Collaborative AstroInformatics

Web 2.0, Telepresence tools, Social networking

Omar Laurino

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Outline

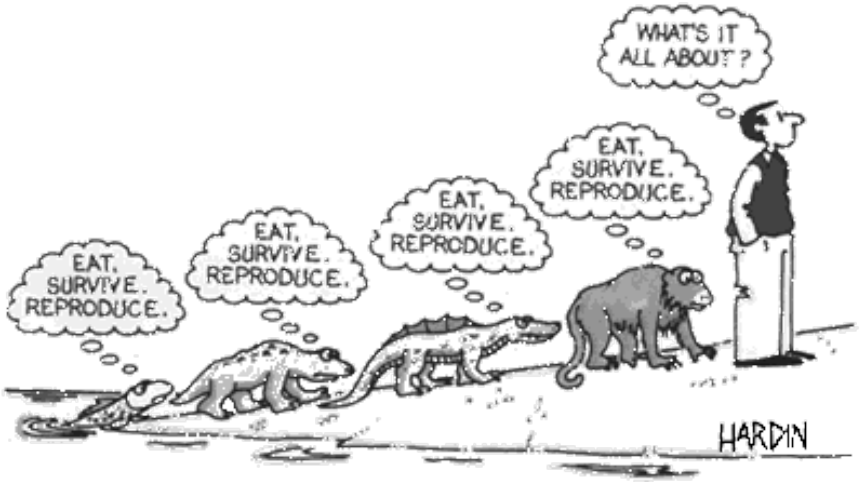
1. Introduction
2. Collaborative document editing
3. Telepresence
4. Social Networking

Buzzwords alert!

IT jargon is full of buzzwords: they assume different meanings according to the speaker/writer/company.

I will try to define concepts behind buzzwords in order to be consistent.

Astroinformatics (quoting K. Borne)



Definition

- discover and access large distributed data repositories, conduct meaningful scientific inquiries into the data, mine and analyze the data, and make data-driven scientific discoveries;
- enable collaborative research and data re-use;
- provide a natural context for the integration of research and education

Integrated Collaborative Environment

An enterprise IT environment that allows a virtual team to do its work.

Components of an ICE (Wikipedia)

- Collaborative software (real-time information flow, “groupware”);
- workflow system (management of business processes);
- documentation management systems (doc processing);
- peer-to-peer collaboration software (p2p file sharing);
- knowledge management systems (know-how);
- social network systems (link people).

May I add a collaborative software development environment?

Web 2.0

The term “Web 2.0” is associated with web applications that facilitate interactive information sharing, interoperability, user-centered design, and collaboration on the World Wide Web. A Web 2.0 site allows its users to contribute to the website’s content. Examples of Web 2.0 include web-based communities, hosted services, web applications, social-networking sites, video-sharing sites, wikis, blogs, mashups, and folksonomies.

I actually don’t like the 2.0 version number, since this definition is about what Tim Berners-Lee wanted to create in the first place when designing the web.

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Collaborative document editing

- Wikis;
- Google Docs;
- Microsoft Office WebApps;
- Adobe.com (commercial, an ICE by itself);
- Google Wave.

Relevant features

- Concurrent modification;
- ACL and permissions;
- version control;
- document scope.

They can be used by both small groups for managing their documentation processes or entire communities at large.

Some remarks

How wikis are different

- may need a dedicated server and installation;
- may be *very* public;
- don't support concurrent modification;
- users can choose which sections to *follow*;

How Google Wave is different

- Sensible mix of document editing, wiki, instant messaging and social networking;
- extensible (gadgets and robots);
- embeddable.

Google Wave

- Email was designed to mimic snail mail.
- Instant Messaging was designed to mimic telephone calls.

Google Wave is a groundbreaking communication and collaboration design.

Quoting Google

- A wave is equal parts conversation and document. People can communicate and work together with richly formatted text, photos, videos, maps and more.
- A wave is shared. Any participant can reply anywhere in the message, edit the content and add participants at any point in the process. Then playback lets anyone rewind the wave to see who said what and when.
- A wave is live. With live transmission as you type, participants on a wave can have faster conversations, see edits and interact with extensions in real-time.

