Architectural Meetings as a help for the Implementation of Building Technologies

Frans van Gassel,
Ger Maas & Johanna van Bronswijk

TU/e Technische Universiteit Eindhoven University of Technology

Where innovation starts

Research paper

Title paper:

A research model for architectural meetings to support the implementation of new building technologies through collaboration of brainpower.

Content:

1. Problem
2. Building Technologies
3. Aim and Method
4. Results
5. To Conclude

Problem




The client and the society do not get the values they want.

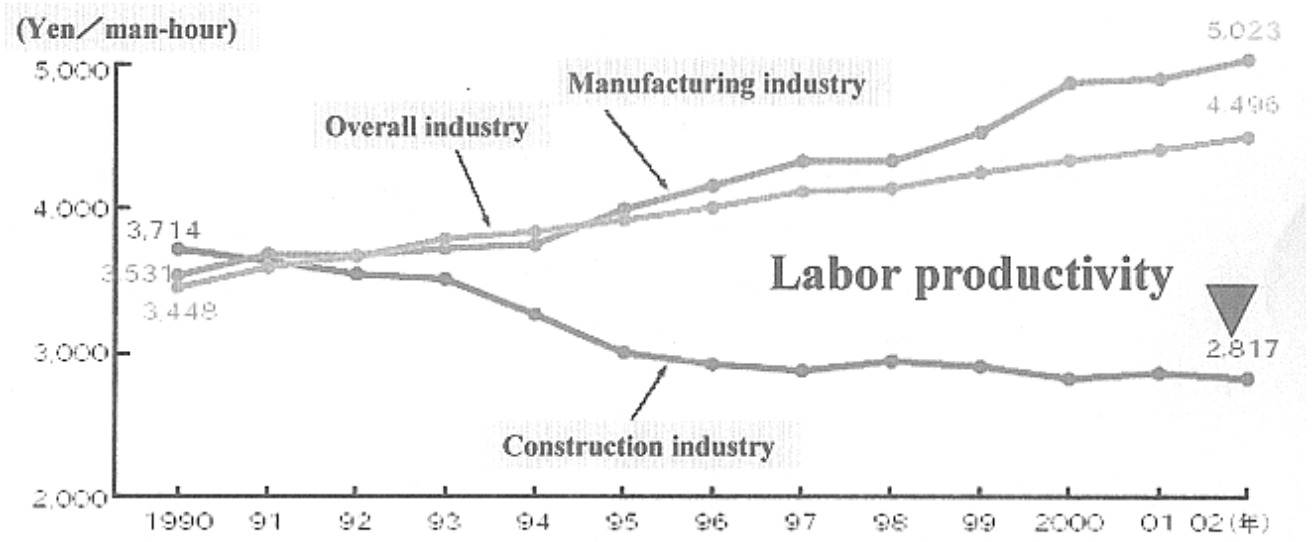
Values clients:

- Profability
- Usability
- Flexibility
- Quality

Values Society:

- Save energy
- Avoid waste and pollution
- Safe working conditions

Problem



"Construction Industry Handbook 2004"
(by Japan Federation of Construction Contractors)

New building technologies to enhance these values for clients and society, such as automation and robotics, do exist, but are not implemented as quickly as desired.

(Hasegawa)

Building Technologies

Some concepts:

- Robotizing
- Mechanizing
- Automating
- Modular Building
- Mass Customization
- Pre-fabrication
- Industrial, Flexible and Demountable (IFD) Building

Robotizing, Mechanizing and Automating

Robotizing, Mechanizing and Automating

Automated construction systems

Humanoid robots

Wabot House

Robotizing, Mechanizing and Automating

Three kinds of tasks:

- Physical tasks

- Cognitive tasks

- Organizing tasks

Performed by:

