

IPHA Technical Seminar 2015

October 21-22, Malmö - Sweden

Tekla's view on BIM



- Tero Kautto
- 21.10.2015

■ Carrier:

- 2015 – Tekla Corporation / Trimble
- 2010 – 2015 Sweco Finland Oy - BIM development manager
- 2007 – 2010 WSP Finland Oy - 3D development manager
- 1999 – 2007 Tekla Oyj
- – 1999 Finnmap Consulting Oy – Structural engineer

■ Author of:

- COBIM 2012 Series 5: Structural design
- BEC2012: Precast modelling requirements



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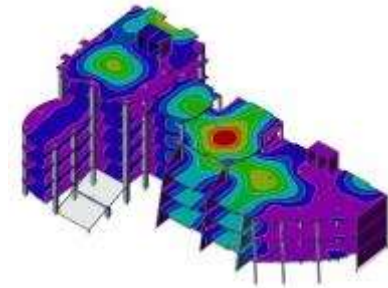


- **Industry-specific positioning solutions for**
 - Building construction
 - Geospatial
 - Agriculture
 - Heavy civil construction
 - Transport and logistics
- **Founded in 1978**
- **Listed on NASDAQ**
- **Customers in 150 countries**
- **Offices in 35 countries, 8 000+ employees**
- **Revenue \$2.4 billion in 2014**



- **Founded in 1966**
- **Over 700 employees**
- **Worldwide partner network**
- **Acquired by Trimble Navigation Ltd in 2011**





Tekla Structures

- > Creation and management of 3D structural models
- > Accurate, constructible models with fabrication level of detail
- > Not restricted by material / structural complexity
- > From conceptual design to detailing, fabrication, erection and construction management

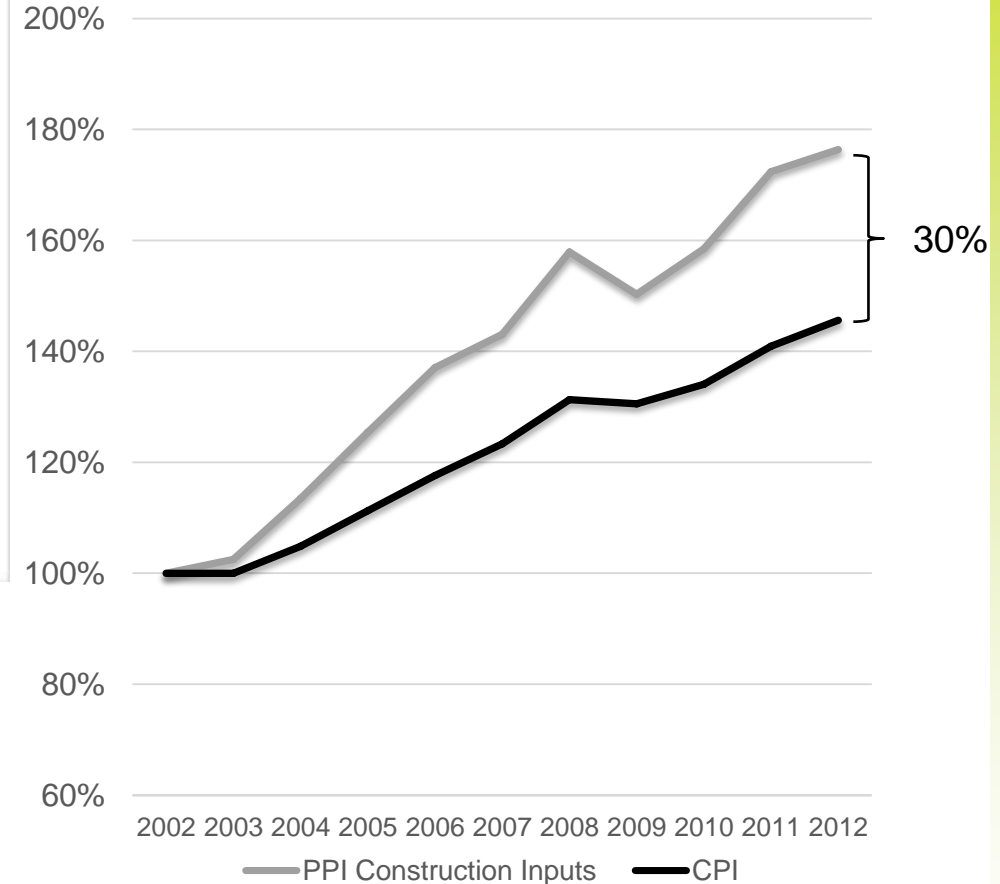
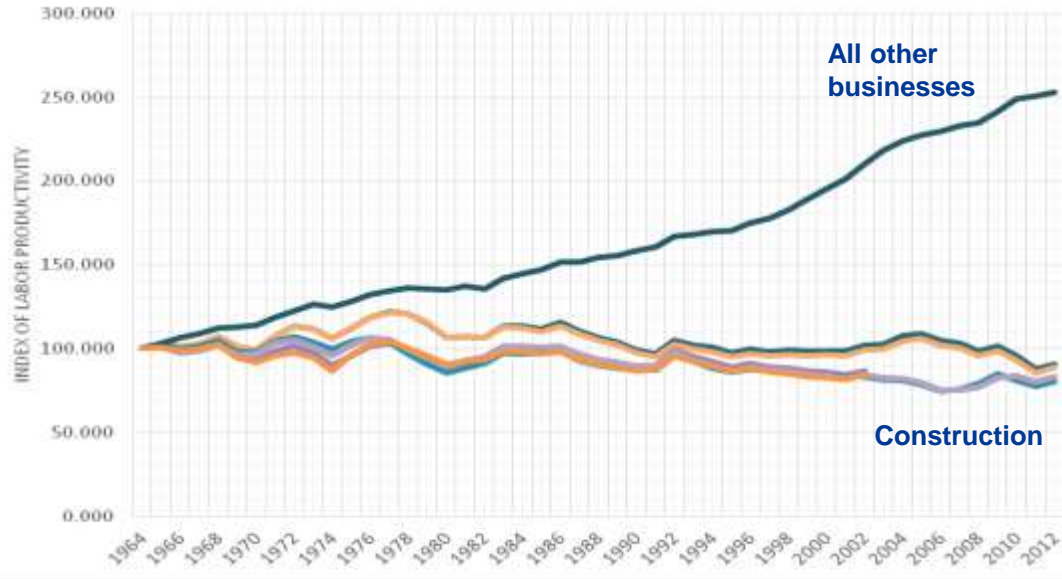
Tekla Field3D & Tekla BIMsight

