

Join the best in class industry meeting for Engineering, Procurement & Construction sector.

# The Amsterdam Engineering Procurement Construction Project Management Forum November 2022 Virtual & In-Person event of the year

28-29-30 November 2022 [REDACTED] Amsterdam City





# Transformation in EPC Industry, During and Beyond Crisis

Sudipta Mohanty

Every sector, every product is becoming **smart**.

Smart watch, smart phone, smart TV and nowadays even smart fans.

If so many **'smart'** things are happening across the world,

**Then Why not the Smart EPC Industry?**

# What's Driving Transformation in the EPC Market?

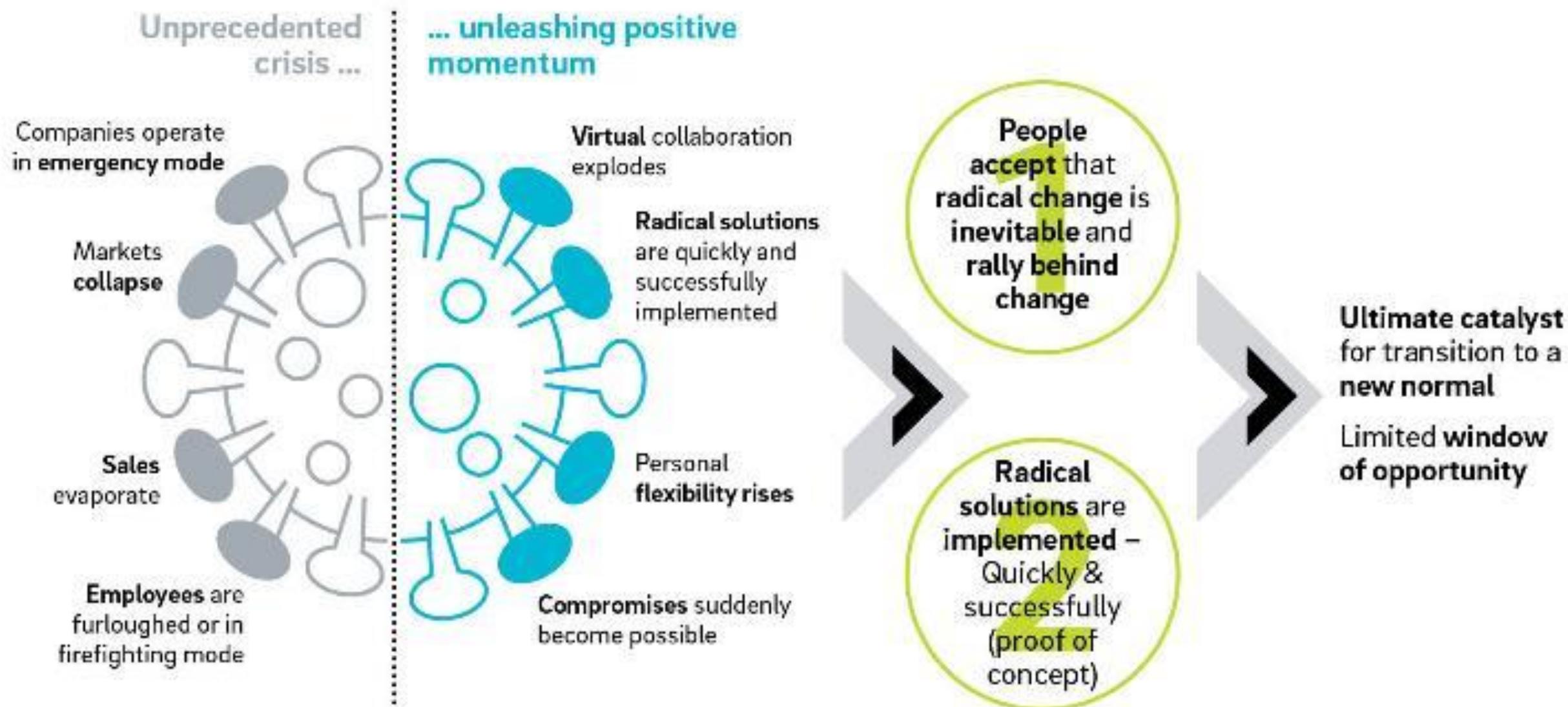
## COVID-19 Accelerated Transformation for EPCs