- Workers
- Equipment
- Computers and software
- Means of communication

Robotizing, Mechanizing and Automating

Mechanization

Some physical tasks → Equipment

Robotization

All physical and cognitive tasks → Equipment, computers and communication means

Automation

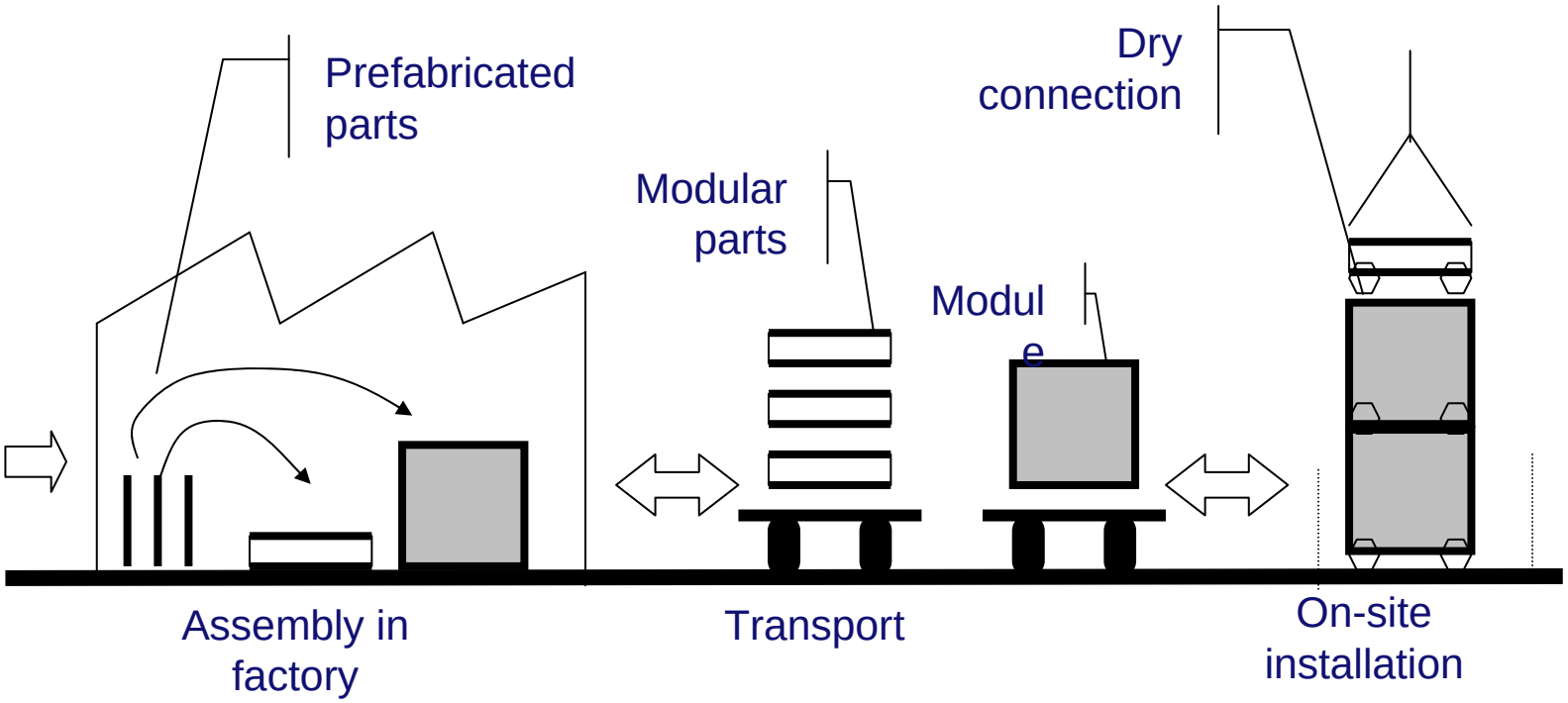
Some organizing tasks → Computers and communication means

Knowledge of:

- Materials
- Construction products
- Ergonomics
- Drive technology
- Machine controls
- Remote control
- Sensors
- Computer/software
- Communication means