- > Construction coordination & collaboration
- > Combine and review models
- > Check for conflicts
- > Communicate and share

Tekla Structural Designer & Tedds

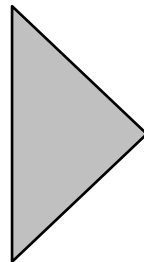
- > Analyze and design buildings
- > Optimized concrete and steel design
- > Modeling, load analysis, design, documentation
- > Tedds to automate repetitive structural calculations

Initial problem



At least 20% is waste

- ~10% materials are wasted
- ~30% of construction is rework
- ~40% of jobsite work is unproductive
- ~40% of projects are over budget
- ~90% of projects are late



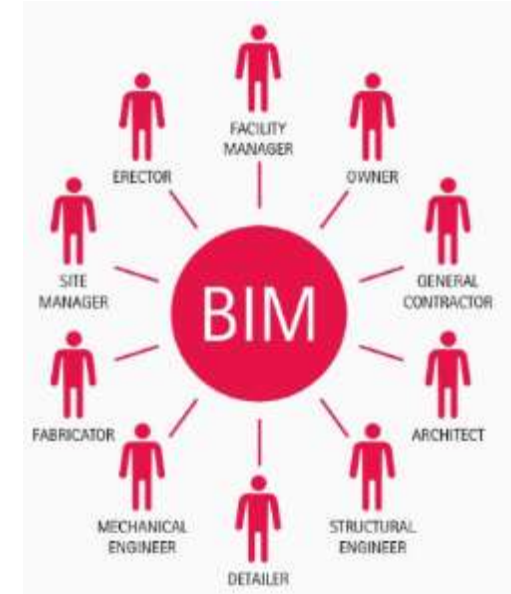
Ineffective communication, planning and collaboration

Source: US Dept of Labor: Bureau of Labor Statistics (BLS)

BIM

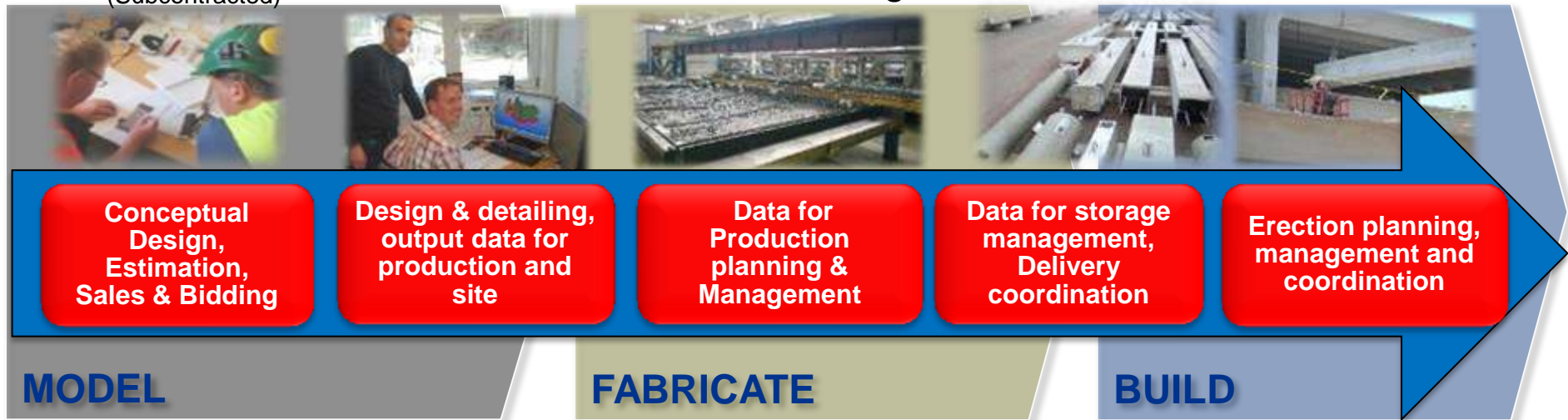
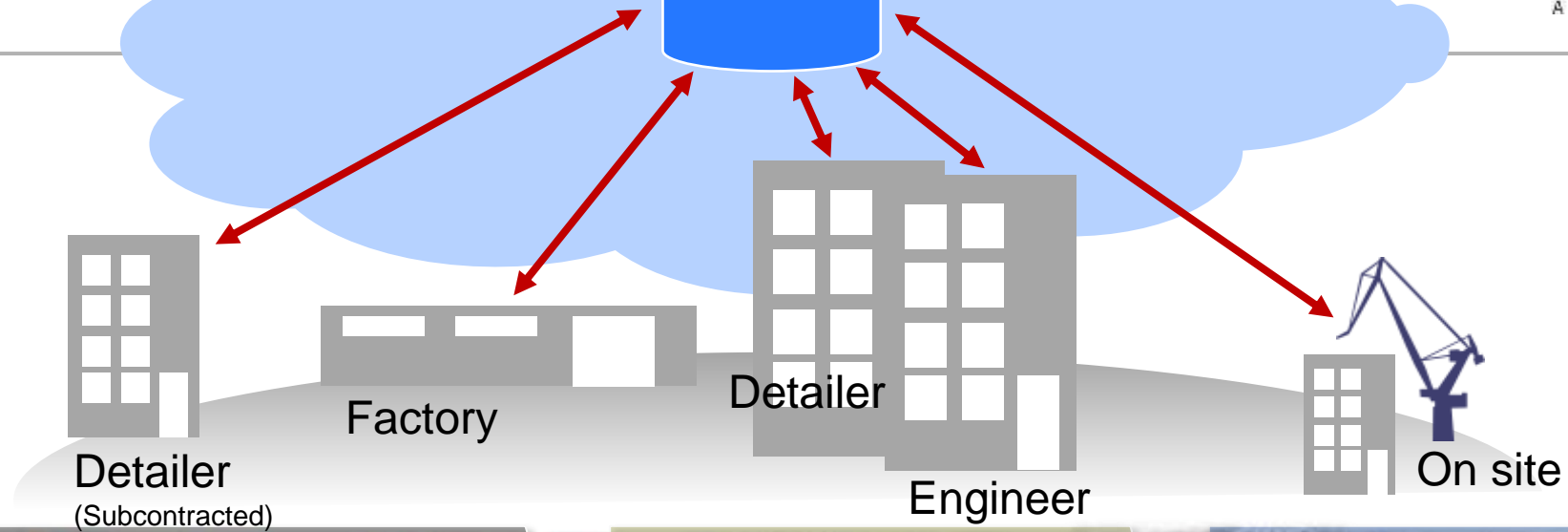
Building information modeling
Building information **management**

