

# Collaborative Visualization

CSCW Fall 2015

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# Collaborative Visualization

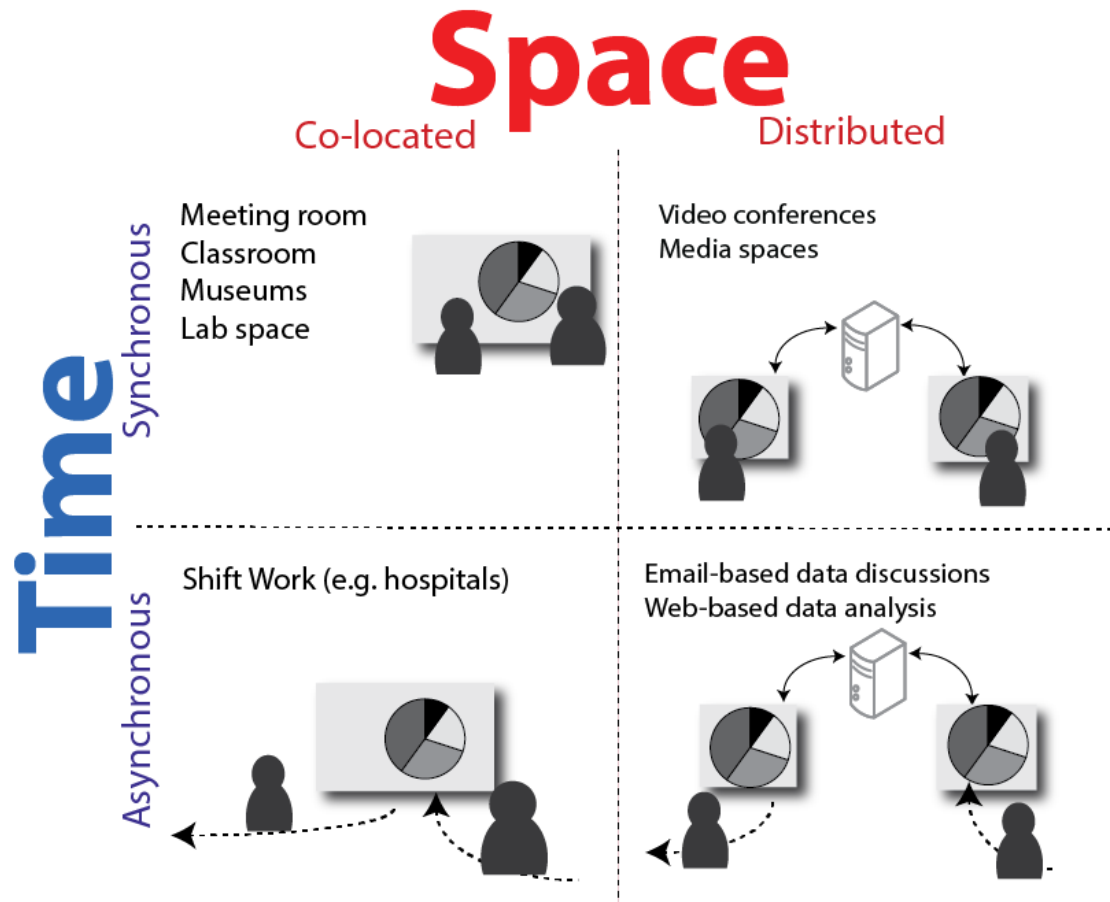
- Visualization exploits an individual's visual perception to facilitate cognition
- Visualization can support **sensemaking**
- Sensemaking is often a **social process**
- Visualizations should be a “social space”
- Many systems tend to support analysis, deliberation and story telling

# Group explorations of data: desired features?

- Need to support group interactions, discussion
- Sharing, pointing, linking and embedding resources
- Traceability of decisions
- Storytelling
- Support newcomers

# From your blog posts...

Collaborative visualization can occur in many scenarios de-lineated according to space and time.



