LMU LUDWIG-MAXIMILIANS-UNIVERSITÄT MÜNCHEN

LFE Medieninformatik • Raluca Vlad

Interactive Displays for Creativity Support

Medieninformatik Hauptseminar
Sommersemester 2009
„Interactive Surfaces“

Goal

Supporting creativity using large interactive displays

www.microsoft.com

Questions that arise

- Can creativity be supported by tools, such as large interactive displays?
- Which such tools do already exist?
- How is creativity support measured?
- Are they successful?

Content

1. Definition of creativity
2. Model to support creativity
3. Technological background
4. Systems to support creativity
5. Recapitulation

1. Definition of creativity

Creativity is the capacity of man to process information, so that new ideas and useful work are the result.

Three perspectives on creativity:

- **Inspirationalists**: plead for the break-through idea
- **Structuralists**: focus on methods and analysis
- **Situationalists**: focus on mentors and peers to facilitate exchange of information

2. Ben Shneiderman‘s Genex Framework

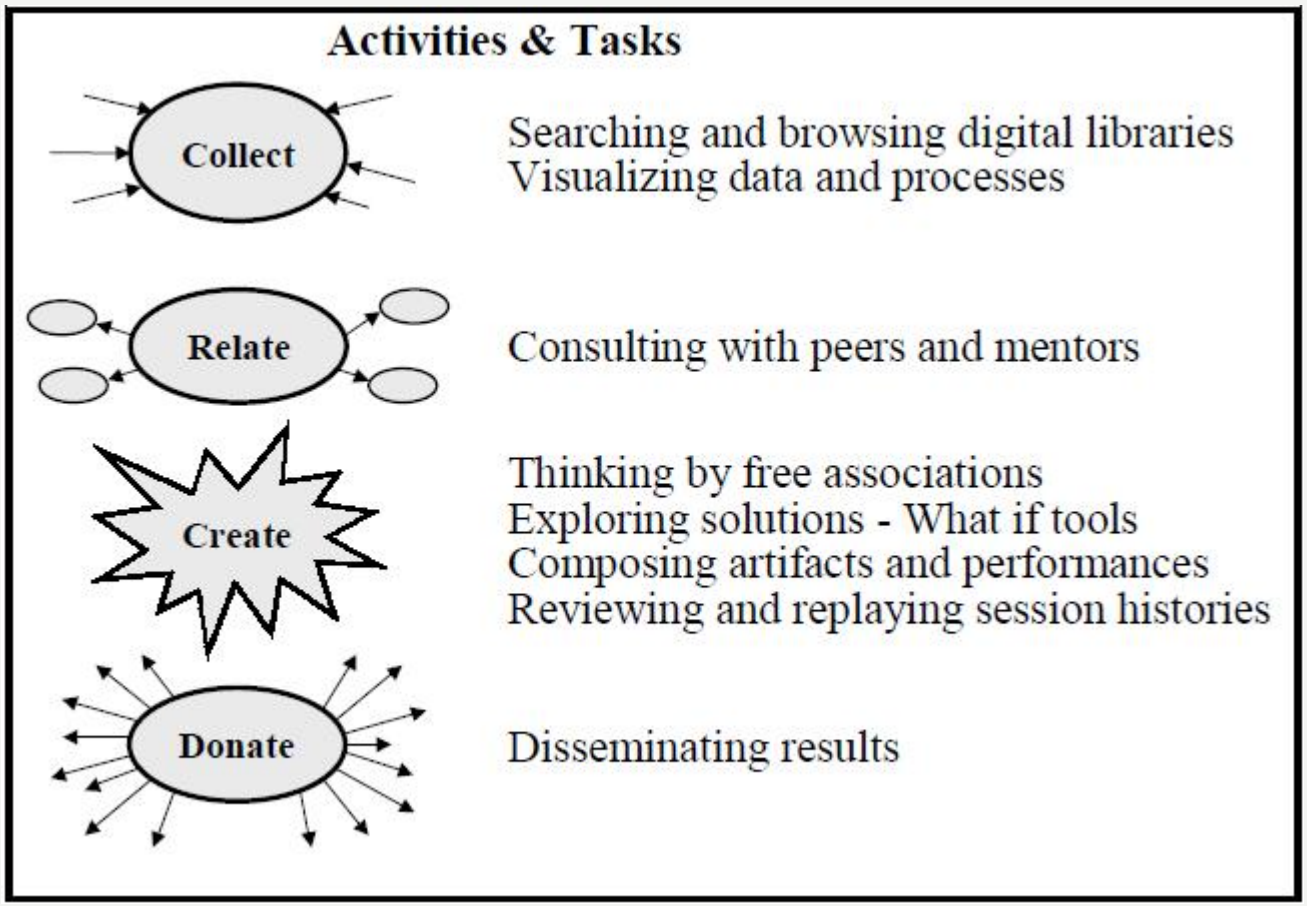
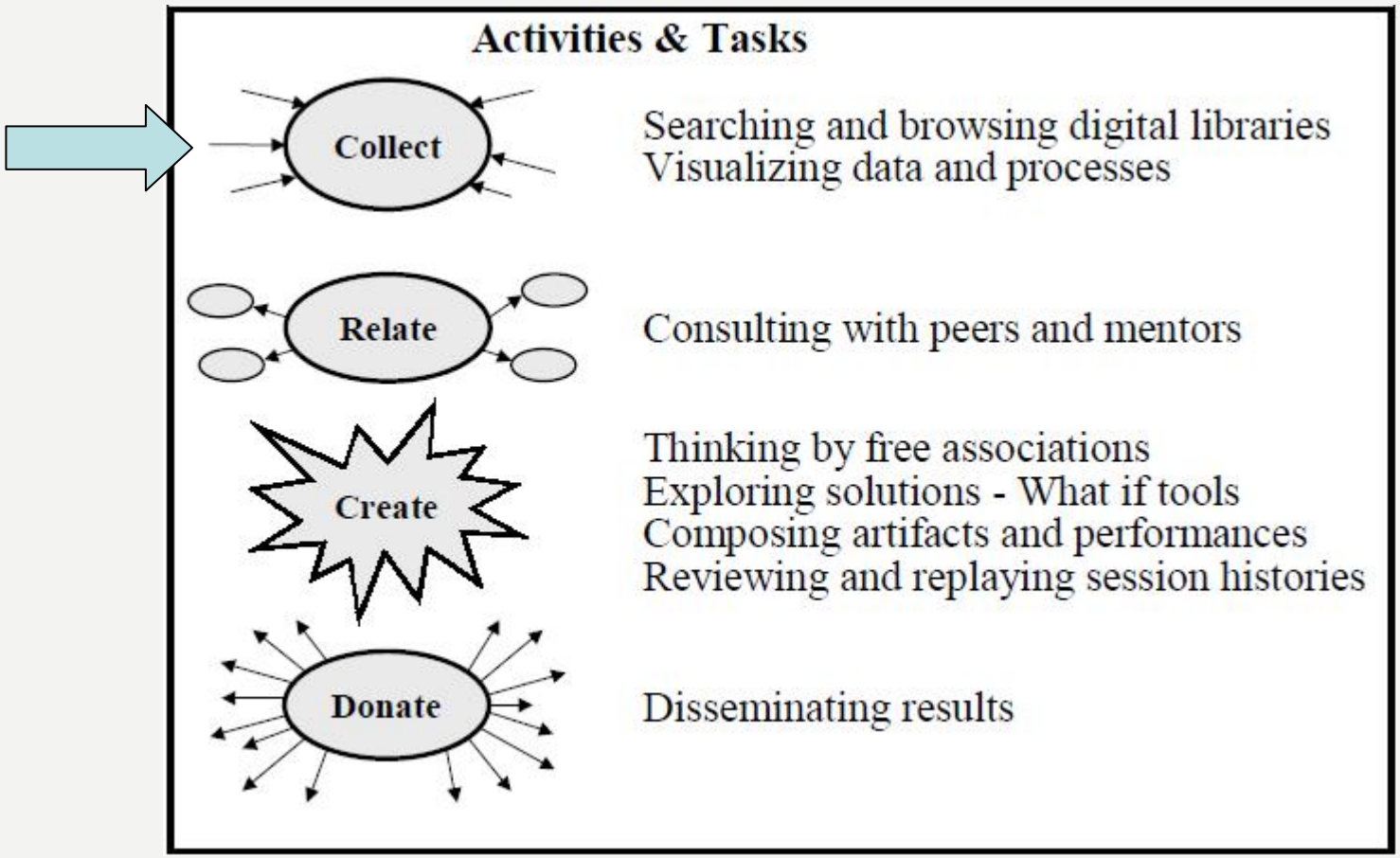


