Title: A dialog about art with software engineering words

Letizia Jaccheri is a Visiting Scholar with the Creativity & Cognition Studios, FEIT until June 2009. In her talk she will focus on the SArt project - software and art - illustrated by three main case studies: Flyndre, Sonic Onyx and the Open Wall project. She will discuss issues related to Open Wall, its open architecture and its open source software. She has been working in the software engineering field since her Masters thesis in the late 1980s. Her projects have addressed software process modelling, object orientation, software engineering education, empirical software engineering and software engineering in a multi-disciplinary perspective. She will conclude with research questions related to her interdisciplinary work in the art, science and technology fields. The seminar will be as interactive as possible as her goal is to become acquainted with individual and groups with whom collaboration may be possible. Jaccheri's home page is http://www.idi.ntnu.no/~letizia/

Norwegian University of Science and Technology

Facts NTNU/UTS

- NTNU: 4200 staff members, budget 4.2 bNOK, 20,000 students, TRD (140.000 persons)
- UTS: 2,555 staff members, income $400m (2 bNOK), 32,000 students

Structure

- Software engineering research
- Sart project (research questions and results)
- Arte in Piazza and plans

Software: facts

1) Software is written in a formal language.
2) Software can be copied at zero cost (Software resembles music and pictures concerning the possibility of copying).
3) A software system consists of components.

Software words

according to sourceforge.org, on the 2nd January 2009, the most popular software on sourceforge.org is Azureus. The Project admins are: gudy, nolar, parg, tuxpaper and there are 33 developers. The intended Audience are Developers, End Users/Desktop, System Administrators, Education, Information Technology, Science/Research. The license is GNU General Public License (GPL). The operating System: All 32-bit MS Windows (95/98/ NT/2000/XP), All POSIX (Linux/BSD/UNIX-like OSes), OS X. The Programming Language is Java. And the topic is BitTorrent, Internet. There are 2609 Java files.

Software: words and more

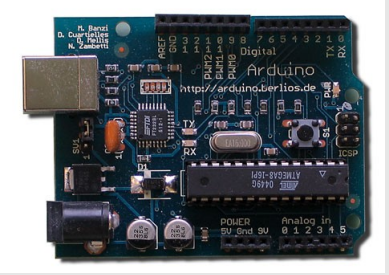
- http://processing.org/learning/3d/birds.html
- processing.org

Software engineering

- SE is the application of engineering to software. It offers technical and scientific knowledge about processes (Agile or Extreme Programming) and tools (compilers and environments like Eclipse)
- user – developer
- evaluation (functionality, performance, usability, modularity)

Open source software

PD



- Product:
  - The code is open (can be seen and changed)
  - There is a well defined license (GNU, BSD, Apache, etc.)
- Process
  - The process is open (mailing lists)
  - The developer is the user
  - The user becomes a developer
  - community/motivation/participate

