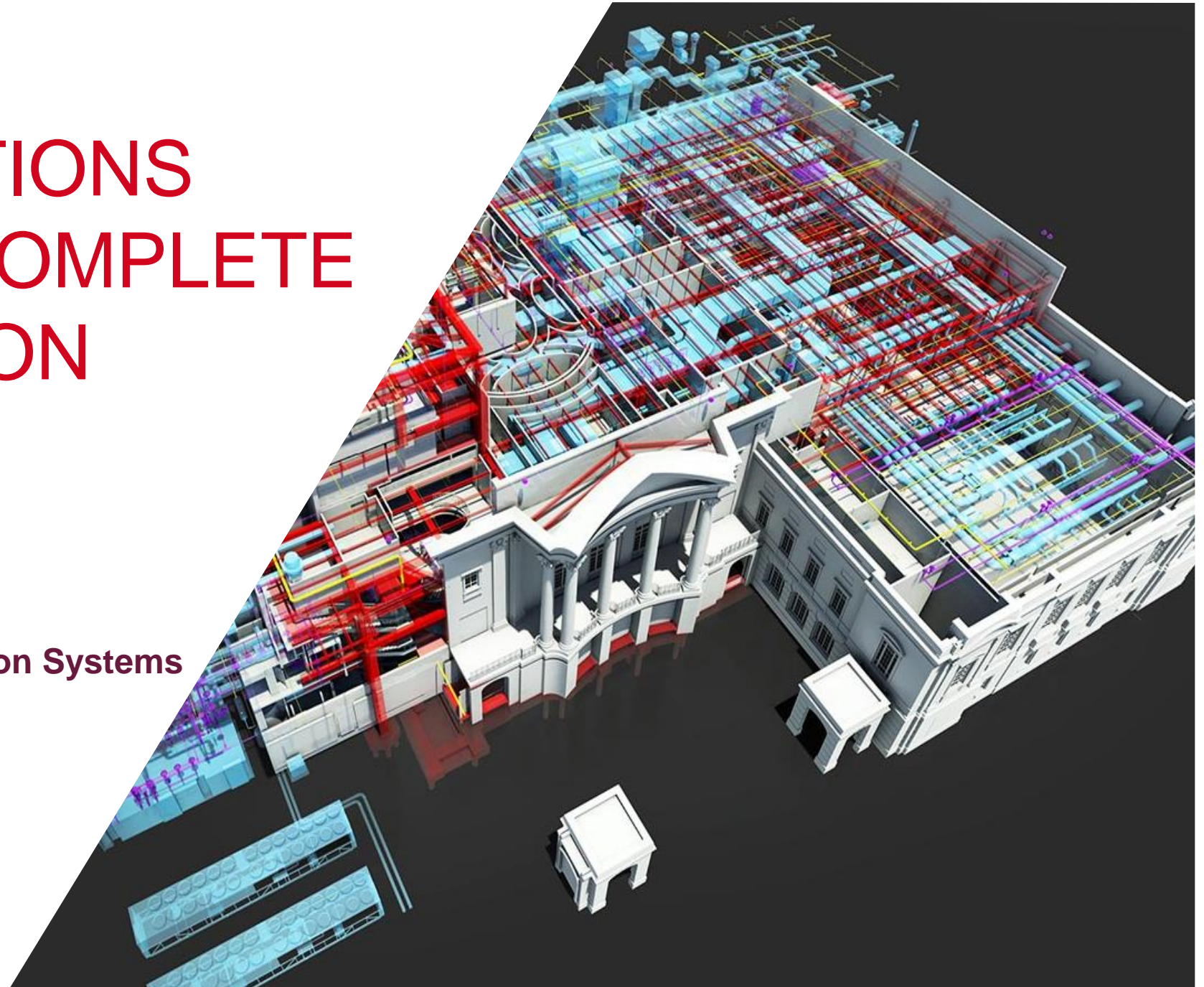




HILTI INNOVATIONS ALONG THE COMPLETE CONSTRUCTION VALUE CHAIN

Peter Rupp
Head of Business Unit Installation Systems
Hilti Corporation

Seismic Academy
Rome, October 3rd 2018



AGENDA

Digitalization as the key productivity driver in the construction industry

Hilti's current offering along the construction workflow

Hilti's vision to reach a seamless construction workflow integration

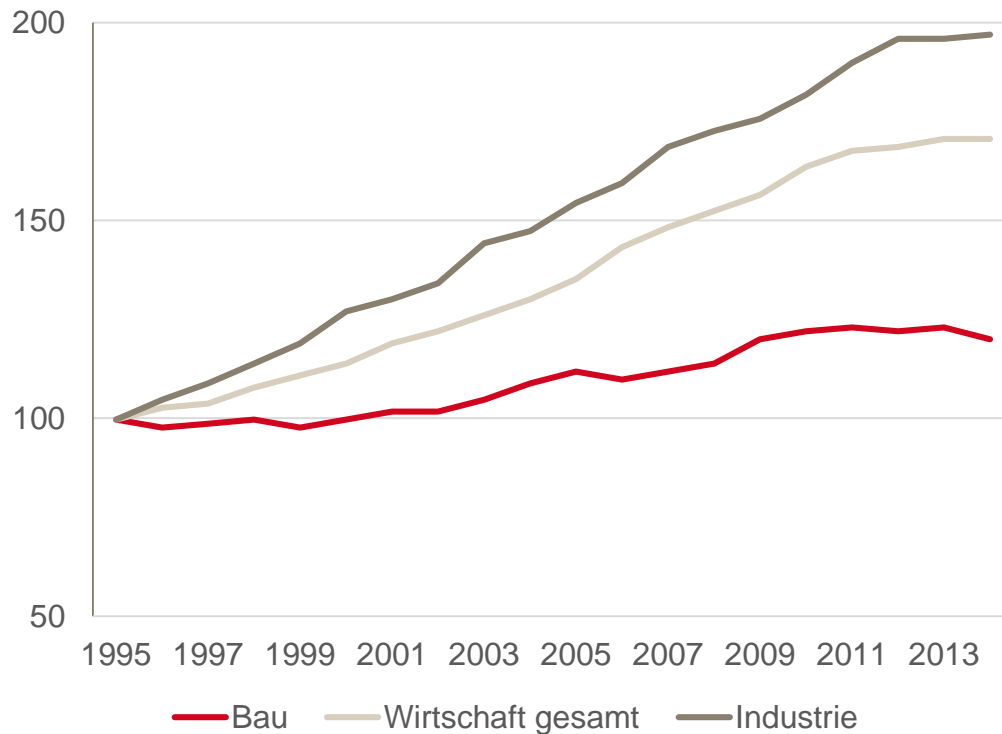
Conclusion

