



The class will  
start at 16h15

Also part of :



sia

Schweizerischer Ingenieur- und Architektenverein  
Société suisse des ingénieurs et des architectes  
Società svizzera degli ingegneri e degli architetti  
Swiss society of engineers and architects

■ Dimitrios Terzis



# Innovation for construction & the environment

Dr. Dimitrios Terzis

11/11/2025

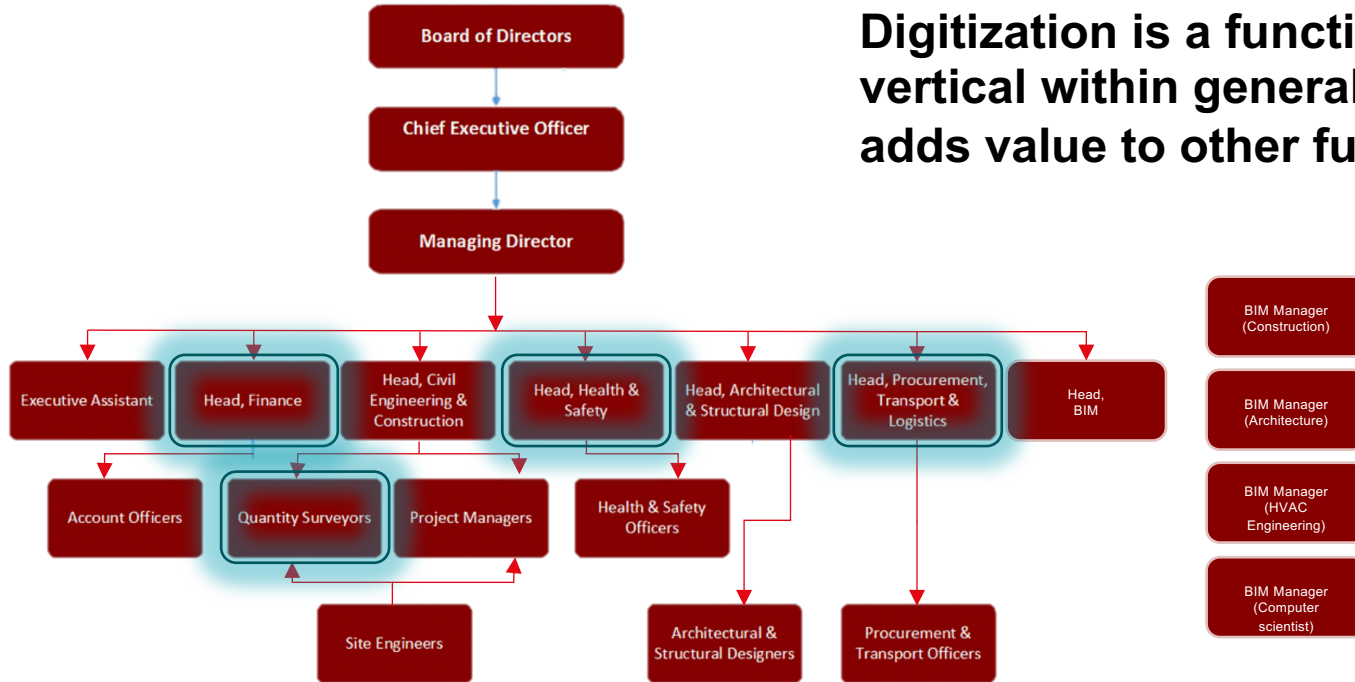
# Today's class

**1) Innovation as a function that applies across an institution's operations**

**2) Innovation from the perspective of a construction giant**  
*With special thanks to K. van Eechoud / Senior innovation manager at Implenia*

# How to integrate innovation into "business as usual": The example of digitization

**Digitization is a function and not just a vertical within general companies. It adds value to other functions!**



# Today's class

**1) Innovation as a function that applies across an institution's operations**

**2) Innovation from the perspective of a construction giant**  
*With special thanks to K. van Eeoud / Senior innovation manager at Implenia*



**CHF 3,765 bn**

2021 revenue



**7,653**

Total workforce

as at 31.12.2021



**CHF 7,148 bn**

Order backlog half year 2022



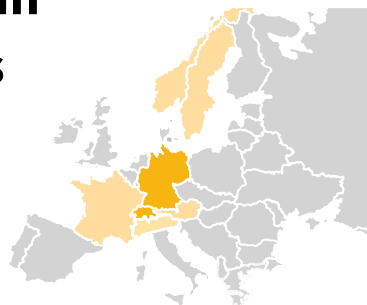
## Sustainability

Industry leader in Sustainalytics rating, AAA rating by MSCI and gold status by EcoVadis

## Positive outlook in relevant markets

CAGR<sup>1)</sup> 2022-24

**Buildings** +1.6%  
**Civil Engineering** +2.7%



## 4 Divisions



**Real Estate**



**Buildings**



**Civil Engineering**



**Specialties**

<sup>1)</sup> Compound annual growth rate (Euroconstruct)

# IMPLENIA





# DIVISION CIVIL ENGINEERING

**DESIGNING AND  
BUILDING MODERN  
INFRASTRUCTURE**

**Expert for complex Civil Engineering projects in Switzerland and Germany as well as Tunnelling and related infrastructure in further markets**

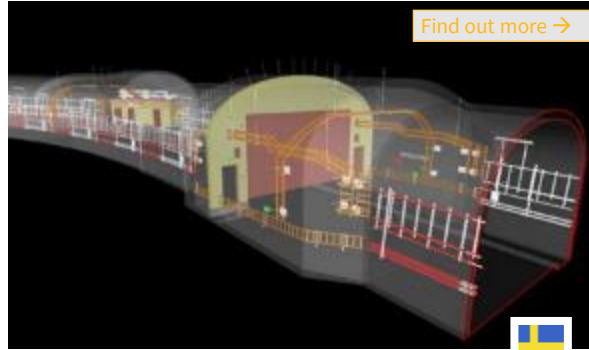
- Leading international position in tunnelling, special foundations and civil engineering
- Development of project-specific solutions thanks to in-house technical design office
- End-to-end management of large hybrid projects

# DIVISION CIVIL ENGINEERING: DESIGNING AND IMPLEMENTING MODERN INFRASTRUCTURE



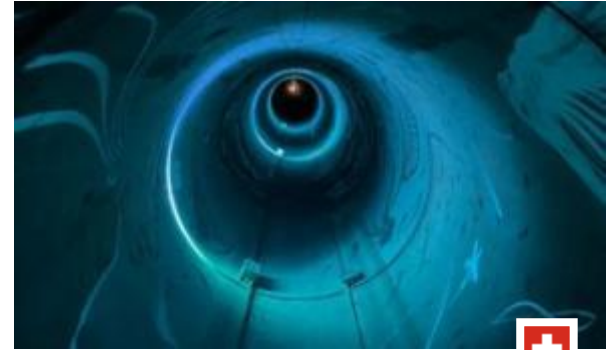
## U81 Stadtbahnlinie, Lot 1&2 Düsseldorf, Germany

Construction of a new light rail line to link the airport and trade fair center to Düsseldorf city center, including an underground station. Logistically challenging construction site in a very confined space, right next to the airfield.