- **openBIM means that BIM operations and BIM data is not tied to any specific tool, software or vendor.**
 - Freedom to choose the tools best suited for the purpose
 - Freedom to transfer data between tools
 - Freedom to develop very purpose specific tools independent of any platform
- **Open standard data formats**
 - IFC, Industry Foundation Classes is most commonly used standard for communication

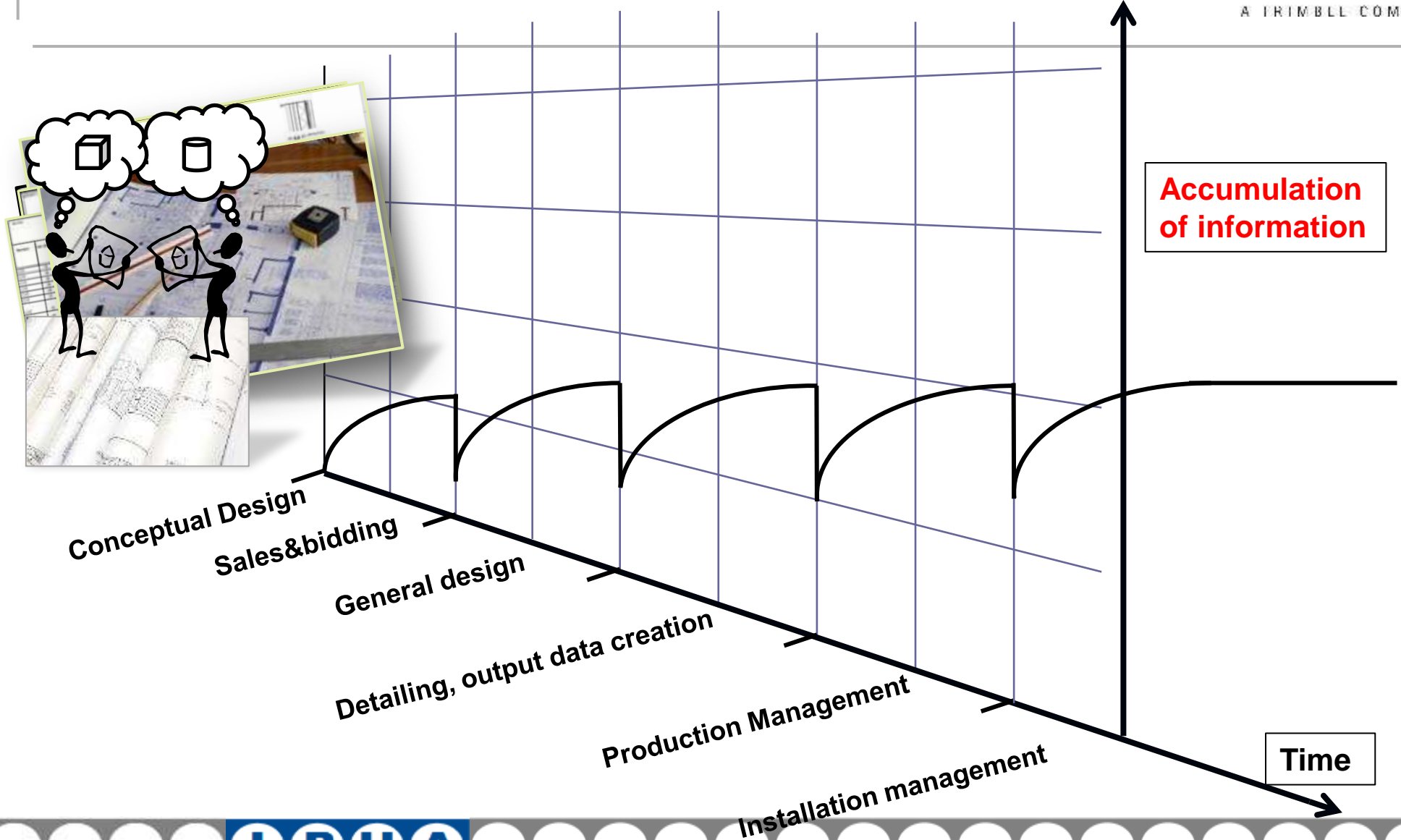


OPEN BIM™

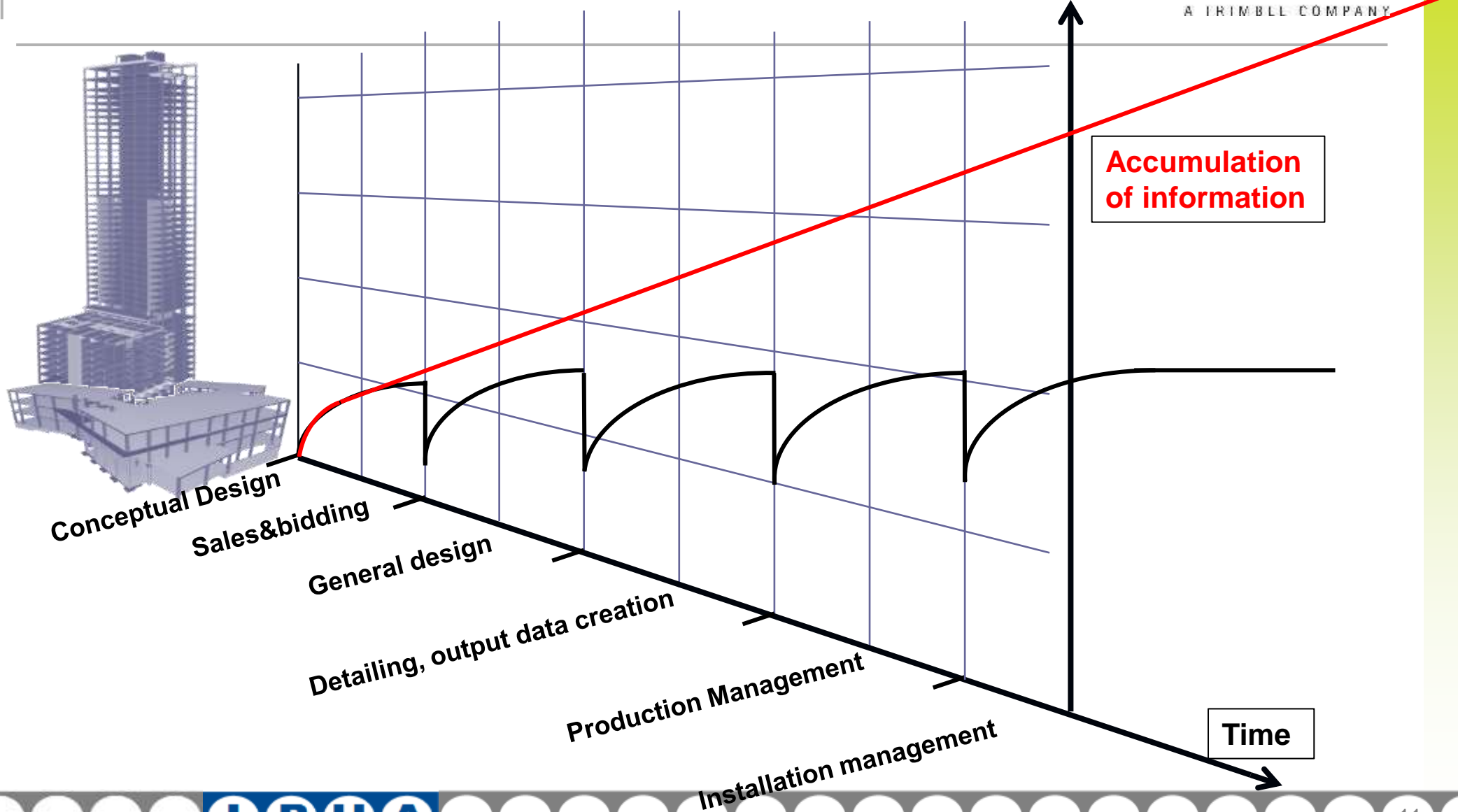
Internal information workflow



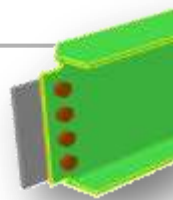
Amount of information



Amount of information



Level of detail

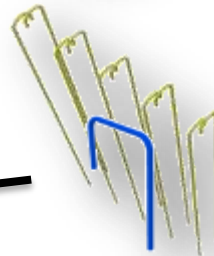


Plates, Bolts & Welds

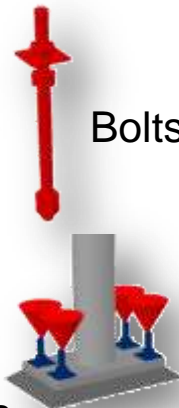
Fabrication / construction level of detail and information



