC)
Format (DC)
Role (MPEG-7)
Creator (DC)
Publisher (DC)
Contributor (DC)
Story-Boarding

- Creation of non-linear multimedia stories
- Definition of story paths according to BME
- Linkage of story elements with multimedia contents

Graph Visualization

Container Visualization
MIST-Editor: Story Creation

Plot

Story-Board

Contents

Semantic annotations
MIST-Viewer: Story Consumption

Media Navigation

Media Player

Emotional Movement
Conclusions

• First ever implementation of the MOD paradigm

• Validation of stories missing:
  - Are all (sub-)problems solved in any paths?
  - Are all potential stories “BME-valid”?

• Story & media analysis
  - How to create „good“ stories?
  - Which „agents“, „places“, etc. are involved?
  - Are „some“ media better than others?
Outlook

- Graph medial (network) analysis
- Web-Service implementation of MIST
- Complete Integration into MECCA
- User modeling
- MPEG-21
  - Mobile end-devices
  - Rights management
- New application domains
  - Cultural heritage
  - E-Tourism

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