Google Wave features

If you haven't done it yet, watch the amazing 1h30m Google Wave Developer Preview at Google I/O 2009 (link)

- Embeddable you can embed a wave in a website (API);
- Extensible you can contribute:
  - robots (google AppEngine hosted virtual participants);
  - gadgets (small embeddable applications);
- Wiky but more flexible and live. You can also playback the entire wave;
- DnD file sharing Drag your file over the wave and all participants will be able to download it;
- it's a protocol!!

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Telepresence tools

The best telepresence tool? Presence! ;) Why?

- Really immersive environment;
- not much technology required;
- immediate feedback (you can see who's sleeping during your talk);

However, it is the most expensive for geographically distributed collaborations. Alternatives?

- Skype
- iChat
- Adobe ConnectNow (commercial)
- Second Life – Virtual Worlds
- Cisco (commercial)
- Aethra (commercial)
- Polycom (commercial)

Relevant features of Telepresence tools

- Interoperability;
- maximum number of participants;
- media support;
- technology involved – economic investment – obsolescence;
- who calls who?
- where do you have to be?

Relevant use cases

- Few groups from few different sites, each group in a room (closed distributed team);
- Seminars (one-to-many, open, streaming?);
- virtual meeting, several people each one from a different site (many-to-many).

VMukti

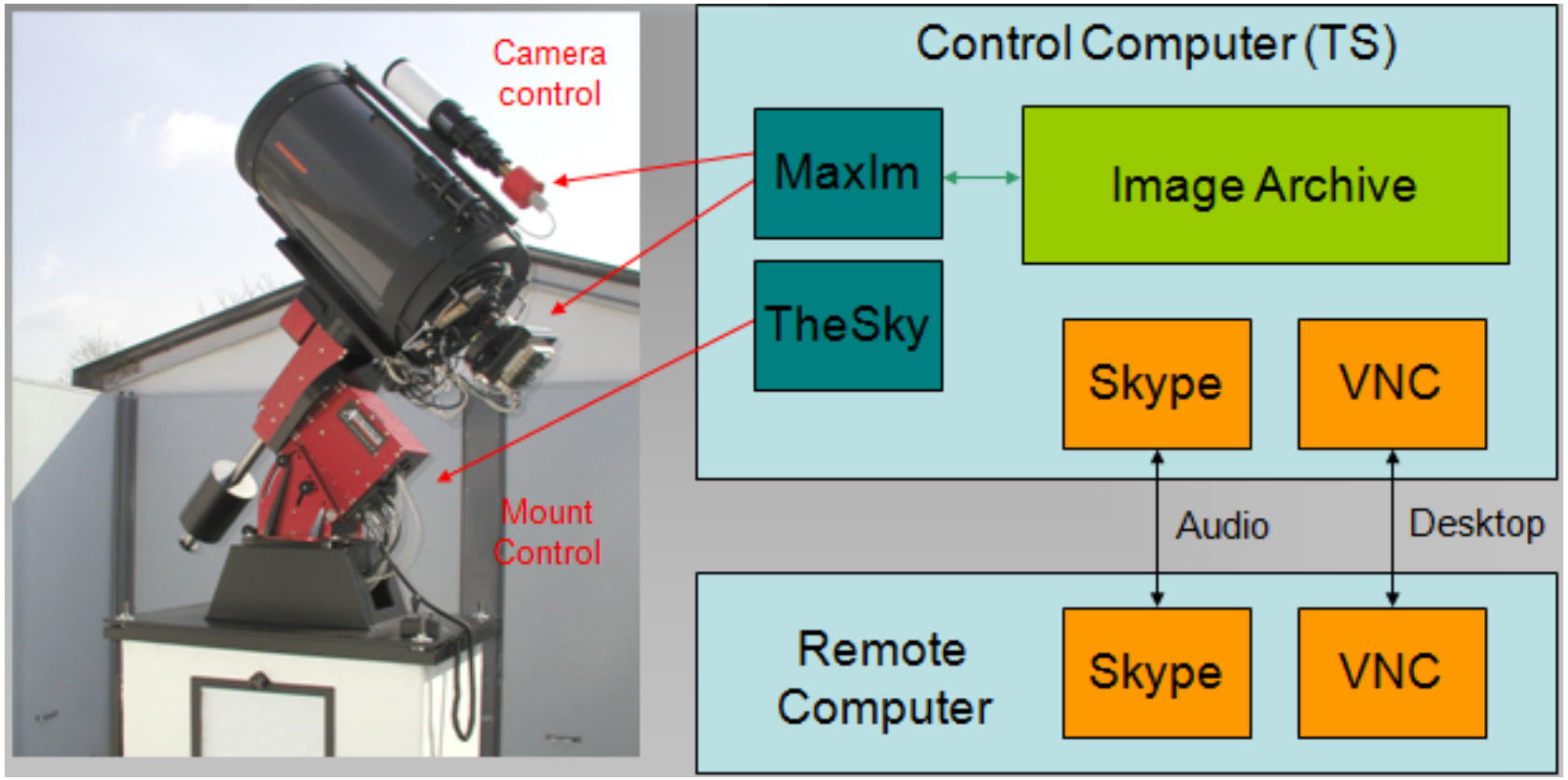
VMukti is a VoIP/Web2.0 open source solution for conferencing and collaboration. It looks really hot, despite the name ;)
Features:

- Multiple Instance of Meeting
- Video/Audio Conferencing
- Native Multi-point Video Communication server management system supporting module uploads, page designs etc., Chat
- Online Co-Authoring
- Remote Desktop Controlling/Monitoring/Sharing
- Online File Sharing/Searching
- Poll/WebLink/Whiteboard
- Online Presentation

But runs on Windows only!

Remotely operated telescope

Educational project by the Trieste Observatory (in Basovizza) for primary and secondary schools.



(Courtesy of Giulia Iafrate).

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Scientific Social Networks

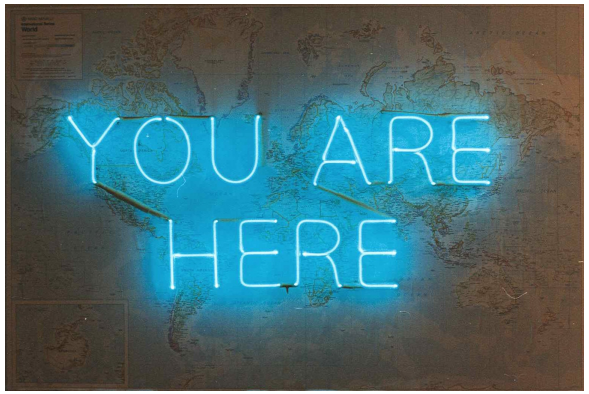
"The co-authorship network of scientists represents a prototype of complex evolving networks. In addition, it offers one of the most extensive database to date on social networks."[a]

[a] Barabàsi et al., "Evolution of the social network of scientific collaborations"

"We find that large groups persist for longer if they are capable of dynamically altering their membership, suggesting that an ability to change the group composition results in better adaptability. The behaviour of small groups displays the opposite tendency – the condition for stability is that their composition remains unchanged."[a]

[a] Palla, Barabàsi, Vicsek, "Quantifying social group evolution"