Fig. 1 - Genex Framework

2. Ben Shneiderman‘s Genex Framework



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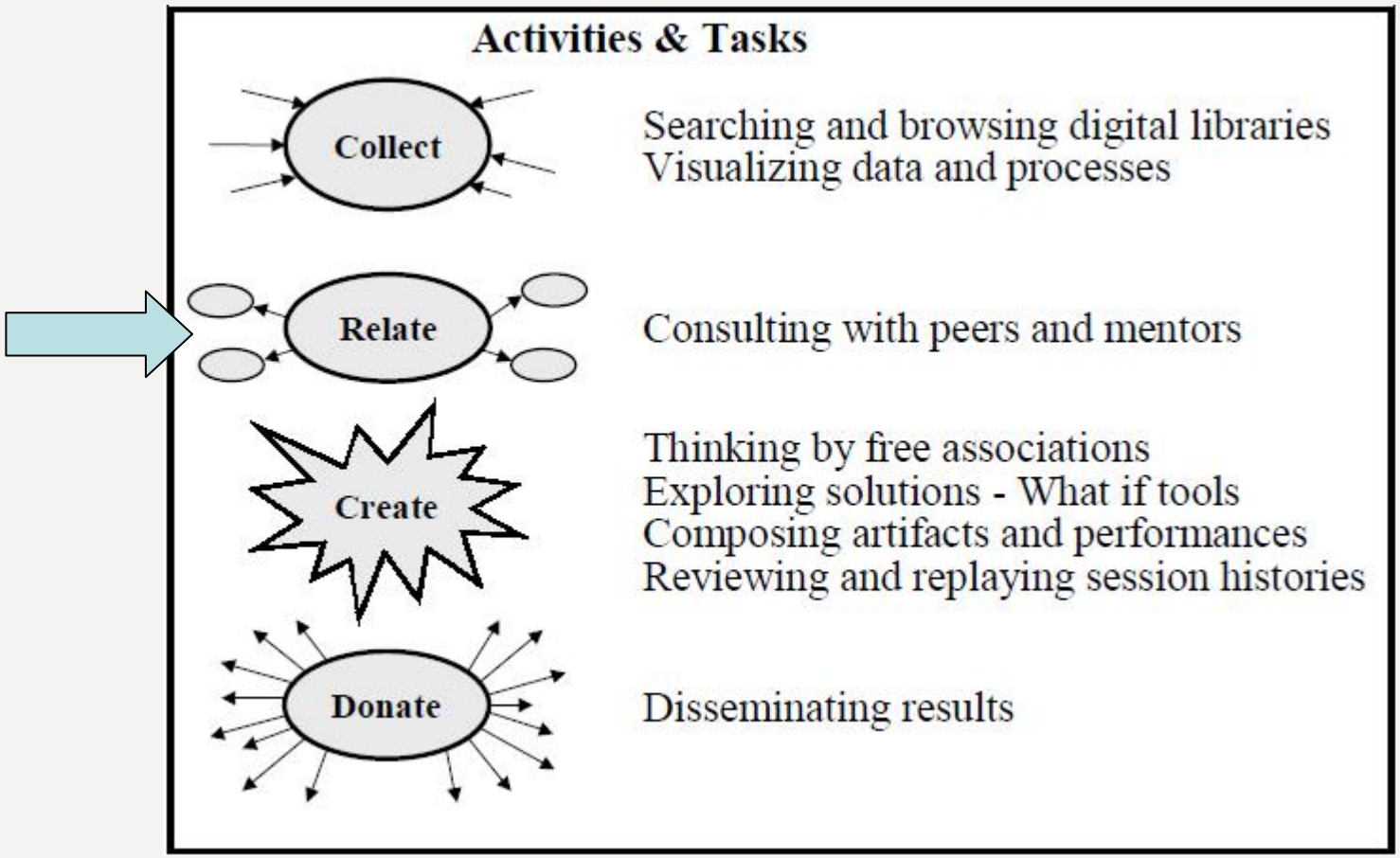