Different expert designers working together

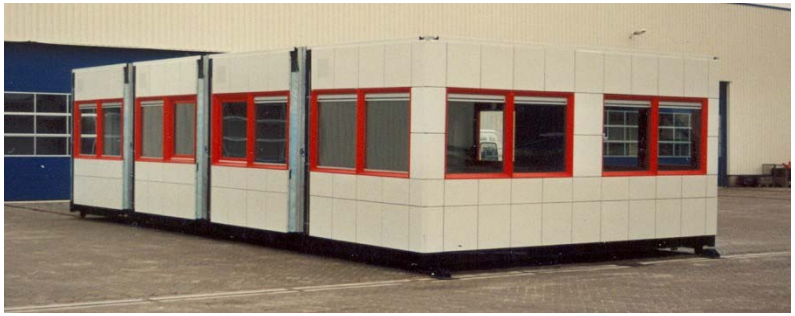
Modular Building



Production chain

Modular Building

Self supporting modules



Not self supporting modules

Mass Customization















(Sekisui)

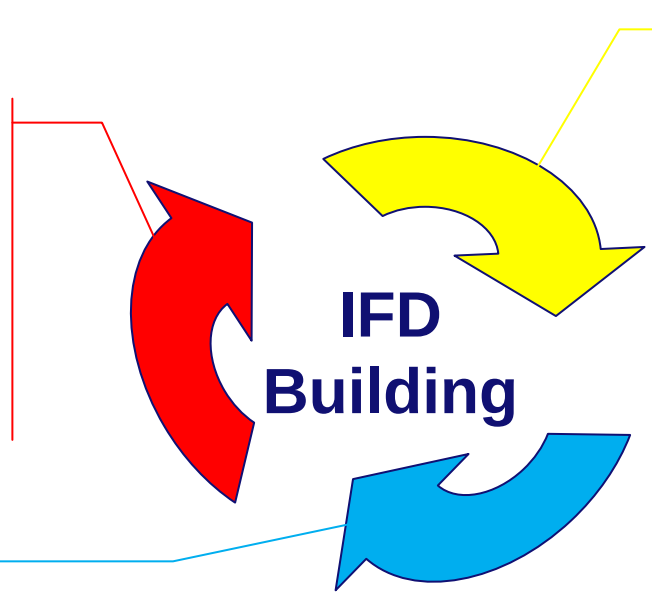
Pre-fabrication

Office as building part

Bath room as building part

IFD Building

Flexible (client)
- Driven by Demand
- Adaptability
- Mass Customisation



Industrial (constructor)
- Prefabrication
- Mechanisation
- Robotization
- Dimension control
- Organisation
- Communication

