END-USER INVOLVEMENT IN HOSPITAL BUILDING DESIGN

A case study on information management & design process:

ERASMUS MC ROTTERDAM

BURCAK YALNIZ  P5 PRESENTATION
5th of November 2020
The design process is different in healthcare buildings.
Who are the end-users in hospital projects?

- Medical staff: Doctors, nurses, medical technicians
- Support Staff: Cleaning and maintenance personnel
- Client organization, Managers, facility managers, building experts
Content

Introduction
Research
Findings
Conclusion
Recommendations
ERASMUS MC ROTTERDAM
History

19th century

the '60

the '70

2018
New hospital building Project

Completion: 2018
240,000 sqm
Phasing & Timeline

Re-development project

**Design: 2003-2015**

- 1998: First project proposal to government
- 2001: Construction project organization / selection of advisors
- 2004: Setting up steering group and quart master
- 2005: Establishing PVE (technical)
- 2006: Establishing PVE (spatial / functional)
- 2009: Start interior design

**Construction: 2009-2017**

- 2009: Start construction
- 2013: Completion – East Wing
- 2014: Start construction – West Wing
- 2015: Definitive layout drawings
- 2016: Decision over two additional floors
- 2017: Completion – West Wing / Early use
- 2018: Delivery of remaining floors
- 2018: Receive first patients / official opening (September)
Existing Development

13,500 employees (23rd employer in The Netherlands)
Future Development
Healing Environment:
Use of natural light
Healing Environment:
Single patient rooms with view & furniture
Healing environment:
Roof gardens accessible for patients
Public areas:
Passage and square
Public areas in the ground floor:
Closed garden
RESEARCH
Problem Statement

design process in healthcare projects

- high number of stakeholders,
- collaboration issues
- information asymmetry
- involvement of end-users like medical staff.

Barriers in communication and information exchange (Pemsel, 2010)
To gain insight into the design process in healthcare building projects:

Particularly how the end-user groups like the medical caregivers and the design team exchanged information and participate on design development.
In hospital building projects, how does the project organization translate the end-user information into design?
end-user - design team

interactions
Single case study on Erasmus MC Rotterdam

Research methods: Qualitative analysis based on

1. Ten in-depth interviews with project organization members (internal/external)

2. Document analysis in more than 100 pages:
   - project information documents
   - process description documents
   - phase documents
   - memos
   - evaluation documents
   - presentations
FINDINGS
**Flexibility**
Themed approach
/Standardized layouts

Involvement of
more end-users & more evaluation

**Design Principles**
1. Safety first
2. Healing is leading
3. Sustainability is cheaper

Prioritized design decisions
Project Organization Governance

Decision making bodies:
- Steering committee/Executive board:
  - Board of Directors
  - Finance & Control
  - OR, CRAZ, Staff Conv.
  - Steering committee
  - New building

- Sounding board

- Quartermasters
- User-coordinators

Working Groups

- Integrated building program director
- Digitalization Project
- New ways of working
- New building project secretary

- Fit out
- Realisation
- Inventory & relocation
- Expertise group
Project/Program

- Board of Directors
  - Finance & Control
  - OR, CRAZ, Staff Conv.
  - Steering committee
    - new building
  - Sounding board
  - Quartermasters
  - Integrated building program director
    - Digitalization Project
    - New ways of working
  - New building project secretary
    - Fit out
    - Realisation
    - Inventory & relocation
    - Expertise group
Building expertise group:
- Internal advisory group within the Housing Department
- Leading the project and program.
- Guide the design and decision making by providing policy and giving advice
- to portfolio holder, board of directors, Housing Director and the management
User Coordinator Group:
Representatives of End-users, they give decision on behalf of the theme they represent.

Quartermasters Group:
Responsible for developing and approval of PVE & drawings.

Working Groups:
Four to six end-users. For every theme there are working groups with medical experts.
End-users are represented in the organization in different levels

Project Organization

Steering committee
new building

Board of Directors
Finance & Control
OR, CRAZ, Staff Conv.