PRODUCTIVITY GAINS IN CONSTRUCTION INDUSTRY ARE LAGGING BEHIND COMPARED TO OTHER SECTORS

Stagnating productivity in construction industry...

Global productivity

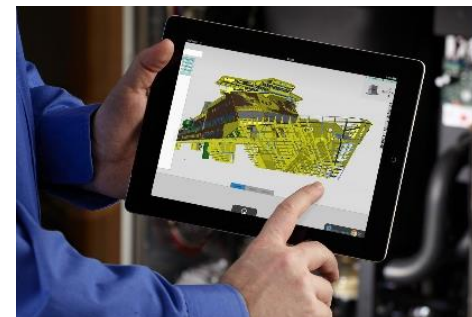
Real value creation per hour, 1995=100



Reference: Global Construction Productivity Economist.com

... with multiple reasons

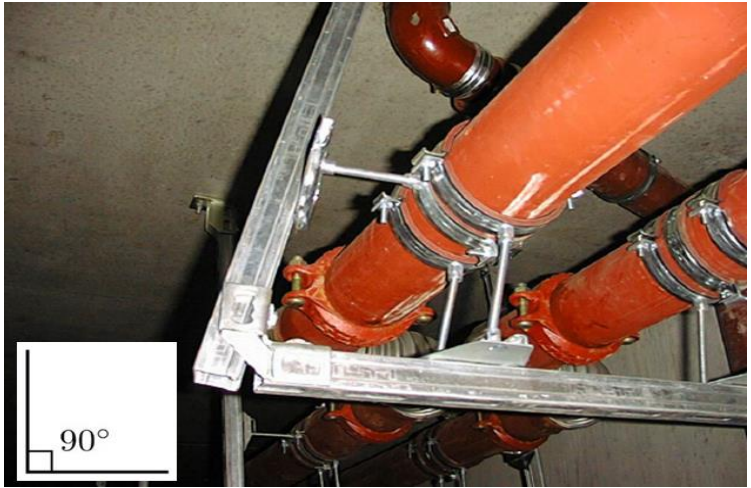
Industry



Construction



THESE SITUATIONS WILL HOPEFULLY BE PART OF THE PAST (AND NOT HAPPENING AGAIN AND AGAIN)



