



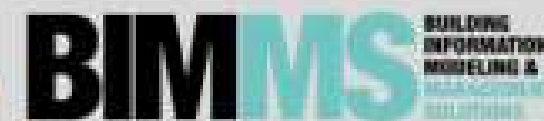
ORDEM DOS
ENGENHEIROS
TÉCNICOS

DIGITAL4OSH

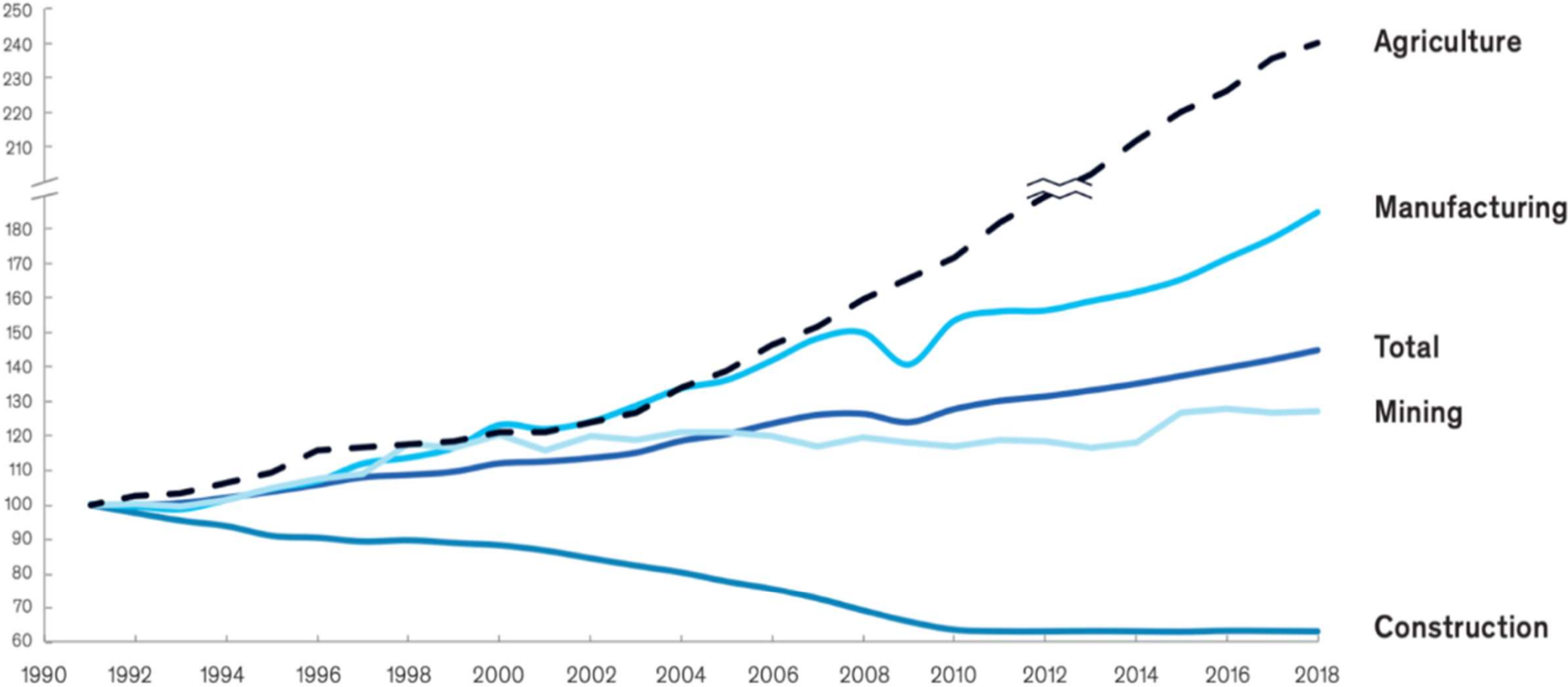
DIGITAL TECHNOLOGIES FOR OCCUPATIONAL SAFETY AND HEALTH IN CONSTRUCTION

BIM4OSH

Lisbon, 15 March, 2024

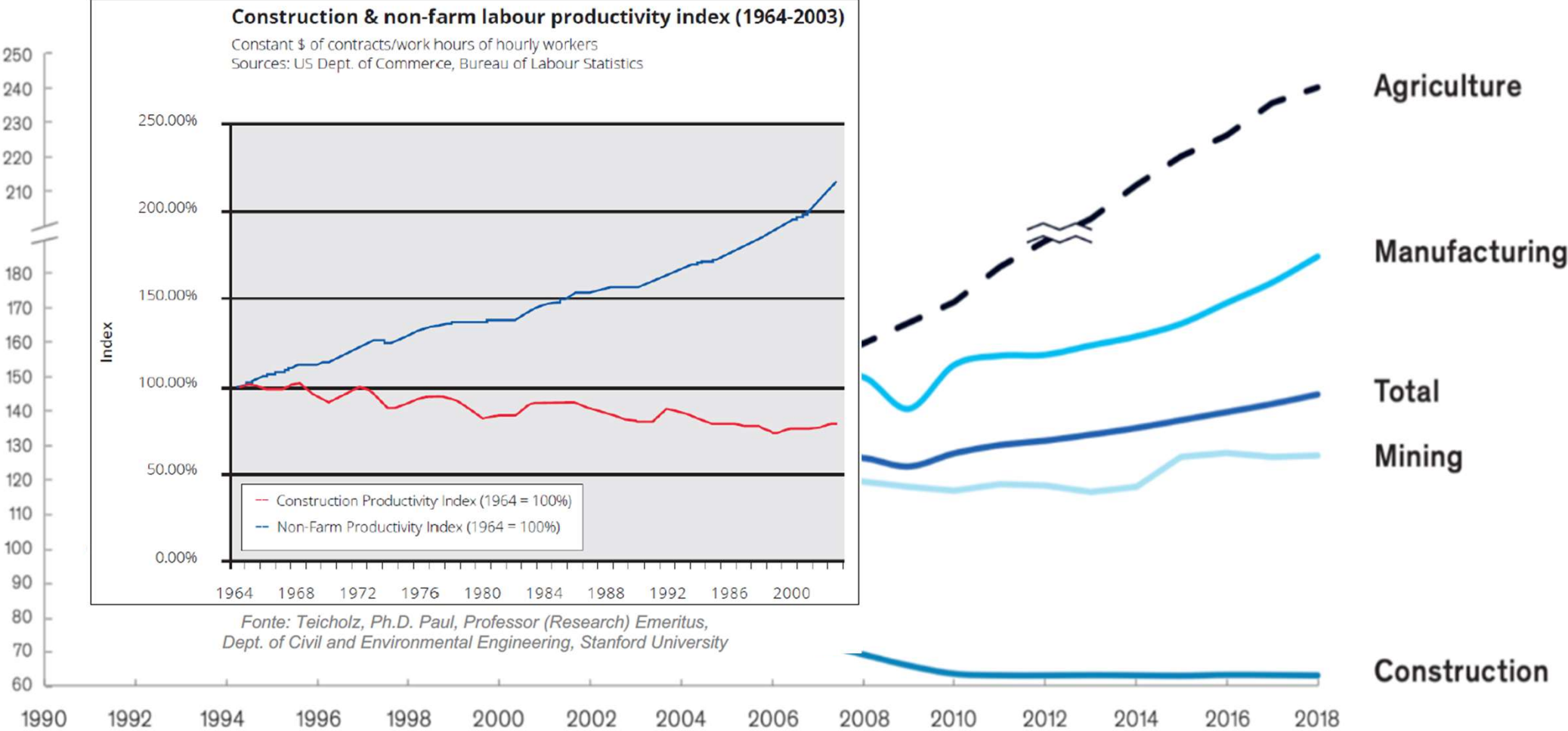


PRODUCTIVITY IN THE CONSTRUCTION & OTHERS SECTORS



Source: World Bank, IHS, International Labour Organization

PRODUCTIVITY IN THE CONSTRUCTION & OTHERS SECTORS



Source: World Bank, IHS, International Labour Organization

PRODUCTIVITY IN THE CONSTRUCTION (COVID TIME)

EU-27 and EA-19 construction production 2005 - 2020, calendar and seasonally adjusted data (2015 = 100)



Source: Eurostat (online data code: sts_copr_m)

EU, development of construction production, January 2020 - February 2021
2015=100

