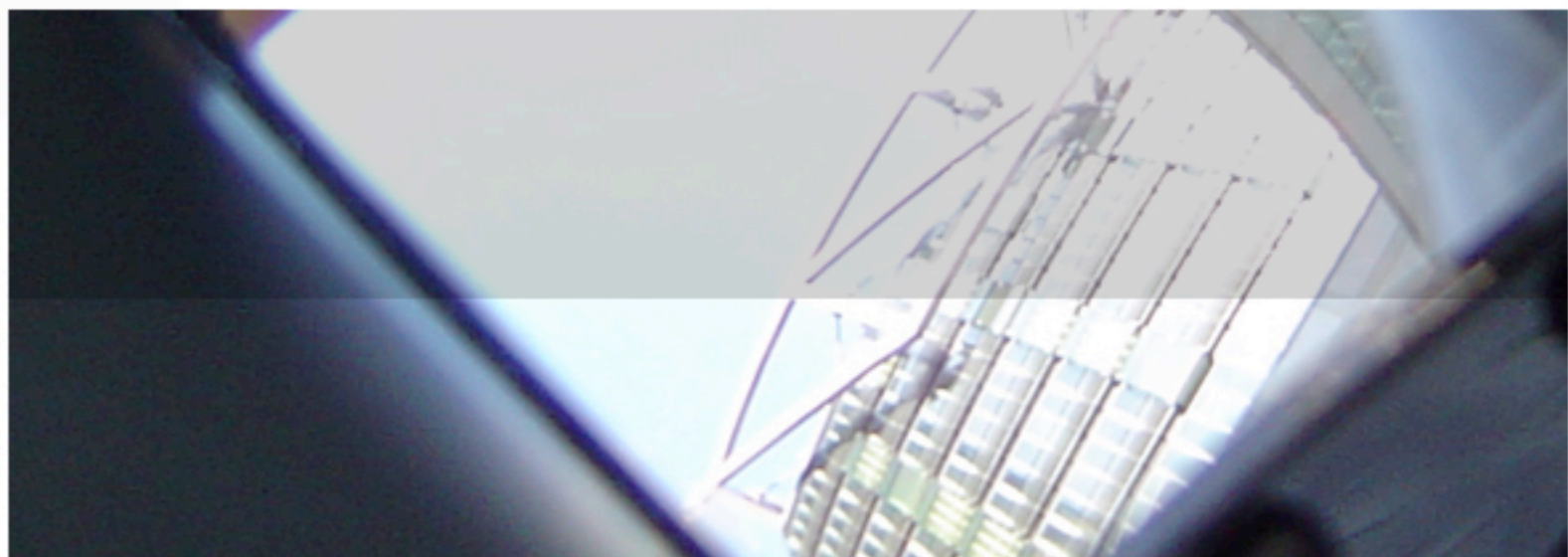# Participatory design and qualitative evaluation methods

IPCity

Ina Wagner, Summer School, Vienna, Sep 22-25,, 2009

IPCity (EU)
Collaborative envisioning in urban renewal

Work place studies/ Ethnography

CSCW

Participatory design

Creative design methods

Gender studies

Ethics

Action for Health (CAN)
EPR in oncology
Ethics

MAPPER (EU)
Studies of 'modeling practice' in automotive industry

- What is design?
- Participatory design
- Participatory workshops
  - Ethnography
  - Qualitative video analysis (multimodal analysis)
- Field trials
- Method triangulation

What is design?

Design work is grounded in systematic inquiry and reflection

It proceeds through inquiring and transforming materials, carrying out a conversation with them

Design work emphasizes experimental and experiential methods

Design work is multi-disciplinary

Design work is an open process

It starts with preliminary, provisional specifications and simple prototypes

With designers seeking to expand the design space

A crucial aspect of this process is to be able to work with fuzzy concepts and placeholders, and to maintain things at different stages of incompletion

Enlisting expertise in different fields (technical consultants, project/facility management, legal, etc.)