Scientific Social Networks

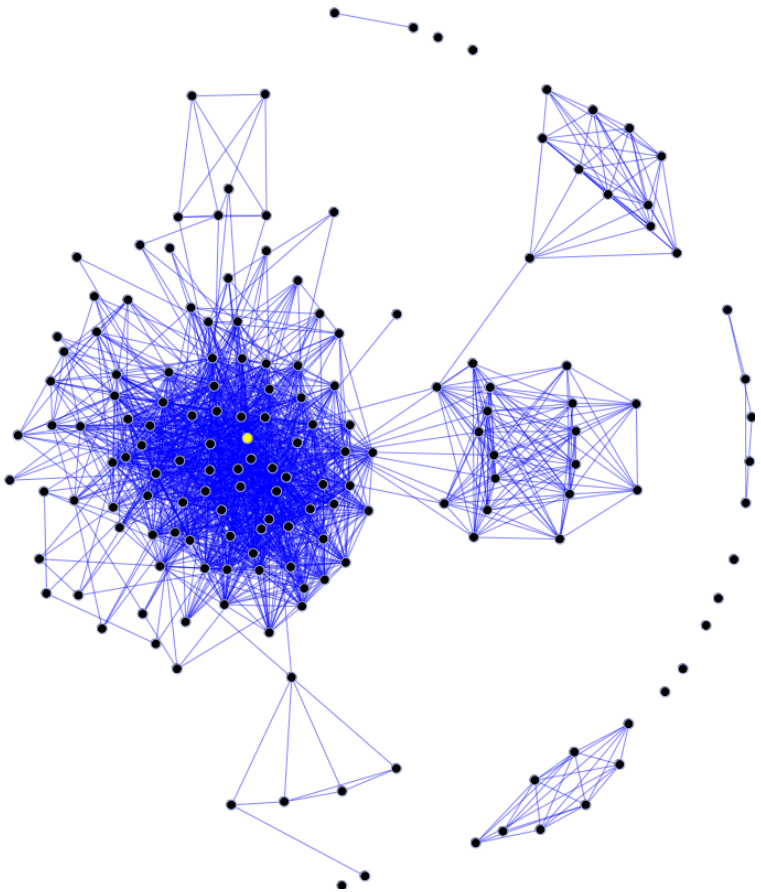


"Social scientists have long recognized the importance of boundary-spanning individuals in diffusing knowledge (Allen 1977; Tushman 1977), and recently, several papers have rigorously demonstrated that technological knowledge diffuses primarily through social relations, not through publications."[a]

[a] Sorenson, and Singh, "Science, Social Networks and Spillovers"

Motivations of a social networking IT platform for science

- The importance of boundary-spanning individuals in social networks might be what X-informatics is all about;
- we break scientific *cliques* and create new, unexpected, effective links across the science community's network;
- an effective scientific social network platform may be an effective step towards *seamless astronomy*. Seamless not only in terms of data and applications access, but also in terms of social interactions between people in the scientific network.



Social bricks

Some examples of useful applications of social networking to science.

- Zotero, a Firefox extension to help you collect, manage, cite, and share your research sources.
- Papers, your personal library of research.
- Mendeley, Like iTunes for research papers. Mendeley is a free research management tool for desktop & web.
- MyExperiment, scientific workflows (I can't introduce software collaborative development, maybe during the discussion?)

But there is no integration, each application forms its social networks...
they should be applications in a single social network platform!!!

Social networking platforms

facebook®

ResearchGATE
scientific network

biomedexperts
your scientific match point

BioMedExperts

biomedexperts
your scientific match point

- literature (co-authorship, Pubmed) based;
- Pubmed provides a 'social' index of more than 1.8 million BioMed scientists;
- focused on BioMed;
- share workflows ("recipes");
- aims at linking expertise through a social network (bringing the brains together);
- 300k active users.

ResearchGate

- focused on the whole scientific community (even religion and political science);
- loosely based on the literature DBs (Pubmed, Citeseek, IEEE, ADS, RePeC, ArXiV, 35M documents);
- expose all the literature DBs with ranking and comments;
- more “facebook-like” interface;
- shares with BioMedExperts the aim of “bringing the brains together”, but adds social ranking and discussions;
- 400k users;
- integrated with other social networks (e.g. LinkedIn, FB).

Facebook

- The killer social networking platform;
- social-network everything (blog posts, links, groups, events, images, videos, applications);
- third party application support with SSO;
- embeddable in third party web applications;
- millions of users;
- completely useless for science, as is.

Some remarks about Facebook

Facebook can be looked at as the reference for the development of an effective social network platform which doesn't just represent or facilitate social interactions, but that allows an effective information stream, also allowing integration of different web applications and/or web services.

However:

- poses serious issues in terms of privacy and intellectual property;
- lacks all useful features for a research environment.

Interlude

So, you look so confident that Facebook is the killer social platform.
Are you really so sure we should look at it for science?

Interlude

So, you look so confident that Facebook is the killer social platform. Are you really so sure we should look at it for science?

Yes, I am.

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Could you elaborate, please?

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Could you elaborate, please?

Sure.