Demountable (society)
- Sustainability
- Life Cycle Analyses
- Waste
- Re-use

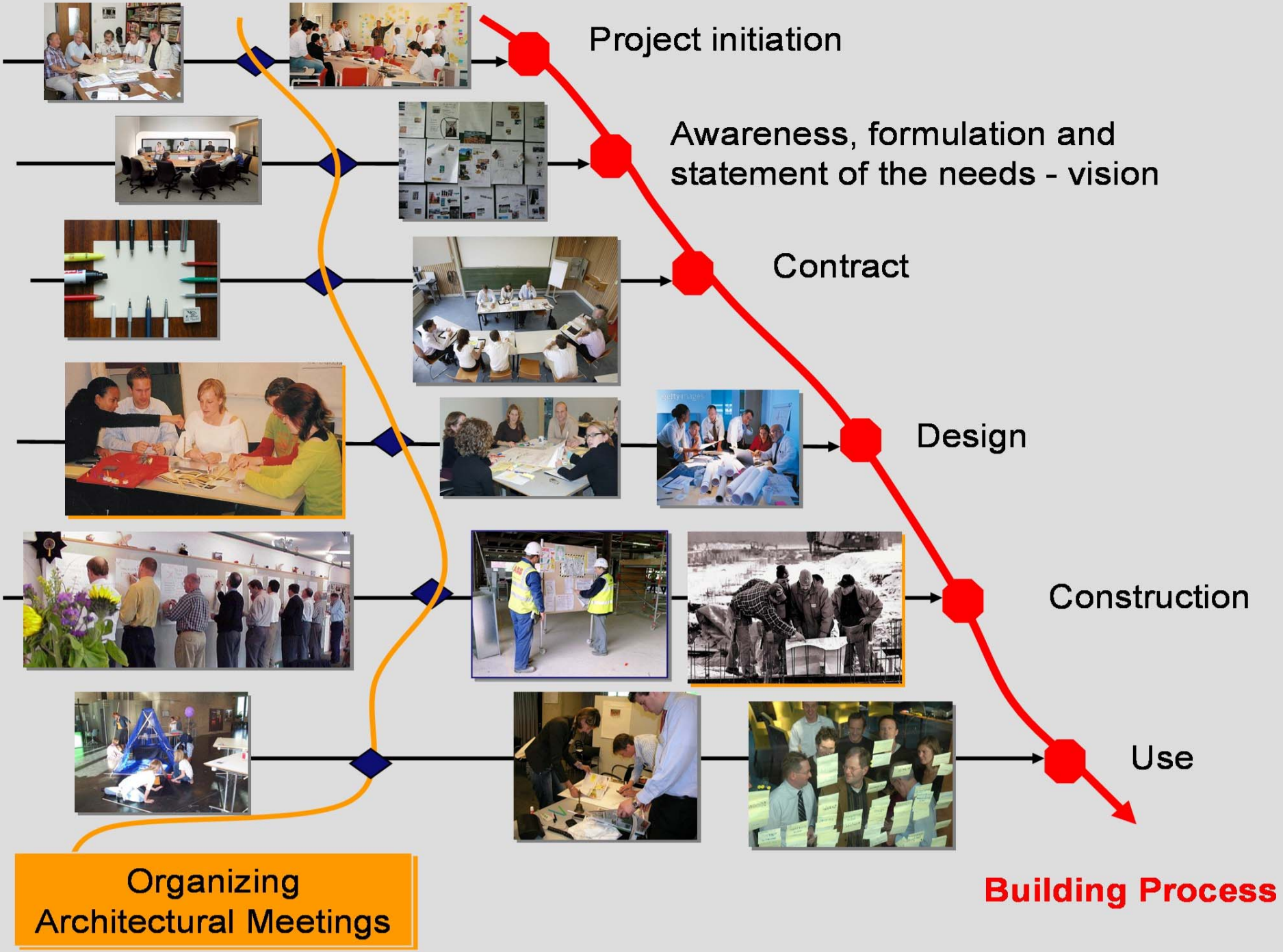
Integrated approach to initiation phase, production and use.

Collaborative Brainpower

Performed by:

- Workers
- Equipment
- Computers and software
- Means of communication
- Collaborative workers

MEETINGS


Project initiation
Awareness, formulation and statement of the needs - vision
Contract
Design
Construction
Use
Organizing Architectural Meetings
Building Process

Aim

To develop a successful approach
for organizing collaborative meetings of the bonding type.

Collaborative meetings:

A meeting attended by different professionals who make their own design thinking transparent and are able to listen with interest and respect for each other. The are willing to learn from each other.

Bonding type:

Meetings that fulfill a fundamental human need to communicate and bond, and hence foster team relationships. They create a sense of belonging and reflect the collective and cultural values of the temporary project organization.

(Emmitt, 2007)

Methods

Three phases;

- Getting insight in the relevant factors of a successful collaborative architectural meeting by desk research.
- Analyzing case studies.
- Developing a research model for meetings.

