DESIGN BRAINSTORMING

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Brainstorming

- Collaborative process for generating, collecting and filtering ideas
  - environments that facilitate this process

- 'board/sketch' type environments
  - initial phase collaborative design
  - multi-user design environments
  - Synchronous/Asynchronous

Multilevel systems in design

- Design is presented as an iterative top-down and bottom-up process that induces the emergence of desirable properties

  – Analysis
  – Abstraction
  – Synthesis

Analysis :: Top-down :: Gestalt

- Analysis is the resolution of anything complex into its elements and the study of these elements and of their interrelationships. It calls for identification, definition, structuring and arrangement. The acquired information is transformed into knowledge.
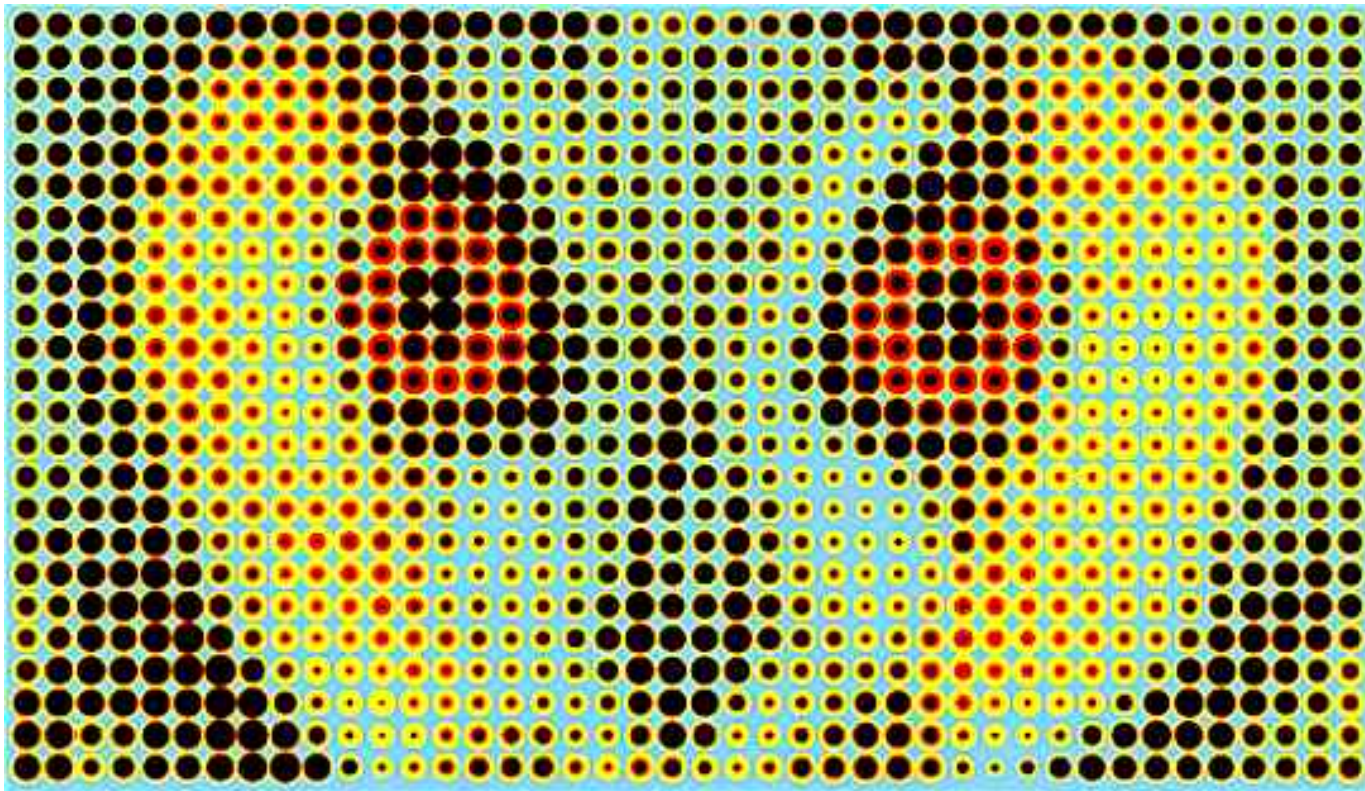
Synthesis :: Bottom-up :: Seed

- Synthesis is the putting together of parts or elements to produce new effects and to demonstrate that these effects create an overall order. It involves search and discovery, and also composition and combination.