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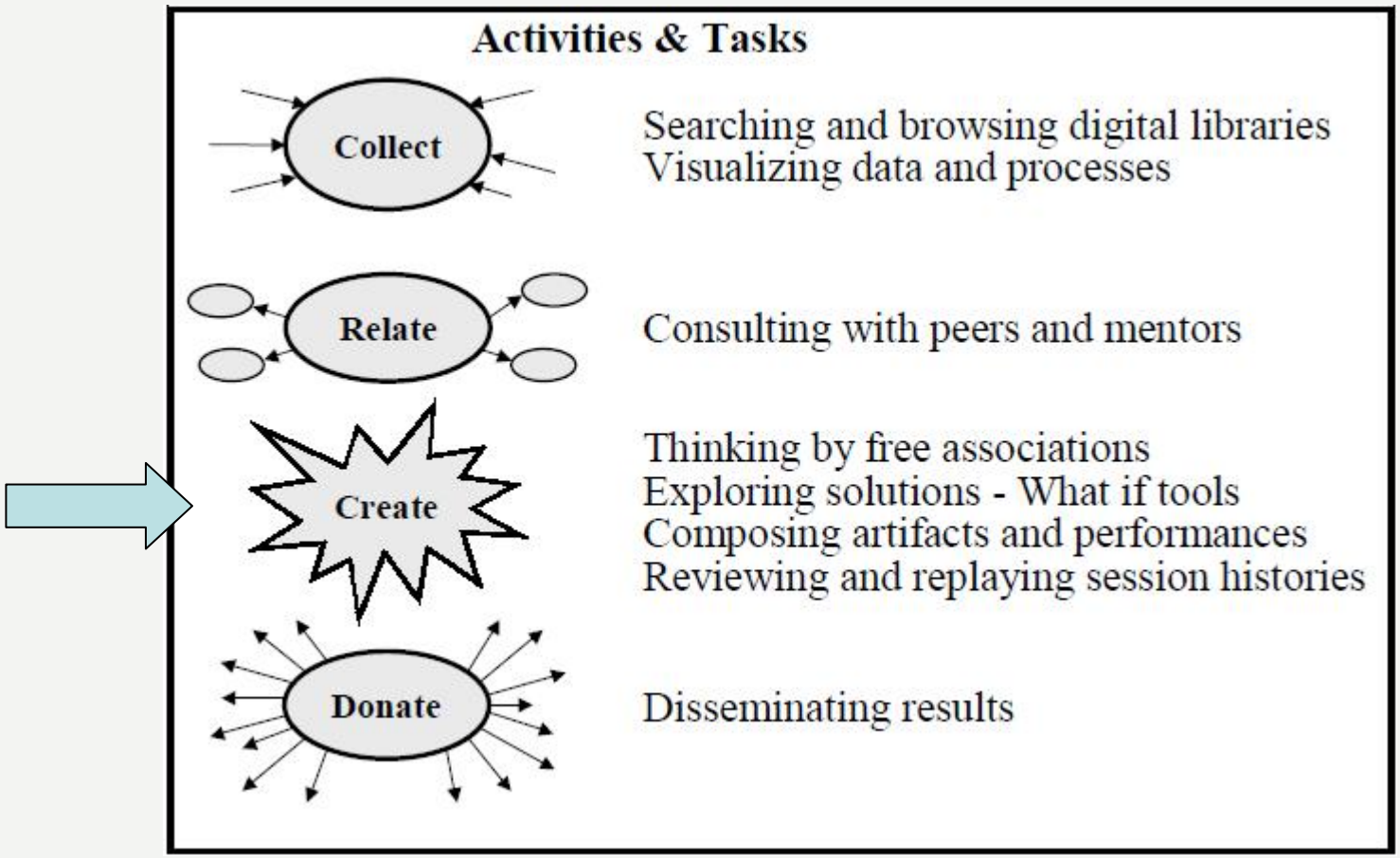