At its core is cooperating with others, mobilizing their imagination

The production of communication objects or 'persuasive artifacts' is an essential part of the design process

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Ethnography
Rich accounts of practices
Attention to social detail
Used for
• Concept design
• Validation

Iterative design with users as co-designers
Concurrency
Appropriation in use

•   Design for use after design
•   Design for design after design

Scenario-based design
Describe/enact a use situation
Can be combined with (video-supported) story telling, simulation techniques

Mock-ups and probes
Represent a design concept (not a solution)
Simple and cheap
Encourages hand-on experience
Provokes discussion and user creativity
Are open and co-adaptive

Cooperative prototyping
Iteratively 'probing' a solution
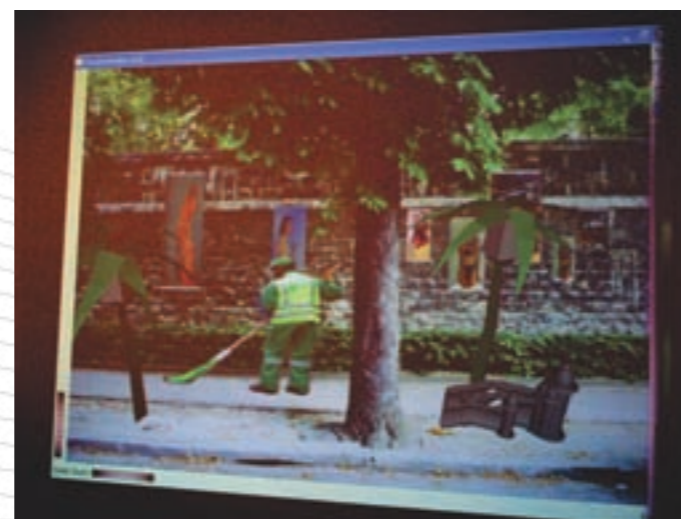Elicit stories - users contribute scenarios

Design games
Conceptualize design in different roles
Exchange perspectives

Drama, role-play
Involves all senses and emotion
Stimulates immediate feedback

Future workshops
Working with many users
Voicing critique
Imagining the future

Participatory workshops: preparations

- Select site and project
- Define urban issues and scenarios: connectivity, centrality, activities, housing types, ambience
- Identify stakeholders: citizens, local authorities, urban planners, various specialists
- Prepare tools: MR Tent (ColorTable, Sketching tool, Sound application)
- Prepare participants: 'Cultural probe interviews'
- Prepare content: 5 panoramas, 2D billboards, 3D objects, sound

Packages of maps, postcards and other material, designed to provoke inspirational responses from people, serve as design material

Make sense where the aim is to understand different perspectives, identify diversity and differences

- Postcards showing an image and questions on the back

- Disposable camera with listed requests for pictures

- Maps - where would you go meet people, to be alone, to daydream, would like to go but can't

- Assignments such as 'collect images, sound, objects that represent your ideas, emotions, the history of a place ...'

Figure 1. A cultural probe package.

Ethnography - 'research paradigm' that has been extended from anthropology to cultural studies, sociology, CSCW, and social psychology.

Guiding principles of ethnographic research (Blomberg et al. 1995)

Natural settings, holism, descriptive, members' point-of-view - "understanding other people's behavior in the context in which it occurs and from the point of view of the people studied"

Methods

• **(Video-supported) observations** (coupled with interviews)

• (Semi-structured) interviews

• Document/artefact analysis

Why observe?

• What people say and what they do is not the same - the inability of giving accurate accounts of one's own activity (people provide approximations, seek to match cultural expectations, the existence of the inarticulated or tacit knowledge)

• The salience of context, concreteness and detail for understanding other people's activities

Types of ethnography

• Studies of a (work) practice - CSCW: for the purpose of design

• Studies of technology use

'Critical ethnography'

• Contextualizes the ethnographer's own positionality (Madison 2005)

• Reflects on the 'organizational character' the ethnographer imposes on the ethnographic material
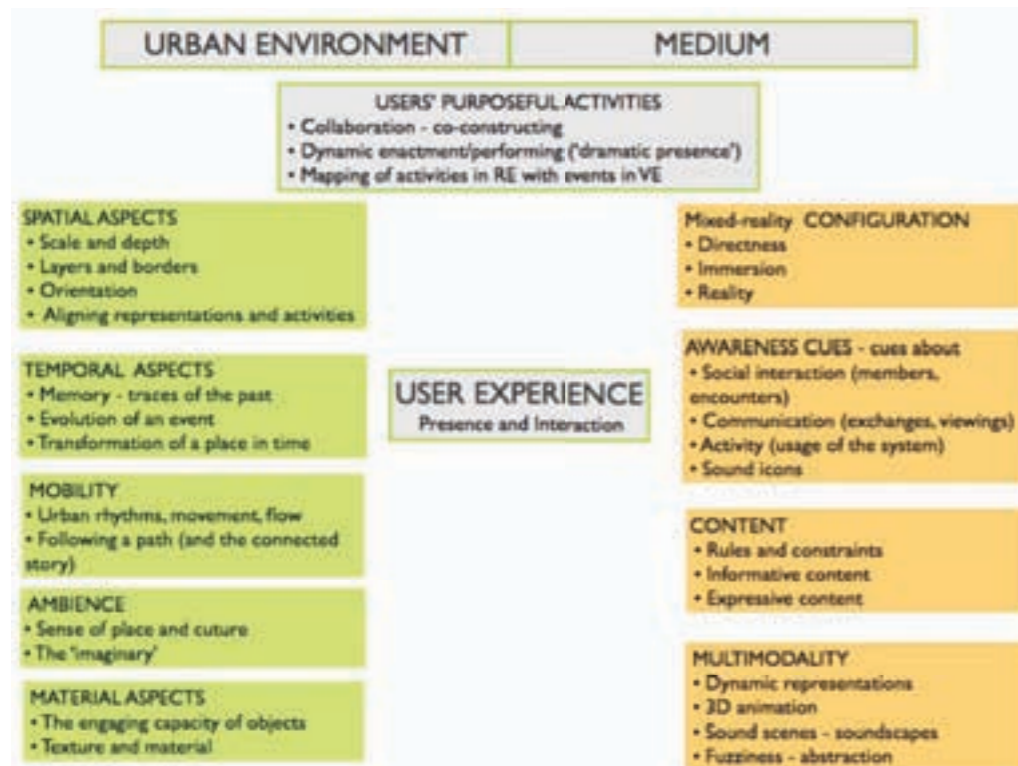
A combination of observational techniques and contextual analysis is needed ...