NEW TECHNOLOGIES ARE AVAILABLE FOR THE CONSTRUCTION INDUSTRY



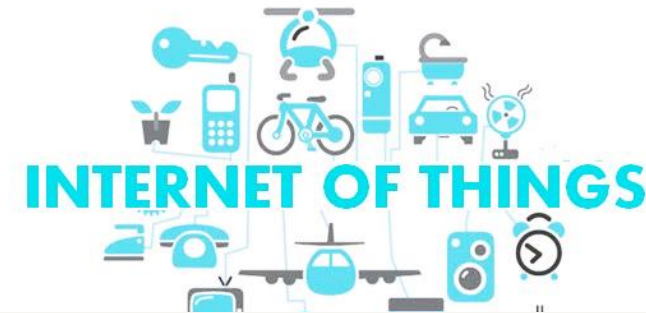
Increasing daily usage of **Smartphones and Tablets** as well as better connections (e.g., 4G, 5G, WIFI)



Availability of **Cloud Computing**, digital modelling and «**BIM to Field**» bring planning to the jobsite



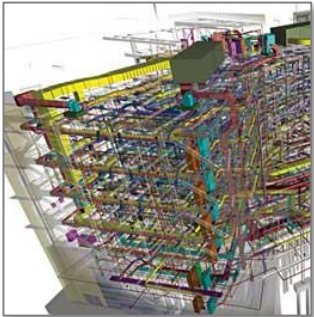
Application of electronics, sensors and wireless communication technologies contribute to an enhanced data transfer



Internet of Things (IoT) solutions are developing fast into construction industry (e.g. sensors to assess condition of concrete, corrosion, preventive maintenance)

THE BIM TREND IS CHANGING THE WAY OUR CUSTOMERS DESIGN, MANAGE, WORK AND DOCUMENT PROJECTS

Changes in DESIGN



- **Design earlier**
- Increasing **detail in the design** drives new design workflows
- New SW and services

Changes to MANAGE projects



- Adopt business models using **BIM for collaboration** (IPD)
- New **project management SW** and tools with BIM at center

Changes on the JOBSITE



- Shift from post install to **pre install**
- Shift **to digital design to field** workflows
- **Connected tools** emerging trend

Changes to DOCUMENT projects



- Systems to **verify as-built** for in-build status, certification and project handover
- Emerging BIM use in **facility management**



AGENDA

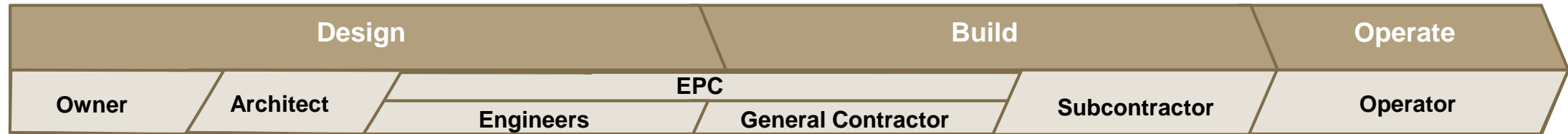
Digitalization as the key productivity driver in the construction industry

Hilti's current offering along the construction workflow

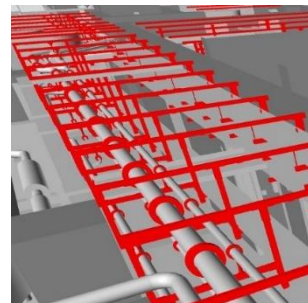
Hilti's vision to reach a seamless construction workflow integration

Conclusion

HILTI BIM SOLUTIONS ALONG THE BUILDING VALUE CHAIN



Engineering



Modeling



BIM-to-field



Validation

TOOLS & SOFTWARE

Design software, BIMobject,
BIM libraries, Firestop Plug-in

Total Station; Detection; Point Creator

Documentation
Software

SERVICES

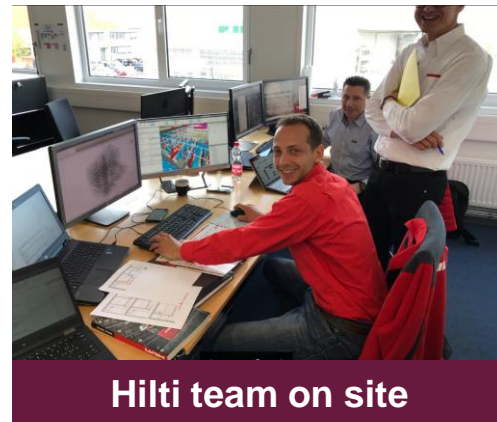
Engineering, Modeling and
drawing Services