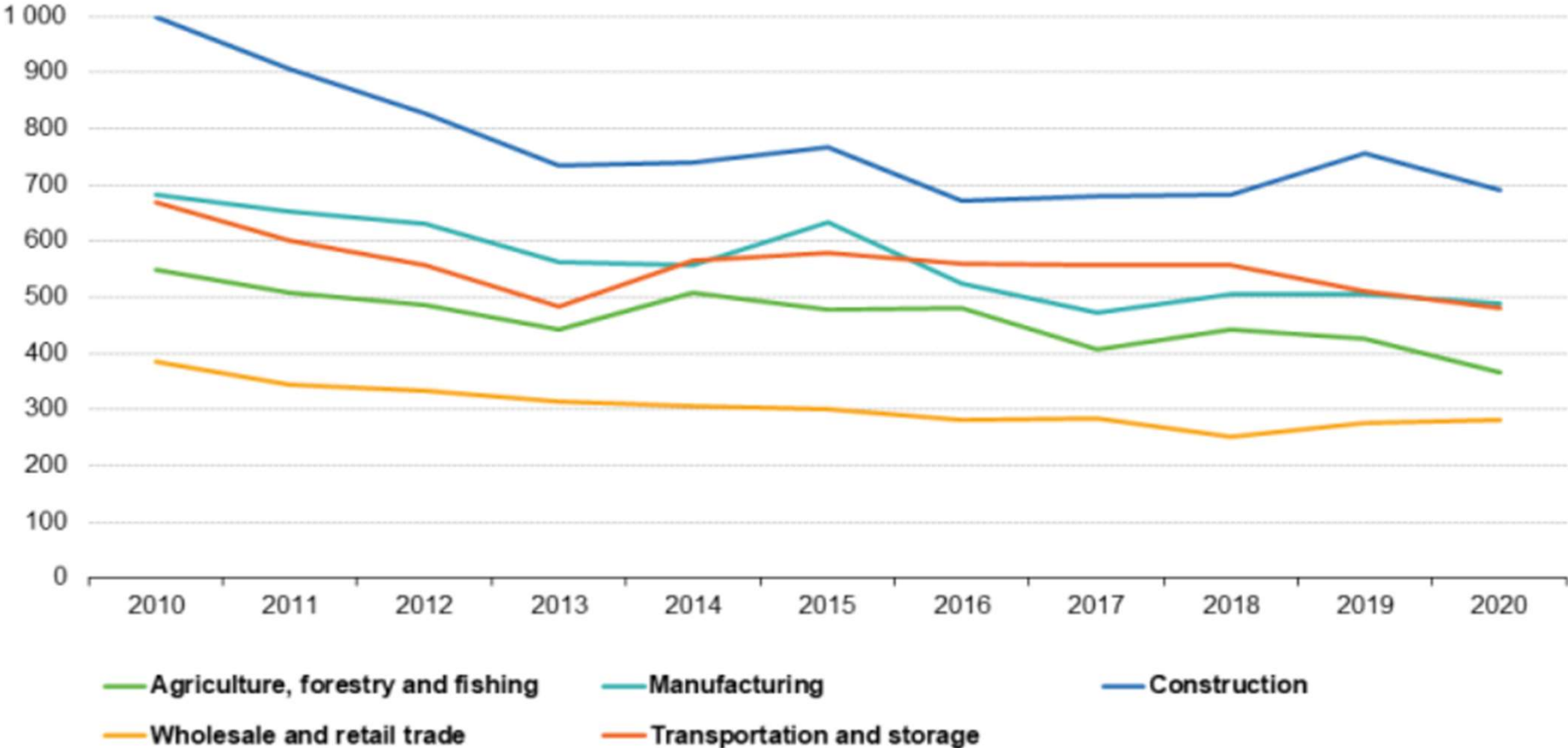


Source: Eurostat (online data code: sts_copr_m)