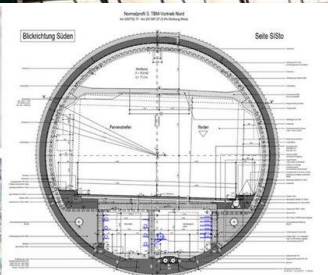
## Connecting tunnel metro Stockholm, Sweden

Connecting tunnel to a metro depot under densely populated urban area, in close proximity to other railroad tracks. Planning and realization on the basis of a BIM model, entirely executed according to Lean Construction.



## District heating microtunneling Wallis, Switzerland

Technically complex district heating tunnel for a modern, ecological energy supply for an entire region. The new channel runs directly under the Rhone River.



## Secondo tubo San Gottardo

- **Lot 243**, Implemia builds access tunnels and logistics excavations using TBM
- **Main tunnel northern lot - Lot 241** stretching 7.9km using TBM and drill & blast

**PROJECT  
2ND GOTTHARD  
TUNNEL**

# INNOVATION AS ONE OF OUR STRATEGIC PRIORITIES



## Portfolio

Strong, differentiated businesses



## Profitable growth

Higher market share and higher margins



## Innovation

Rapid scaling of innovation



## Talent and organisation

Right people in the right roles

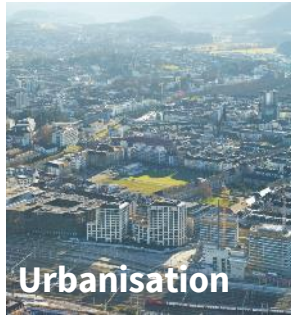
# MEGATRENDS AND INDUSTRY SHIFTS CONTINUE TO OFFER ATTRACTIVE OPPORTUNITIES FOR INNOVATION AND NEW BUSINESS MODELS

## Megatrends



- Increasing demand for **living space**
- Sustainable use of **resources**

→ **10 billion people by 2059<sup>1)</sup>**



- **Densification**
- **Smart Cities**
- **Sharing Economy**

→ **81.2% in urban areas by 2025<sup>2)</sup>**



- **Modernization** of infrastructure
- Further **expansion** and **networks**

→ **EUR 10.7 billion infrastructure-investments in Europe by 2040<sup>3)</sup>**

## Industry shifts



### Sustainability

Increasing focus on environmentally and socially sustainable solutions



### Consolidation & internationalisation

Increasing importance of economies of scale, risk diversification and innovation investments



### Industrialisation

Increasing productivity through factory-based production of modules



### Digitalisation

Increasing need of systems and solutions, e.g. Building Information Modeling (BIM), artificial intelligence, data analytics, metaverse, virtual reality

# FIELDS OF INNOVATION AND GLOBAL INDUSTRY SHIFTS



Rising importance of **factory-based production modules**. Increasing productivity potential through **standardisation, automation** as well as **prefabrication**



Scalable solutions through modular capability and **productisation** ahead of competition



**Increasing need of systems and solutions**, e.g. Artificial Intelligence, data analytics, Virtual Reality, automation, **Building Information Modeling** (integrative, transparent and collaborative planning)



Integration of more **cutting-edge technologies** along entire project lifecycle and roll-out **faster** than competition



Focus on **environmentally and socially sustainable** solutions, driven by government and ESG regulations as well as changing mindset



**Sustainable** construction and development including decarbonisation strategy

## INNOVATION OPPORTUNITIES

# FROM TRADITIONAL MODELS TO INDUSTRIALIZED CONSTRUCTION

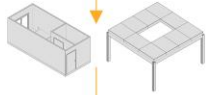
## Kit of Parts

Set of interoperable standard components



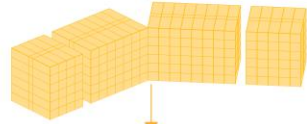
## Platforms

Volumetric modules and/or parts assembled according to ruleset



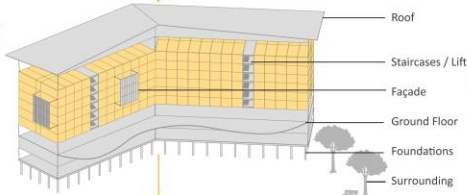
## Reference Design

Integration of platforms using standard components



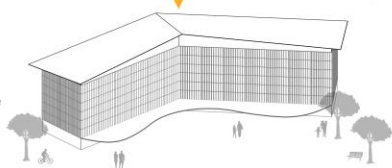
## Supplemental Design

Portions of the building and activities not scalable

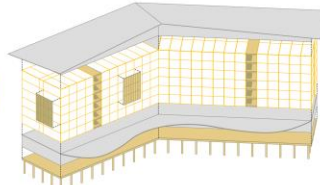


## Physical Asset

Integration of reference and supplemental design



Standardisation increases with product versions



Identification of opportunities for future standardization to increase the reference design % (by developing platforms for staircases and lifts, façade, foundations, etc.)