Meeting processes (1)

Social, Cognitive and Project aspects (Sebastian)

Social (environment, team work, behavior):

- Leadership (Hohn)
- Group interaction (Gorse)

Cognitive (creativity, knowledge decision)

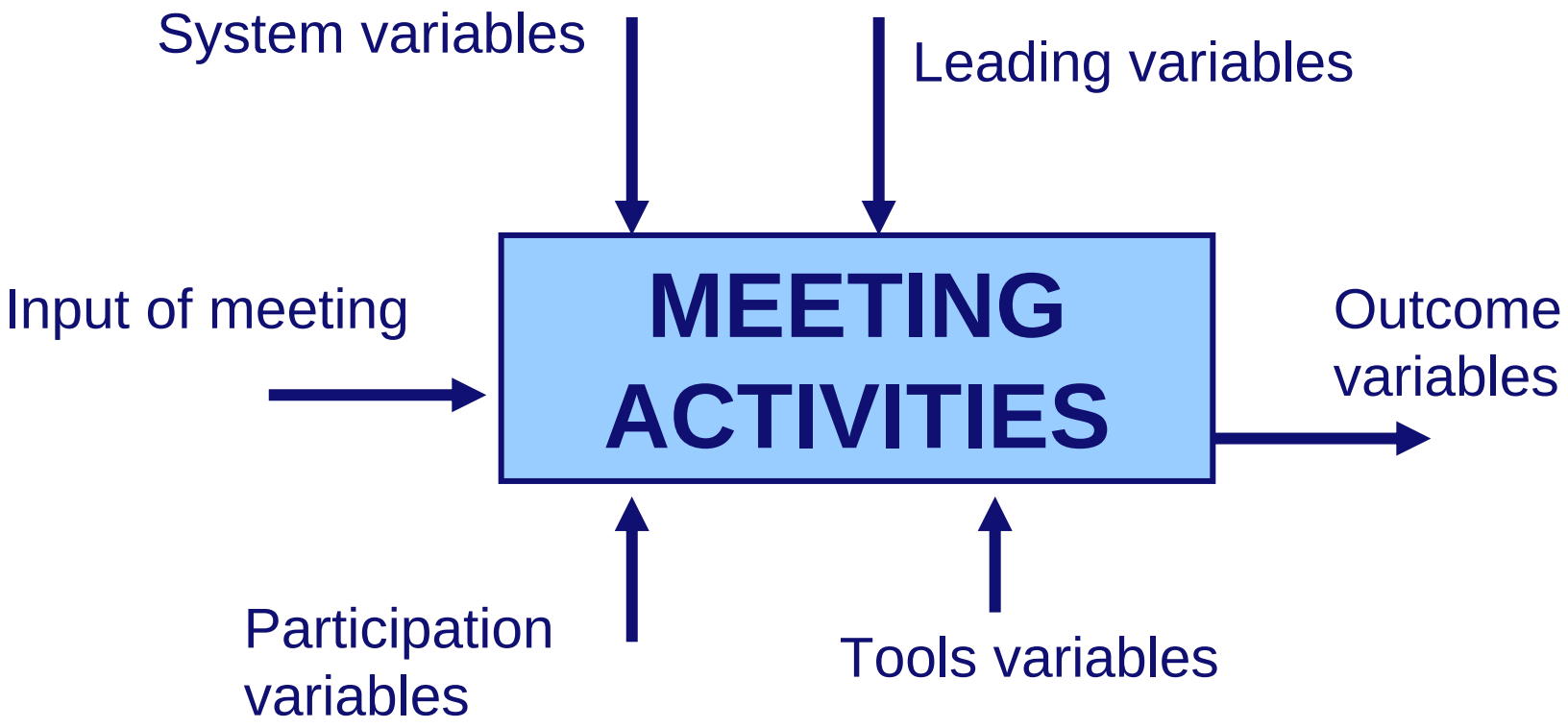
- Learning styles (Kolb)
- Designing is learning (Dorst)
- Unconscious thinking (Dijksterhuis)
- Personality dynamic (Seagal and Horne)

Meeting processes (2)