eurostat

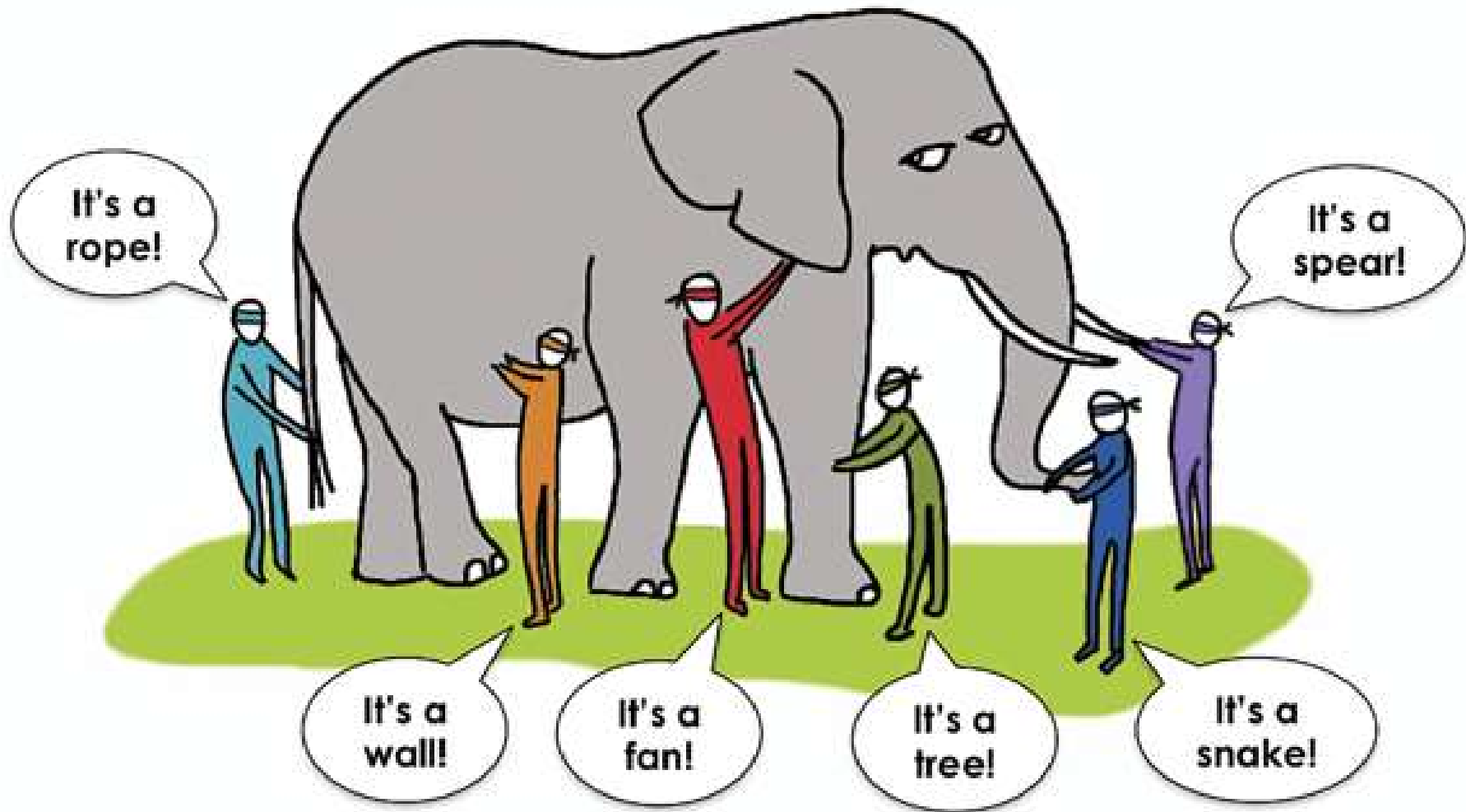
eurostat

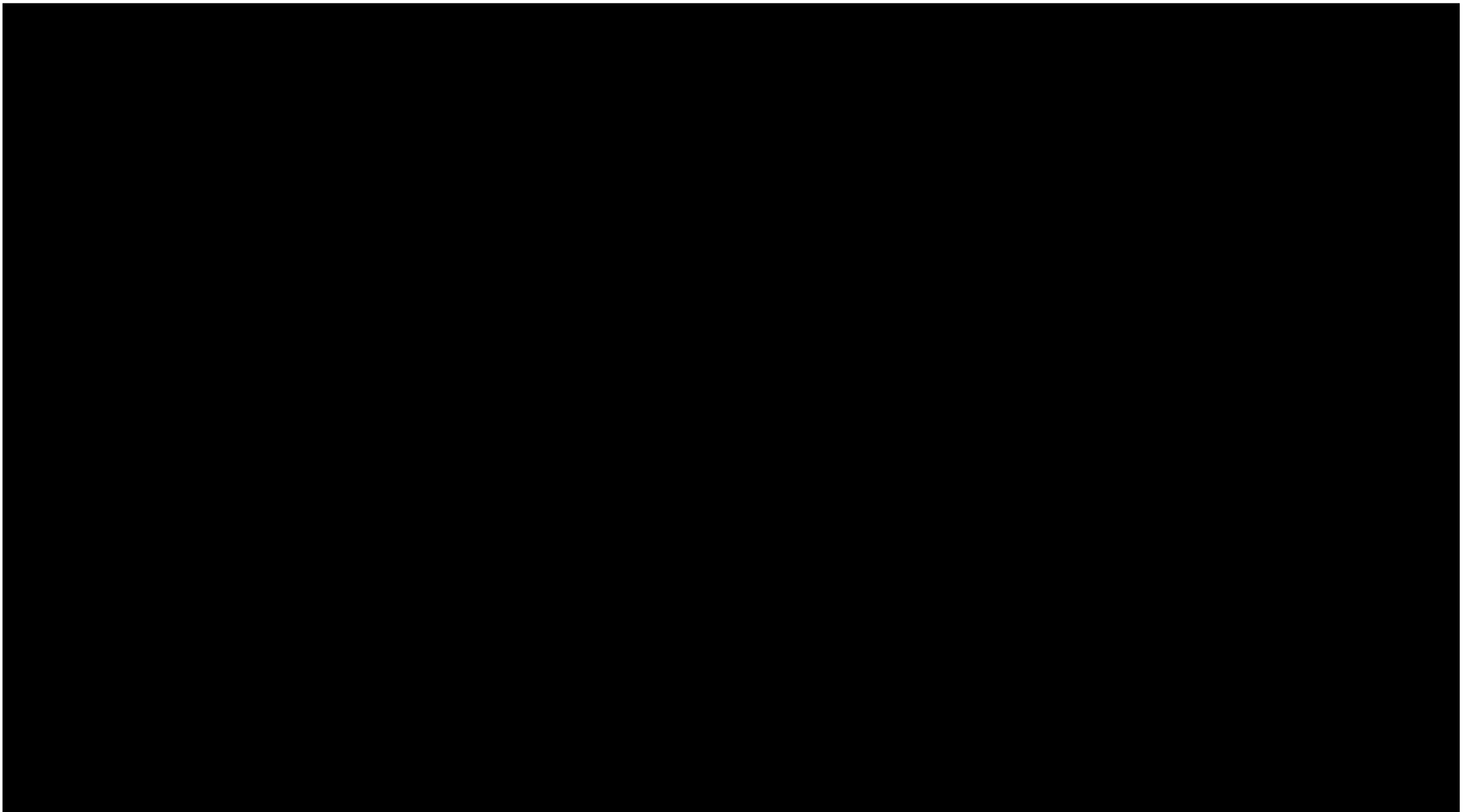
FATAL ACCIDENTS AT WORK IN THE CONSTRUCTION & OTHERS SECTORS WITH THE HIGHEST RISK LEVELS (PERSONS)



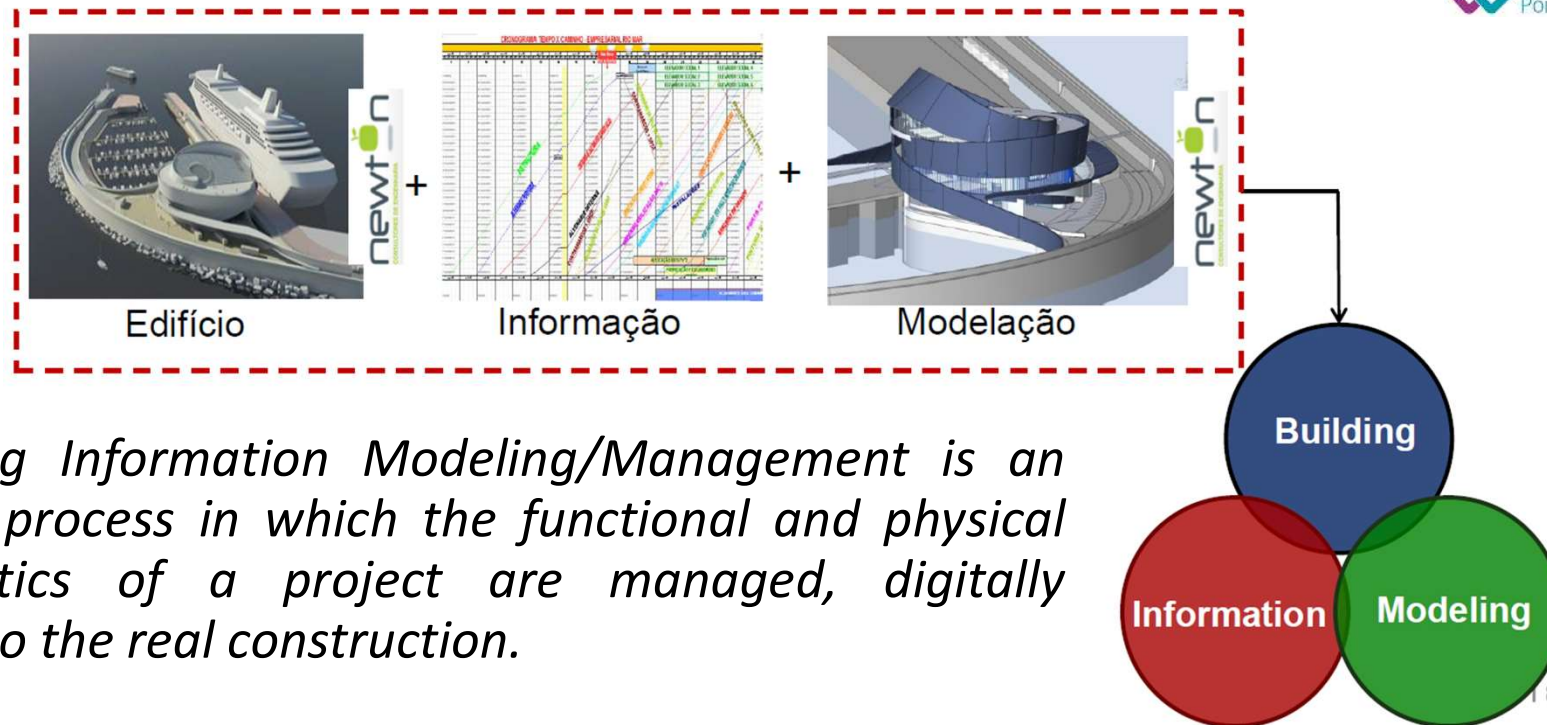
Source: Eurostat (online data code: hsw_n2_07)

WHAT IS BIM ?





BIM is a methodology for sharing information and communication between all stakeholders, during all stages of the life cycle of a construction that is supported by a digital model, accessible by software which allows the virtual manipulation of that same construction.