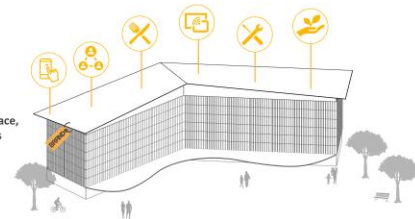


**Virtual Asset**  
Integration of services



## Product

Integration of space, location, services and brand



## Real Estate Products

In-House Development of Real Estate Products, Co-Creation: Product Development as a Service

IMPLENIA

## DIGITALIZATION & BIM

- Company wide process standardization and digitalization: **INSPIRE** transformation
- Increased adoption of **BIM & reality capturing**
- Several technology **pilots & implementations**
  - FIELD2BIM / BIM2FIELD
  - Artificial intelligence
  - Virtual- and Augmented Reality
  - Common data environments
  - Real estate development & marketing



# IMPLENIA SUSTAINABILITY

## Empa and Eawag Research Campus



- Implenia as **preferred partner** for the implementation of **customer-driven, sustainable developments**
- Innovative **laboratory building, parking garage** as timber-concrete hybrid construction, ecologically focused workplaces at the **office building**
- **Applied research results of the Empa and Eawag laboratories** for energy generation and storage as well as wastewater treatment and recycling

## Implenia leading in ESG

**MSCI**  
ESG RATINGS



CCC B BB BBB A AA **AAA**



Sustainalytics and Ecovadis for assessment period 2021; MSCI ESG rating of AAA as of Dec 2021

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# SUSTAINABILITY

## 12 AMBITIOUS GOALS IN FIVE PRIORITIES UNTIL 2025

### SUSTAINABLE PRODUCTS AND SERVICES

**1. SUSTAINABLE DEVELOPMENT & REALISATION**  
Highest standards in projects

**2. SUSTAINABLE SUPPLY CHAIN**  
Cooperation with sustainable partners

**3. ECO CONSTRUCTION SITE**  
Project-specific sustainability concepts

### RESPECT FOR THE ENVIRONMENT

**4. CO<sub>2</sub>-REDUCTION**  
2050 target: net zero CO<sub>2</sub>-emissions.  
2025 target: reduce CO<sub>2</sub>-emissions by 15%

**5. ENVIRONMENTAL PROTECTION**  
Professional environmental management in all projects

**6. CIRCULAR ECONOMY**  
New circular business models promote closing of material cycles

### SOCIAL COMMITMENT & COMPLIANCE

**9. IMPLIENIA WITHOUT BORDERS**  
Engagement in social partnerships

**10. ETHICAL GOVERNANCE**  
Business aligned with ethical principles

### ATTRACTIVE WORKING ENVIRONMENT

**7. SUSTAINABILITY IN OUR DNA**  
Sustainability in our daily actions

**8. ENGAGED EMPLOYEES**  
Aim for 0 accidents & high employee satisfaction

### FINANCIAL & OPERATIONAL EXCELLENCE

**11. SUSTAINABLE FINANCE**  
ESG-criteria are integrated in our business & investment decisions

**12. DIGITAL & INTEGRATED PROCESSES**  
Operational excellence & high-quality standards

FUTURE OF CONSTRUCTION?

# THE FUTURE OF CONSTRUCTION WILL BE LARGELY BASED ON THE FUTURE OF LIVING, WORKING AND MOBILITY

**Future of living**



**Future of work**

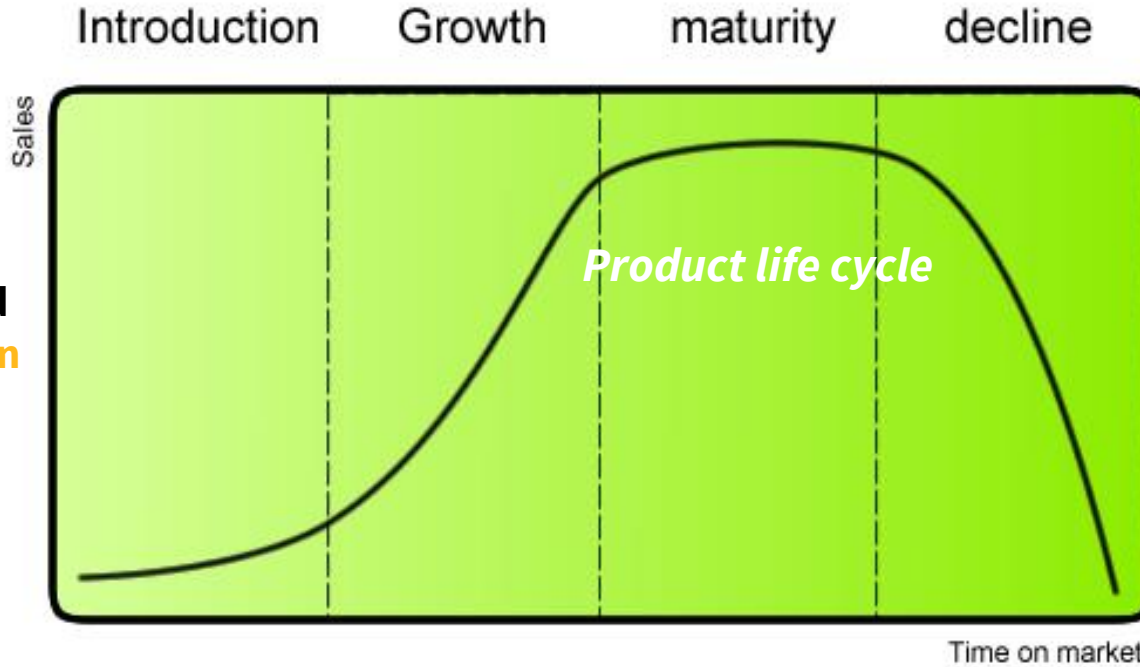
*Future of energy*

**Future of mobility**

WHY WE INNOVATE?

