# Groupware for Urban Planning and Computer-based Public Participation

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## I - What is groupware?

- 1.1. Definitions
- 1.2. Participatory design
- 1.3. Benefits and limitations
- 1.4. Cooperative information systems

### Several definitions

- Coleman (1995): "Groupware is an umbrella term for the technologies that support person-to-person collaboration; groupware can be anything from email to electronic meeting systems to workflow".
- Nunamaker, Briggs and Mittleman (1995): "Groupware is any technology specifically used to make group more productive".

## Groupware for Urban Planning

- I - What is Groupware?
- II - Is Groupware Useful for Urban Planning?
- III - Public Participation
- IV - Conclusions
Groupware is ...

- Computer Supported Cooperative Work (CSCW)
- Team Database
- Group Decision Support System (GDSS)
- E-Mail
- Group Support Systems
- Project Management
- Coordination Software
- Group Conferencing
- Electronic Conferencing
- Shared Drawing

- Group Memory
- Electronic Brainstorming
- Video Teleconferencing
- Information Filtering
- Electronic Meeting Systems
- Group Scheduling
- Workflow Automation
- Team Calendar
- Electronic Voting
- Group Development Tools
- Shared Edition

A Taxonomy of workflow (Marshak, 1995)

**Business Process:** Request a Purchase Order

**Person 1**
- Task: Purchase Request

**Person 2**
- Task: Compare Request to Budget

**Person 3**
- Task: Estimate Effect of Request

**Person 4**
- Task: Forecast New Budget

**Person 5**
- Task: Compose Approval / Rejection Letter

**Tasks or Actions:**
- Productivity Tools
- Forms Processor
- Legacy Accounting System
- Spreadsheet
- Word Processor

Example of task sequence
1.2. Participatory design

- **Objective**: people should design something cooperatively.
- For instance in CADCAM: design of cars, planes, bridges, buildings.
- ==> a database storing:
  - different steps and different versions
  - and all interactions between all engineers.

1.3. Benefits and limitations

- According to Coleman (1995), benefits are:
  - increased productivity,
  - better customer service,
  - fewer meetings,
  - automating routine procedure,
  - integration of geographically disparate teams,
  - better coordination globally,
  - leveraging professional expertise.
Limitations

- there is a too low level of education in the business community about groupware
- organizations are resistant to change
- there are few standards in the groupware market

1.4. Cooperative Information Systems

- Cooperative information systems:
  - a database storing all information and knowledge necessary
  - to support the collective work.
- Characteristics
  - distributed database system
  - one central database
  - and several local databases.

Cooperative Information Systems

The 4-square map for groupware options (Johansen et al, 1996)
II - Is groupware useful for urban planning?

- 2.1. Description of the French planning process
- 2.2. Actors and Roles in Urban Planning
- 2.3. Conditions of success
- 2.4. Groupware in action
- 2.5 Towards systems for spatial negotiation
- 2.6. Architecture

2.1. Description of the French planning process

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial Decree</td>
<td>Blueprint design Study Opinion on blueprint Possible modifications</td>
</tr>
<tr>
<td>Local Council Notice</td>
<td>Public inquiry decree Public inquiry Possible modifications Local Council Notice</td>
</tr>
<tr>
<td></td>
<td>2 months 1 month 3 months</td>
</tr>
</tbody>
</table>

2.2. Actors and roles in urban planning

<table>
<thead>
<tr>
<th>Actors in Urban Planning</th>
<th>Frequency</th>
<th>Groupware in use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Departmental Prefect</td>
<td>From time to time, minimum once a month</td>
<td>Technical advices, Final approval</td>
</tr>
<tr>
<td>City councilors in charge of urban planning</td>
<td>Several times a week</td>
<td>Technical advices, Meetings, Simulation, Votes</td>
</tr>
<tr>
<td>Other city councilors</td>
<td>Several times a year</td>
<td>Technical advices, Meetings, Simulation, Votes</td>
</tr>
<tr>
<td>City dwellers associations</td>
<td>At the beginning and during public consultation (inquiry)</td>
<td>Desire collection</td>
</tr>
<tr>
<td>Public consultation</td>
<td>At the end, daily, one month long</td>
<td>Photo-realistic visualizations, Simulation, Opinions</td>
</tr>
<tr>
<td>Urban planning staff and Municipal engineers and architects</td>
<td>Daily, during the whole process</td>
<td>Simulations, cartography, Meetings, Authoring, Messaging, Conferencing</td>
</tr>
</tbody>
</table>
2.3. Conditions of success

- a/ will of participation
- b/ training
- c/ well-designed CSCW system infrastructures

Equation of success for groupware is:

\[
\text{Groupware Success} = \text{Technology} + \text{Culture} + \text{Economics} + \text{Politics}
\]
Each zone of the city can be at different states of approvals

Graph of decomposition, and recomposition of versions

2.5. Towards systems for spatial negotiation

- private criteria.
- public criteria

- By spatial negotiation tools,
- $\Rightarrow$ of agreements
Spatial negotiation tools

- Agreements between
  - the city and its current environment
  - the version of plan and written statement under study
  - the simulated consequences from different points of view
  - the known actor's public criteria at global level together with their evaluation
  - possibly some other aspects