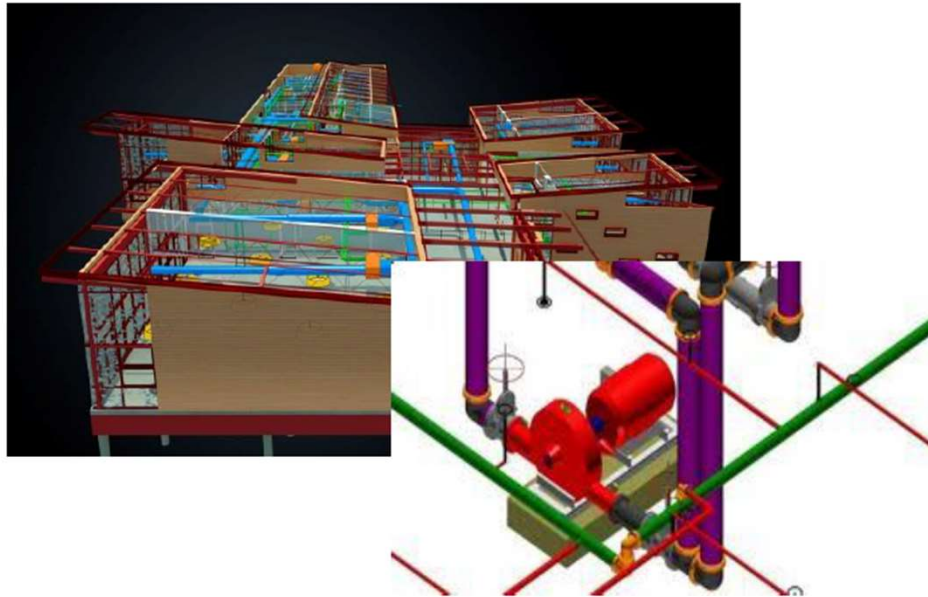
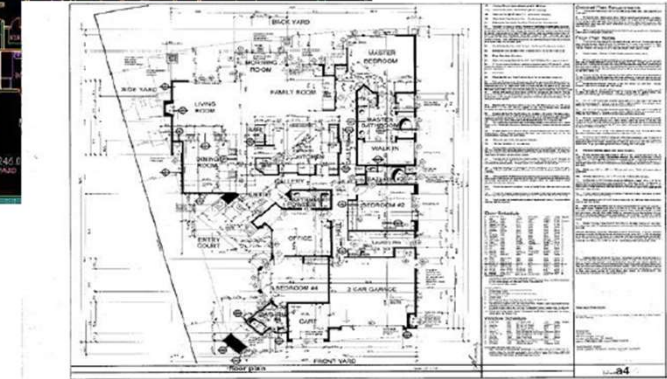
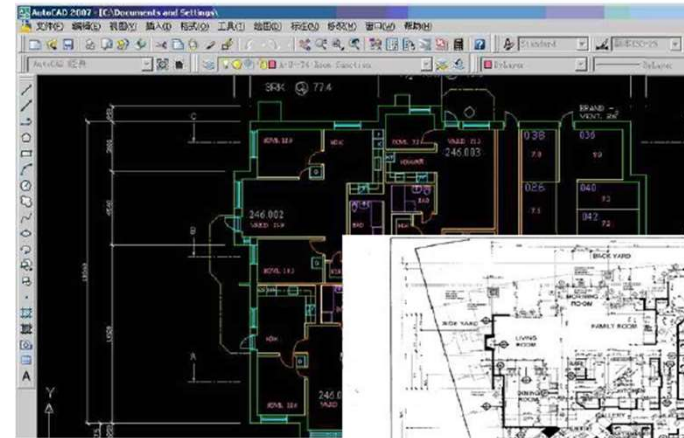


So, Building Information Modeling/Management is an integrated process in which the functional and physical characteristics of a project are managed, digitally simulated to the real construction.

OBJECT ORIENTED MODELING

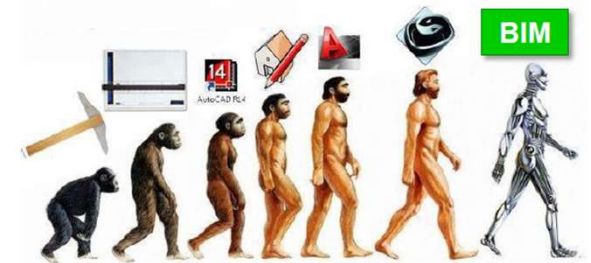
ENTITY-BASED: Geometric Modeling (Traditional Methodology)

- It is a simple geometric representation incapable of assigning any type of semantic information to the modeled element;
- This drawing tool allows you to display any type of element using points, lines and areas.



OBJECT ORIENTED: Object Oriented Modeling

- This representation allows to present the building through its components;
- It was only recently implemented;
- Requires high performance hardware.



PRODUCT (OBJECTS) DATA TEMPLATES

WHY DICTIONARIES ?



USE OF PDT

INTERNATIONAL
STANDARD

ISO
23387

First edition
2020-07

Building information modelling
(BIM) — Data templates for
construction objects used in the life
cycle of built assets — Concepts and
principles



ISO/TC 59/SC 13
ISO/TC 59/SC 13 N 666

ISO/TC 59/SC 13
Organization and digitization of information about buildings and civil engineering works,
including building information modelling (BIM)
Email of secretary: info@stand.iso.org
Secretariat: SN (Norway)

Presentation of prEN ISO 23386 and 23387
Document type: Other committee document
Date of document: 2018-10-24
Expected action: INFO
Background:
Committee URL: <https://isotc.iso.org/livelink/livelink/open/tc29sc13>



prEN ISO 23387 – TERMINOLOGY



DATA TEMPLATE

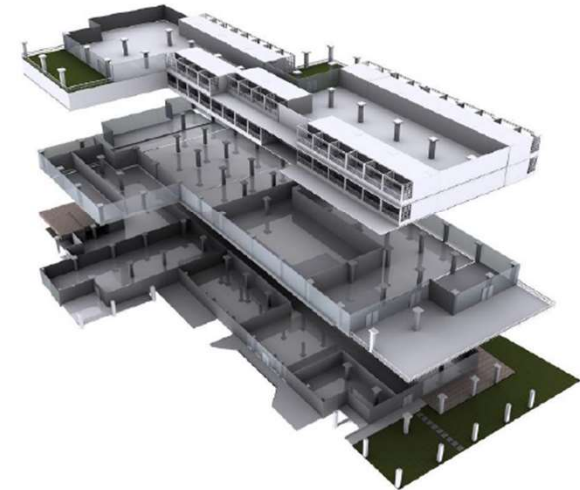
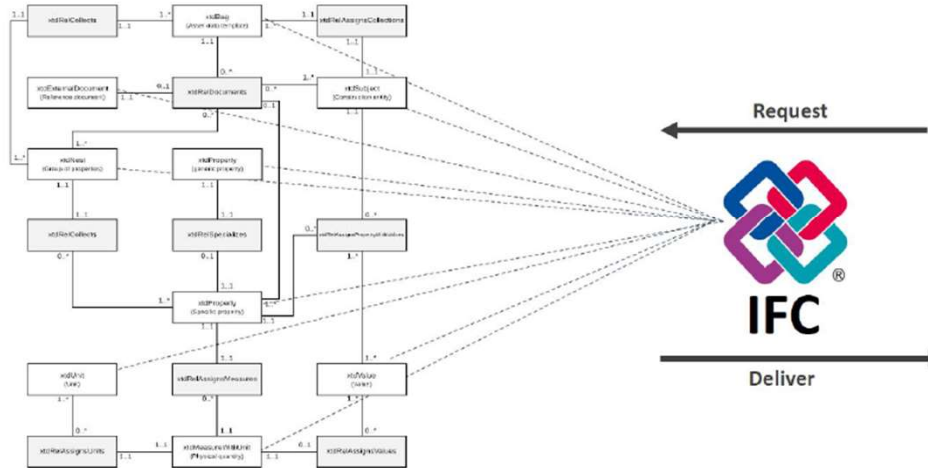
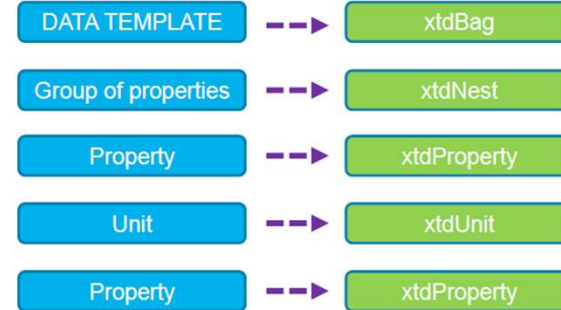
digital template, using a standardized data structure, providing the information needs for describing the characteristics of construction works entities

NOTE 1 The relevant use of the data template should be used together with the term "data template". E.g. a data template for a product should be named "product data template". A data template for a system should be named "system data template", etc.