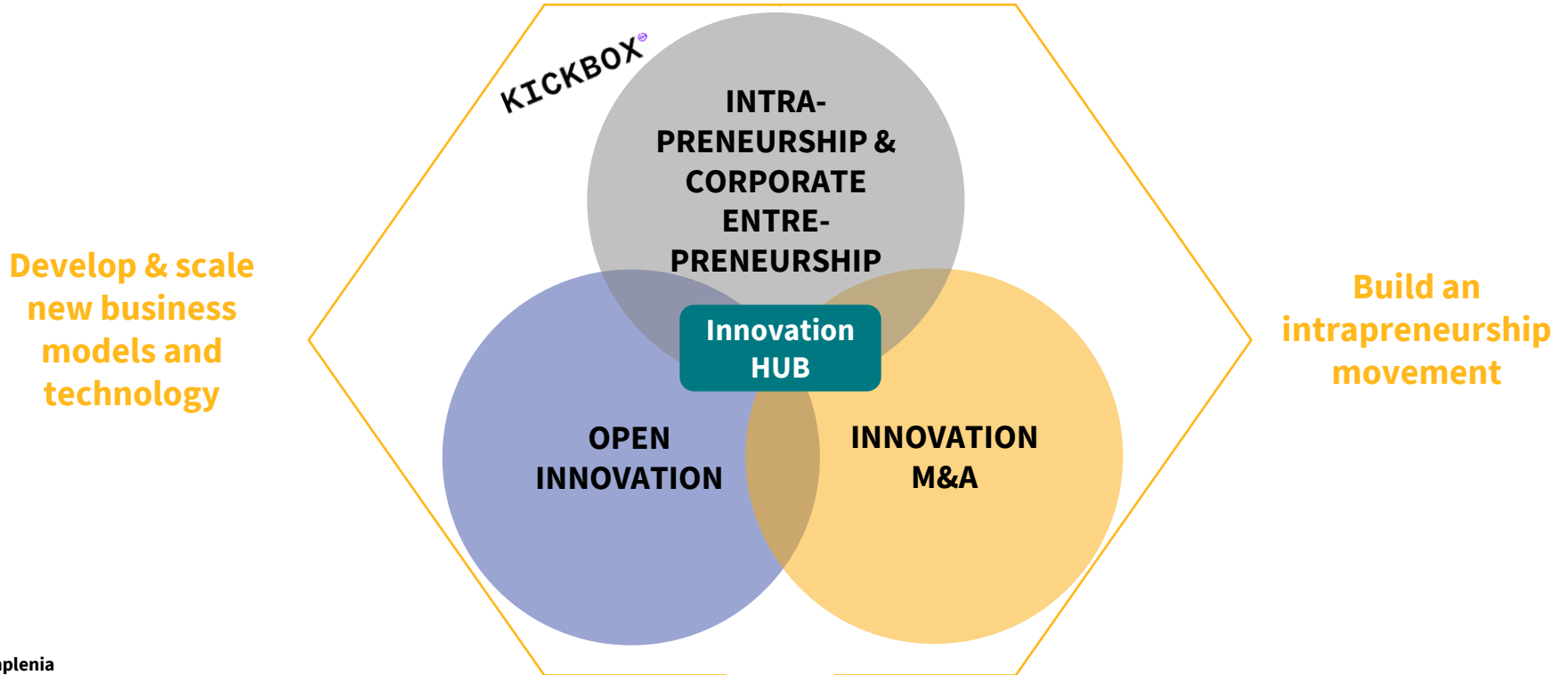
# INVESTMENTS IN SUSTAINABILITY, INDUSTRIALIZATION AND DIGITALIZATION ARE NOT A GUARANTEE FOR LONG TERM SUCCESS..

innovation and experimentation



Several construction services are subject to decline

# ACCELERATING INNOVATION AND INTRAPRENEURSHIP TO DEVELOP & SCALE NEW BUSINESS MODELS



# WE MOBILIZE OUR EMPLOYEES TO BECOME INTRAPRENEURS WITH KICKBOX AND START DOING

# 91

Digital Platform

Red Box



Validate

Sponsor

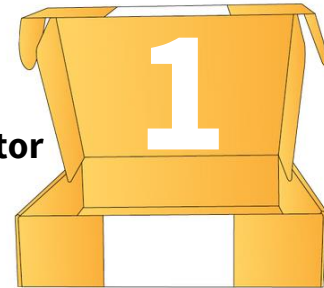
Blue Box



Pilot

Investor

Gold Box



Implement

- **Support** Innovation Hub team, innovation **coaching**, e-mail coaching
- **Network** of internal and external experts
- **Tools** (E.g. Kickbook, Kickmap, eLearning, IT, piloting)