Embeds



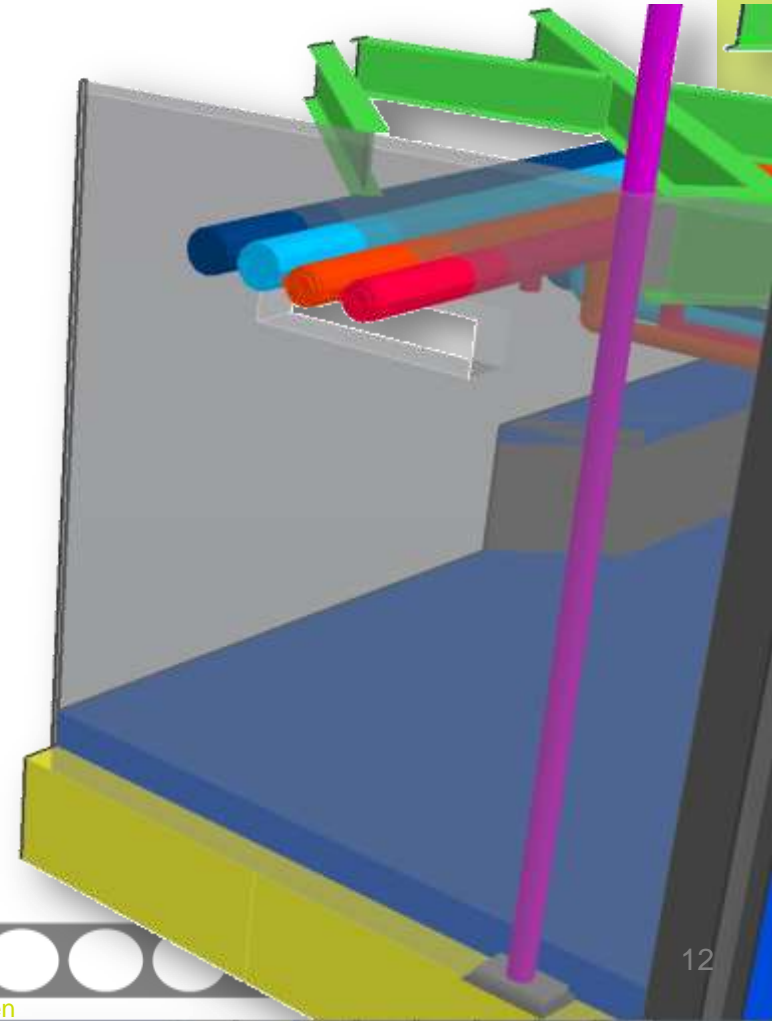
Reinforcement



Bolts

Lay-Out Points

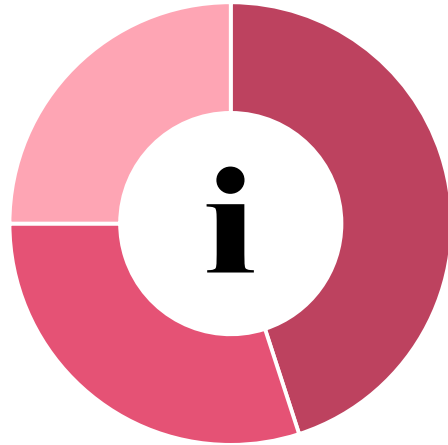
Design



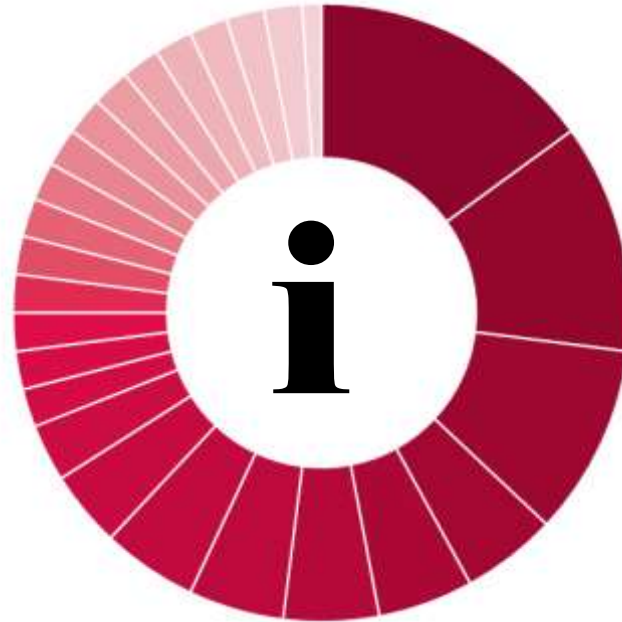
Information utilization and interoperability



- Model coordination
- Drawing creation



- Model coordination
- Drawing creation
- Link to ERP

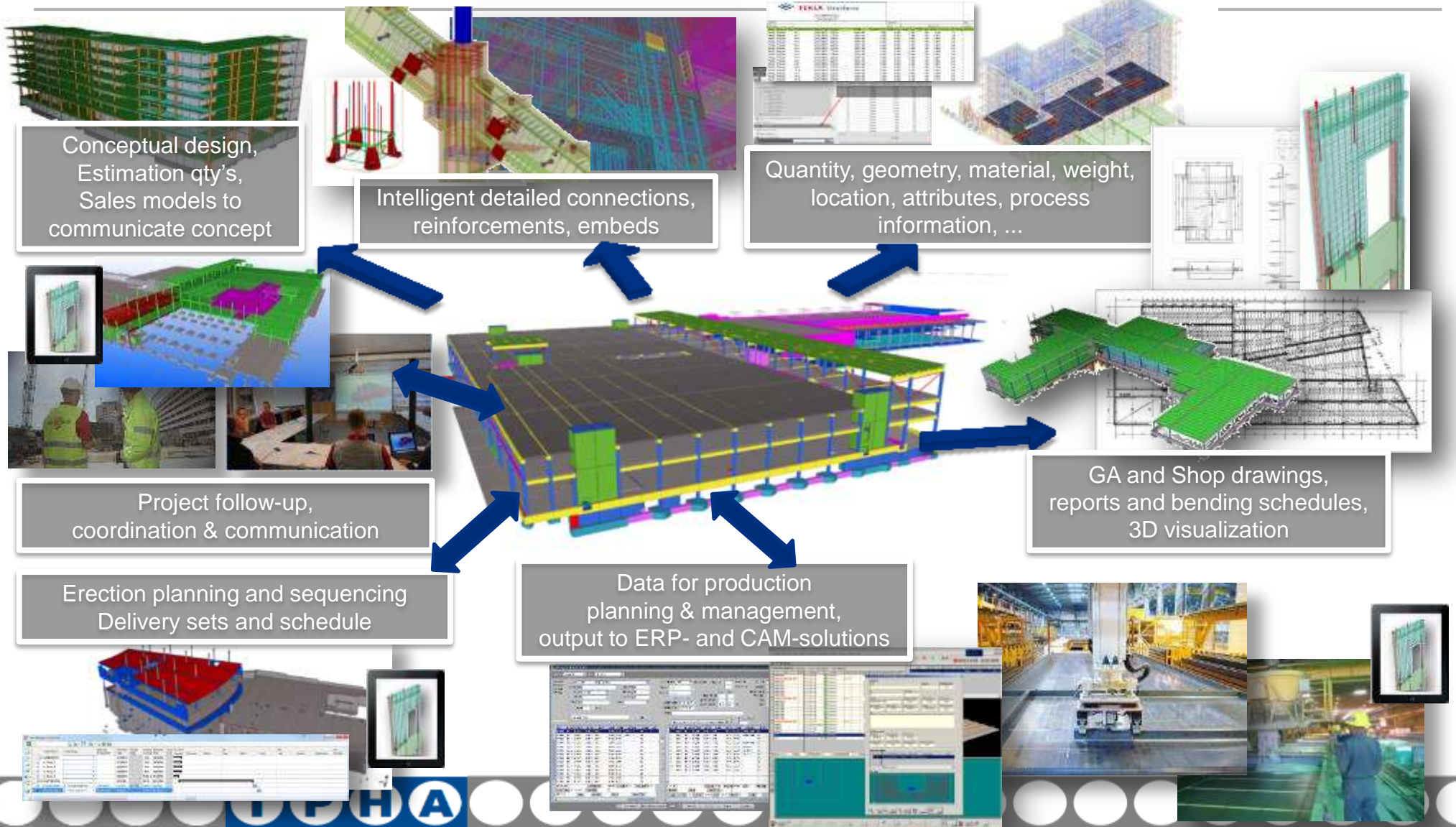


- Virtual prefabrication
- Production automation
- Production coordination
- Cost projection & tracking
- Sales estimates
- Erection coordination
- Model coordination
- Drawing creation

- Interoperability
- Open API-concept



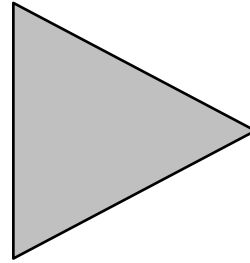
Decrease waste, improve planning and communication with constructible model



Initial problem was...