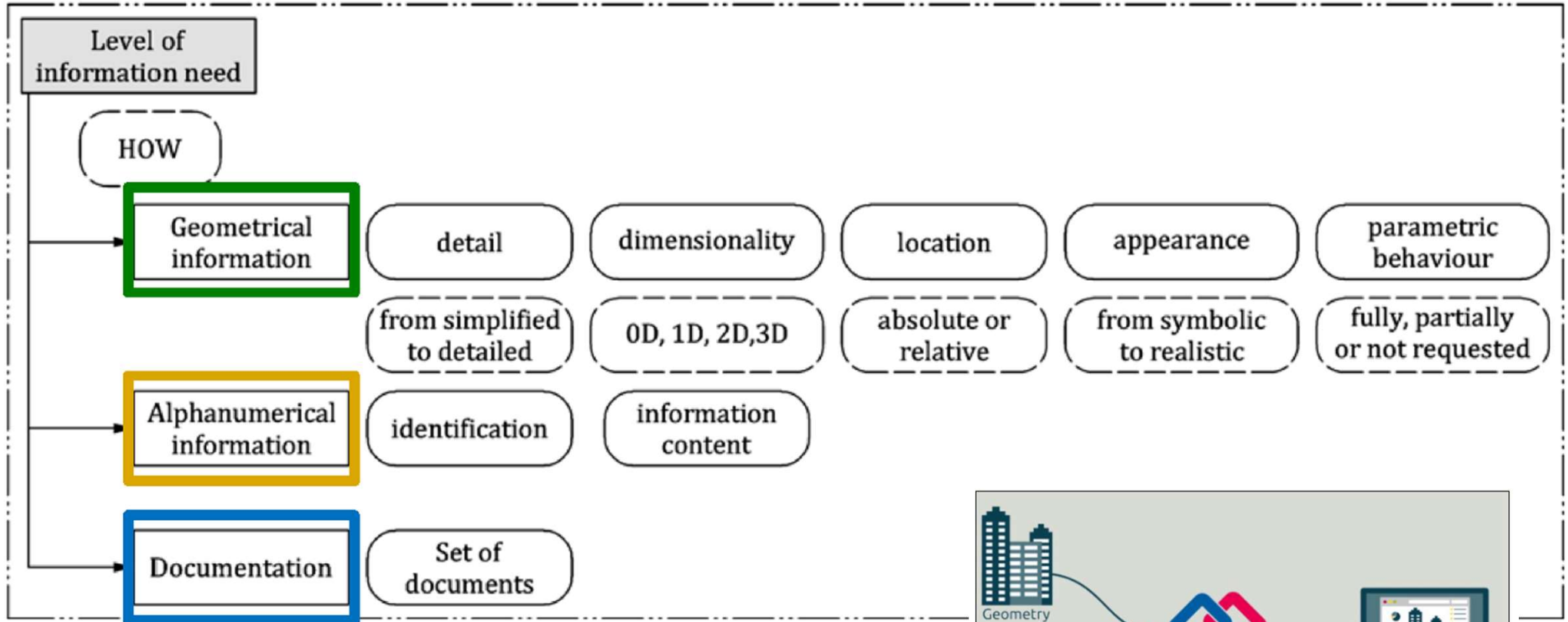
NOTE 2 ISO 12006-3 concept type is xtdBag

USE OF ISO 12006-3

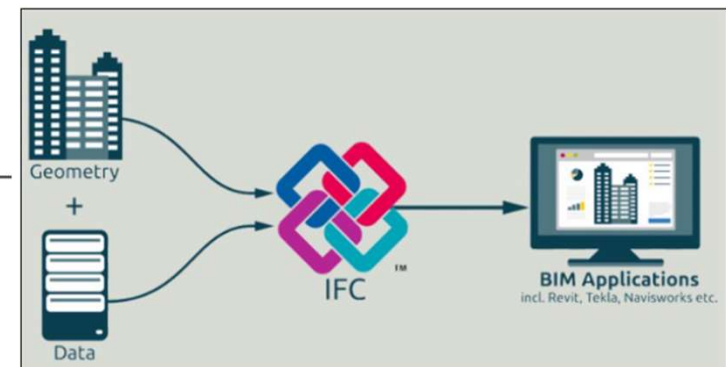
1§ to describe ISO 12006-3 CONCEPTS USED



LEVEL OF INFORMATION



Fonte: EN 17412-1:2020



Fonte: <https://www.buildingsmartkorea.org/what-is-ifc-and-open-source>

✓ Level of Information Need

Information delivery milestone:	Preliminary Design
Purpose:	Visualization
<i>Actor</i>	<i>Lead appointed party — Architect</i>
• Object:	"Site"
• Geometrical information:	Not requested
• Alphanumerical information:	
• Identification:	Site type
• Information content:	Address, geo-location, ...
• Documentation:	
• Set of documents:	Survey drawing
• Object:	"Wall"
• Geometrical information:	
• Detail:	Simplified volume representation including openings
• Dimensionality:	3D
• Location:	Absolute
• Appearance:	Realistic with texture of materials
• Parametric behaviour:	Not requested
• Alphanumerical Information:	Not requested
• Documentation:	Not requested
• Object:	"Window"
• Geometrical information:	
• Detail:	Simplified volume representation of frames and panels
• Dimensionality:	3D
• Location:	Absolute
• Appearance:	Realistic with texture and transparency of materials
• Parametric behaviour:	Not requested

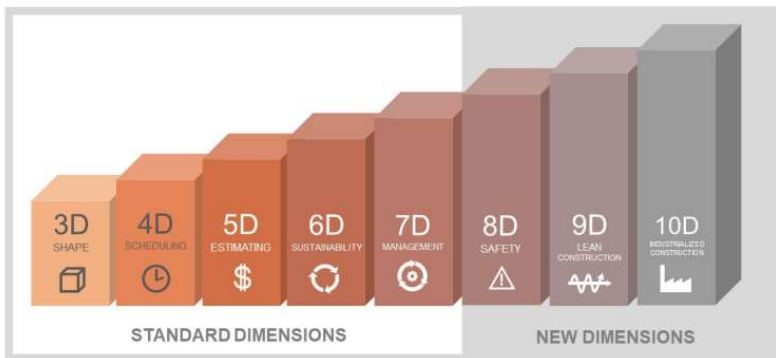
...	
Purpose:	Cost Estimation
<i>Actor</i>	<i>Appointed party — Quantity Surveyor</i>
• Object:	"Site"
• Geometrical information:	Not requested
• Alphanumerical information:	
• Identification:	Site type
• Information content:	Cost of site preparation
• Documentation:	Not requested
• Object:	"Wall"
• Geometrical information:	Not requested
• Alphanumerical information:	
• Identification:	Wall type (e.g. loadbearing exterior wall)
• Information content:	Type, quantity, area, volume, composition/material (via type), classification
• Documentation:	
• Set of documents:	Bill-of-materials, bill-of-quantities
• Object:	"Window"
• ...	
• Object: "Slab"	"Slab"
• ...	
• ...	

Fonte: EN 17412-1:2020

BIM DIMENSIONS



DIMENSIONS OF BIM



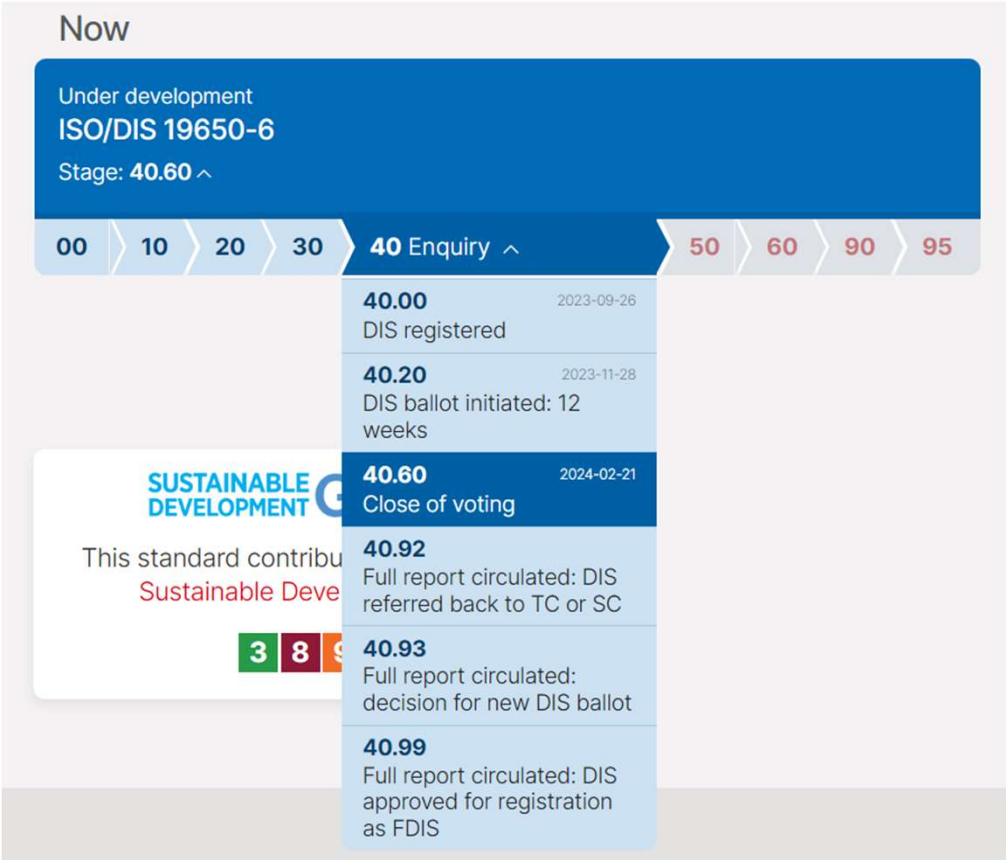
PRODUCT (OBJECTS) DATA HAZARDS

ISO/DIS 19650-6

Organization and digitization of information about buildings and civil engineering works, including building information modelling (BIM)

