SUPPLY CHAIN MANAGEMENT WITH BIM: TOWARDS BETTER CONTROL OF CONSTRUCTION LOGISTICS

GRADUATION RESEARCH | LISA OOSTERWIJK
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SUPPLY CHAIN MANAGEMENT

“THE MANAGEMENT OF ALL ACTIVITIES RELATED WITH THE TRANSFORMATION OF GOODS, FROM RAW MATERIALS TO THE END USER”
LOGISTICS

“THAT PART OF SUPPLY CHAIN MANAGEMENT THAT FOCUSES ON THE ORGANIZED MOVEMENT OF MATERIALS WITHIN A SINGLE ORGANIZATION”
CONSTRUCTION LOGISTICS

01  ON-SITE VERSUS OFF-SITE

02  LOGISTICS ARE INEFFICIENT

03  LACK OF CONTROL
BUILDING INFORMATION MODELLING

“A DIGITAL REPRESENTATION OF THE PHYSICAL AND FUNCTIONAL CHARACTERISTICS OF A FACILITY”

- US NATIONAL BIM STANDARD PROJECT COMMITTEE (2015)
facility management
planning
budget
construction
ARCHITECTURAL
INSTALLATIONS
BIM
FACILITY MANAGEMENT
HOW DOES SUPPLY CHAIN MANAGEMENT WITH BIM HELP CONTRACTORS TO GET CONTROL OF THE LOGISTICS OF A BUILDING PROJECT?
SUPPLY CHAIN MANAGEMENT

SUBCONTRACTORS

SUPPLIERS

BIM

MAIN CONTRACTOR

INDIVIDUAL LOGISTIC INFORMATION

COMBINED LOGISTIC INFORMATION

SUPPLY CHAIN MANAGEMENT

ACCEPTABILITY

FEASIBILITY
CASE

PROJECT BÈTATOREN
LOGISTIC PLAN

BIM-PROTOCOL
CURRENT SITUATION

MAIN CONTRACTOR — LOGISTIC PLAN & BIM-PROTOCOL — SUBCONTRACTORS

IMPROVED SITUATION

MAIN CONTRACTOR — LOGISTIC PLAN & BIM-PROTOCOL — SUBCONTRACTORS

Information Flows

Subcontractors

Suppliers
BIM-MODEL

Design Phase

Coordination Model

Design Phase

Advisors

Architectural

Construction

Installations

Procurement Phase

Coordination Model

Procurement Phase

Advisors

Architectural

Construction

Installations
<table>
<thead>
<tr>
<th>Subcontractors</th>
<th>Designation</th>
<th>Location</th>
<th>Time</th>
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<tr>
<td></td>
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<td>X</td>
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<tr>
<td></td>
<td>Bathtub</td>
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<tr>
<td></td>
<td>Radiator</td>
<td>✓</td>
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<tr>
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<td>Toilet</td>
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<td>Sink</td>
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<td></td>
<td>Floor tiles</td>
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<tr>
<td>Tegel Idee</td>
<td>Bathroom / Toilet</td>
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<tr>
<td></td>
<td>Wall tiles</td>
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<td>Facade structure</td>
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<tr>
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*Parameter differs per component
**CURRENT SITUATION**

- **ARCHITECT**
  - Coordination Model
- **ASPECT-MODEL 1**
- **ASPECT-MODEL 2**

**SUBCONTRACTORS**

- **SUPPLIERS**

**MAIN CONTRACTOR**

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**IMPROVED SITUATION**

- **ARCHITECT**
  - Coordination Model
- **ASPECT-MODEL 1**
- **ASPECT-MODEL 2**
- **PLANNING**

**SUBCONTRACTORS**

- **SUPPLIERS**

**MAIN CONTRACTOR**
PHASE 3

SUBCONTRACTORS

SUPPLIERS

BIM

LOGISTICS MANAGEMENT

LOGISTICS MANAGEMENT

INDIVIDUAL LOGISTIC INFORMATION

COMBINED LOGISTIC INFORMATION

MAIN CONTRACTOR
MANAGING THE ON-SITE LOGISTICS

01 CHECKING THE ASPECT-MODELS

02 LINKING THE MODEL TO THE PLANNING

03 MANAGING THE INVENTORY
Current Situation

Information Flows

Cooperation Model
Aspect-Model 1
Aspect-Model 2

Main Contractor

Logistics Management

Subcontractors
Suppliers

Improved Situation

Cooperation Model
Aspect-Model 1
Aspect-Model 2
Planning

Main Contractor

Logistics Management

Subcontractors
Suppliers
PHASE 4

SUBCONTRACTORS

SUPPLIERS

LOGISTICS MANAGEMENT

BIM

MAIN CONTRACTOR

INDIVIDUAL LOGISTIC INFORMATION

COMBINED LOGISTIC INFORMATION

LOGISTICS MANAGEMENT
"The adoption of BIM for the management of the on-site logistics, is financially feasible."

Main costs: hardware, licences and training

Serious investment

Costs are similar to common CAD-software

Costs are often perceived higher than they are

Benefits outweigh the costs
"The adoption of BIM for the management of the on-site logistics, is organizationally feasible."

- Main contractor already has a coordinating role
- Step-by-step implementation
- Adopting new software and new processes
- Support from (top) management
- Benefits outweigh the costs
“The adoption of BIM for the management of the on-site logistics, is socially feasible”

- Third parties need to cooperate
- Showing the benefits
- Training and education
- Focus on integration and communication
- Demand cooperation
"THE LOGISTIC INFORMATION AND BIM ARE **DISCONNECTED**"
IMPROVED SITUATION

“GETTING CONTROL OF THE ON-SITE LOGISTICS”

01 TAKE RESPONSIBILITY AND CONTROL THE CHANGES IN THE PROCESS

02 MAKE SURE THE INFORMATION PROCESSES AND BIM ARE CONNECTED, AND LINKED TO LOGISTICS

03 ALIGN THE BIM-MODEL WITH THE ON-SITE CONSTRUCTION LOGISTICS
**INFORMATION FLOWS**

**FINAL FRAMEWORK**

- **Link with BIM**
  - Connected
  - Disconnected

- **Planning**
- **Location**
- **Dimensions**

- **General Site Information & Planning**
- **Architect**
- **Design**

- **Coordination Model**
  - Aspect-Model 1
  - Aspect-Model 2
  - Planning

- **Performance Measurement & Feedback + Evaluation**

- **Logistics Management**

- **Main Contractor**
- **Subcontractors**
- **Suppliers**
THANK YOU FOR YOUR ATTENTION