INTRAPRENEURSHIP

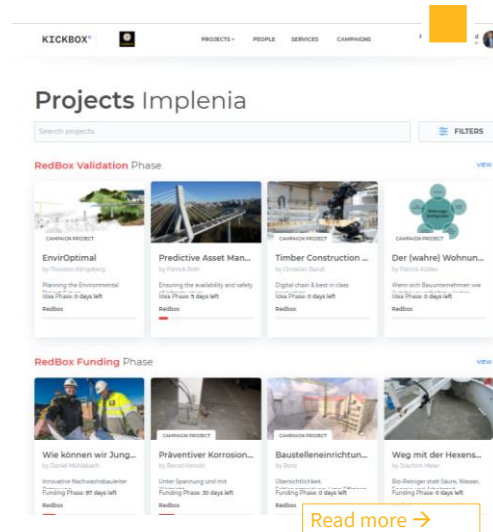
# 91 IDEAS SUBMITTED AND A GROWING COMMUNITY OF INTRAPRENEURS AT IMPLENIA



**EVENTS** LIKE PITCH EVENTS, COMMUNITY MEETUPS, FUTURE TALKS & SCREWUP NIGHTS

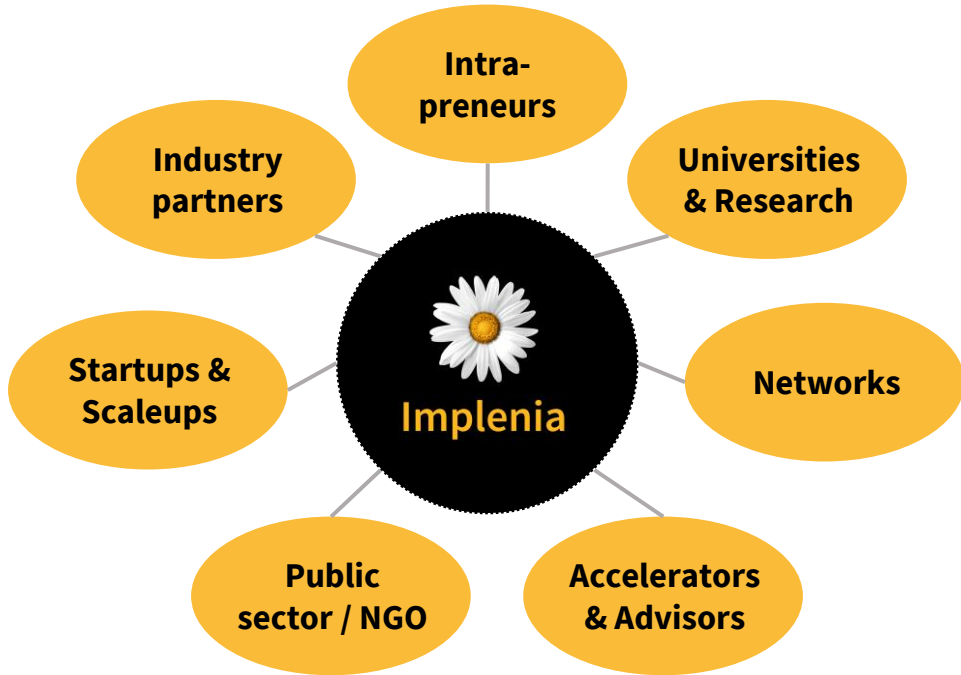
© Implenia

**DIGITAL PLATFORM WITH INNOVATION PROJECTS AND A COMMUNITY OF +900 EMPLOYEES**



**WORKSHOPS AND SUPPORT FROM PROFESSIONAL COACHES AND INNOVATION EXPERTS TO TEST IDEAS**

# INNOVATION IN CONSTRUCTION SERVICES, NEEDS A STRONG ECOSYSTEM OF PARTNERS



## Innovation partners



# INNOVATION OPPORTUNITY SPACES WHERE IMPLENIA PRIORITIZES PARTNERSHIPS AND INVESTMENTS TO SCALE NEW OFFERINGS

## *Opportunity spaces*

**Underground space concepts, streets 2.0, future energy infrastructure**



**Predictive asset management of infrastructure**



**Innovative construction and engineering services**



**Modular construction systems and industrialized modernization**



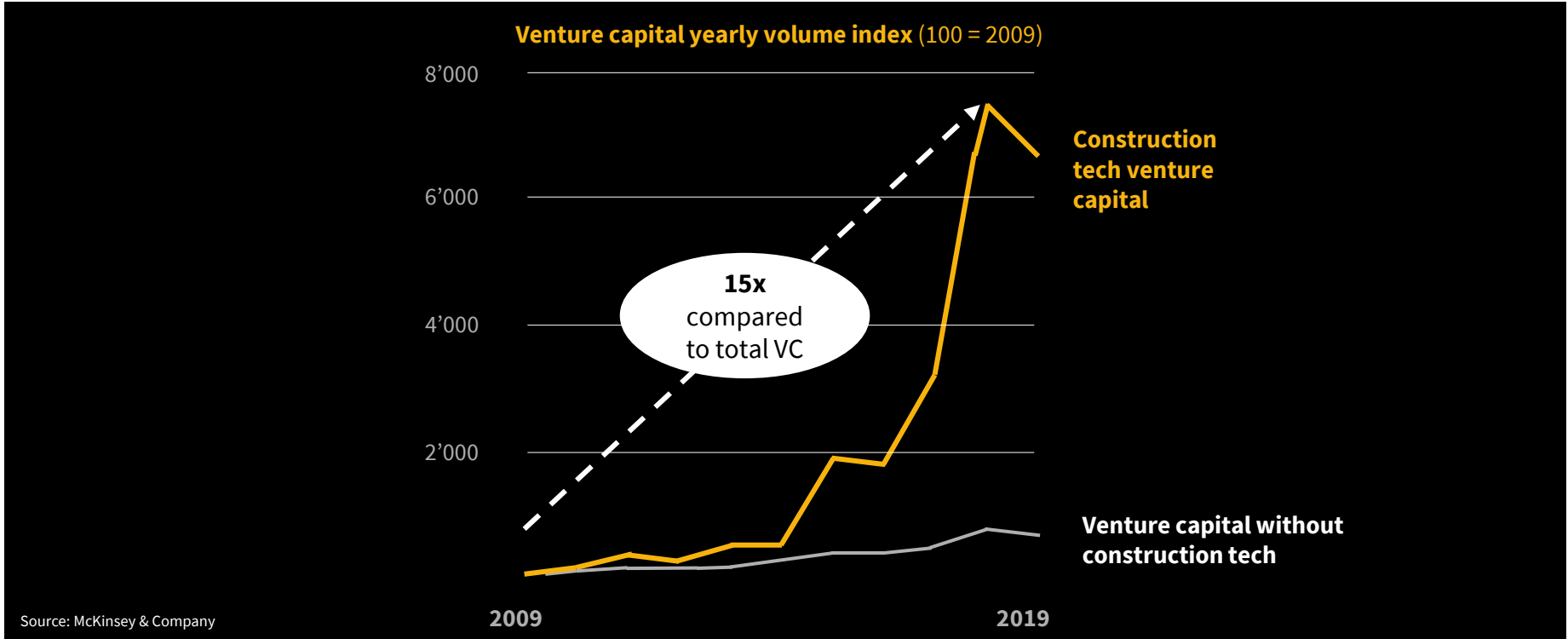
**Digital development, planning and real estate services**