Abstraction

- Abstraction gives the possibility of finding a higher level interrelationship, that is, one which is more generic and comprehensive. Such a process reduces complexity and emphasizes the essential characteristics of the problem and thereby provides an opportunity to search for and find other solutions containing the identified characteristics. At the same time new structures emerge in the minds of designers and these assist with the organization and retrieval of the many ideas and representations.
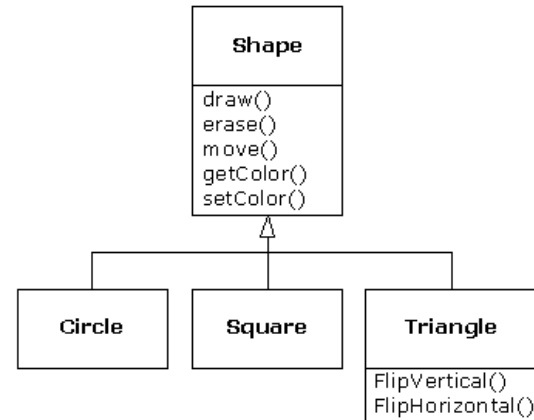
Early Phase Design

- Early design representation and strategies
  - We sketch
  - We talk
  - We make models
  - All these efforts are to externalize designers' thoughts and share with others even with oneself
- Context for computer supported collaborative design

Guggenheim Museum Bilbao, North Elevation

Catia rendering
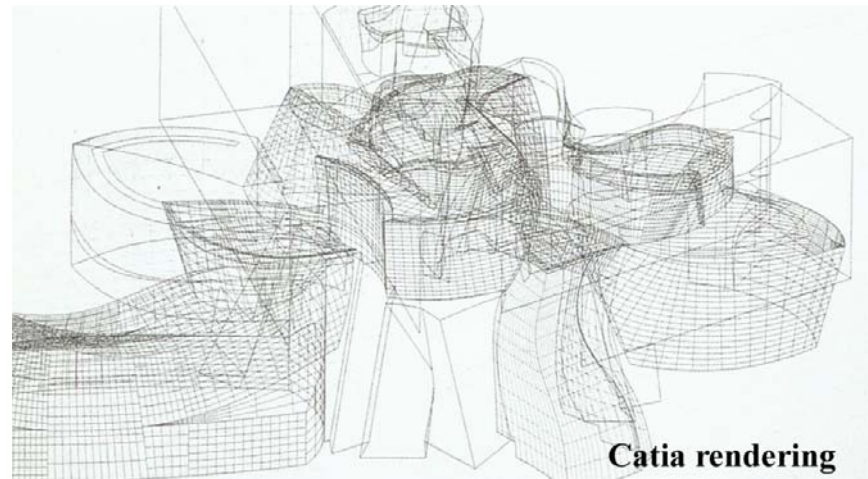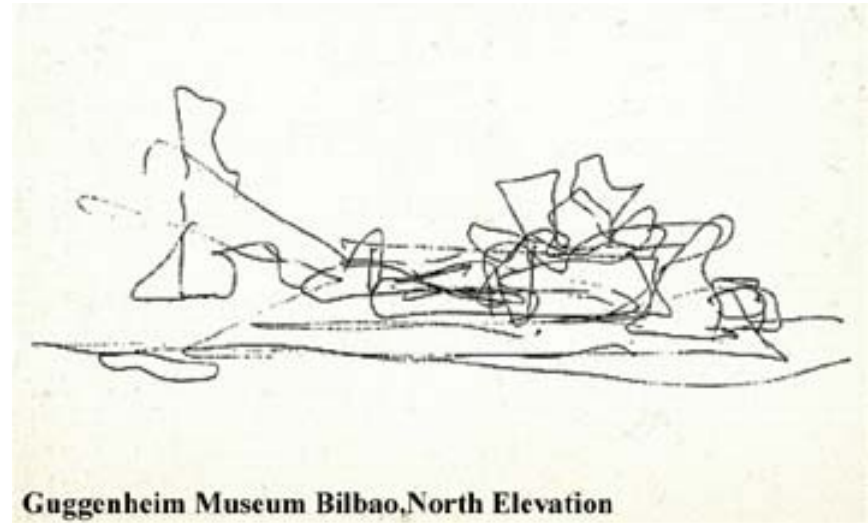
Design Brainstorming

- Rules of brainstorming
  - No idea is a bad idea
  - Be creative
  - Take risks and be brave
  - No criticism allowed, no comment until later
  - Record, don't discuss
  - Feed off and expand on other people's idea
- Transforming any object into something new
  - Substitution
  - Modify
  - Combine
  - Put to other users
  - Adapt
  - Minify or eliminate
  - Magnify
  - Rearrange
  - reverse

Experimental Design

- Two experiments: **synchronous, localized, short-term** brainstorming.

- **Improvisatory** nature.

- Individuals had some **domain knowledge** of brainstorming.

- Start with individual brainstorming, then presentations, then group brainstorming, then group idea reduction.

- Support **audiovisual** communication, especially during group brainstorming.

- Support different kinds of representation **media** (text, various sizes post-its).

- Support note taking **distinct** from sketches.

- Support colors insofar as it tracks each individual's **contributions**.

- Support **observation** of other individuals during individual brainstorming.

- Support constant **feedback loops**.

- Support the presence of a **moderator** to maintain discussion focus.

- Support **rapid iterative** drafting.

- Support a **public workspace** (whiteboard) in addition to **private workspaces** (desk).