Market Disruptions Add More Pressure

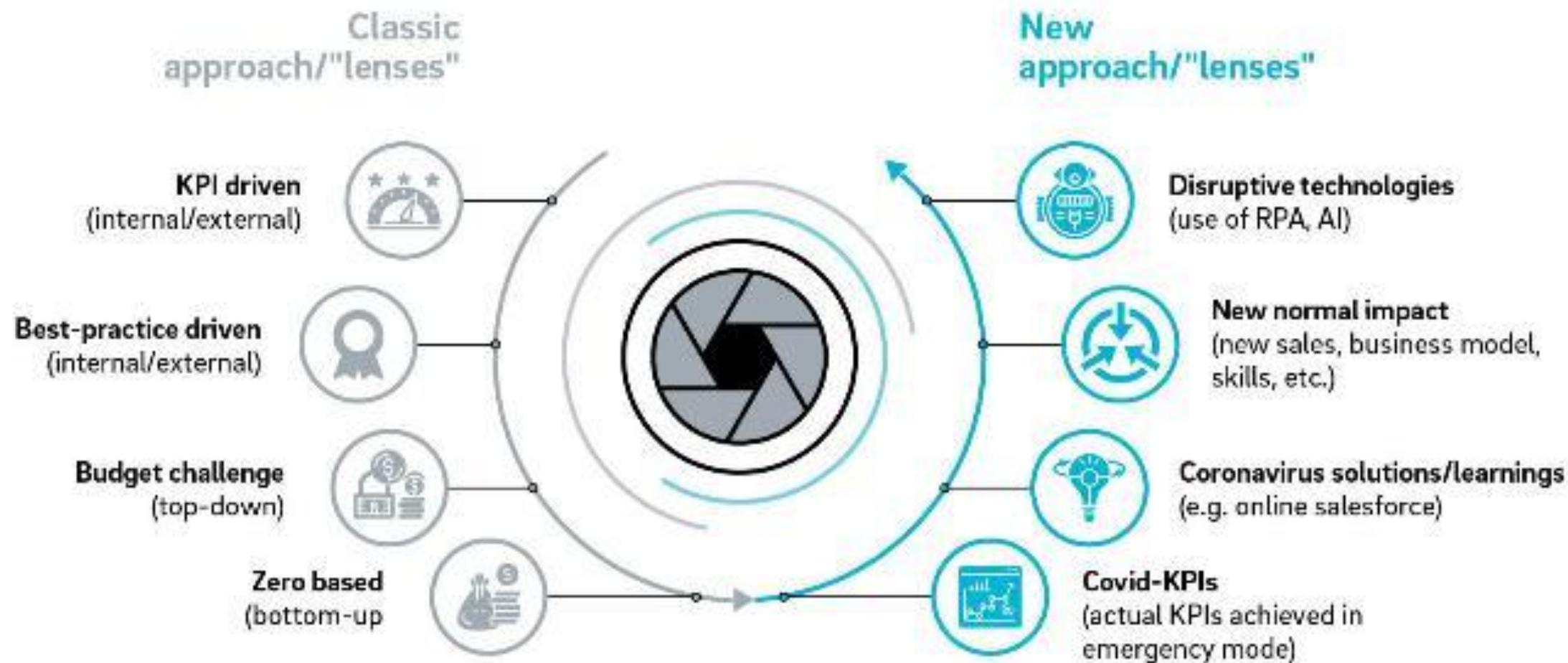
Proof of Concept: Early Adopter Success



# Opportunity for transformation through COVID-19



# Dimensioning – New "lenses"



How has Covid-19 accelerated digital transformation

## From Street to Screen Economy:



**97%**

of executives said that COVID-19 accelerated “digital transformation.”

# Acceleration from COVID-19



Empowering more remote collaboration and productivity



Enhanced privacy and security to support remote work



Accelerated deployment of intelligent robotic process automation and low code technologies



AI-driven predictive and prescriptive analytics and digital twins



Future product and process development will be accelerated

**63% OF LEADERS**

state that the COVID-19 pandemic prompted them to embrace digital transformation

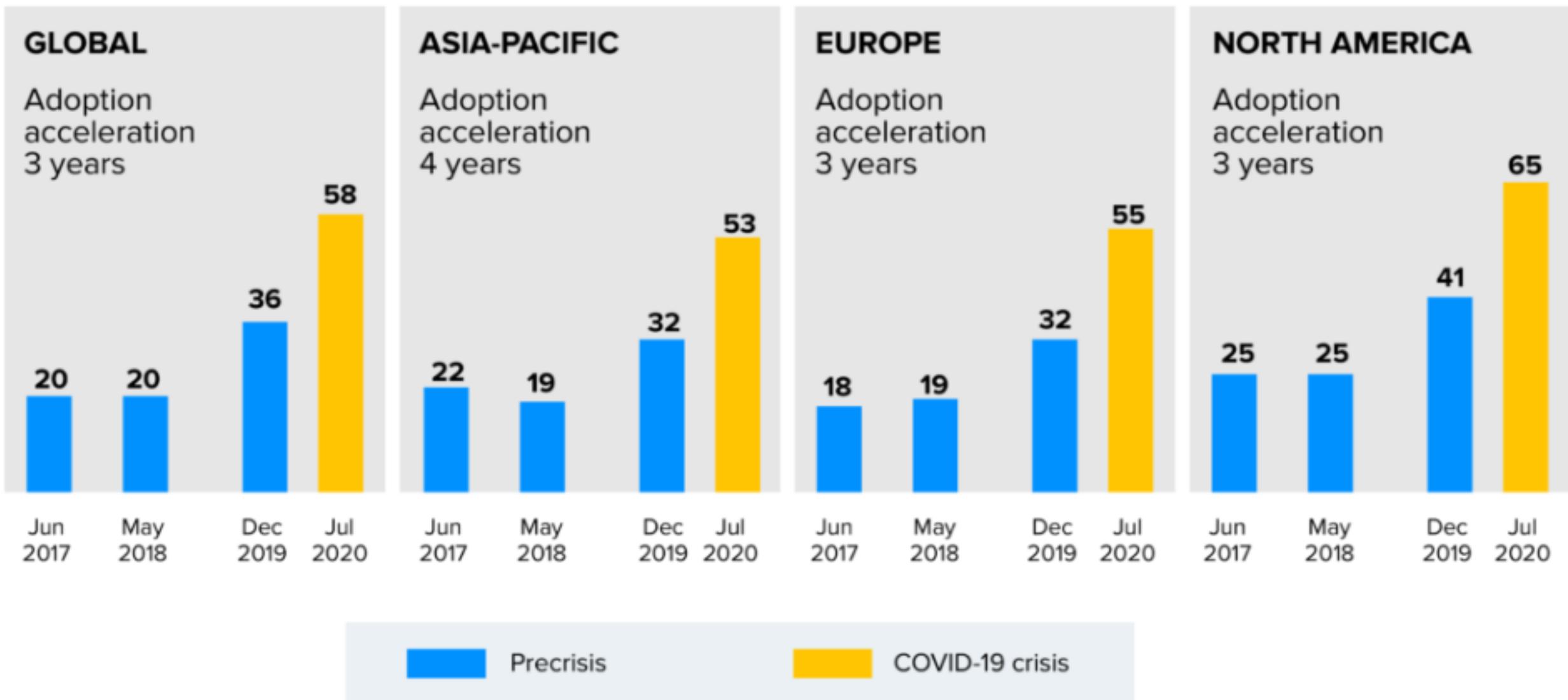
**SOONER THAN  
ORIGINALLY PLANNED.**

*Data Source: Celerity*



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# Some of the key industry transformational trends unfolding in the EPC industry over the recent years, make it SMART