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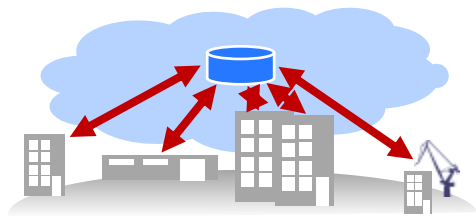


Ineffective **communication**,
planning and **collaboration** are
the source of most problems

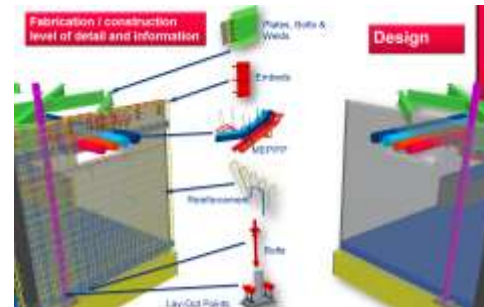
BIM process...



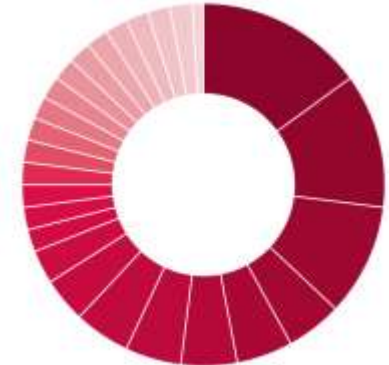
External
communication,
planning and
collaboration



Internal communication,
planning and
collaboration



Information in accurate
and constructible model



Process around
model
information

...will increase **YOUR** productivity!

Case: Porin Puuvilla

The past times of Porin Puuvilla



The modern times of Porin Puuvilla



Shopping Center Puuvilla

- Gross leasable area 43,000 m²
- Total area 100,000 m²
- Building volume 400,000 m³
- Total investment value ca. EUR 130 million
- Contract price value ca. EUR 110 million
- Construction time 11/2012–10/2014
- 80 – 90 retailers as a tenant