- Complexity of MR application - combination of multiple displays and spaces

- Complexity of setting/tasks

    - Situations that are open, eliciting participation

    - Co-construction of something new

    - Format of participatory workshops

- Choice of method of analysis

    e.g. multimodal analysis (talk, embodied interactions, visual elements, sound ...)

An additional quantitative analysis may be useful concerning selected, narrowly defined aspects of the observed phenomena, looking for e.g. frequencies or sequencies of particular types of interaction

URBAN ENVIRONMENT		MEDIUM

USERS' PURPOSEFUL ACTIVITIES
- Collaboration - co-constructing
- Dynamic enactment/performing ('dramatic presence')
- Mapping of activities in RE with events in VE

SPATIAL ASPECTS
- Scale and depth
- Layers and borders
- Orientation
- Aligning representations and activities

TEMPORAL ASPECTS
- Memory - traces of the past
- Evolution of an event
- Transformation of a place in time

MOBILITY
- Urban rhythms, movement, flow
- Following a path (and the connected story)

AMBIENCE
- Sense of place and cuture
- The 'imaginary'

MATERIAL ASPECTS
- The engaging capacity of objects
- Texture and material

USER EXPERIENCE
Presence and Interaction

Mixed-reality CONFIGURATION
- Directness
- Immersion
- Reality

AWARENESS CUES - cues about
- Social interaction (members, encounters)
- Communication (exchanges, viewings)
- Activity (usage of the system)
- Sound icons

CONTENT
- Rules and constraints
- Informative content
- Expressive content

MULTIMODALITY
- Dynamic representations
- 3D animation
- Sound scenes - soundscapes
- Fuzziness - abstraction

Participatory urban planning workshop in Cergy-Pontoise with 48 active participants in total:
- Material from open pre-interviews with participants (based on 'cultural probes')
- 10 hours of video recordings (including audio), hundreds of pictures, screenshots
- Recordings of participants' evaluation of their experience

Joint analysis sessions guided by 'concept map', trying to understand the **user experience** with a focus on
- Participants' co-constructing MR scenes and mapping
- Spatial, temporal, material, social aspects of presence
- Role of sound, dynamic representations, 'fuzziness', expressive content - 'ambience', sense of place and culture

Writing the 'ethnographic account' - 'storyboard' of selected videoclips (series of stills) and transcripts, organized around 'presence concepts'

Qualitative analysis of video material - selecting scenes

- Analyze embodied interactions and use of resources (table, tokens, content)
- Compare what people do with what they say
  - content level
  - expressive meta level
- Analyze the MR scenes they compose

Multimodal research

Kress and Van Leeuwen (1996), O'Toole (1994)
- 'Modal function' (how the viewer's attention, thought and emotions are engaged by and related to an artifact),
- 'Representational function' (what is depicted)
- 'Compositional function' (how the artist organizes the available space, makes use of color, form, lines, etc.).