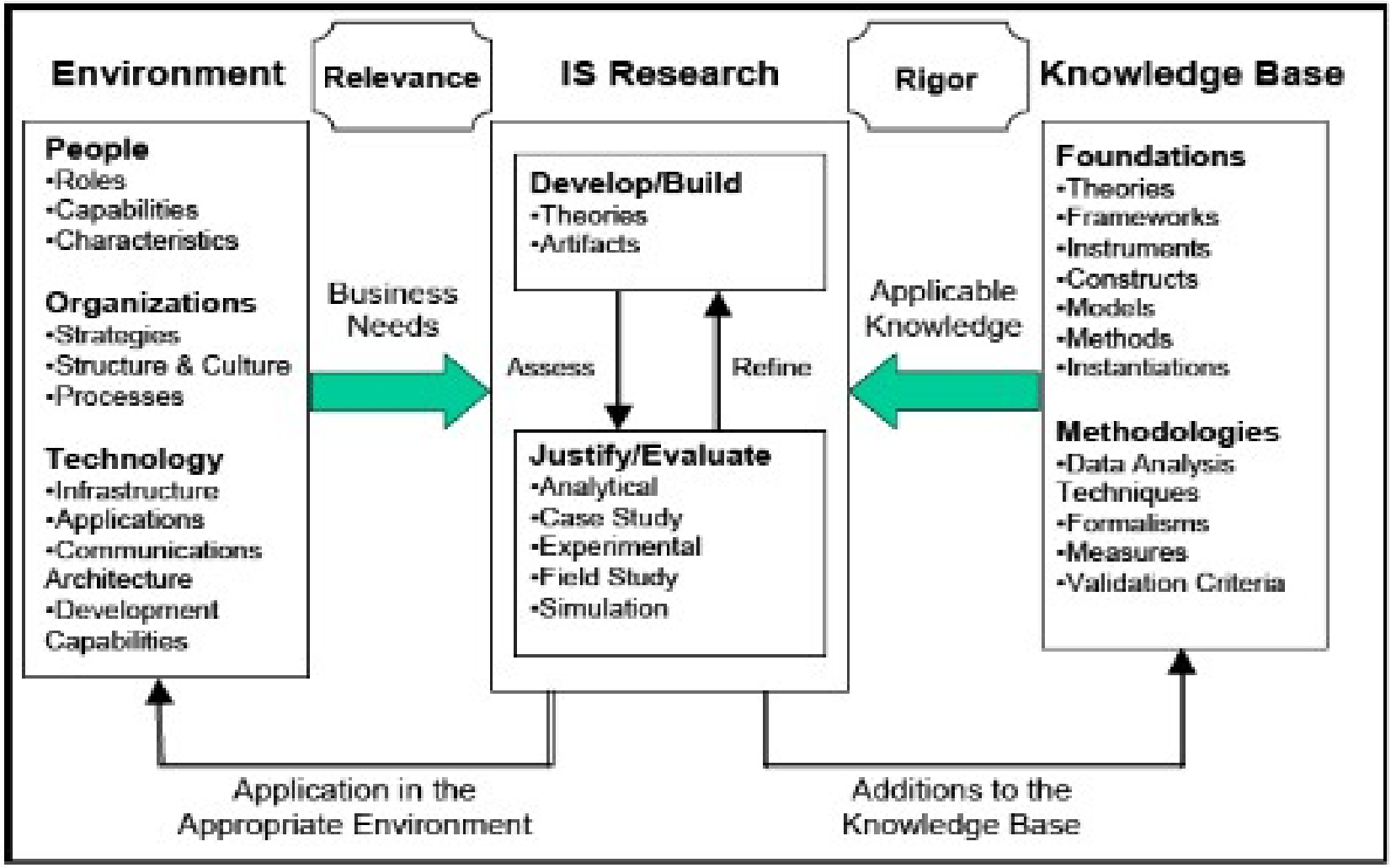


Fig. 1. Information Systems Research Framework (source Hevner et al. 2004)

SArt Project

- SArt Results (http://prosjekt.idi.ntnu.no/sart)
- Literature review published, endnote
- participation to 3 artistic projects, responsibility for one of this, The Open Wall

SArt: the literature review

- Who: artist, IT engineer, researcher, theorist
- Why:
  - Learning about cooperation
  - Innovation of products and interfaces
  - Aesthetics in computing
  - Develop and exhibit IT based artworks
  - Reflection on society (IT) through art
  - Dissemination
- What (tools)
- Where (museum, open space, lab, etc.)

Flyndre

Artists: Øyvind Brandtsegg and Nils Aas

Location: Straumen Inderøy, Norway

Sonic Onyx
Artist Samir M'kdami

Location: Trondheim

Research questions SArt (1)

1. What is the intersection of software and art? How do software engineers and artists cooperate?

   1.a Where, when and how software engineers and artists work together or involve each other?

   1.b What tools and technologies are used in this intersection of the two domains?

2. RQ (2)

How can we offer technology to artists through software engineering i.e., providing better tools, processes and roles

2.a How the collaboration between artists and software engineers takes place?

2.b What are the artists' need, usage, and requirements for software?

2.c What are the features and criteria that make the collaboration between software engineers and artists in an interdisciplinary project successful?