Stakeholders of the project

Owner

Renor

 **ILMARINEN**

Design&Fabrication

ARKKITEHTIKONTTORI
KÜTTNER & PUSSINEN

 **FMC GROUP**

Narmaplan
FMC GROUP

PROJECTUS TEAM

PARMA

 **A-INSINÖÖRIT**

 **FIRECON**
Oikein valmistettu.

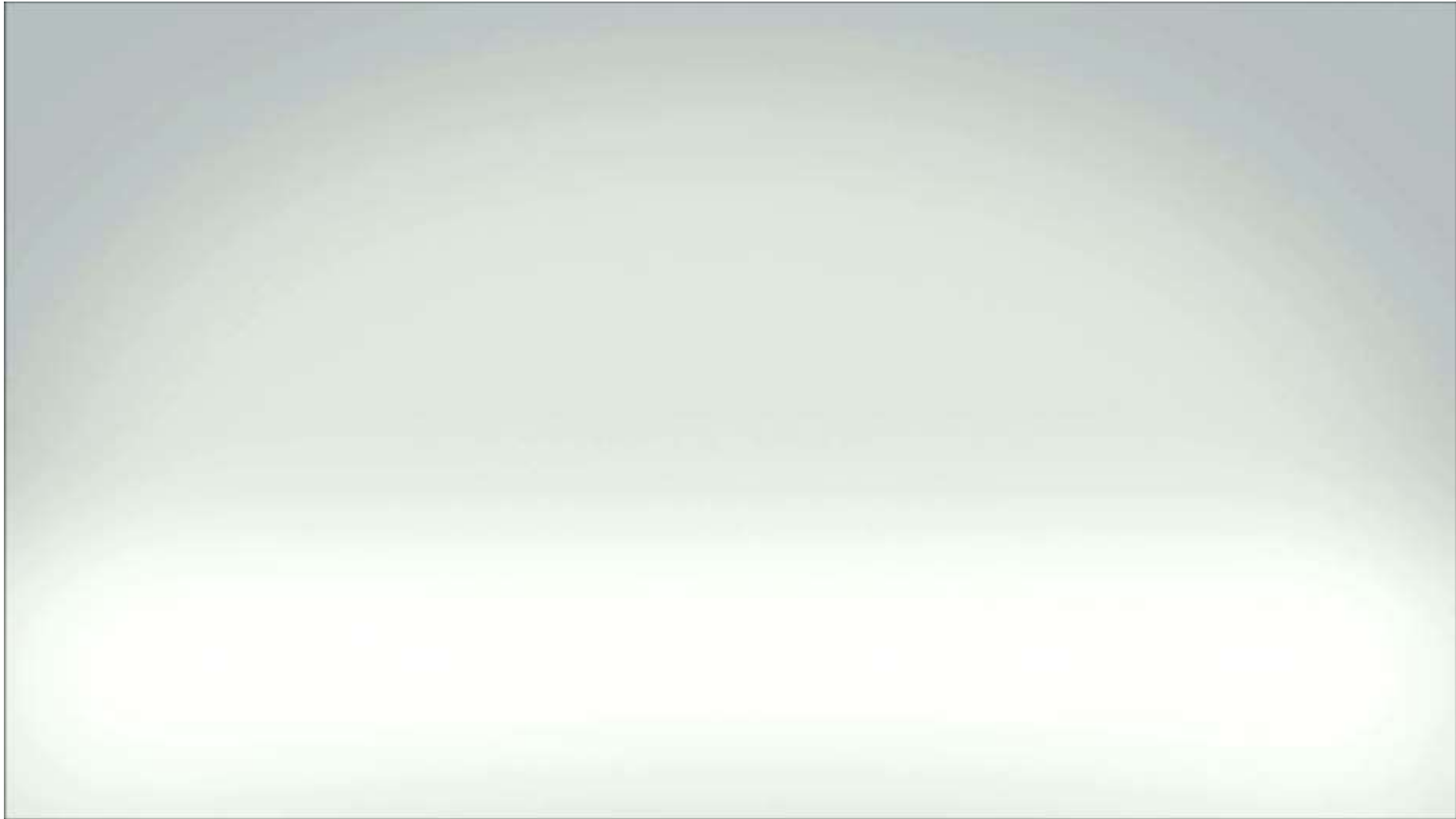
BEAM  **NET**

TPE TURUN PELTI
JA ERISTYS OY

 **CONTRIA**

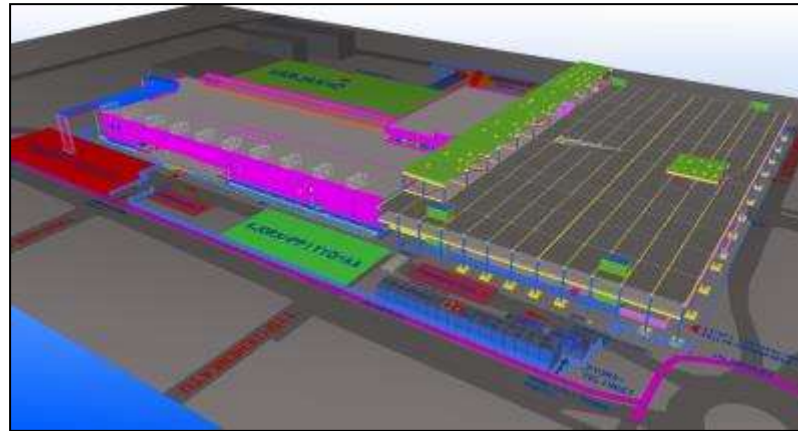
Construction
SKANSKA

Introduction to model



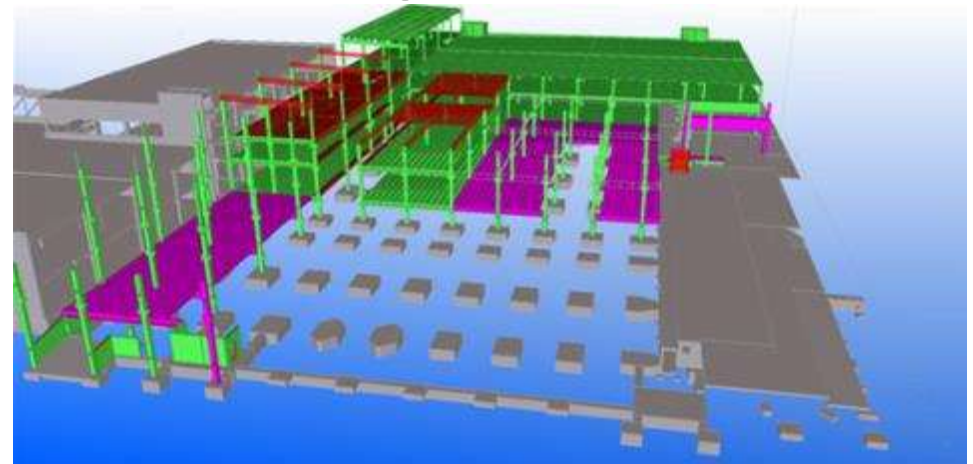
Key success factors in general

- All project parties modelled according to rules and regulations ✓
- Models were used for daily design tasks ✓
- Model coordination was done frequently ✓
- Models were utilized in design meetings ✓
- Site and safety plan was done with models ✓
- Model, design and production information was available at site with tablets and BIM kiosk ✓ ✓