JIT deliveries;
Cutting/Kitting/Preassembly

Documentation Service
Maintenance Support

OUR BIM SERVICES INCREASE OUR RELEVANCE IN A CONSTRUCTION PROJECT

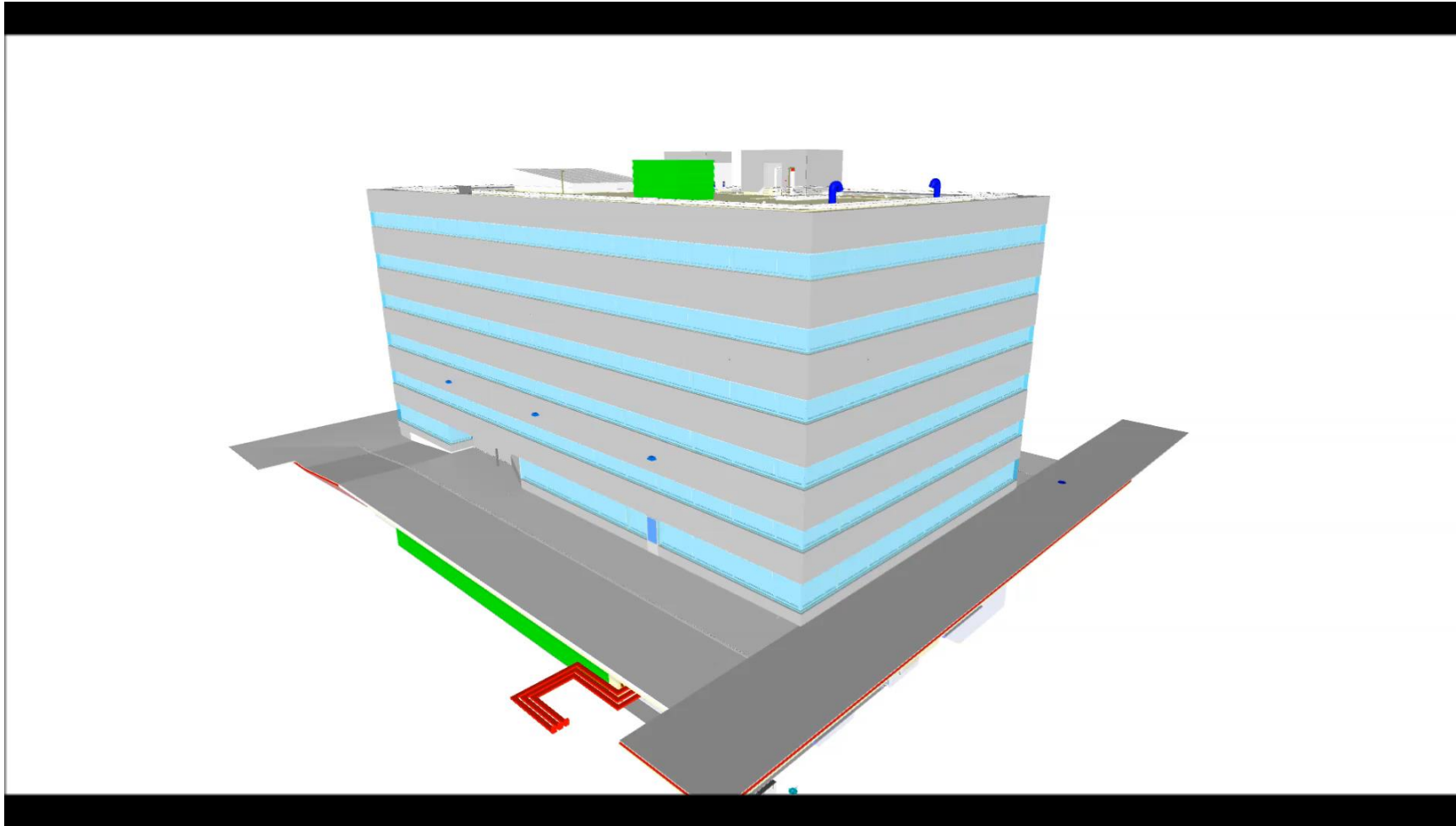
- **Hilti is part of the planning team** within the project management office
- Hilti defines the **process for MEP support systems** together with the owner and the MEP planner
- Hilti actively participates at the **ICE Session** (Integrated Concurrent Engineering) for the 3D coordination of MEP
- **Hilti cast-in channels** contribute to rehabilitation activities without any noise or dust emission