Information management using building information modelling - **Part 6: Health and safety information**

Status : Under development



Lisbet Landfald · 2^o
Project Manager at Standards Norway
Oslo, Oslo, Noruega · [Informações de contato](#)
+ de 500 conexões

- Standard Norge / Standards Norway
- NTH Norges tekniske høgskole

Nick (MA DipArch) Nisbet · 1^o
Built Environment Information Consultant
Great Kinghill, Inglaterra, Reino Unido · [Informações de contato](#)
+ de 500 conexões

- AEC3
- The Bartlett School of Sustainable Construction

PRODUCT (OBJECTS) DATA HAZARDS

✓ ISO 19650 series

Organization and digitization of information about buildings and civil engineering works, including building information modelling (BIM) - Information management using building information modelling

Part 1: Concepts and principles (EN ISO 19650-1:2018)

Part 2: Delivery phase of the assets (EN ISO 19650-2:2018)

Part 3: Operational phase of the assets (EN ISO 19650-3:2020)

Part 4: Information Exchange (EN ISO 19650-4:2022)

Part 5: Security-minded approach to Information management (EN ISO 19650-5:2020)

Part 6: Health and safety (em elaboração)

6.3.3 Risk management

The design team shall, based on their skills, knowledge and experience, as well as the Health and Safety information provided in the contract, determine and set out the design risk management tasks and other suitable design applications necessary to develop an inherently safer design solution. In both an iterative and progressive manner within the approach to design risk management the design team shall identify and evaluate the:

- **process and/or product hazards;**
- *activity hazards;*
- *location hazards;*
- *hazards arising from temporary works, or permanent works in a temporary vulnerable state;*
- *hazards which may give rise to ill health, either on immediate exposure or after along latency period;*
- *hazards referenced by legislation; and*
- *hazards during an emergency event.*

*The design team shall identify the hazards and risks that **arise during an emergency event in construction, commissioning or end-use**, and mitigate them through the approach to design risk management.*



ISO/TC 59/SC 13 "Organization and digitization of information about buildings and civil engineering works, including building information modelling (BIM)"

Secretariat: SN

Committee manager: Landfald Lisbet Mrs



ISO/CD 19650-6 for comments

Document type	Related content	Document date	Expected action
Project / Draft	Project: ISO/CD 19650-6 Ballot: ISO/CD 19650-6 (restricted access)	2022-09-19	COMMENT/REPLY by 2022-11-15



bsi.


Página principal
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Ajudas
português
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Universidade do Minho | Biblioteca da Universidade do Minho | University of Minho Library | BUM - Dissertações de Mestrado

Utilize este identificador para referenciar este registo: <https://hdl.handle.net/1822/70433>

Título: O impacto e utilidade do BIM no planeamento da segurança: análise realizada por especialistas

Autor(es): Lopes, Cátia Alexandrina Correia

Orientador(es): Couto, J. Pedro  
Tender, Manuel


Palavras-chave: Planeamento da segurança
BIM
Prevenção
Riscos
Gestão da construção
Safety planning
Prevention
Risks
Construction management

Data: 2017



março/abril 2017 n.º 237




Página principal
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Universidade do Minho | Escola de Engenharia | School of Engineering | C-TAC - Territory, Environment and Construction Centre | C-TAC - Artigos em Revistas Nacionais

Utilize este identificador para referenciar este registo: <https://hdl.handle.net/1822/59670>

Título: A integração do BIM na gestão da prevenção na construção

Autor(es): Reis, Ricardo da Cunha
Tender, Manuel
Couto, J. Pedro  
Lopes, Cátia
Cunha, Telma

Palavras-chave: BIM
BIMSafety
Compilação Técnica
Gestão da prevenção
PSS

Data: Mar-2018

Título: Desenvolvimento de uma ferramenta baseada em BIM para apoiar a avaliação de riscos em projetos de construção

Outro(s) título(s): Development of a BIM-based tool to support risk assessment in construction projects

Autor(es): Castelo Branco, Luana Coeli Santos

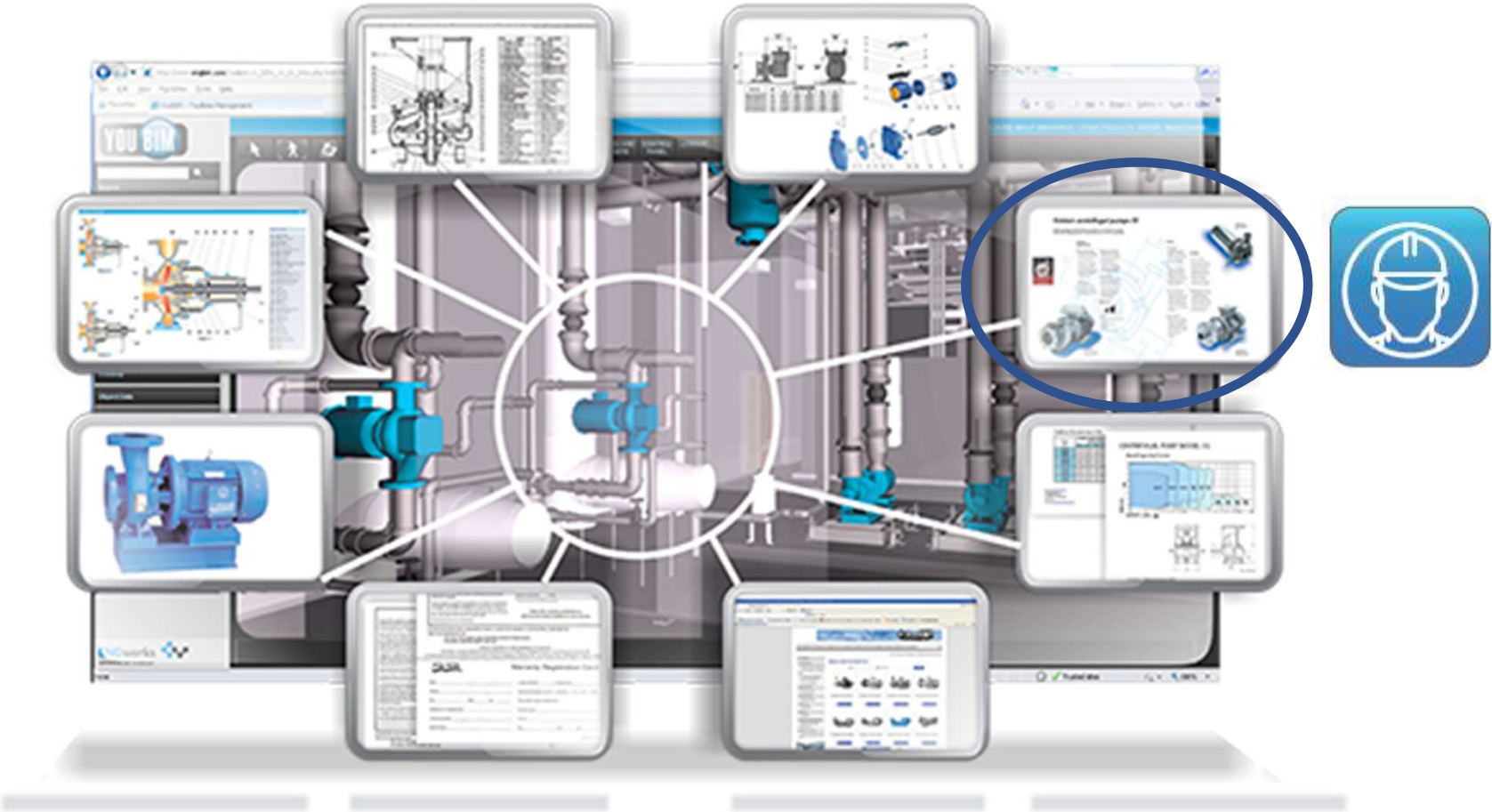
Orientador(es): Couto, J. Pedro  

Palavras-chave: Modelagem de informações de construção
Metodologia de avaliação de riscos de acidentes de trabalho
Gerenciamento de construção
Building Information Modeling (BIM)
Gestão de risco
Workplace accident risk assessment methodology
Construction management
Risk management

Data: 17-Jan-2023



PRODUCT (OBJECT) IS ALWAYS ASSOCIATED TO A TASK (ACTIVITY)