Key success factors in Precast

- Parma used modeling to win precast design and build contract ✓
- A-insinöörit and Narmaplan detailed precast elements according to BEC2012 modeling requirements. ✓
- Precast element information was taken directly from model to EPR system ✓
- ERP information was bought back to model and shared to project parties via model ✓
- Production coordination and monitoring was done without drawings ✓
- Element installation review was done before and during installation with model ✓



Mission accomplished

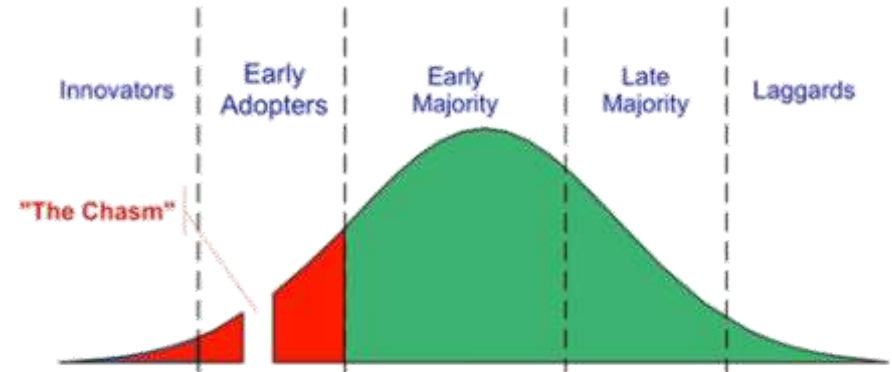


10,000

PRECAST UNITS DELIVERED

ERROR-FREE AND ON TIME

Current BIM status



- Designers have widely adopted modeling as information creation tool
- Project banks / platforms are used as delivery channel
- Information is mostly consumed as drawings