<b>Aspect</b>	<b>Collaborative Visualization Challenge</b>
Users	Multiple Participants, domain specific e.g. multiple software developers
Tasks	Collaborative activity centric e.g. pair software analysis
Cognition	Collaborative foraging and collaborative sensemaking e.g. mining software for increased understanding
Results	Consensus, shared insight e.g. what parts of a system need refactoring
Interaction	Multiple inputs e.g. how to design systems to avoid interaction conflicts
Visual Representations	Multiple displays, novel display, and input technology e.g. different views of a software system like structure and evolution
Evaluation	Social interaction e.g. how to evaluate the possible additional insights or the group learning effect that can be achieved using such a system

(taken from: <https://softvis.wordpress.com/2012/01/18/collaborative-visualization-definition-challenges-and-research-agenda/> )

# The power of interactive visualizations:

- Hans Rosling video, social data visualization:  
<http://www.youtube.com/watch?v=jbkSRLYSojo>
- Sandbox (submitted in the blog, thank you):  
[https://www.youtube.com/watch?t=4&v=ha0PO\\_ONPQ](https://www.youtube.com/watch?t=4&v=ha0PO_ONPQ)
- Collaborative visualization of scientific data in a VR environment:  
<http://www.youtube.com/watch?v=B4g9J-aSF-c>

# Now pay attention!

## 1. **Crowdsourcing social data analysis**

- Video: <https://vimeo.com/36378130>
- Paper: <http://vis.stanford.edu/papers/crowd-analytics>

## 2. **Comment space**, structured comments:

- Video: <https://vimeo.com/19275098>
- Paper: <http://vis.stanford.edu/papers/commentspace>

## 3. **Many eyes**, collaborative analytics:

- Video: [https://www.youtube.com/watch?v=g91\\_EBxVh3E](https://www.youtube.com/watch?v=g91_EBxVh3E)
- Paper: <http://hint.fm/papers/viegasinfovis07.pdf>

# Activity (1 of 2)

- Eirini will pass around index cards with the name of one of the visualization systems (one of the videos you just watched)
- **Part A:** For the system assigned to your group, **use the Moca framework (from the readings this week) to “describe”** the system assigned to you
  - Hint: you may have to make many assumptions and “guess” how the system is more likely to be used...
  - Refer to the Moca paper again to show you how to apply the framework (although in that case they have more background on the use cases and users)
  - Document your description of the system using this framework, and post it on Slack (week4-evaluation channel)



# Activity (2 of 2)

- **Part B:** For each of the systems, there is an associated research paper where the system was evaluated – see GitHub for the slides for this week
- Using McGrath's circumflex (handout), describe and critique the evaluation technique used to evaluate the visualization system assigned to you.
- Answer:
  - What was the key **research question** asked in the paper?
  - What were the **benefits** and **limitations** with the evaluation method used?
  - What **would you do differently**, if anything? Why/why not?
- **Post your results** on Slack (the Week4-evaluation channel, by end of today)
- **Bonus marks** for this activity so put your names on the submissions as well as mention your team members in your post

# Summary of Goals

*“Social data analysis is a version of exploratory data analysis that relies on social interaction as source of inspiration and motivation”* (From your blog)

- Support building of “common ground” for conversations
- Embed discussions in the graphical objects
- Support storytelling
- And more!

# Another example: sense.us

- Features:
  - View bookmarking (application bookmarks)
  - Doubly linked discussions
  - Graphical annotations (geometric vs data centric)
  - Saved bookmarked trails
  - Social navigation through comment listings and user profiles
- For a video, see later (no audio though):  
<http://vis.stanford.edu/files/sense.us/>

# And even more systems...

See also (later after class)

- Tableau public:

<http://www.tableausoftware.com/public>

- Google public data (anything missing?):

<http://www.google.com/publicdata/directory>

- Spotfire: <http://spotfire.tibco.com/>

- See <http://courses.cs.washington.edu/courses/cse512/14wi/lectures/CSE512-Collaboration.pdf>

for a great set of slides on this topic

# Blog comments

- Power of online games to solve scientific problems (e.g., solving a 13 year old problem concerning the AIDS virus reproduction in 3 weeks --

[https://href.li/?http://www.theguardian.com/technology/2014/jan/25/online-gamers-solving-sciences-biggest-problems](http://www.theguardian.com/technology/2014/jan/25/online-gamers-solving-sciences-biggest-problems)