Embodied interactions
- Body postures
- Gaze
- Gestures
- Object manipulations

Visual elements
- Physical map
- 'Content cards'
- Scenes as seen against different backgrounds

Sound elements

The role of talk
- Participants talk intensely but not all the time
- They focus on the 'doing', interspersed with brief questions or comments or even jokes
- In general, their talking is less rich then the scenes they produce

The role of the visual

Different backgrounds (panorama, video-augmentation, see-through) provide different resources for understanding and experiencing

The role of embodiment
- Participants use pointing and drawing gestures
- They use the body posture and gestures to extend each other's interaction possibilities
- They also use gestures to establish physical contact with the map as a representation of the site

MapLens and DigiMap (control group) tested with 37 participants, ages ranging from 7 years to 50 years, 20 females and 17 males. Qualitative and quantitative analysis:

- **Pre-phase forms** (demographic data and ascertaining perceived experience with: technology, phones, use of maps, etc.)
- **Observations**: Each team was accompanied through-out by one researcher taking n**otes**, **photographs** and/or **videos**
- **Questionnaires**: On return from the game, participants completed a three-page questionnaire from Flow, Presence, and Intrinsic Motivation research
- **Interviews**: Each participant then described their experience, highlighting aspects that had caught their attention in semi-structured one-to-one recorded interviews
- Throughout the trial **participants took photos** as evidence of completing tasks

Quantitative analysis:

- Types of pointing gestures, 2 handed use and alignment of the phone, types of body movements, types of turning in the environment, number and types of photos, role switching, looking to the environment.

- Counting the number of instances and degrees of these events for each team and category: MapLens and Digimap

Qualitative analysis - key finding:

- **The physical map as a tangible artifact acts as a meeting point -** participants' activities are firmly anchored in their immediate physical environment organizing their bodies and map to create a common ground and make place for collaboration while connecting to images, stories, etc. of remote others.
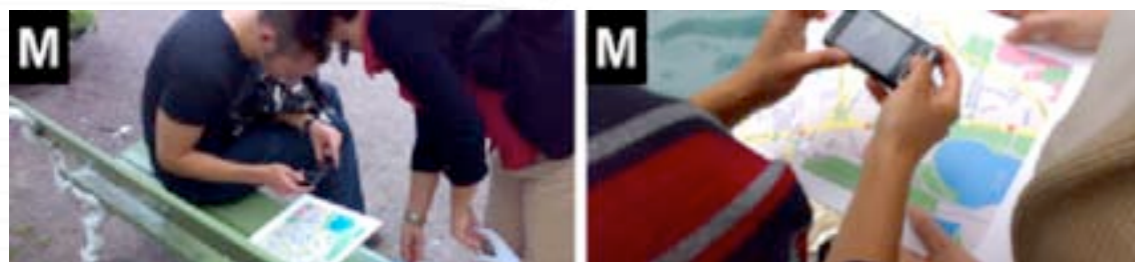
Item and Mann-Whitney U-test	System with higher median	System with lower median
*Items related only to **map system** use*		
Presence: I was able to imagine the environment and arrangement of the places presented using the map system well (*)	DigiMap MD=4.00	MapLens MD=3.76
Presence: I concentrated on whether there were any inconsistencies in this mapping system (*)	MapLens MD=5.00	DigiMap MD=4.00
*Items related to **both map system use and the game***		
Presence: The task and technology took all my attention (*)	MapLens MD=4.00	DigiMap MD=3.00
Presence: I felt I could be active in my surrounding environment (move, use the mobile phone and switch from task to task) (*)	DigiMap MD=5.00	MapLens MD=3.34
Flow: How to play the game and how to work the technology was easy (**)	DigiMap MD=6.00	MapLens MD=5.00
Flow: My skill level increased as I progressed (**)	DigiMap MD=7.00	MapLens MD=5.00
IMI: I think I am pretty good at these tasks. (**)	DigiMap MD=6.00	MapLens MD=5.00
IMI: I found the tasks very interesting (*)	DigiMap MD=6.00	MapLens MD=5.00
*Items related only to the **game***		
Flow: The difficulty level got easier as the game progressed (**)	DigiMap MD=7.00	MapLens MD=4.31
Flow: I knew how I was progressing in the game as I was proceeding (*)	DigiMap MD=6.00	MapLens MD=5.35
Flow: I helped other players in other groups (**)	MapLens MD=2.08	DigiMap MD=1.00

Note: (*) = $p<.05$ and (**) = $p<.01$. Presence 1-5 scale, Flow and Motivation 1-7 scale.

Participatory approach

- Iterative design (cycles of design-evaluation-re-design)

- Deep knowledge of use situations

- Complex applications - open to appropriation

- Creativity of users

Common set of methods for analysis

- Video observation (+ notes, photos, screenshots ...)

- In-depth qualitative analysis of video (and other material) $\rightarrow$ substantial key findings

- Quantitative analysis, based on rather specific research questions and simple coding schemes

- Comparisons (control groups, with previous field trials, with/without technologies)

- Questionnaires - showcase specific ones as well as a questionnaire focusing on commonalities