2.6. Architecture of a CSCW system for urban planning

Contents of the databases

<table>
<thead>
<tr>
<th>CENTRAL DATABASE</th>
</tr>
</thead>
<tbody>
<tr>
<td>- basic geographic data</td>
</tr>
<tr>
<td>- census-Master Plan under construction</td>
</tr>
<tr>
<td>- Map and written statements (all versions)</td>
</tr>
<tr>
<td>- states of progress and of validation</td>
</tr>
<tr>
<td>- project management system</td>
</tr>
<tr>
<td>- comprehensive hypermaps</td>
</tr>
<tr>
<td>- results of the poll</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LOCAL DATABASES</th>
</tr>
</thead>
<tbody>
<tr>
<td>- specific data</td>
</tr>
<tr>
<td>- urban data</td>
</tr>
<tr>
<td>- versions in analysis and in evaluation</td>
</tr>
<tr>
<td>- local hypermaps</td>
</tr>
<tr>
<td>- particular laws</td>
</tr>
<tr>
<td>- multimedia messaging systems</td>
</tr>
<tr>
<td>- simulation results</td>
</tr>
</tbody>
</table>

Examples of a video-conferencing meeting
3.1 - Introduction

- Importance of public participation during the urban planning processes
- Issues
  - participatory design
  - urban plan visualization
  - opinion collection and synthesis
  - communication between residents and city council
  - facilities organization
- Existence of NIMBY’s (Not In My Back Yard)

Objectives

- expand the public’s role
- increase citizens participation
- enable wider public involvement

Characteristics

- community-based
- reciprocal (resident ↔ city-council)
- contribution-based
- unrestricted
- accessible and inexpensive
- modifiable
Public Participation Ladder

Evolution of practices (Brun, 99)

Nobre’s ruler

Evolution of practices (Brun, 99)
3.2 - Specifications

- Roles and actors
- Functional capabilities

Roles and actors (Nijkamp 91)

<table>
<thead>
<tr>
<th>Type of role</th>
<th>Information demand</th>
<th>User demand</th>
<th>Type of system</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information specialists</td>
<td>Raw data</td>
<td>Analysis flexibility</td>
<td>Large Flexible</td>
</tr>
<tr>
<td>Preparer of policy</td>
<td>Raw and pre-treated data</td>
<td>Analysis Good flexibility</td>
<td>Compact Manageable</td>
</tr>
<tr>
<td>Policy decision makers</td>
<td>Strategic information</td>
<td>Optimisation models</td>
<td>“Small is beautiful”</td>
</tr>
<tr>
<td>Interested citizens</td>
<td>Information</td>
<td>Good accessibility</td>
<td>“Small is beautiful”</td>
</tr>
</tbody>
</table>

Functional capabilities (Nyerges, 97)

Level 1

- **Group communication**
  - idea generation through electronic voting, white boards, computer conferencing, public computer screens

- **Information Management**
  - storage and retrieval thru spatial DBMS

- **Graphic displays**
  - visualization, maps, tables, diagrams

- **Spatial analysis**
  - functions like proximity, data mining, etc

Level 2

- **Process models**
  - descriptive simulation models, GIS embedded models

- **Advanced spatial visualization**
  - virtual and augmented reality, multimedia animation

- **Decision models**
  - multi-criteria decision making support system

- **Structured group process**
  - facilitating group interaction, electronic brainstorming
New visualization tools (Shiffer 99)

- To recollect the past with annotation mechanisms
- To describe the present with navigational aids
- To speculate about the future

Annotations (post-it - like)

- Simple graphical marks
- Video sketching
- Textual annotations
- Audio annotations
- Visual annotations

ARGSAPS

3.3 - Virtual Reality

- Workbench systems
- Cave systems
- Virtual cities

Virtual workbench (Stanford)
Visualizing building possibilities

3.4 - Examples of discussion forums

- Twin cities (St Paul - Minneapolis)
- Virtual Slaitwaite (UK)

Twin cities

- Creation of a web site
  - Official documents
  - Board meeting minutes
  - Zone program
  - Information about the zone
  - Links to local media
  - Links to related sites
  - Discussion forum
3.5 - Argumaps

- Argumaps = Argumentation maps
- Created by Claus Rinner
- Electronic discussion and GIS
- Linked WWW and Collaborative DM
- Storing arguments
  - planning arguments
  - pro-opinion
  - contra-opinion

Argumaps examples

- Examples
  - pins
  - flags
  - smileys

Argumaps with pins

Argumaps with flags
3.6 - Conclusions about PP

- Modern technology can change the nature of public participation
  - virtual reality
  - discussion forum
  - argumaps
- Technical barriers, administrative barriers, technocratic barriers
- To few experiences
- ==> cyber-citizens

IV - Conclusions

- Cooperative work
- Participatory design
- Spatial negotiation system
- A groupware system for all people acting in the planning process
- Implementing such a tool to discover all the needed characteristics
- Connection of a GIS to an existing groupware system

Thanks!


http://lisi.insa-lyon.fr/~laurini
Applications

- Urban land use planning
- Urban engineering