BIM4OSH

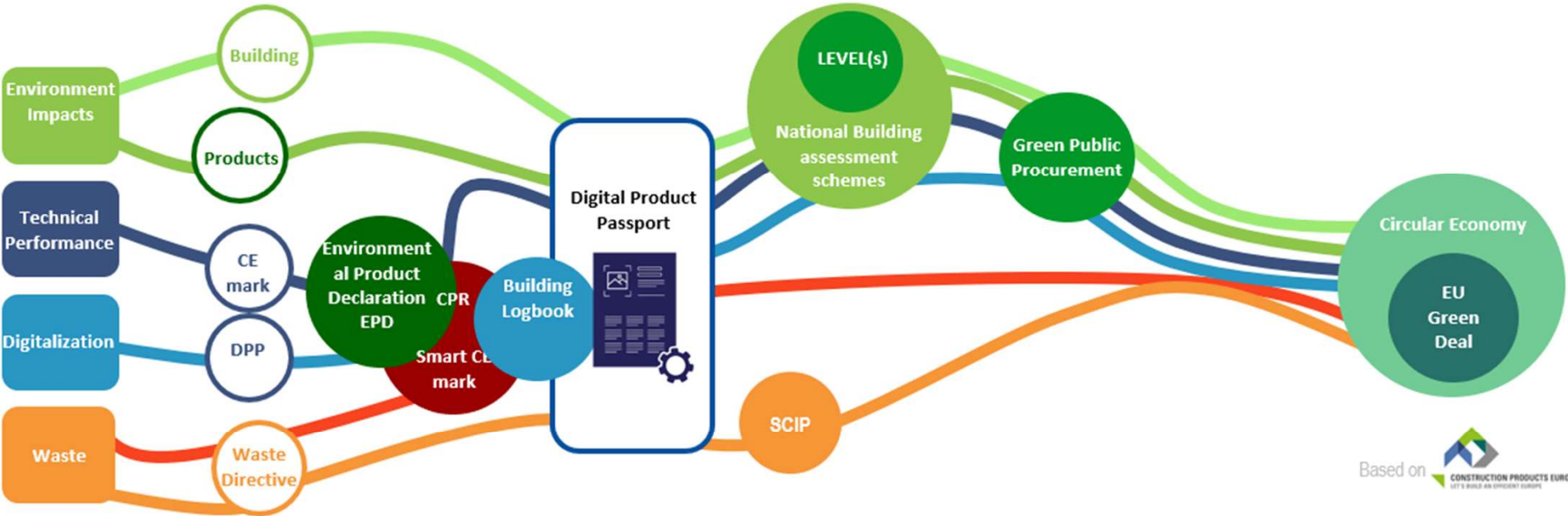
BIMSAFETY DATA TEMPLATES

vs.



Let's talk about it...