Creation is solved

Transfer of information

Usage is problem

Web of Building Data

■ Publish

- Information can be published into web

■ Granulation

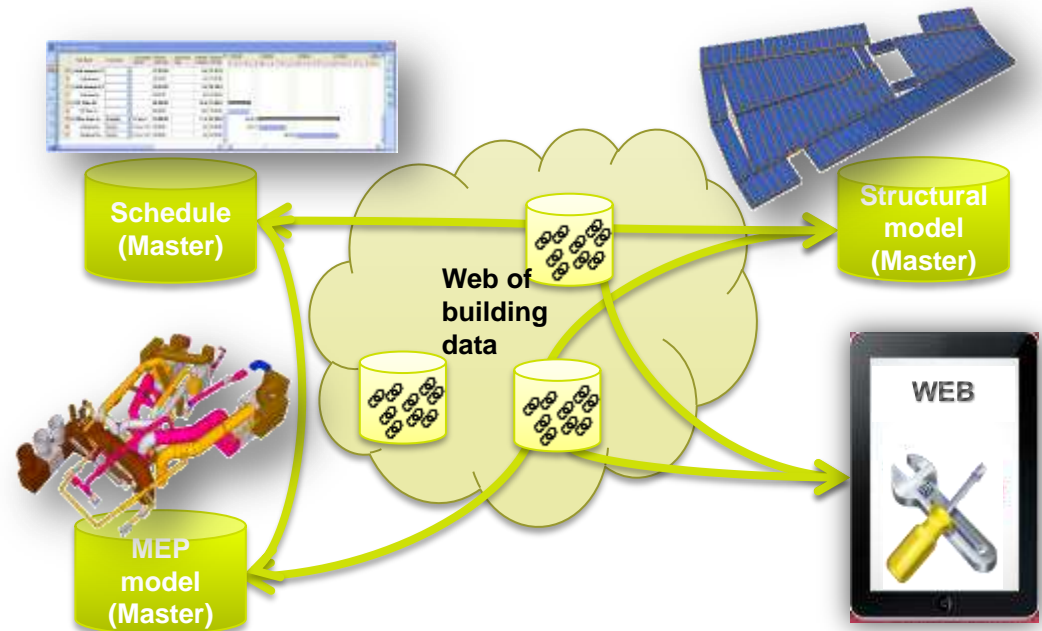
- Partial models
- Individual objects
- Instance level interoperability

■ Link

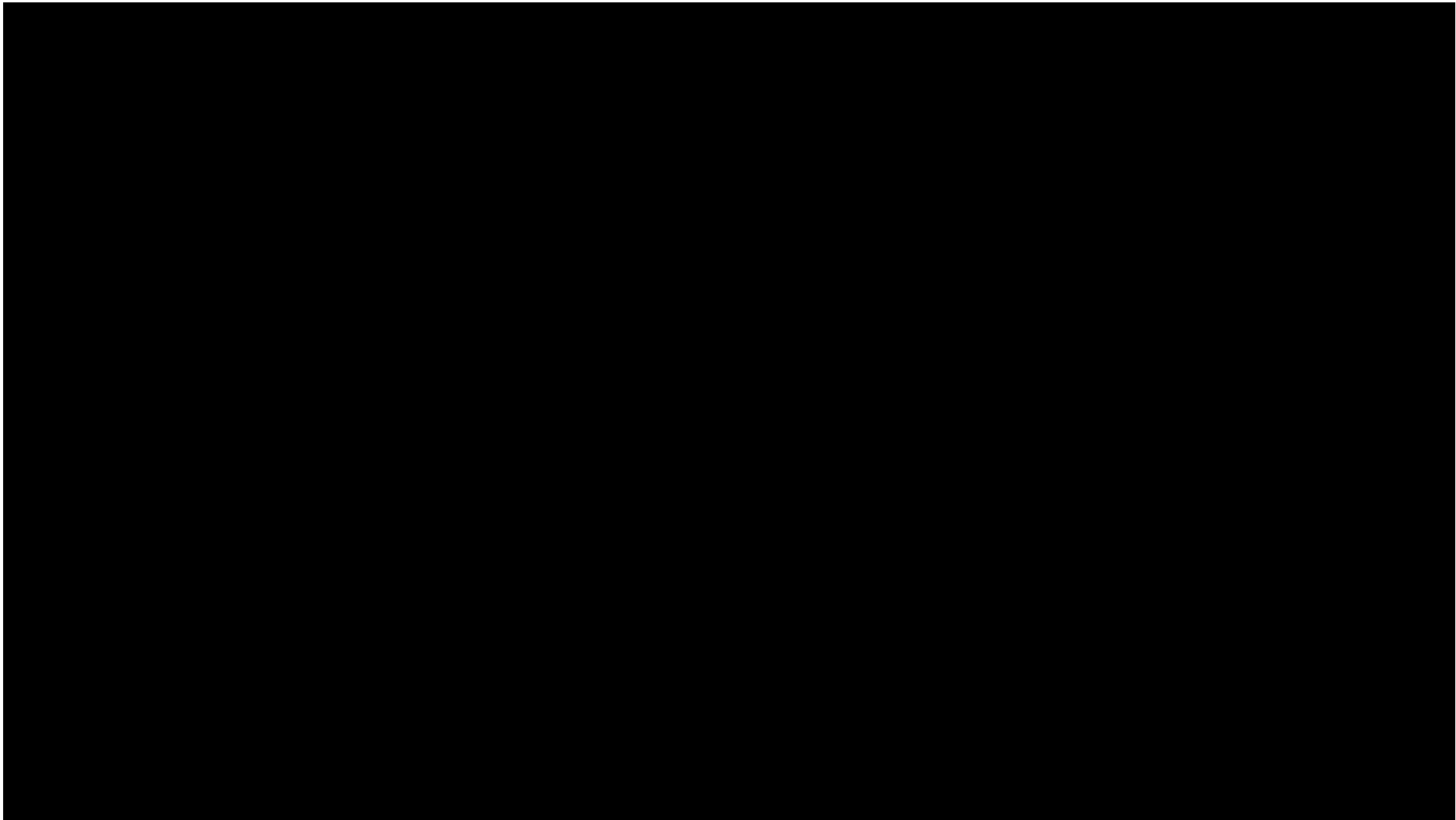
- Building information can be easily connected to
 - any data inside project
 - any data in web

■ Manage

- Distributed management model is perfect fit for fragmented construction industry



and...





TEKLA[®]
*potential*³



If you think you have reached your potential, think again!

Thank you!