**Industrialized Construction:**

**Adoption of Digital Technologies:**

**Value Chain Control:**

**Safety and Sustainability:**

**Talent Pipeline Creation:**

# BENEFITS OF INDUSTRIALIZED CONSTRUCTION



Reduced labor costs



Improved safety



Quicker build schedules



Improved quality of finished project



Enhanced productivity through optimization and automation



Access to a larger labor pool



Less waste / Very efficient



Reduced Site Disruption

**Some of the key industry transformational trends unfolding in the EPC industry over the recent years.**

**❑ Industrialized Construction:**

- Discreet manufacturing
- Prefabrication / Modular Construction
- offsite manufacturing,

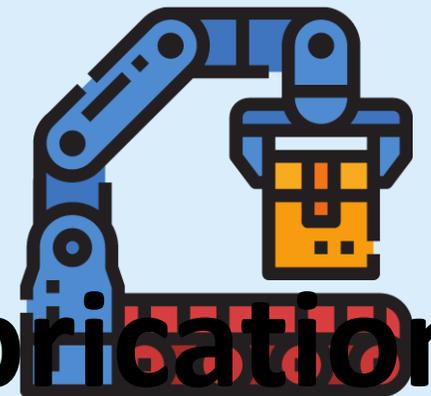
**❑ Adoption of Digital Technologies:**

**Value Chain Control:**

**❑ Safety and Sustainability:**

**❑ Talent Pipeline Creation:**

Discrete Manufacturing follows a nonparallel path that makes separate parts at various sites across the country or world and pulls them together to make the final product at the end.



**Prefabrication**

**Some of the key industry transformational trends unfolding in the EPC industry over the recent years.**

**❑ Industrialized Construction:**

**❑ Adoption of Digital Technologies:**

- Automation,
- IoT,
- Analytics
- Industry learning

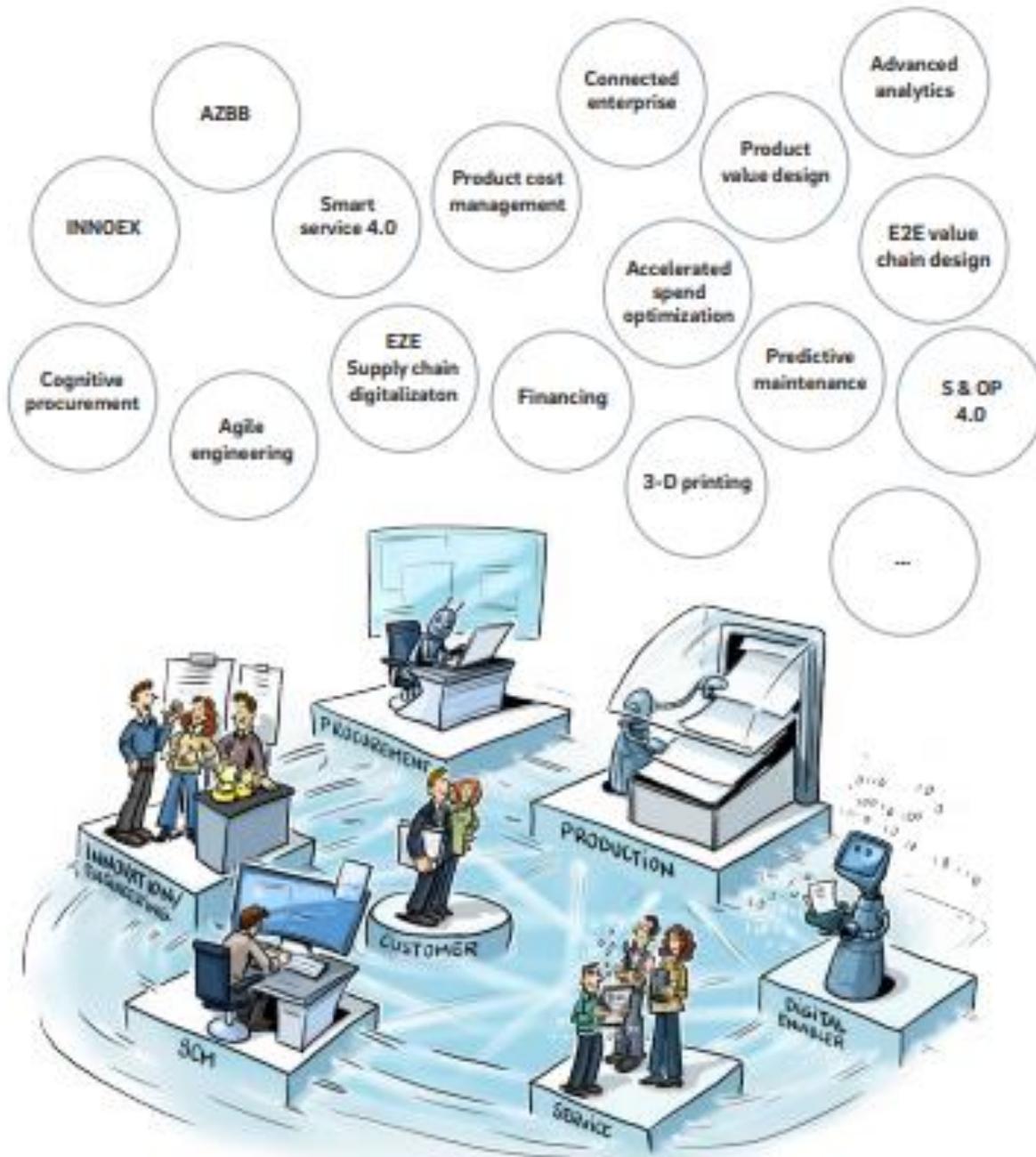
**Automated processes related to labor, material and equipment along with back office integration, digital collaboration, engineering-IT integration and digital O&M**