RQ (3)

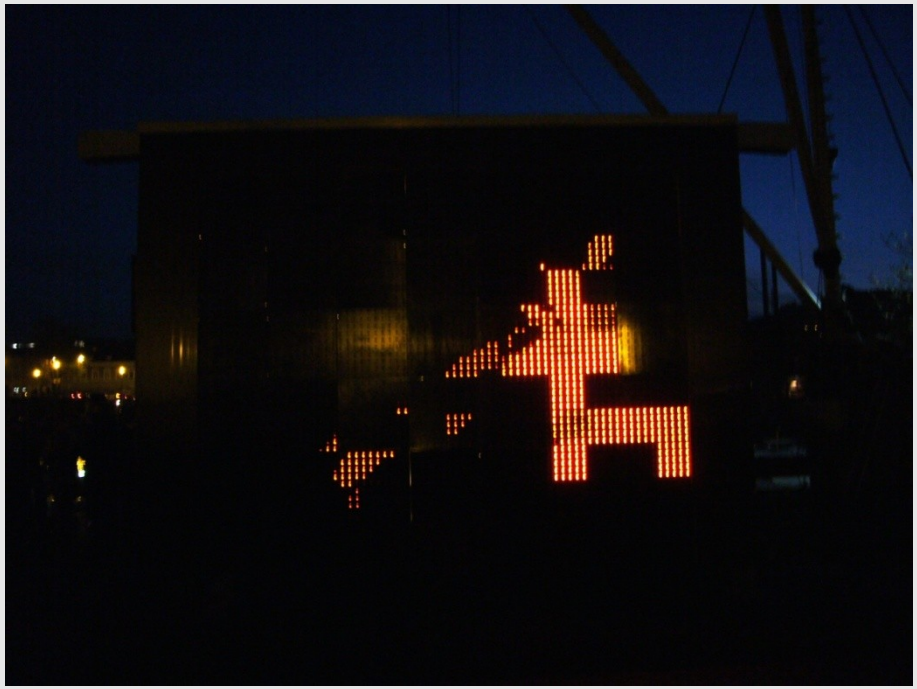
How can *we* improve the development process of software dependent artworks and projects, in terms of software development, maintenance, upgrade and usability of the artwork?

3.a What are issues and challenges that software engineering has to tackle to implement software dependent art projects?

3.b How can we help artists with the maintenance, upgrade and usability of software dependent artworks?

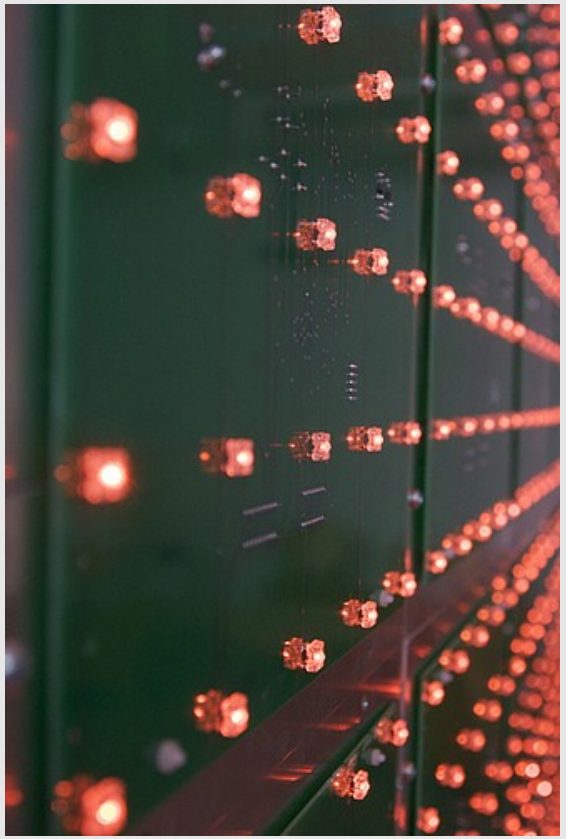
The open wall - When

- 2005 architect Åsmund Gamlesæter initiates the project as he wants to build a LED facade for an experimental house
- 2007, the Open Wall software goes open source with BSD license
- 2008, 3 groups of students re-build the installation during a 3 weeks intensive course
- 2008 Itovation competition 20 artists/engineeers



The open wall What?