Virtual Environments
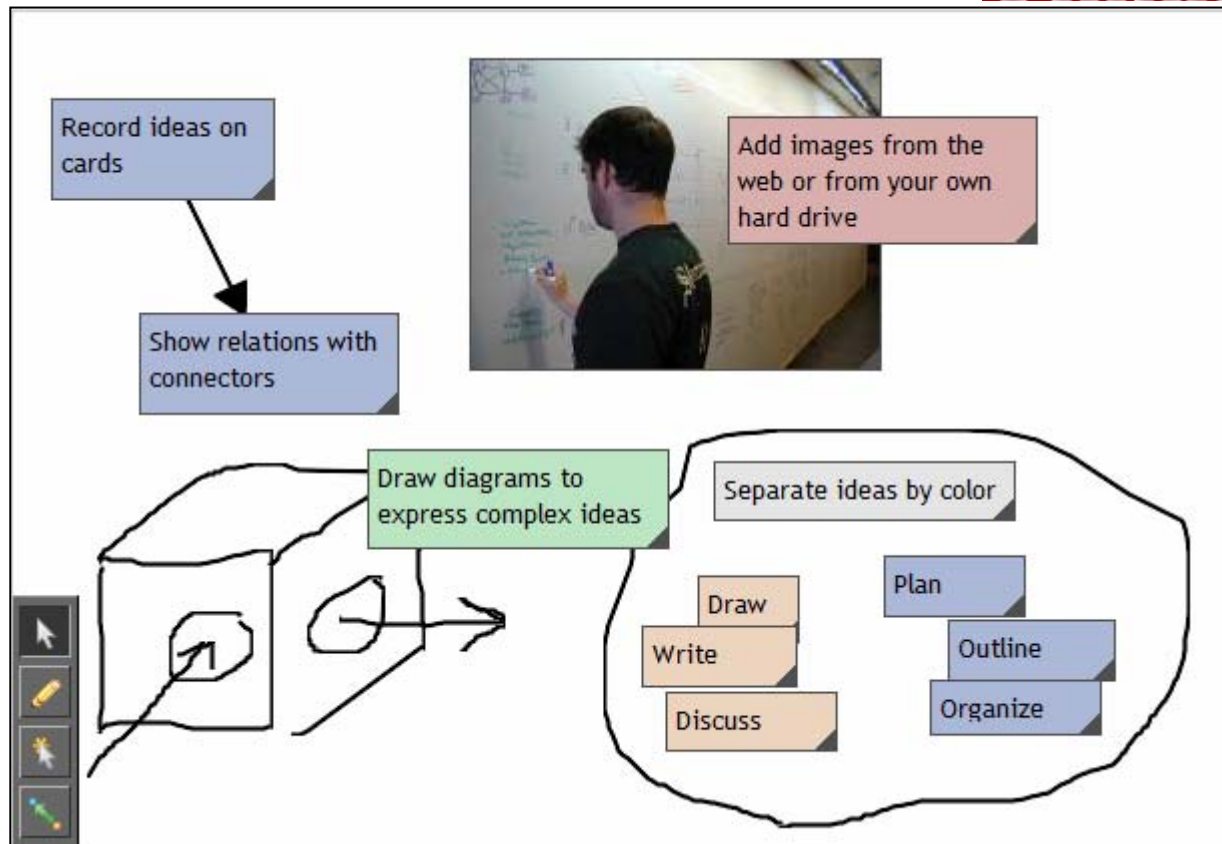
- Single online workspace.
- Text chat, voice chat, uploads, sketches.
- Associations (aka. relations).

Virtual Environments

- Private and Public workspaces.
- Notes, sketches, sharing images and files.

Virtual Environments

•Simultaneous Private and Public workspaces.

•Flexible backgrounds, representations.

Virtual Environments

- Conferences, streaming.
- Documents for review.
- Multiple sessions.
- Versioning.

Analysis

- Feature rich applications

- Web 2.0 "certified"

- Verdict - klutzy !

Analysis

- Web apps still miles away from the "Desktop Experience"
- Synchronous and Asynchronous features
  - Whiteboard conference
  - wiki

Whiteboard conference - skype

- Real-time interactive whiteboard for multiple users
- Voice and video
- Synchronization + offline
- Save and load work

Wiki's

- A Glorified Whiteboard (http://www.edutopia.org/1756)
- Incubator phase – seeding
- Idea/opinion polling - evolutionary growth
- Moderation - reseeding

Wiki's - features

Wiki Characteristic	Useful to Brainstorm?
Good for sharing information.	Yes
Easy to track progress.	Yes
Easy to track user contributions.	Yes
Easy to use and set up.	Yes
Good for organizing ideas and notes.	Yes
Adaptable to change.	Yes
Suitable medium for discussion.	Yes
Easy to assimilate context.	Maybe
Continuous information sharing.	Yes
Distributed maintenance.	Maybe
They are flexible.	Yes

Discussion