**❑ Value Chain Control:**

**❑ Safety and Sustainability:**

**❑ Talent Pipeline Creation:**

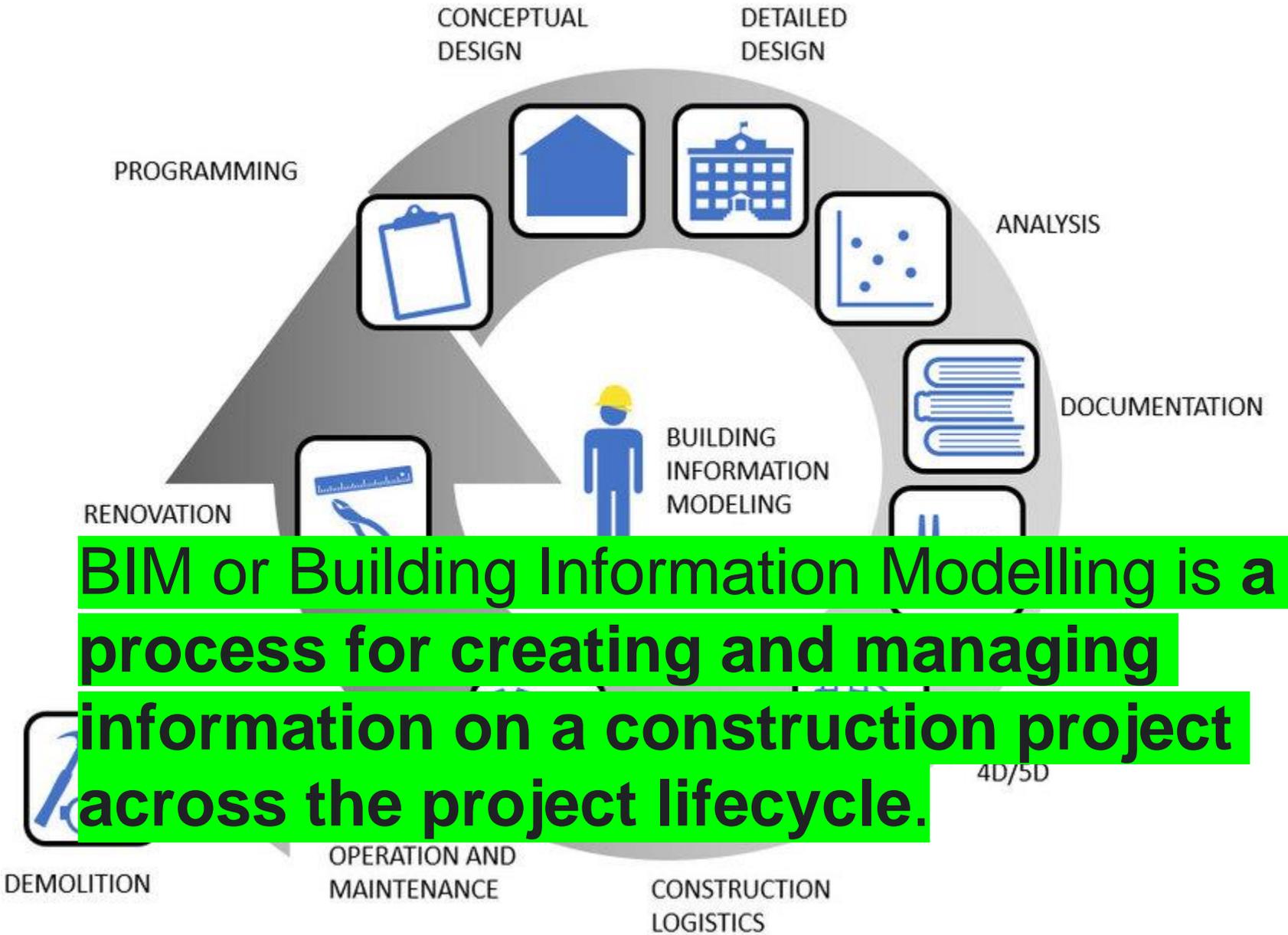
# Top Digital Use cases for EPC projects.



## • Building Information Modelling (BIM) for end-to-end visibility

- 3D concrete printing
- Autonomous Construction
- Pre-fabricated Modular construction
- Cloud enabled real-time collaboration
- Big data analytics for Opportunity Management
- 3D laser scanning for inspection
- LIDAR for survey estimates
- Drones for aerial surveys
- GIS/ GPS for geolocation map
- Wearables for employee safety
- Mobile applications for 3D visualization
- IIOT enabled Operations Tower
- Augmented reality for Maintenance / Inspection
- Mobility solutions for field technicians / worker
- Predictive analytics for operations

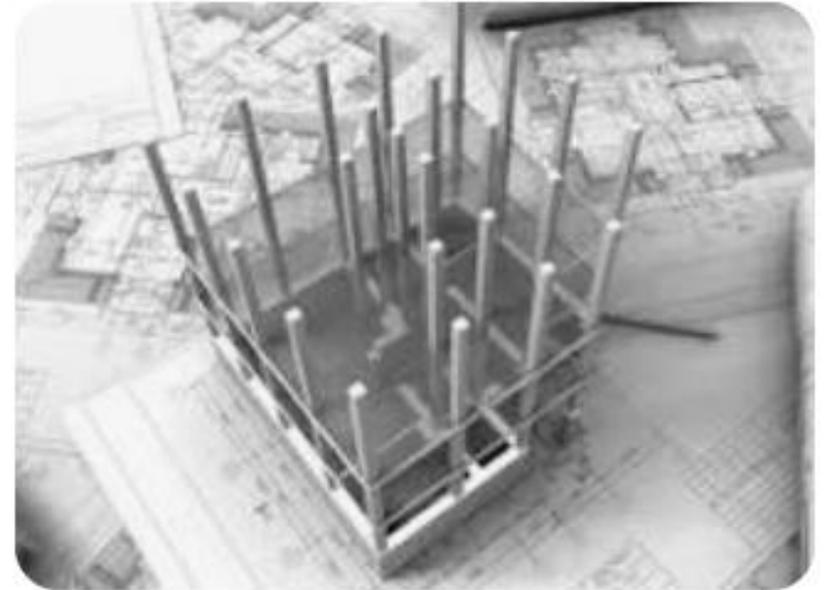
# Building Information Modelling (BIM) for end-to-end visibility