**Circular construction solutions**



# RULES OF THE GAME IN THE INDUSTRY START TO CHANGE: NEW INNOVATIVE STARTUPS INCREASING JUMP ON OPPORTUNITIES



OPEN INNOVATION

# SOME OF THE LARGEST DEALS IN CONSTRUCTION AND PROPTech STARTUPS IN 2022 SO FAR



**60M USD**

Series C



**45M USD**

Series B



**30M USD**

Series B

OPEN INNOVATION

# SELECTED STARTUPS IN THE CONTECH AND PROPTech SPACE WE SCREENED AND TESTED LATELY



IRE



IBU



ICE



ISP



# INNOVATION OPPORTUNITY SPACES WHERE IMPLERIA PRIORITIZES PARTNERSHIPS AND INVESTMENTS TO SCALE NEW OFFERINGS

## *Opportunity spaces*

**CONSTRUCTION  
SOFTWARE & DATA  
ANALYTICS**



**PREDICTIVE ASSET  
MANAGEMENT OF  
INFRASTRUCTURE**



**INNOVATIVE  
CONSTRUCTION  
SERVICES**



**MODULAR &  
INDUSTRIALIZED  
CONSTRUCTION  
SERVICES**



**SMART BUILDINGS &  
REAL ESTATE  
SOLUTIONS**



**CIRCULAR BUSINESS  
MODELS &  
MATERIALS**

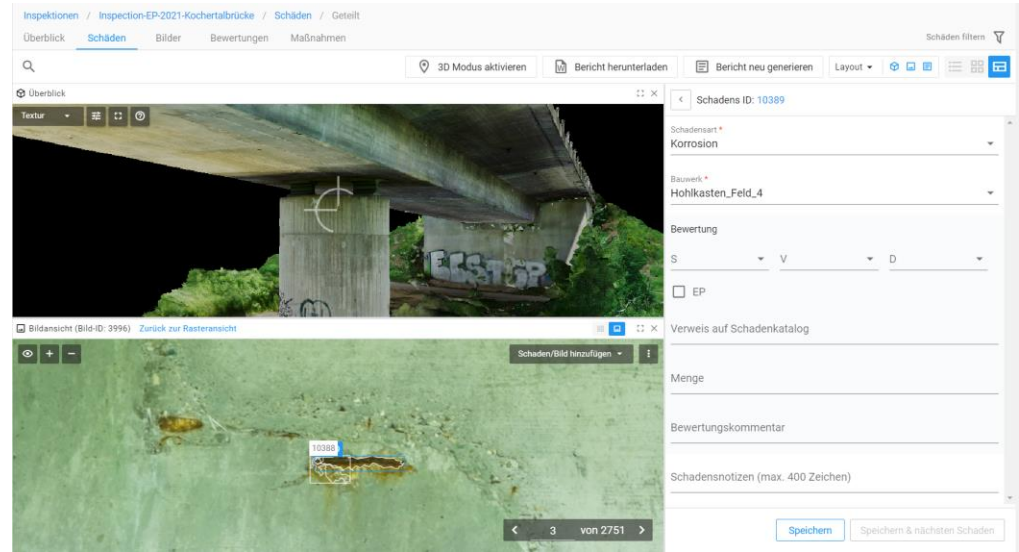
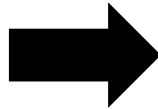


A person wearing an orange high-visibility safety vest with reflective silver stripes and a white daisy logo is using a tablet. The background is a blurred industrial or warehouse environment. A semi-transparent white box is overlaid on the left side of the image, containing the text 'CORPORATE INNOVATION IN ACTION'. A solid yellow square is positioned in the upper left quadrant of the image.