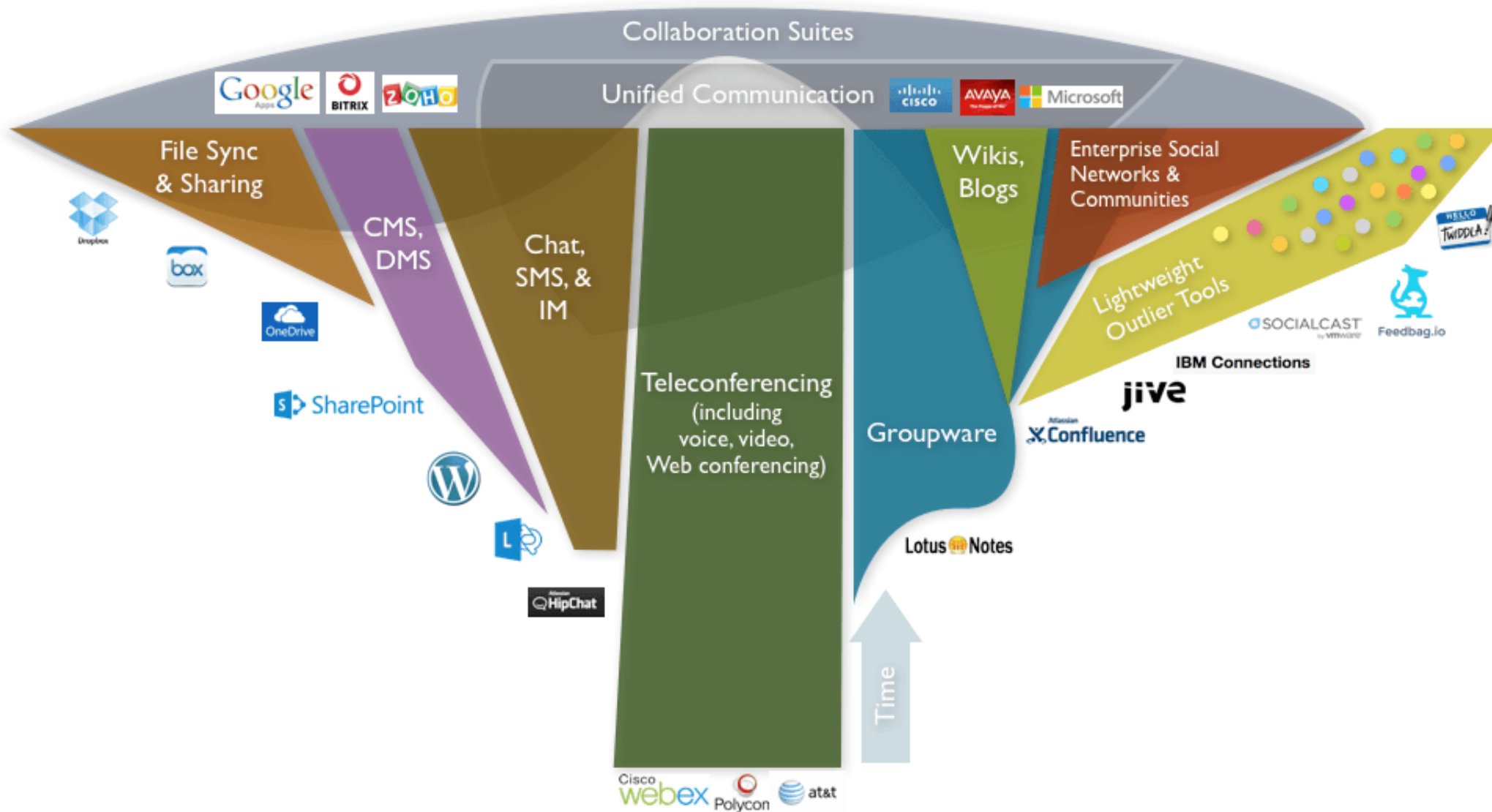
# What can be done (Blogs)?

- ground our understanding in specific real-world examples
- integrate collaboration support as a standard in future visualization systems
- expand to more research on hybrid collaboration scenarios
- develop new methods to assess the impact of collaborative tools & continue to refine and assess their value across different types of collaborative settings, data, tasks, or group sizes
- (Collaborative Visualization applications) Gain more popularity among the society & be more widely accessible

# More from your blog posts...

“Visualization will play a more important role. There will arise more visualization tools with stronger functionality to assist collaboration. They will minimize the barrier when data and cognition are being exchanged across fields.”