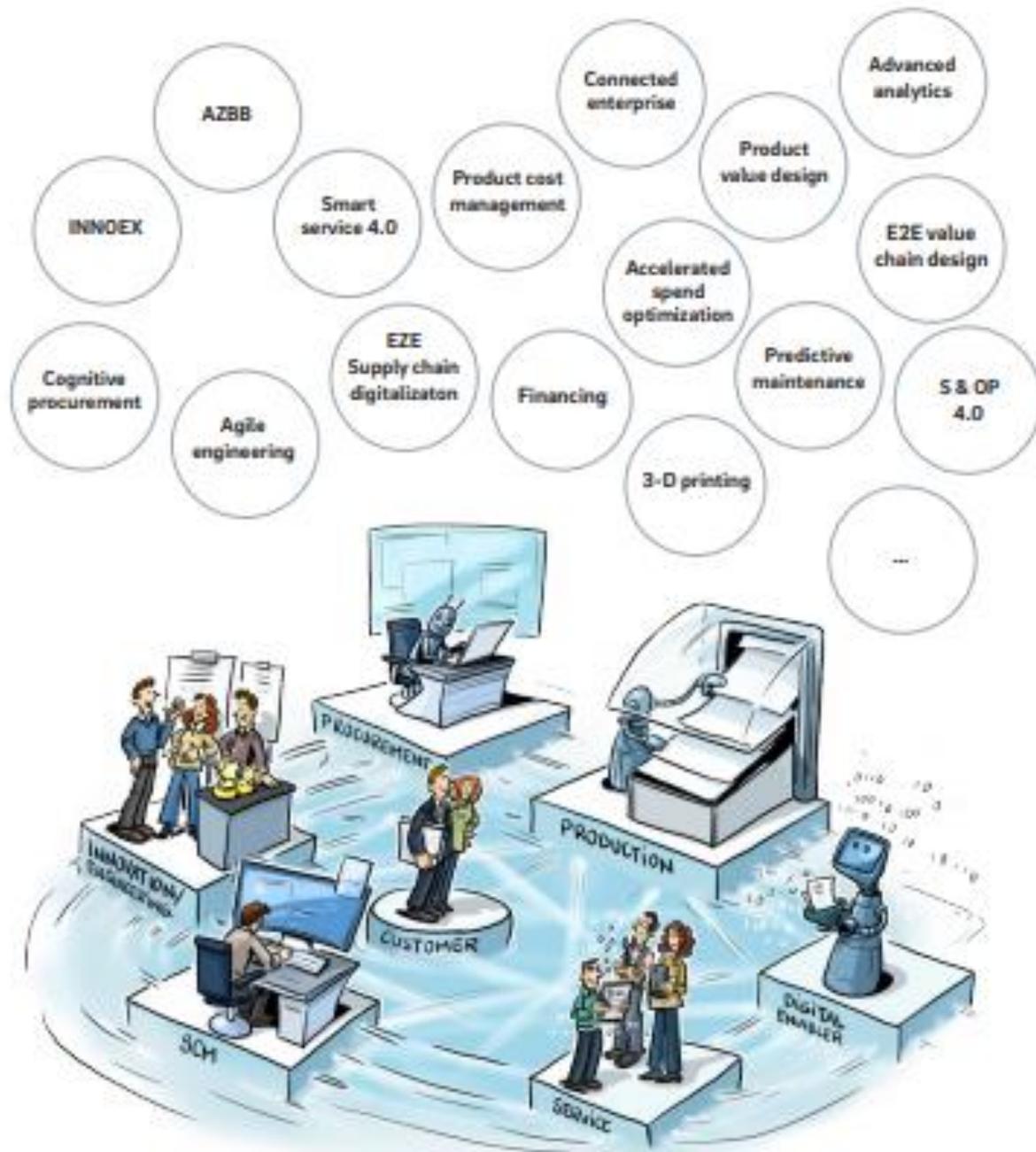


## **The Four Phases of BIM Implementation**

- Evaluation/Assessment.
- Preparation for the Transition / Project Pre-Planning.
- Execution of the Plan / Design and Construction.
- Operations and Maintenance through Experience and Expertise.

**BIM allows architects to predict potential construction hazards and prevent them by adjusting the design.** Contractors can also lead their teams safely through every step in the workflow and document the process to meet safety regulations and pass on-site evaluations. 13-May-2020





## Pre Engineering Phase Digital integration

- 3D laser scanning for inspection
- LIDAR for survey estimates
- Drones for aerial surveys
- GIS/ GPS for geolocation map
- Mobile applications for 3D visualization
- IIOT enabled Operations Tower