Our offering within integrated MEP planning

Large laboratory project in Switzerland

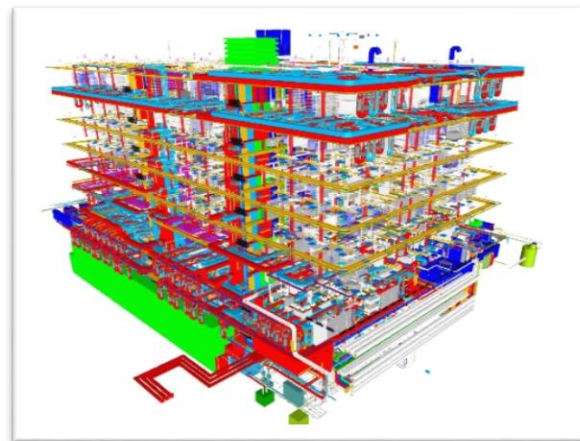
EXAMPLE BIM MODEL WITH COMPLETE MEP MODELLING...



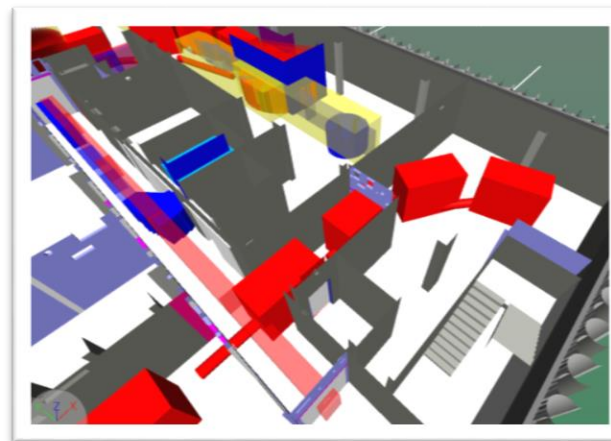
Large laboratory project in Switzerland

...PROVIDING NUMEROUS BENEFITS

3D-Model



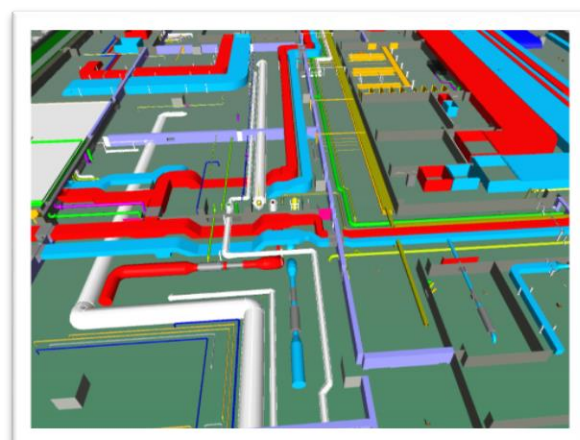
Coordination



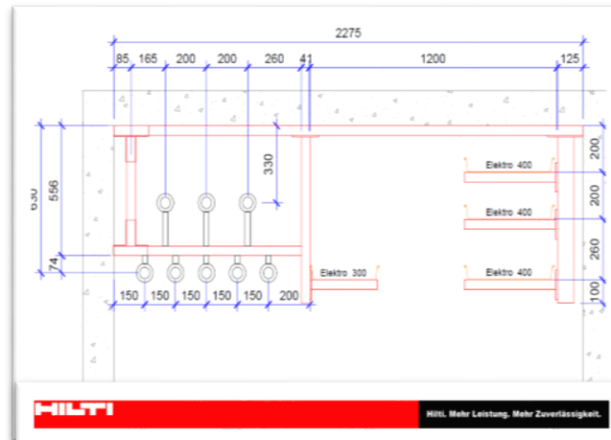
Visualization



Basic Design



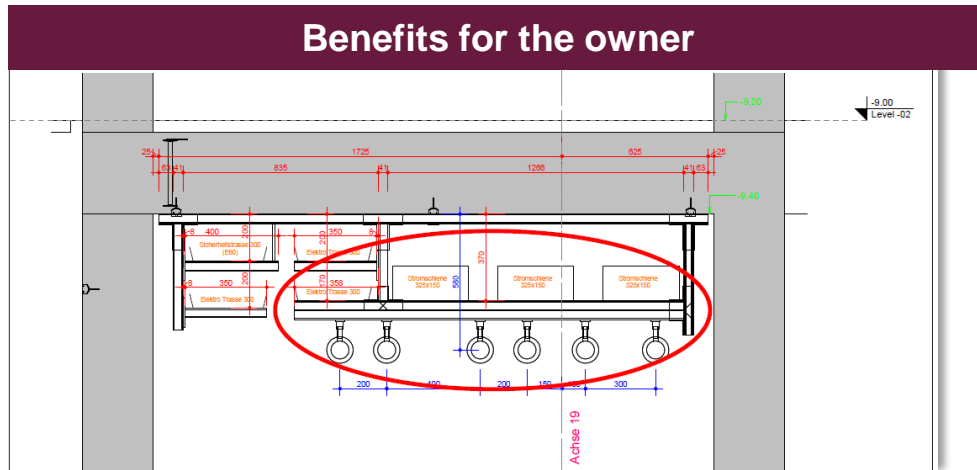
Execution Plan



Bill of Material

| -<Teilleiste> | | | | | |
|---------------|--------|------------|------------------------------------|----------|--------------|
| A | B | C | D | E | F |
| Anzahl | Modell | Hersteller | Typ | Ebene | Schrittfolge |
| 1 | 309640 | Hilti | Verbinder WGV-S3 D | Level-04 | |
| 1 | 309640 | Hilti | Verbinder WGV-S3 D | Level-04 | |
| 1 | 309640 | Hilti | Verbinder WGV-S3 D | Level-04 | |
| 1 | 309604 | Hilti | Montageschnehe MG-41 D 8M | Level-04 | 1.707 |
| 1 | 309592 | Hilti | Montageschnehe MG-41 8M | Level-04 | 616 |
| 1 | 309592 | Hilti | Montageschnehe MG-41 8M | Level-04 | 616 |
| 1 | 51149 | Hilti | WPA-41 2" EL | Level-04 | |
| 1 | 229892 | Hilti | WPA-SI 2 1/2" | Level-04 | |
| 1 | 229892 | Hilti | WPA-SI 2 1/2" | Level-04 | |
| 1 | 229892 | Hilti | WPA-SI 2 1/2" | Level-04 | |
| 1 | 229892 | Hilti | WPA-SI 2 1/2" | Level-04 | |