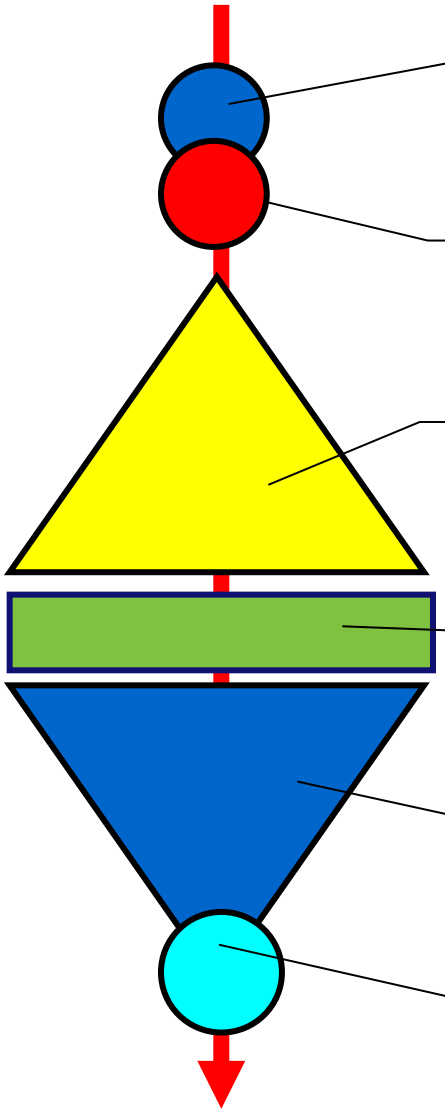
Project (goal, vision, constraint, result)

- Collaborative design (Kvan)
- Systematic Inventive Techniques (SIT) (Horowitz & Maimon)
- Reformulating the problem (Basadur)
- Phases: naming, framing, moving and reflecting (Valkenburg)
- Phases: forming, storming, norming, performing and adjourning (Robbins)

Result: Architectural meeting model



Systematic variables



Imaging the problem

Reformulating the problem

Diverging

Clustering

Converging

Communicating result

Input and Outcomes variables

Aim of the meeting:

- To enhance skills
- To develop better ideas
- To develop a vision

Outcomes:

- More knowledge and skills by participants
- Relevant ideas
- A shared understand about product and process

Leading and Participants variables

Type of the leader:

- Researcher
- Facilitator

Time span:

- One meeting
- Series of meetings

Type of participants:

- Novice professionals
- Expert professionals

Tools variables

- Rational thinking
- Intuitive thinking
- Doing
- Dreaming
- Reflecting

- Individual appeal
- Small group appeal
- Plenary appeal

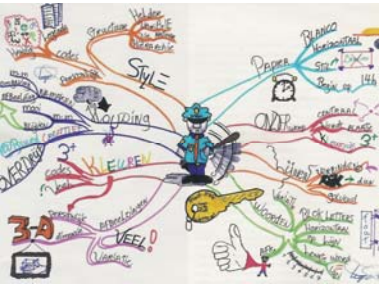
Tools

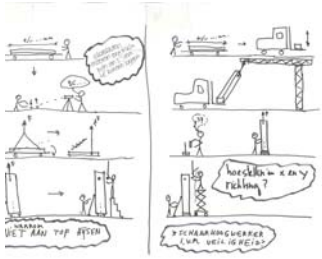
Tools


ZOEK DE 3 BEGELEIDERS...


Jack..!
WOOSH
Gotcha..!


TRIGIE
DE KLAUWEN VAN HET VERLEDEN





Facilitating architectural meetings

Meeting scenario

- Aim meeting, Type of leader, Time span, Outcome, Participants, Location, etc

Activity table

	Systematic variables	Sub outcomes	Tools
1	Imagine the aim		
2	Reformulating the question		
3	Diverging		
4	Clustering		
5	Converging		

To conclude

Coming research:

Developing *rules of thumps* to design a meeting scenario by case research with the help of the meeting model.

Questions