- 480 cm long and 180 cm high
- 96 circuits boards (16 x 6 boards 25 LED each) containing 2400 orange LED lights with 5 cm distance to the next light
- light with 99 possible intensities
- Each board: microprocessor, power connection, and Ethernet
- Connection through a set of switches or hubs
- http://sart.svn.sourceforge.net
- The open wall competition



The open wall Where

- installed on the façade of an experimental house in the town of Trondheim
- A sister installation is build and installed in a discotheque in town
- The current Open Wall is in a meeting room at the Department of CIS
- The installation is available through a WEB interface which allows its users to upload, change and see pictures on the Open Wall
- sourceforge.net

The open wall Why

- Researchers: reflection about ICT (openness, copyrights, and authorship)
- Artists: develop/learn
- Students: learn about cooperation
- Spectators: dissemination (ICT through art)

The open wall
Who?

- Architect AG is the initiator of the project. Technical help from the hardware group and artistic advice from the artist EG
- NM takes decisions about the open source release
- LJ and EG supervise the students who rebuild the installation in 2008
- HT develops the web based interface, other students and CIS employees work on the project
- Competition sponsored by NTNU

Conclusions (after 3 years)

- 4 Master theses, 1 PhD in progress, 1 PostDoc (2 years), 10 Published papers
- Open source software tools as focal point for software engineering and Art:
  - communities and cooperation (roles)
  - creativity and motivation
  - licenses and copy rights
- Roles (researcher, artist, engineer, theorist)
  - But which role when organizing a competition or managing an OSS community?

Arte in Piazza (Summary)

- Arte In Piazza exploits new media installation art as a medium to encourage citizens to participate in the creative production of new media content. To reach our goals, we will develop an artwork strategy that will govern an artists-in-residence program (AiR) where artists, researchers and software engineers (SE) will cooperate to create software intensive artworks and supporting software tools. To contribute to the development of ICT as an area of knowledge, the project will study the process of new media content production and will develop new knowledge on how to better support it by software tools. Moreover, we will develop new software tools for new media content production. Citizens will be invited to reflect on ICT issues with focus on open source philosophy. The project is of trans-disciplinary nature between software development and new media art. It builds upon similar, well documented in the literature research efforts (e.g XEROX AiR) that have demonstrated to generate value creation in terms of ICT inventions and innovations.

Arte in Piazza (goals)

- G1: New knowledge about the creative production of new media content and the supportive software tools;
- G2: Artworks in public space which are of high artistic quality, heavily dependent on OSS, and which will stimulate reflection on ICT and production of new media content by spectators;
- G3: New/better software tools for facilitating artworks production;
- G4: Increased creative production of new media content by the society.

Arte in Piazza (Budget)

- The budget is 12,5 MNOK and covers: -2 ICT PhDs (4MNOK) -2 ICT Post-docs 2 y. each (3MNOK) -1 SE at 50% (1,5MNOK) -4 ICT visiting researchers for 1 month each (0,2MNOK) -4 artists in AiR for 6 m. each (1,5MONOK) -1 art expert at 25% (0,75MNOK)
  - 1MNOK = 0.2 M Australian Dollars = 100KE
  - 1PhD gross NOK 308.100-468.700 per year
  - 10% possibility to succeed (Answer in March 2009)
  - European FP7 9ME for 2009/2010 http://cordis.europa.eu/fp7/

plans for UTS stay until 30th June

- Participate to meetings and art events, talk to people, establish relations
- Learn
  - Courses about interactive art, new media production, artwork management, open source,
  - how to attract and supervise PhD students, Artists in residence
  - Good publication channels
- Arte in Piazza (prepare or resubmit)
- Dissemination project (ArTe OSS tools – cooperative production of new media art by young adults)