Sounding board

Quartermasters
Working Groups

User-coordinators

Integrated building program director

Digitalization Project
New ways of working

New building project secretary

Fit out
Realisation
Inventory & relocation
Expertise group

TECHNICAL DESIGN TEAMS (TDTs)
### 3 Key Groups in Briefing & Design

<table>
<thead>
<tr>
<th>Building expertise group</th>
<th>User Coordinators</th>
<th>Programmers</th>
</tr>
</thead>
</table>
| • Manage the design and the process.  
• Guide the design process & prepare policy & doc.  
• Evaluate the PVE and design products on different aspects.  
• Facilitate information exchange | • Represent and engage end-users, take decisions  
• Explain and communicate the design progress and the decisions with end-users.  
• Receive feedback from the group after each design phase (design cafes) | • Prepare the PVE  
• Communicate requirements with the designers and the end-users in the working groups  
• Integrate the user requirements into the design. |
Layout and PvE development & evaluation

Design

Development

PVE

Review 1

PVE+PHASE DOC.

Program Manager

REVIEW MATRIX

FINAL PvE

Review 2

Approvals by the Steering Committee & Executive Board

Layout plans
Layout evaluation & Coordination drawing development

- PVE
- Layout plans
- Coordination drawings
- REVIEW MATRIX
- Expert groups + end user groups
User Involvement

- Form of involvement is evolved during the design process.
Findings - 2

Information Exchange

Two groups with key roles on information management

- **User Coordinators**

  ![User Coordinator Diagram]

- **Building Expertise Group**

  ![Building Expertise Group Diagram]
### Roles on information management

#### User Coordinators

<table>
<thead>
<tr>
<th>PRE-DESIGN</th>
<th>DESIGN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Programming</td>
<td>Concept + developed design</td>
</tr>
</tbody>
</table>

- **Obtain information from end-users**
- **Help Programmers & expertise group to collect information**
- **Exchange information with other user coordinators**
- **Inform Quartermaster**
- **Inform End-users**

- **Exchange information with user coordinators**
- **Exchange information with program managers & designers**
- **Inform Quartermaster**
- **Inform End-users**
- **Exchange information in Decision matrix**

- **Deliver information to the Design team**
- **Deliver feedback from the design team to the management if necessary.**

#### Building Expertise Group

<table>
<thead>
<tr>
<th>SUPPLY</th>
<th>DEMAND</th>
</tr>
</thead>
</table>

- **Obtain information from UC**
- **Inform-Management/Board**
- **Evaluate information**
- **Facilitate the information Exchange (decision matrix)**
- **Guide/Ensure information flow.**

- **Deliver information to the Design team**
- **Deliver feedback from the design team to the management if necessary.**
## Findings

### REVIEW MATRIX: Tool for information exchange trail – communication decision making

**Toetsing cc: dinatiekenning; specials verpleegafdelingen Rg en Bd West tgv inpassing Thorax**

**HV.93264**

**Datum: 3 maart 2014**

<table>
<thead>
<tr>
<th>Coördinatie-tekening</th>
<th>Reactie van toetser</th>
<th>Opmerking gemaakt door:</th>
<th>Opmerkingen</th>
</tr>
</thead>
</table>

### Algemeen

**Later aanleveren**

Ivm vakantieweek niet tijdig reactie kunnen aanleveren, deze volgt nog!

**AV**

**Eerder besproken**

Rien/ Dieudonné hebben de tekeningen op een eerder moment doorgenomen. Donderdag 27/2 wordt de lijst doorgenomen op wel/niet verwerkt

**RG**

**Renvooi**

Patientendetectie voor Erasmus. Zijn er wel voorzieningen opgenomen, om dit mogelijk te maken?