# **CORPORATE INNOVATION IN ACTION**

## PREDICTIVE ASSET MANAGEMENT OF INFRASTRUCTURE

# TECHNOLOGY PILOTS AND CUSTOMER VALIDATION TO DEVELOP NEW SERVICES ALONG THE ASSET LIFE CYCLE OF BRIDGES

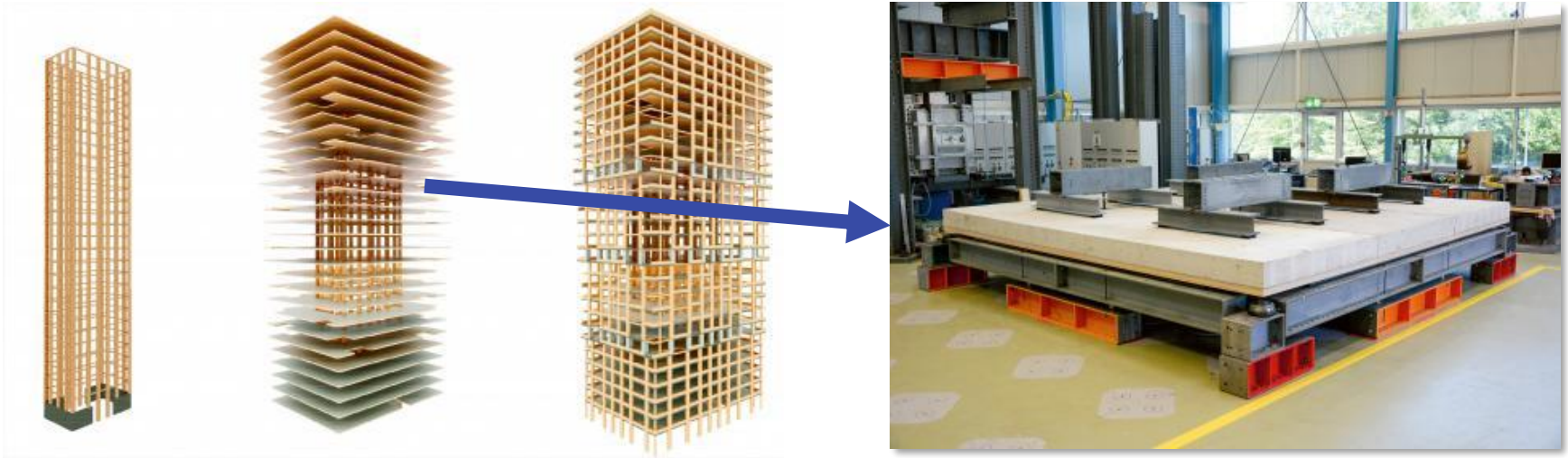


**Pilot STRUCINSPECT:** Evaluation of two providers of AI based automated defect detection for concrete bridges

TIMBER CONCRETE SLAB WITH INTEGRATED SPRINKLER

# APPLYING A NEW TIMBER CONCRETE SLAB IN ONE OF THE HIGHEST TIMBER BUILDINGS (80M) IN EUROPE

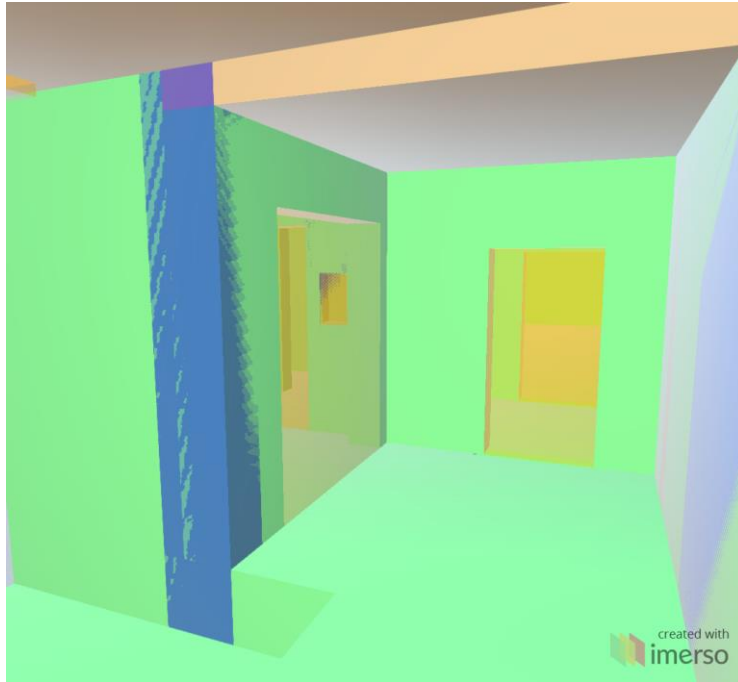
**PATENT PENDING**



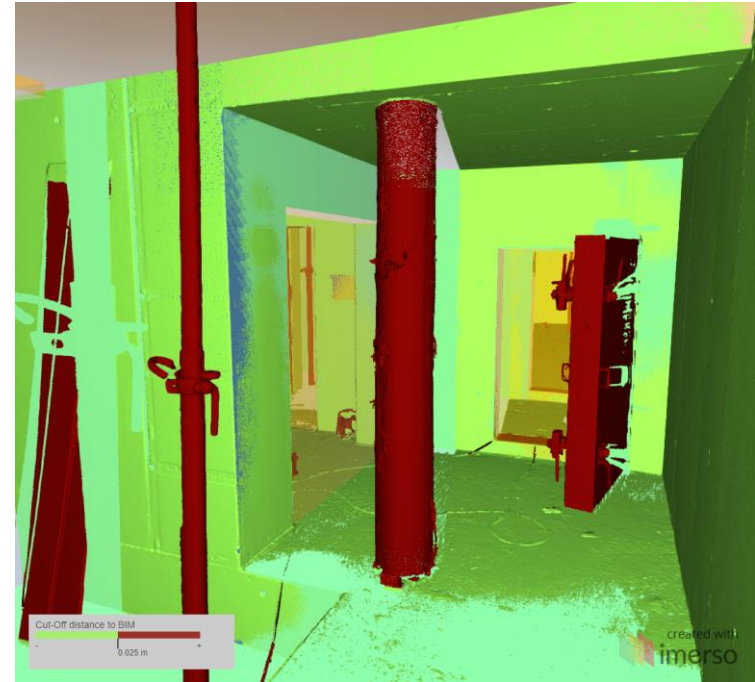
**Pi Holzhochhaus, Zug:** designed and planned for our client Techcluster Zug

# CLASH DETECTION USING BIM, REALITY CAPTURING AND AI

AS PLANNED BIM Model



AS BUILT BIM Model with point cloud overlay





# **DIGITIZING THE REAL ESTATE MARKETING JOURNEY**

**CASE STUDY**

# DIGITIZING THE REAL ESTATE MARKETING JOURNEY

## PAINS IN REAL ESTATE MARKETING



Implema Schweiz AG - Division Development  
Zürcherstrasse 39, CH-8400 Winterthur, Schweiz

T +41 58 474 70 00  
F +41 58 474 77 45  
www.lokkstadt.ch/tender

certifiziert nach ISO 9001/14001  
und OHSAS 18001  
www.implema.com

### Käuferblatt Tender

| WOHNUNG                | EHEMANN ODER KÄUFER 1 | EHEFRAU** ODER KÄUFER 2 |
|------------------------|-----------------------|-------------------------|
| Name(n) **             |                       |                         |
| Vorname(n) gemäss Pass |                       |                         |
| Strasse, Nr.           |                       |                         |
| PLZ, Ort               |                       |                         |
| Geburtsdatum           |                       |                         |
| Zivilstand             |                       |                         |
| Bürgerort(e)           |                       |                         |
| Beruf                  |                       |                         |
| E-Mail                 |                       |                         |
| Telefon-Nr.            | P: G:                 | P: G:                   |

\*\*Bitte zusätzlich ledigen Namen (bzw. Doppelname) angeben.

Falls Sie Ausländer sind: Ausländerausweis A, B oder C

Ehemann oder Käufer 1  A  B  C  
Ehefrau oder Käufer 2  A  B  C

Die unterzeichneten Ehegatten bestätigen, **folgendem Güterstand** zu unterstehen:

- Errungenschaftsbeteiligung** (ordentlicher Güterstand, kein Ehevertrag, keine Beibehaltungserklärung)
  - Güterverbindung** nach altem Recht gemäss Ehevertrag oder Beibehaltungserklärung (Kopie bitte Notariat vorlegen)
  - Gütergemeinschaft** gemäss Ehevertrag (Kopie bitte Notariat vorlegen)
  - Gütertrennung** gemäss Ehevertrag (Kopie bitte Notariat vorlegen)
- und beabsichtigen, das Grundstück zu erwerben als
- Alleineigentümer**  Ehemann oder Käufer 1
  - Miteigentum** je zur Hälfte  Ehefrau oder Käufer 2
  - Gesamteigentum**  infolge Gütergemeinschaft
  - infolge einfacher Gesellschaft

Ort und Datum:

Unterschrift(en)

Stand Mai 2020

🌟 Eine Arealentwicklung von Implema.

lokkstadt®

**Tender Riegel, Winterthur**

Status: 31.07.2022, Cheyenne Liller, 702762

Stand: 01.08.2020

**51'528'000** Marktwert Gesamtprognose (CHF)

+ 43 Anzahl Einheiten verkaufteinheiten

+ 97% Ansat Marktwert verkaufteinheiten

50% Absorption soll bis 31.12.2019

**Kumulierter Verkauf**

| Verkauf            | Total     | Frei     | Verkauft  | Marktwert                | Verkauf      | %        | Reserviert  | m        | s        | Marktwert Reserviert  | %           |
|--------------------|-----------|----------|-----------|--------------------------|--------------|----------|-------------|----------|----------|-----------------------|-------------|
| 15.0 - 1/4kg       | 0         | 0        | 0         | Fr. 0.00                 | 0.00%        | 0        | 0           | 0        | 0        | Fr. 0.00              | 0.00%       |
| 2.0.0 - 1/4kg      | 6         | 1        | 4         | Fr. 1048'000.00          | 2.09%        | 0        | 0           | 0        | 0        | Fr. 0.00              | 0.00%       |
| 3.0.0 - 1/4kg      | 15        | 0        | 15        | Fr. 207'500.00           | 0.40%        | 0        | 0           | 0        | 0        | Fr. 0.00              | 0.00%       |
| 4.0.0 - 1/4kg      | 18        | 0        | 18        | Fr. 2194'000.00          | 4.25%        | 0        | 0           | 0        | 0        | Fr. 0.00              | 0.00%       |
| Gewölbe            | 2         | 1        | 1         | Fr. 455'000.00           | 0.88%        | 0        | 0           | 0        | 0        | Fr. 0.00              | 0.00%       |
| <b>Zwischenst.</b> | <b>45</b> | <b>2</b> | <b>42</b> | <b>Fr. 47'938'000.00</b> | <b>93.0%</b> | <b>1</b> | <b>2.0%</b> | <b>5</b> | <b>1</b> | <b>Fr. 895'000.00</b> | <b>1.7%</b> |

|       |      |                  |                |                |
|-------|------|------------------|----------------|----------------|
| 51006 | Easy | 00 CHF           | 830'000.00 CHF | 245'000.00 CHF |
|       |      | 00 CHF           | 943'000.00 CHF | 282'000.00 CHF |
|       |      | 00 CHF           | 830'000.00 CHF | 245'000.00 CHF |
|       |      | 1'286'000.00 CHF | 990'000.00 CHF | 296'000.00 CHF |