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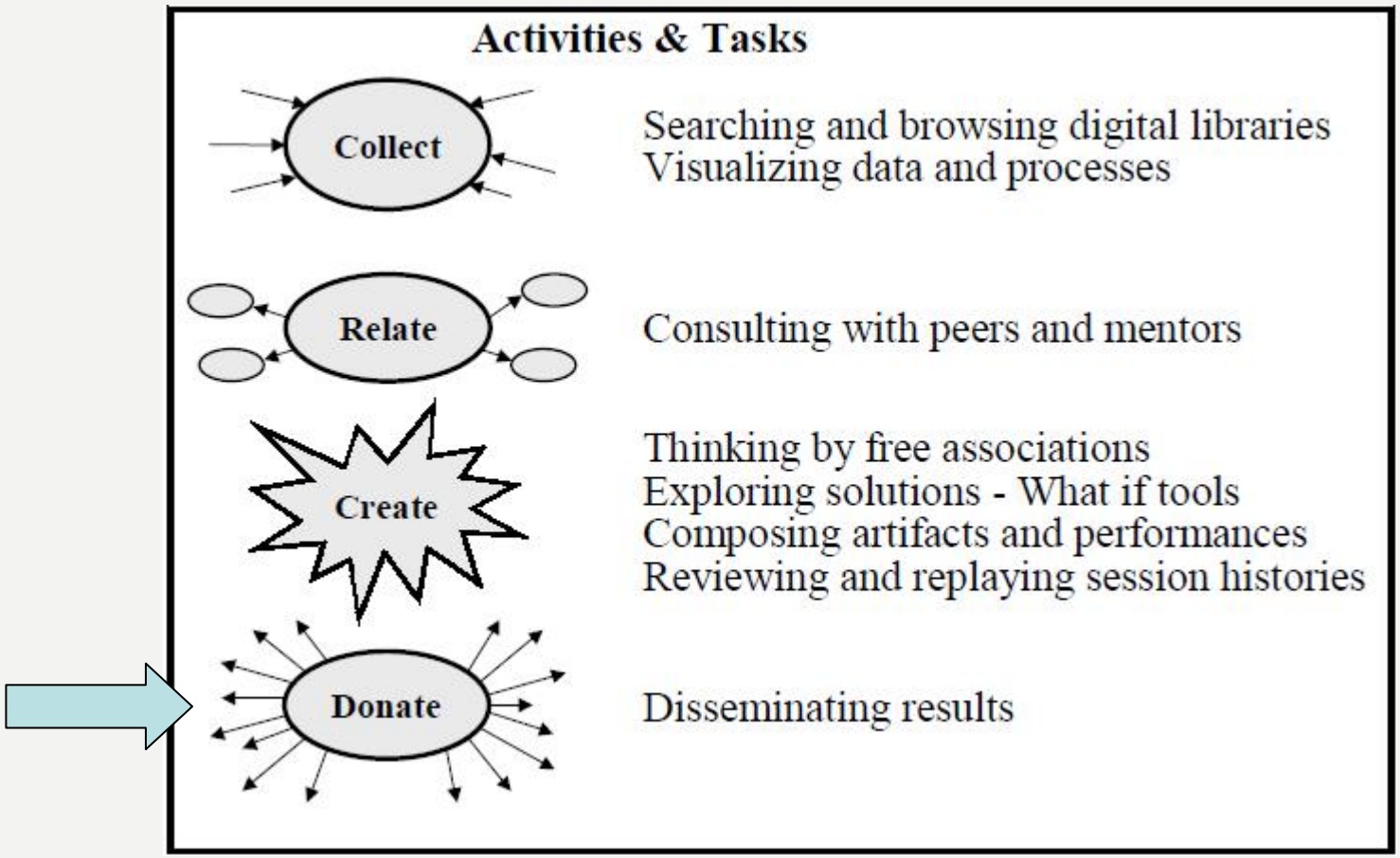

Fig. 1 - Genex Framework

3. Technological support

- **Vertical displays:** wall-mounted displays to present and share information
- **Horizontal displays:** tabletops serve for individual and co-located work
- Interaction with large displays laptops, objects, gestures

www.ipsi.fraunhofer.de

4. Systems to support creativity

- Portfolio Wall
- Brainstorming system
- Creativity in art history
- WeSpace

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4. Systems to support creativity: Portfolio Wall

- System supporting the early design phase in automotive area
- Supports discussion and improvement on sketches
- Use of digital wall display

Fig. 2 - Portfolio Wall (General Motors)

4. Systems to support creativity: Portfolio Wall

Video 1 – Portfolio Wall

4. Systems to support creativity: Portfolio Wall

- **Supported phases:**
  - → **Relate:** discussing and refining of ideas based on shared sketches
  - → **Create:** re-evaluating previous ideas by returning to earlier sketches

- **Results:** information more visible and accessible

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4. Systems to support creativity: Brainstorming

- Study on system that supports brainstorming
- Goal: Determining the influence of the digital system on the creative process in comparison to the manual paper-based method
- Use of wall display and tabletop

Fig. 3 System to support brainstorming (Media Informatics - LMU Munich)

4. Systems to support creativity: Brainstorming

- **Supported phases:**
  - → **Relate:** Visualization of post-its and support for logical grouping and relating
  - → **Create:** Supports associative thinking

- **Measurements:**
  - → Quantitative evaluation: Counting ideas
  - → Collaborative process: Search for idea-chains
  - → Subjective quality: Questionnaires