| 1 | 309597 | Hilti | Montageschnehe MG-41/5 8M | Level-04 | 2.500 |
| 1 | 309679 | Hilti | Lochplatte WQZ-C-11 | Level-04 | |
| 1 | 309679 | Hilti | Lochplatte WQZ-C-11 | Level-04 | |
| 1 | 309679 | Hilti | Lochplatte WQZ-C-11 | Level-04 | |
| 1 | 309633 | Hilti | Schalenanbindung WGA-1/2" | Level-04 | |
| 1 | 309634 | Hilti | Schalenanbindung WGA-3/4" | Level-04 | |
| 1 | 309634 | Hilti | Schalenanbindung WGA-3/4" | Level-04 | |
| 1 | 309633 | Hilti | Schalenanbindung WGA-1/2" | Level-04 | |
| 1 | 309633 | Hilti | Schalenanbindung WGA-1/2" | Level-04 | |
| 1 | 309633 | Hilti | Schalenanbindung WGA-1/2" | Level-04 | |
| 1 | 56428 | Hilti | Gewindestift GR-G 1_2x2000 4.8 Zs | Level-04 | |
| 1 | 56428 | Hilti | Gewindestift GR-G 3/4"x2000 4.8 Zs | Level-04 | |
| 1 | 56428 | Hilti | Gewindestift GR-G 3/4"x2000 4.8 Zs | Level-04 | |
| 1 | 56428 | Hilti | Gewindestift GR-G 1_2x2000 4.8 Zs | Level-04 | |
| 1 | 56428 | Hilti | Gewindestift GR-G 1_2x2000 4.8 Zs | Level-04 | |
| 1 | 56428 | Hilti | Gewindestift GR-G 1_2x2000 4.8 Zs | Level-04 | |

X-MEDIA MEP COORDINATION AND PRE-ASSEMBLY LEADS TO SIGNIFICANT MATERIAL SAVINGS AT FASTER DELIVERY



- **Up to 50% installation material savings** due to MEP coordination
- **Up to 70% higher installation productivity** through pre-assembly of MEP typicals
- **Increased quality standard with less changes and claims** due to integrated design and «one source of truth»



