CapaCity

from Concepts to Actions for a Proactive Adaptation of Cities

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ICUC9

20th – 24 July 2015 - Toulouse
Plan of the presentation

1. Context
2. The CapaCity Project
3. Review of urban designers’ practice
1. Context

Architectures, Urban Design and adaptation

Cities:
- Climate change agents,
- Climate change victims,
- Climate change solutions,
1. Context

Architecture, Urban Design and adaptation

4 levers for Architects and Urban Designers in order to implement mitigation and adaptation measures:

Urban form	| Materials	| Vegetation / Water	| Heat release
Mains reasons:

- Urban Microclimate is a rather new and complex discipline
- Microclimate modeling tools, typically designed by researchers, are not suited to the Urban Designers’ needs.

Despite this, Urban Designers are expected to take action quickly to adapt the cities to climate change.
2. The CapaCity project

Research objective

from Concepts to Actions for a Proactive Adaptation of Cities

A three year project funded by ADEME ...

... crossing scientific and professional knowledge.

Research objective: A prototype version of a multicriteria design-aid-tool to help integrate climate adaptation and mitigation into Urban Design.
2. The CapaCity project

Year 1
- Synthesis of scientific knowledge
- Consultation with urban designers
- Survey
- Workshops

Year 2
- Conception of a tool prototype
- Test of the prototype on on-going projects

Year 3
- Decision support tool
3. Review of urban designers’ practice

A two-step method:

- A survey to assess the use of existing tools by Urban Design professionals, as well as their expectations towards a design-aid-tool.

- Workshops to deepen the analyses of how tools are used in the design process, and which data is required by the professionals to address the issue of adaptation

The method has been designed and implemented by Catherine Dubois from Laval University within the CapaCity team.
3. Review of urban designers’ practice

- 200 professionals answered the survey:
3. Review of urban designers’ practice

- The environmental issues mostly address by Urban Designers are:

  - 17% Urban sprawl
  - 16% Buildings’ energy consumption
  - 14% Mobility & transportation

- Microclimate and Outdoor Comfort came 4th (11%).
- Renewable Energy was classified last.
3. Review of urban designers’ practice

- The tools mostly used by Urban Designers and by Design Teams throughout the design process are:

  - 75% Graphics programs
  - 60% Guidelines and websites
  - 55% 2D drawing software
  - 53% Spreadsheet

- The majority (74%) **never use advanced modeling software**
Main objective: Understand the way existing design-aid-tools and available data are used (or not) in the design process.

Method: A game where Urban Design professionals are asked to work as a team to conceive a project (real case-study) while addressing the adaptation of the neighborhood to climate change.

- 2 half a day workshops
- 5 design teams of 4 to 5 professionals
The case study: 400 housings must be built by on the site “La Cité Blanche”, a renovation project lead by Toulouse Métropole.
The Game Rules:

Each team has some basic data on the project (maps, aerial views, ...)

Each team has 6 “resources cards” to play:

- 3 cards to use a technical or a technological resource of their choice (thematic maps, software, guidelines ...).
- 3 cards to consult an expert of their choice for 15 minutes.
### 3. Review of urban designers’ practice

#### Workshops

The Game Rules – Resources cards

<table>
<thead>
<tr>
<th>Technical resources</th>
<th>Technological resources</th>
<th>Human resources</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Guidelines</td>
<td>• GIS software</td>
<td>• Urban Climatologist</td>
</tr>
<tr>
<td>• Technical books</td>
<td>• 2D design software</td>
<td>• Building Energy engineer</td>
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<tr>
<td>• Architectural or Urban reference books</td>
<td>• 3D design software</td>
<td>• Sustainable Urban Design expert</td>
</tr>
<tr>
<td>• Maps (location, topography, transportation network, etc.)</td>
<td>• Simplified energy consumption software</td>
<td>• Representative from Toulouse Metropole</td>
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Findings:
- The technical and technological resources were little used by the teams.
- The human resources were consulted but not as much as they could have been.
- The professionals use “rules of thumb” in the early design stages, and expect to have *quick fix solutions* for environmental design.
- The typology choice is one of the first to be made and has a strong environmental impact.
- Architectural or Urban references are often used by designer as starting points for environmental design.
Outlooks:

- A design-aid tool is essential in the early design stage were each decision has a heavy environmental impact.
- The design tool cannot be as complex as existing ones, if so it will only be used in the advanced design stage, were crucial choices already are set in stone.
- A typology based tool, giving references and quick fix solutions seems accurate but the work we are leading is still in progress.
Thank you for your attention!

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