4. Systems to support creativity: Brainstorming

- **Results for digital system:**

  → Equal number of ideas compared to traditional method
  → High acceptance of gestural interaction
  → Subjectively improved quality of ideas, decreased communication

  Overall: 80% preference for digital system

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4. Systems to support creativity: Art history

- System used in iconography
- Goal: Description and interpretation of picture motives
- Use of a tabletop with semi-transparent area and tangible cards

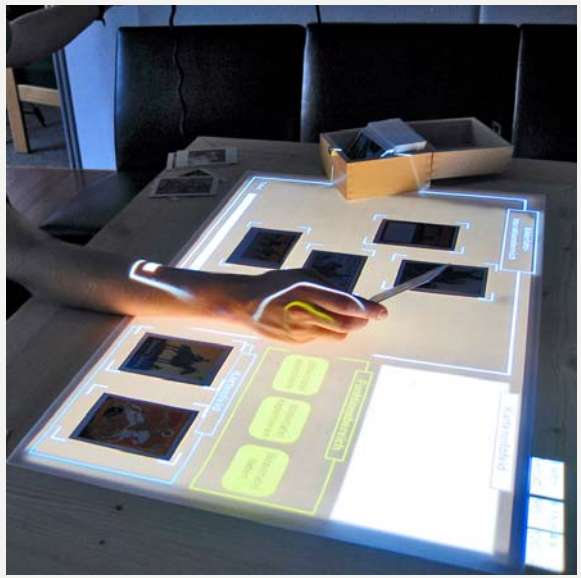

Fig. 4 System to support creativity in art history

4. Systems to support creativity: Art history

- **Supported phases:**
  - → **Create**: Enabling composition of artefacts
  - → **Donate**: Possibility to upload the work for public purpose

- **Measurement:** Thinking aloud technique

- **Results:**
  - → Very agreeable
  - → Tasks easily solved
  - → Technology never interfering with work

4. Systems to support creativity

- Portfolio Wall
- Brainstorming system
- Creativity in art history
- WeSpace

4. Systems to support creativity: WeSpace

- System used by scientific group of astrophysicists
- Goal: Collaborative exploration of large amounts of data
- Use of tabletops, data walls, laptops

Fig. 5 – WeSpace
(COMPLETE Group - Harvard University Cambridge)

4. Systems to support creativity: WeSpace

Video 2 – WeSpace

4. Systems to support creativity: WeSpace

- **Supported phase:**
  - → **Relate:** Sophisticated methods for comparative astrophysical image analysis
- **Measurements:** Subjective review of the participants
- **Results:** WeSpace features aided in finding new discoveries, leading to publication of papers

5. Closing the circle: Perspectives on creativity

- **The Inspirationalists**
  - → Brainstorming: Supporting divergent thinking to break existing mind set
- **The Situationalists**
  - → WeSpace: Enables relating of data sets for group expertise and aids comparing the visualizations

5. Closing the circle: Perspectives on creativity

- **The Structuralists**

  → Art History: Supports composition of artefacts in a methodical way

  → Portfolio Wall: Supports step-by-step exploration, facilitates history functions, applying changes and re-starting

Thank you for your attention!

Bibliography

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Fig: 2: Portfolio Wall
W. Buxton, G. Fitzmaurice, R. Balakrishnan, and G. Kurtenbach. Large displays in automotive design. IEEE Comput. Graph. Appl., 20(4):68–75, 2000.

Fig: 3: System to support brainstorming
O. Hilliges, L. Terrenghi, S. Boring, D. Kim, H. Richter, and A. Butz. Designing for collaborative creative problem solving. In C&C ’07: Proceedings of the 6th ACM SIGCHI conference on Creativity & cognition, pages 137–146, New York, NY, USA, 2007. ACM.

Fig. 4. System to support creativity in art history
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Fig: 5: WeSpace
D. Wigdor, H. Jiang, C. Forlines, M. Borkin, and C. Shen. Wespace: the design development and deployment of a walk-up and share multisurface visual collaboration system. In CHI ’09: Proceedings of the 27th international conference on Human factors in computing systems, pages 1237–1246, New York, NY, USA, 2009. ACM.

Video 1 - Portfolio Wall:
http://iic.harvard.edu/research/scientists-discovery-room-lab-sdr-lab

Video 2 –WeSpace:
http://www.youtube.com/watch?v=crcCE7MsGLY