Large O&G offshore project in China



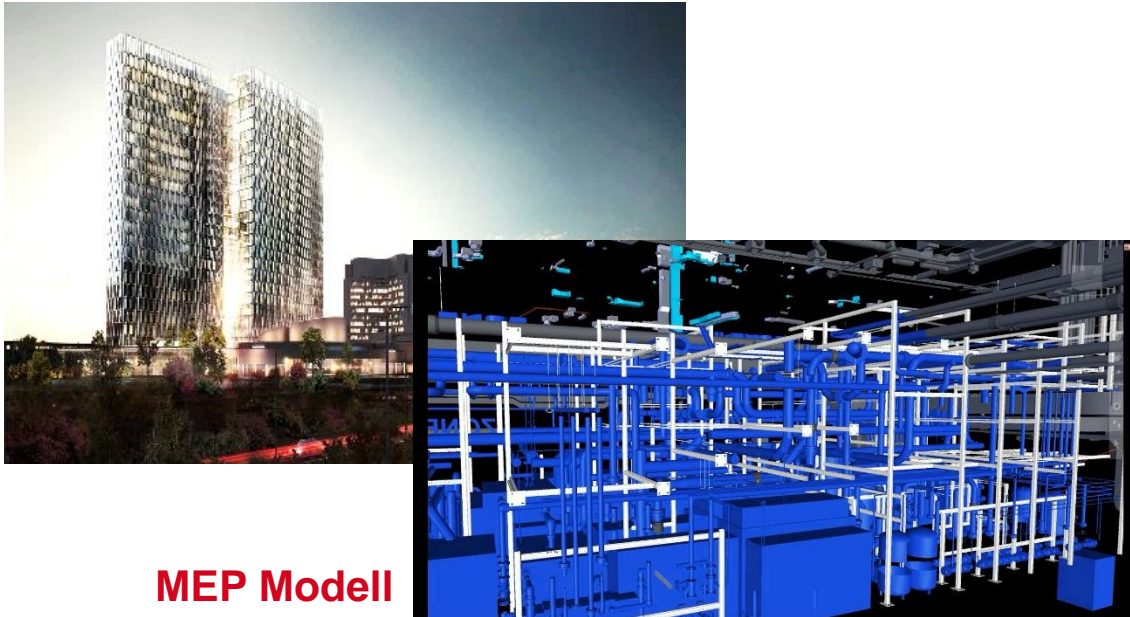
Large laboratory in Switzerland



Large O&G offshore project in Russia

INTERNATIONAL REFERENCE-PROJECTS

European Patent office – The Netherlands



MEP Modell

Size: 1'750 jobs, height 107m, 80'000m², 207 Mio €

Role of Hilti: Holistic design and BIM modeling of all MEP supports (anchors and installation material), pre-assembly of all MEP supports

Cathedral Hill Hospital – San Francisco, US



Model of a fire protected facade

Size: 555 beds, 16 floors, 100'000m², 1.7 b US\$

Role of Hilti: Planing of passive fire protection with BIM objects, PROFIS Software, Firestop Documentation Manager

AGENDA

Digitalization as the key productivity driver in the construction industry

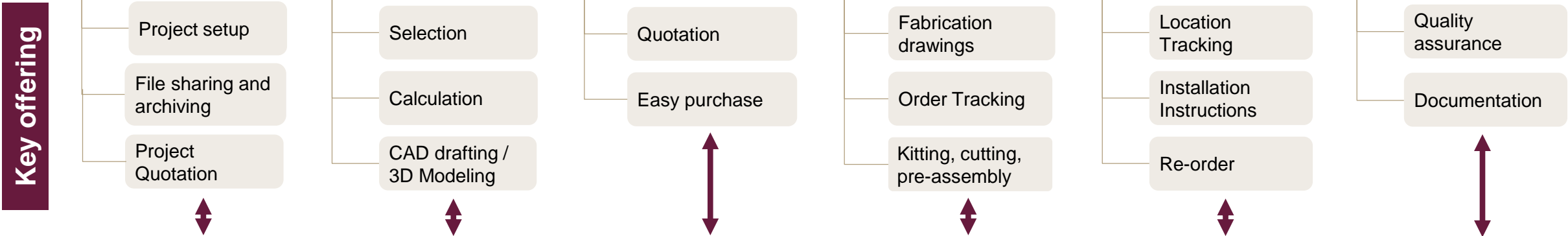
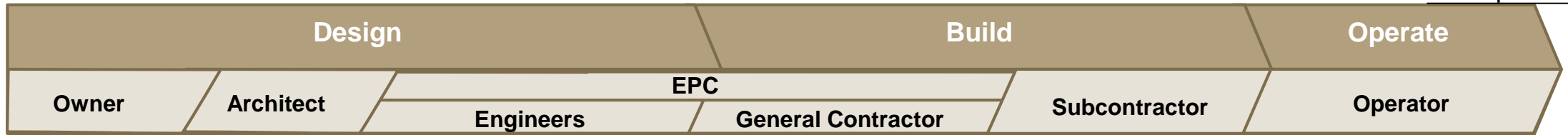
Hilti's current offering along the construction workflow