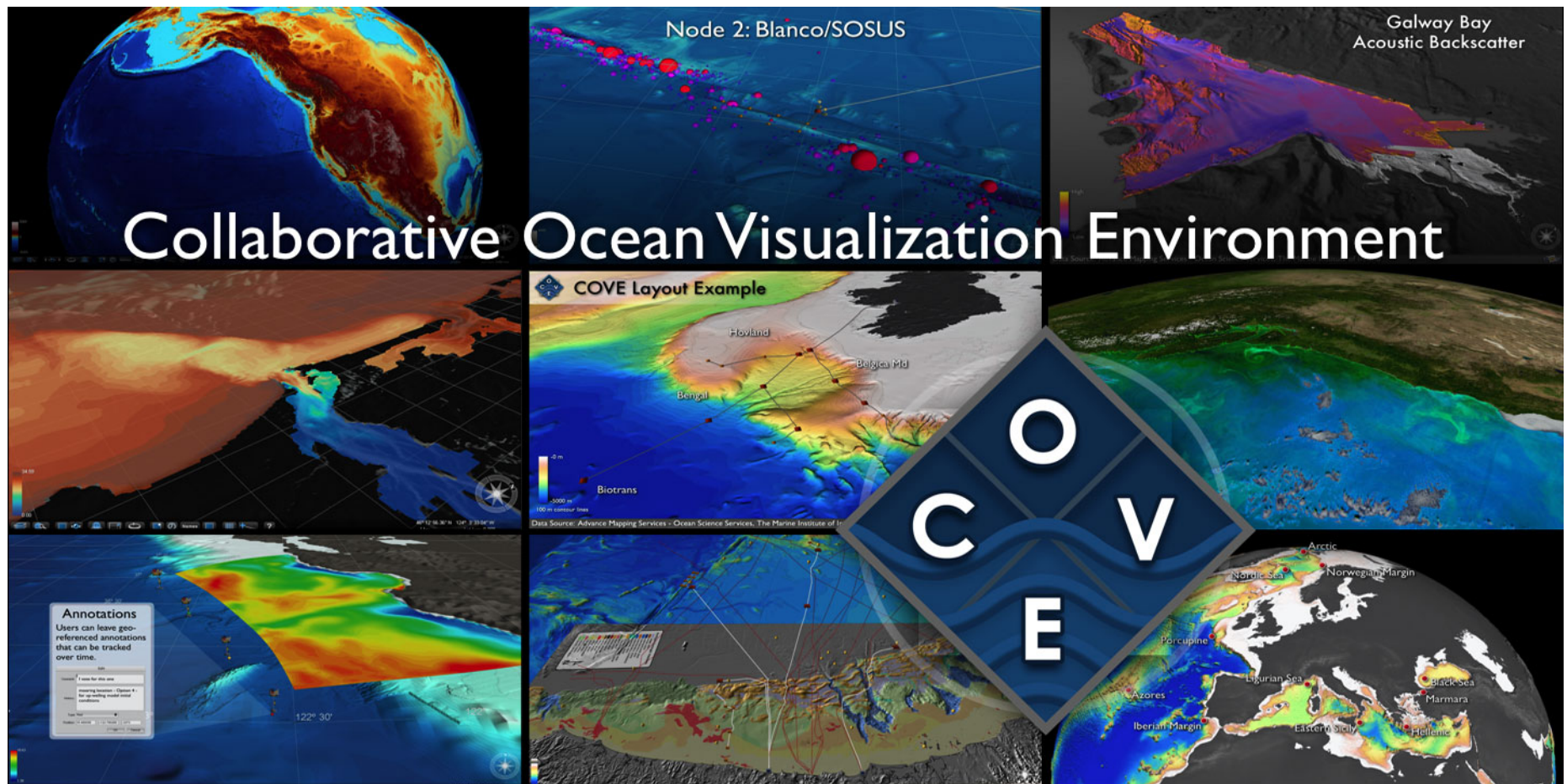
# The Evolution of Collaborative Technology



From <http://zdnet.com/blog/hinchcliffe> on ZDNet.

<https://www.enterpriseirregulars.com/74980/digital-collaboration-goes-deeper-gets-lightweight-intelligent/>





<https://softvis.wordpress.com/2012/01/18/collaborative-visualization-definition-challenges-and-research-agenda/>