**REALIZING A NEW  
TUNNEL YIELDING  
ELEMENT**

**KICKBOX IDEA FROM MANUEL  
ENTFELLNER  
IMPLENIA TUNNELLING AUSTRIA**

**CASE STUDY**

HS-EPS TUNNEL ELEMENTS

# AN EXAMPLE OF ADDED VALUE THROUGH INNOVATION AND INTRAPRENEURSHIP



KICKBOX IDEA: SUBMITTED OCTOBER 2019

# IMPROVE SAFETY & HANDLING OF TUNNEL ELEMENTS IN ONE OF EUROPE'S MOST COMPLEX PROJECTS



**PATENT PENDING**



[HS-EPS Tunnel Elements - Implenia AG](#)

**MOTIVATED EMPLOYEE**

+

**VALIDATED PROBLEM**

+

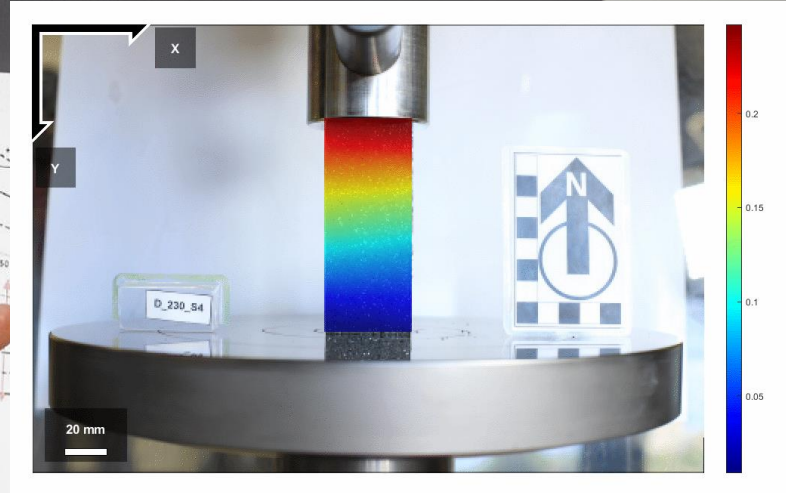
**SUPPORTIVE MANAGER**

+

**EARLY FEASIBILITY TESTS**

+

**KICKBOX FOR AWARENESS**



**REDBOX**



**RIGHT PARTNERS**  
+  
**PATENT FILING (NEAR MISS..)**  
+  
**FIRST FIELD TEST**  
+  
**CONVINCING AND BE BOLD**  
+  
**CO-SPONSORING HUB &  
MANAGER**

**VALIDATION: -15 minutes time  
saving per installed element!**

**BLUEBOX**

# LET'S DISCUSS THE FUTURE OF CONSTRUCTION!



HOW MIGHT WE **APPLY**  
**ROBOTICS** IN CIVIL  
**ENGINEERING?**

HOW MIGHT WE **BUILD** THE  
**MOST SUSTAINABLE** CIVIL  
**INFRASTRUCTURE?**



HOW MIGHT WE **DEVELOP** NEW  
**SERVICES** FOR UNDERGROUND  
**SPACE** USE, **MOBILITY** AND  
**LIVING?**

IMPLENIA

# TALENTS MAKE A STRONG FOUNDATION

VISIT OUR CAREER PAGE



## A GOOD WORKING ENVIRONMENT

We invest in an attractive, modern working environment for our 8,000 employees from 85 nations. We promote progressive working models, diversity and a safety culture in all areas of the company.



## RESEARCH AND DEVELOPMENT

We offer attractive prospects for a long-term career, encouraging employees in all phases of life through our talent management system and our extensive training and development offering.

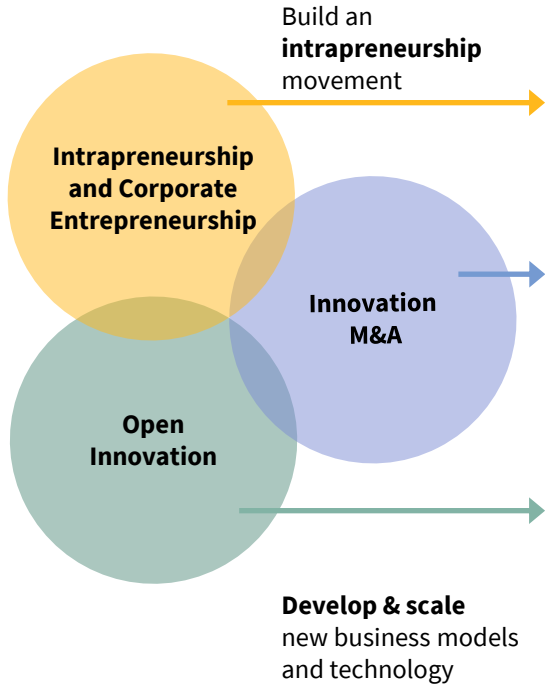


## INNOVATION AS PART OF OUR CULTURE

We work in strong teams and actively uphold values such as collaboration and agility. With our Innovation Hub, we encourage our employees to contribute and develop their ideas for innovative solutions.

# INNOVATION FOCUS PURSUED WITH THREE-FOLD INNOVATION STRATEGY

## Three-fold strategy



## Fast stage-gate innovation

### Innovation Hub

**Incubation platform >940 users, 91 ideas, 14 pilots** in market test

### Innovation opportunity spaces

Implenia prioritises partnerships and investments to scale new offerings

- **Industrialisation**
- **Digitalisation & BIM**

### Research & Innovation partnerships

- Network with Fraunhofer Institut, EPFL and ETHZ
- Bauen Digital CH, SwissPropTech, Innohack, X-Innovation Lab Hamburg

## HS-EPS<sup>1)</sup> tunnel element

A **performance material product** creating a safe, lightweight, and flexible solution that revolutionises how to handle squeezing ground and complex geological conditions in tunnelling

- **Lab and field tested**
- **>2'000 pieces sold**
- **Patent pending**, go-to-market defined and ramped up