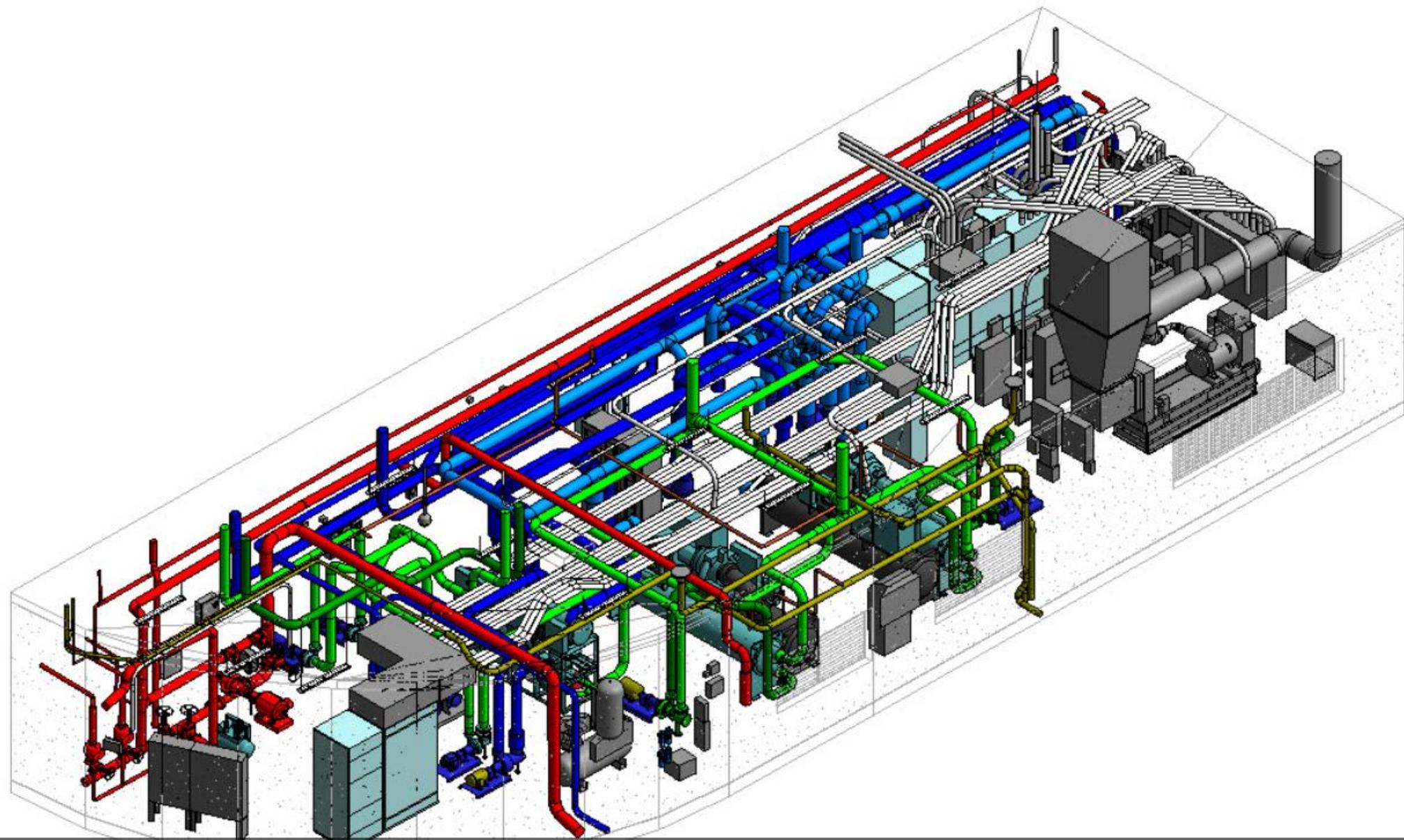


# AFFORDABLE LONG-RANGE 3D SCANNER

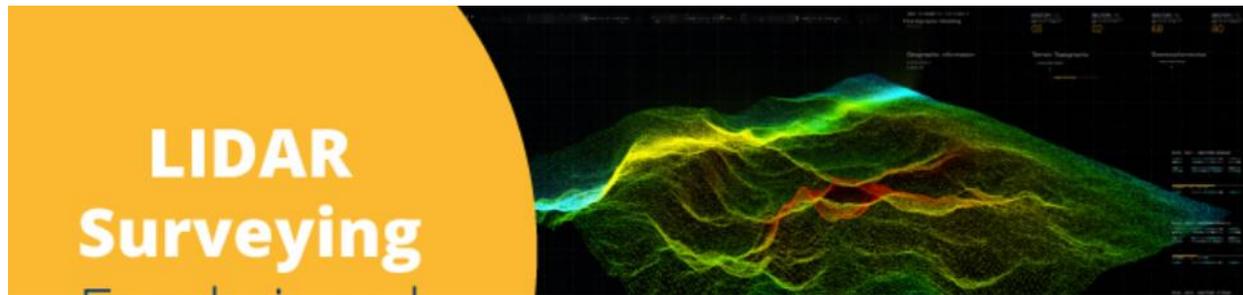


IDEAL FOR ARCHITECTURE, CONSTRUCTION,  
WIND TURBINES, AIRPLANES AND MORE









A LIDAR instrument consists of a laser, a scanner and a GPS receiver mounted on a platform



# Intelligent Aerial Solutions

Dronelab's expertise and premium drone services help stakeholders manage their energy, efficiency, and safety demands in constructive ways. Dronelab helps transform decisions for a better and more productive outcome.