Digital Product Passport - to meet the European legal framework

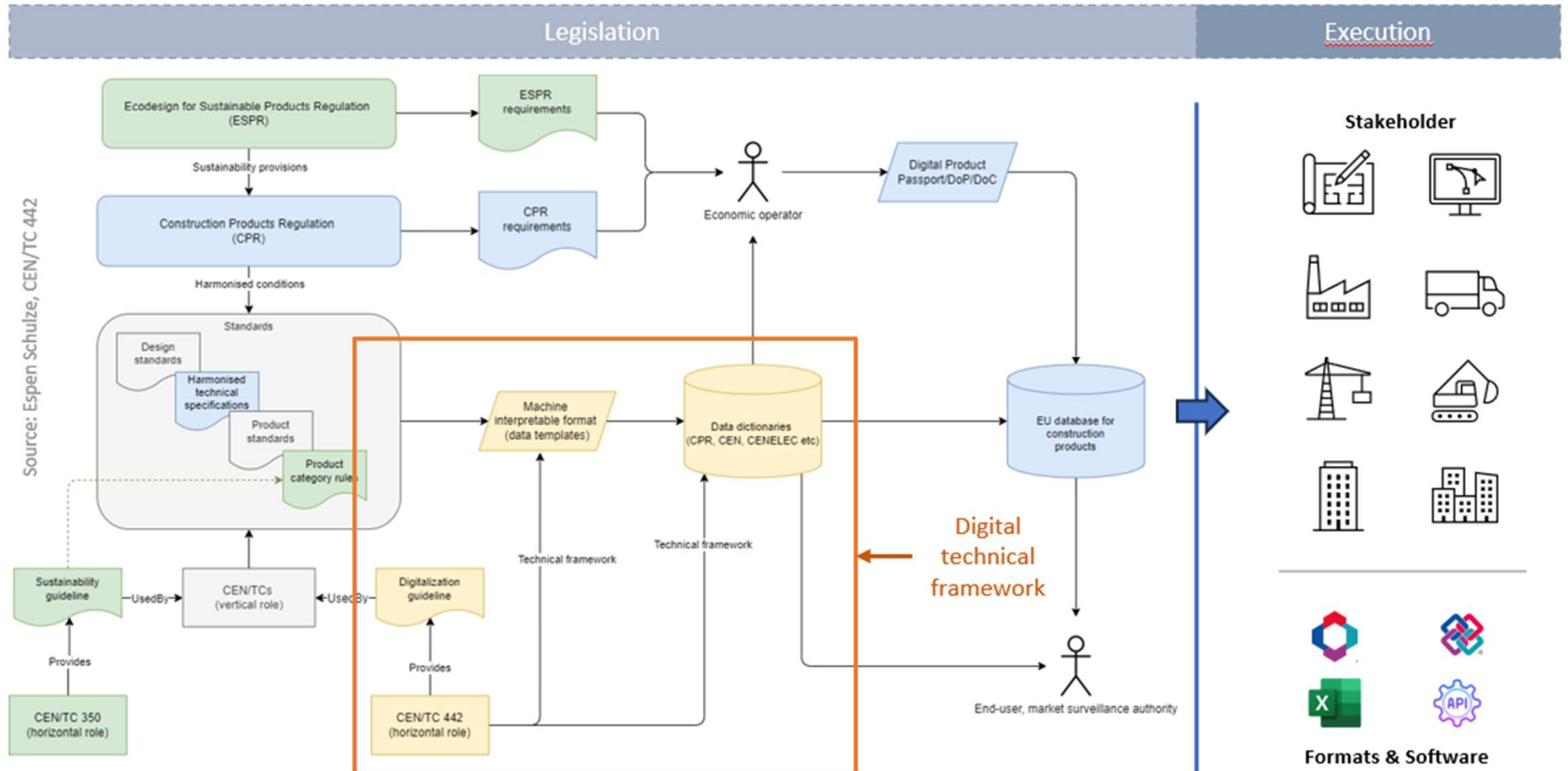


Based on  CONSTRUCTION PRODUCTS EUROPE
LET'S BUILD AN OPPORTUNIST EUROPE

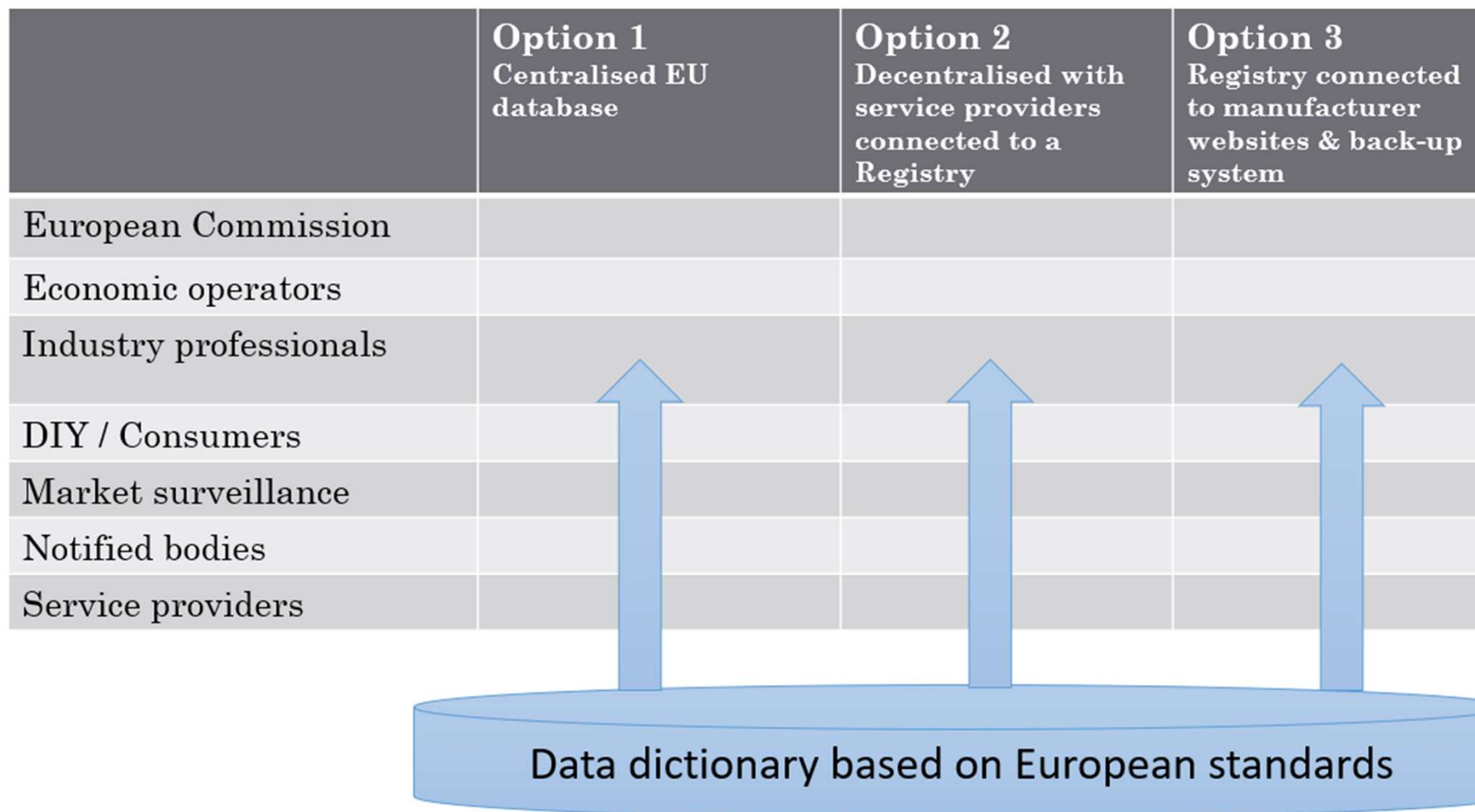
EU DIGITAL PRODUCT PASSPORT



https://www.youtube.com/watch?v=DPzTe9F_G78



Three alternatives – cost , pro & cons



EU DIGITAL PRODUCT PASSPORT

bimobject

Software ▾ Procurar objectos BIM, categorias ou marcas

Q Procurar

Os seus projetos ▾



Casa / Marcas / Hilti



+ Seguir

Hilti

Hilti offers products, systems and services that have leading-edge technology and provide professional customers in the construction and energy sectors with innovative solutions that feature outstanding added value. The Group's strategy is aimed at sustainable value creation through market leadership and differentiation. The overarching goal is to create enthusiastic customers on a daily basis and to build a better long-term future. Hilti Group headquarters are located in Schaan, Principality of Liechtenstein, where the company was founded in 1941 by brothers Eugen and Martin Hilti. All company shares are held by the Martin Hilti Family Trust, a fact that ensures long-term continuity and the ongoing development of the company."

Website www.hilti.com
Morada Feldkircherstrasse 100, 9494,
Schaan Liechtenstein



<https://www.bimobject.com/pt/hilti?location=pt>

EU DIGITAL PRODUCT PASSPORT



English

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CALL FOR PROPOSALS | Closed

Digital Product Passport

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Details

Status	CLOSED
Reference	DIGITAL-2023-CLOUD-DATA-04-DIGIPASS
Publication date	2 May 2023 in https://europa.eu/!vyMb68 >
Opening date	11 May 2023

day on

BIM4OSH
BIMSAFETY COORDINATOR

Let's talk about it...



Construction Domain Session 3: 1. MEP engineers are contributing to the environment; 2. Development of a Lightweight BIM System for Duct

3. Safety is the top priority at the construction site in Korea. Safety work is only possible when all 3D/4D/5D are compatible together from design to completion. In addition, various smart equipment such as drones, 3D scanners, CCTVs, and IoT sensors should be used, and openBIM is essential for this. I would like to introduce POSCO E&C's 8D BIM (Safety) case based on openBIM.

Construction



Hidetaka Yachi

BIM expert, Shinryo Corporation

in



Lei Xu

Professor at the Department of Architecture, Tohoku Institute of Technology, Sendai, Japan



Ying Liu

Ph.D. Student, Department of Architecture, Graduate School, Tohoku Institute of Technology, Sendai, Japan

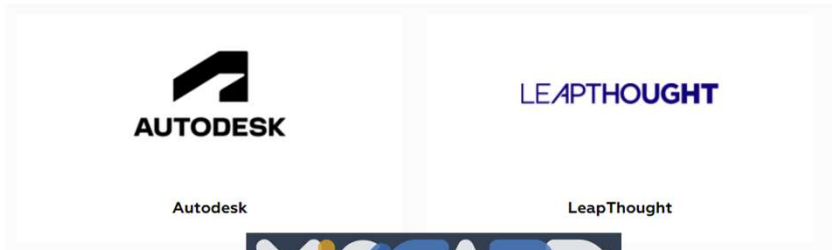


Dae-yeon Keum

BIM Expert, POSCO E&C

in



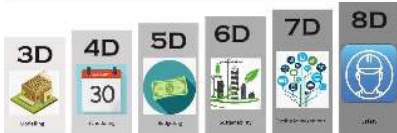
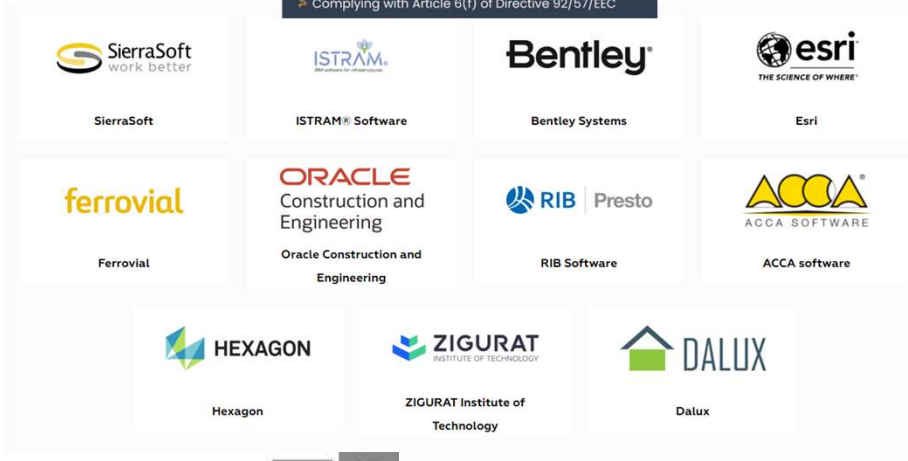


XISCARD

XISCARD is an intuitive access control app

WHY XISCARD?

- Easy to implement
- Easy to operate
- No need for large infrastructures
- Completely modular
- Real-time readings
- Adapted to construction sites
- Evolves with construction sites
- Link to common data environment (CDE)
- Complying with Article 6(f) of Directive 92/57/EEC



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VALENCIA, SPAIN

12-15 MARCH, 2024

EUROPEAN GREEN CAPITAL

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- Technical Resources

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URL: https://www.buildingsmart.org/standards/domains/

System tray: 12°C, 06:16, 15/03/2024



IN COMPLIANCE WITH:

IDENTIFY AND EVALUATE PROCESS AND/OR PRODUCT HAZARDS



GENERAL PRINCIPLES OF PREVENTION (COUNCIL DIRECTIVE 89/391/EEC):

- (b) **evaluating the risks** which cannot be avoided;
- (e) **adapting to technical progress**;
- (g) developing a coherent overall **prevention policy which covers technology, organization of work, working conditions, social relationships and the influence of factors related to the working environment**;
- (i) giving appropriate **instructions to the workers**.



7 GOLDEN RULES FOR VISION ZERO

1. Take leadership – demonstrate commitment
2. **Identify hazards – control risks**
3. Define targets – develop programmes
4. **Ensure a safe and healthy system – be well-organized**
5. Ensure safety and health in machines, equipment and workplaces
6. Improve qualifications – develop competence
7. **Invest in people – motivate by participation**

developed by





Thank you!



RICARDO DA CUNHA REIS

JOÃO COUTO / MANUEL TENDER / CATIA LOPES / TELMA CUNHA / LUANA BRANCO



Escola de Engenharia
Universidade do Minho

MIGUEL AZENHA / JOSÉ CARLOS LINO / ANTONIO AGUIAR COSTA