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Could you elaborate, please?

Sure.

Developing social network platforms

Many frameworks/technologies:

- Elgg (php, SKA collaboration uses it);
- AppleSeed (distributed, interesting idea);
- OpenSocial (common API, containers).

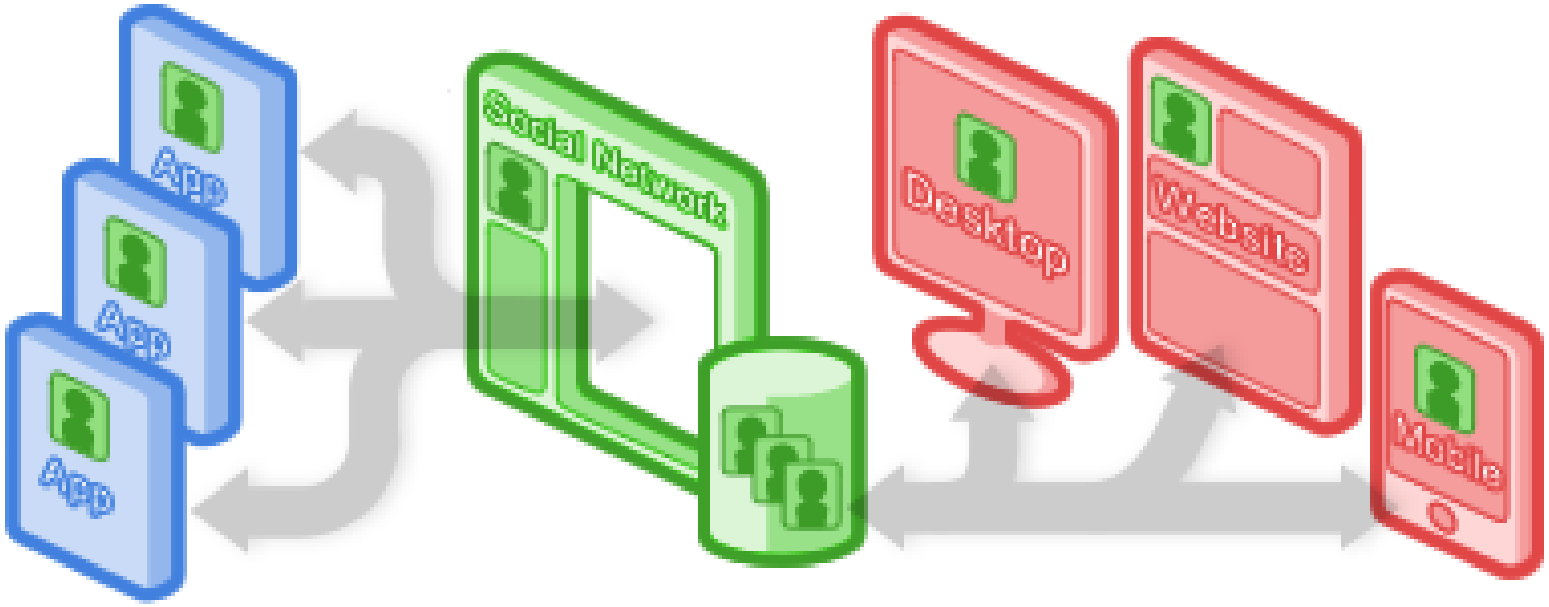
Two paradigms:

- Walled garden;
- Open and Distributed.

"Why can't a Facebook user send a message to a MySpace one?"

OpenSocial

- It is a specification of interoperable standards;
- it needs an implementation: a container.



- Build a social interoperable app;
- create a social app platform;
- share and access social data on the web.

From enterprise to research

Integrated Collaborative Environment

$\downarrow$

Distributed Scientific Social Websites

- Each institution could develop its website (e.g. OpenSocial);
- institutions/developers could also provide interoperable web applications;
- researchers could customize their UI/preferred applications (custom portals!);
- researchers social data would be accessed from the web;
- social features (ranking, sharing, discussing, discovering);
- collaborative software (e.g. Google Wave).

If the social communication is effective, applications can spread and compete, new links can form in the network, and new collaborations can start!