## Inspection

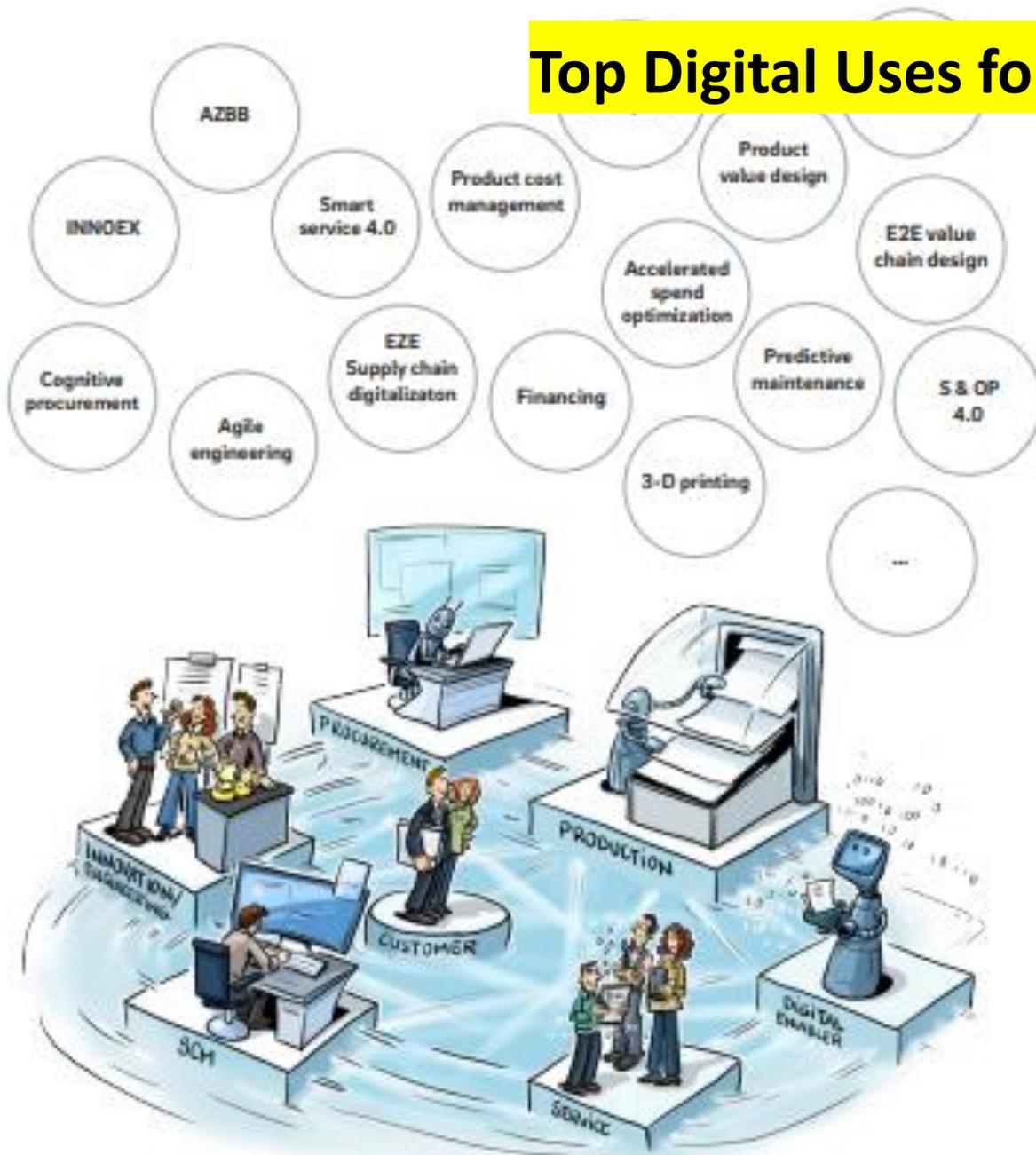
### Where We Can Use!

Real time & accurate insight into security, Remote Area Inspection, Risk Assessment and perimeter control.

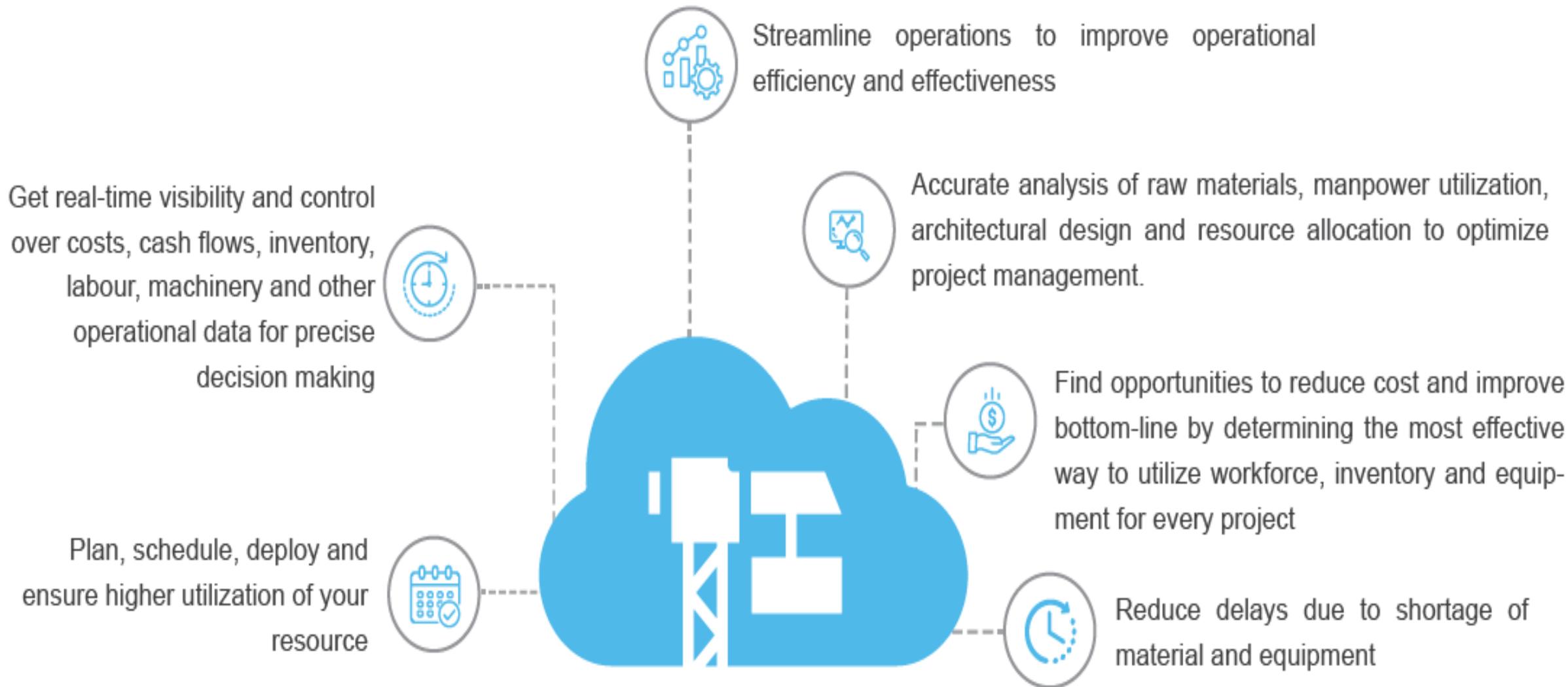
- Powerline inspection
- Wind Turbine inspection
- Heritage Inspection
- Ship Inspection
- Solar inspection
- Bridge Inspection
- Aircraft Inspection
- Port Inspection