Hilti's vision to reach a seamless construction workflow integration

Conclusion

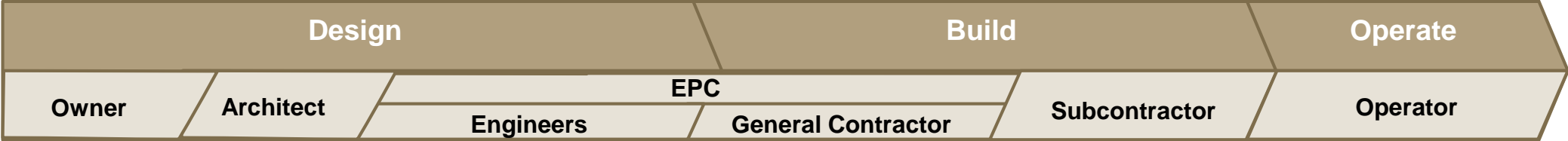
ECOSYSTEM VISION: CUSTOMER CENTRIC END TO END PLATFORM & SERVICES FOR MEP SUPPORTS AND BEYOND

Example MEP



MEP building data
contains all data generated from SW and Services for one building throughout the lifecycle

WE MAPPED WHAT END TO END DD2C PARTNERSHIP IN MEP LOOKS LIKE, AND ARE PILOTING IT IN REAL PROJECTS



1. The support is engineered

2. modelled in BIM

3. generation of unique ID per typical

4. ordered

5. pre-assembled

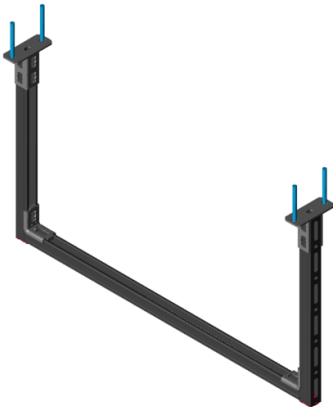
6. tagged with its unique ID

7. shipped to the jobsite

8. positioned and installed based on it's ID

9. checked as installed in the model

10. as- built model for operations



Estimated productivity gains of factor 3-5

AGENDA

Digitalization as the key productivity driver in the construction industry

Hilti's current offering along the construction workflow

Hilti's vision to reach a seamless construction workflow integration

Conclusion

WE HAVE SIGNIFICANTLY INCREASED OUR EFFORTS AND INVESTMENTS INTO DIGITALIZATION

Investments

- **> 100 Mio. CHF** into digital initiatives

Locations

- Four globally distributed, **digital R&D centers** in Schaan (LI), Kaufering (DE), Plano (US), Kuala Lumpur (MY)

Employees

- **> 300 employees** are working in digital R&D topics
- ~ 1000 Engineering Service employees
- ~ 18'000 employees in sales

Joint Ventures



Cooperations & digital Development Partners



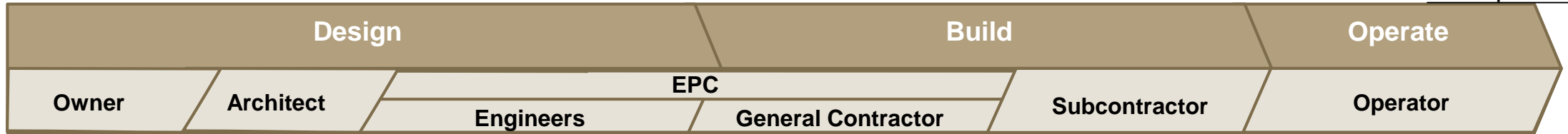
Universities



And many more...

ECOSYSTEM VISION: CUSTOMER CENTRIC END TO END PLATFORM & SERVICES FOR MEP SUPPORTS AND BEYOND

Example MEP



Key offering

We are highly dedicated to contribute to a **HIGHER PRODUCTIVITY** and **SAFETY** in the construction industry.