**I2**

nee; indien noodzakelijk zullen er in de toekomst op de gewenste plaatsen extra datavoorzieningen opgenomen worden

**Verpleegpost**

Intercom Per verpleegpost opgeven met welke intercoms verbonden zijn aan het tafelmodel bij de verpleegpost inclusief camera’s.

**I2**

**Zonwering**

Zonwering bediening Bediening zonwering ontbreekt in diverse ruimten.

**I2**

**Eisen**

Gestelde eisen aan de patiëntenkamers ontbreken op de afsprakentekeningen, vraag mevrouw zodoet achteraf getoetst kan worden waar aan voldaan moet worden voor de gebruiker.

**I2**

Deze opmerking kan niet geplaatst worden. Daar waar afwijkingen zijn to voorgaande fasen, bijvoorbeeld ten aanzien van aansluitingen, is dit op de tekening aangegeven. Voor het overige gelden de randvoorwaarden conform reeds voorgaande en goedgekeurde fasen.
<table>
<thead>
<tr>
<th>Drawing No:</th>
<th>category</th>
<th>subject / projectteam</th>
<th>Remark by the reviewer</th>
<th>Remark made by:</th>
<th>Feedback programmer / project manager</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
<td></td>
<td>RE HB&amp;A</td>
<td>RE HB&amp;V: functional advisor, technical advisor, workplace expert, (internal) hospital planner from corporate real estate department</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>RE VGB</td>
<td>RE VGB: teamleader / MT-members of the maintenance organization</td>
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<tr>
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<td></td>
<td>SB Facilities</td>
<td>SB Facilities: user coordinator collecting input from the logistics department, cleaning, hospitality, mobility &amp; security</td>
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<td></td>
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<td></td>
<td></td>
<td>SB Arbo</td>
<td>SB Arbo: Ergonomics &amp; Environmental (*)</td>
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<td></td>
<td></td>
<td>UNIP</td>
<td>UNIP: Unit Infection Prevention (*)</td>
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<td></td>
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<td></td>
<td></td>
<td>SB IT</td>
<td>SB IT: Information &amp; (Medical) Technology</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>User Coord.</td>
<td>User Coord.: peers in the same role from other themes and functions</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(*)these units are the Safety Experts and they can have a formal responsibility for quality assuring in some organisations</td>
</tr>
<tr>
<td></td>
<td>Sanitary</td>
<td></td>
<td>Sufficient space must be available in front areas near washbasins for hanging a towel dispenser and waste bin</td>
<td>XX</td>
<td>this is the standard configuration; in areas where there is insufficient space next to the washbasin, there is always room on the side wall for hanging</td>
</tr>
<tr>
<td></td>
<td>Guardpost</td>
<td>Desk is place not facing the door. Doesn’t work well (you want to be able to see who is entering space).</td>
<td>XX</td>
<td>This comment is submitted to the architect. Incidentally, it should be noted that in principle this is not a area where staff will sit for a long time as they move in space.</td>
<td></td>
</tr>
</tbody>
</table>
Decision Making Process

- Informed & transparent decision-making process.
- End-user groups are not participating formally in decision making procedures.
- They participate in different rounds of reviewing activities.
- Review matrices are used as decision making support tools.
CONCLUSION
Findings on roles of the building expertise group and boundaries in Erasmus MC (own ill. Based on Jensen, 2011)
coordinator role of the user representatives
intermediator role of the building expertise group
+ acting between different boundaries are the key
RECOMMENDATIONS
Practice

- Identifying roles and responsibilities
- **Transparent** decision-making process:
- Use of **boundary objects** and methods:
- **Systematic** end-user involvement and representation
- Higher level of user involvement **in technical design phase**
• User involvement in other healthcare design projects and large-scale building projects

• End-user and user satisfaction on their involvement in Erasmus MC

• In depth analysis of review matrices
Impact of COVID-19

In depth analysis of review matrices

Conclusion

Yalniz P5 Presentation

Reflection & Additional Recommendation
THANK YOU FOR YOUR PARTICIPATION!

- All photos are retrieved from EGM architects 2020