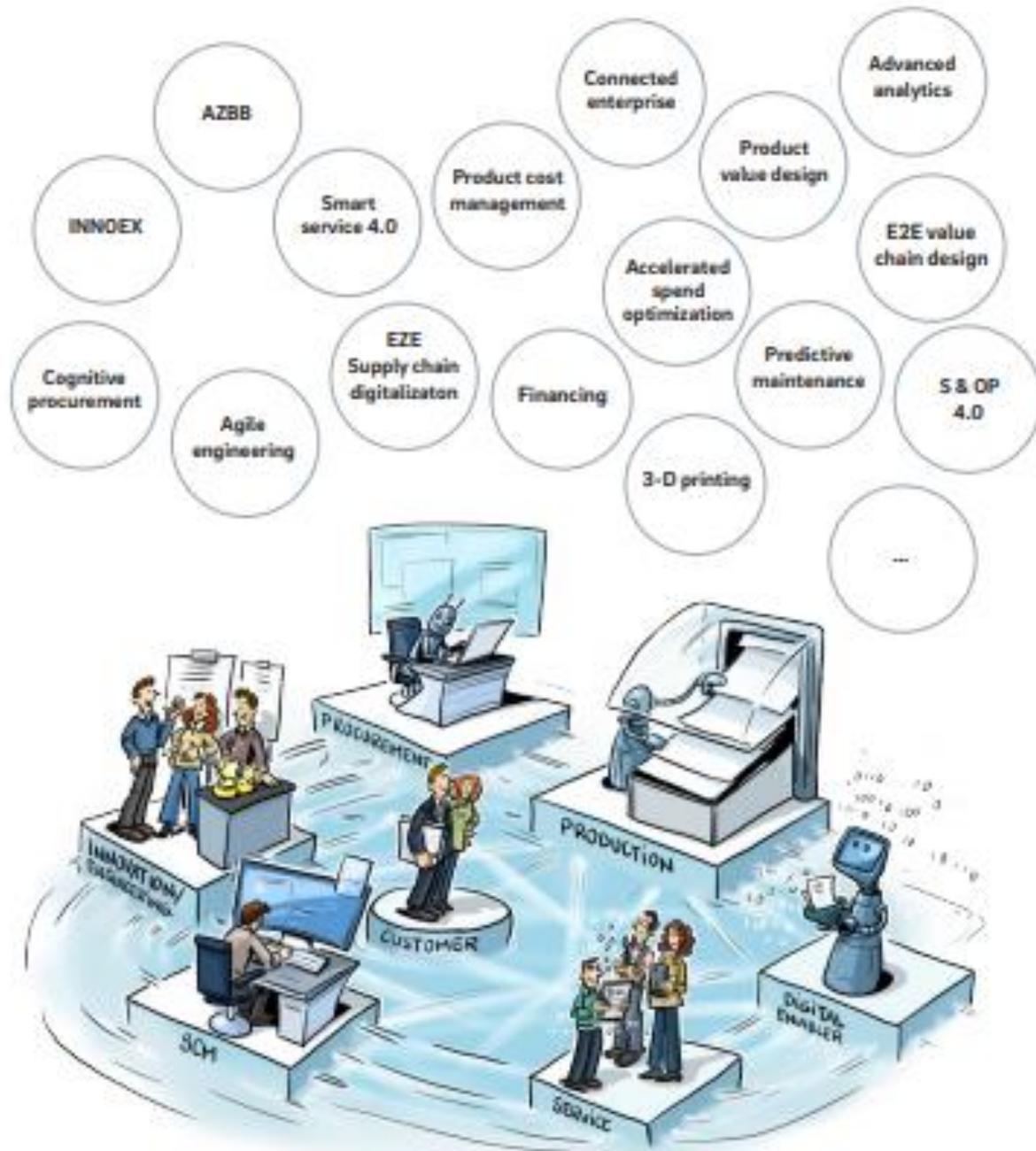
# Top Digital Uses for post Engineering & Procurement phases



- Cloud enabled real-time collaboration
- Integration with Building Information Modelling (BIM) for end-to-end visibility
- GIS/ GPS for geolocation Tracking
- IIOT enabled Operations Tower



# Top Digital Use at Construction sites EPC projects.



- 3D concrete printing
- Autonomous Construction
- Pre-fabricated Modular construction
- Cloud enabled real-time collaboration
- Building Information Modelling (BIM) for end-to-end visibility
- 3D laser scanning for inspection
- LIDAR for survey estimates
- Drones for aerial surveys
- GIS/ GPS for geolocation map
- Wearables for employee safety
- Mobile applications for 3D visualization
- IIOT enabled Operations Tower
- Mobility solutions for field technicians / worker
- Predictive analytics for operations

# Digitalization in Construction

Traditional reinforced concrete has been used for decades as an economical construction method. A shift is happening with the implementation of digital technology.

As interest in digital tools and processes grows, so too the interest is increasing to use 3D concrete printing (3DCP). Digitalization is the driver aiming to improve productivity and save time, while offering something truly unique.



# How Does 3D Concrete Printing Work?

1. A print head/nozzle is mounted onto a robot arm or gantry.
2. The print head/nozzle is connected to a pump with a hose pipe.
3. The components of the material are mixed.
4. The mix is pumped into the print head/nozzle.
5. Lines are extruded on top of each other.
6. Additions or admixtures can be added to alter the properties of the mix.



# What Type of Objects Can Be 3D Printed?



Image: Constructions 3D

**On-site printing**



Image: Affentranger 3DCP

**Infrastructure & civil engineering**



Image: Affentranger 3DCP

**Formwork**



Image: Besix

**Facade elements**



Image: Pikus

**Outdoor Furniture**



Image: Pikus

**Indoor Furniture**



Image: Affentranger 3DCP

**Colored concrete**



Image: Pikus

**Customized projects**

# Prefabrication

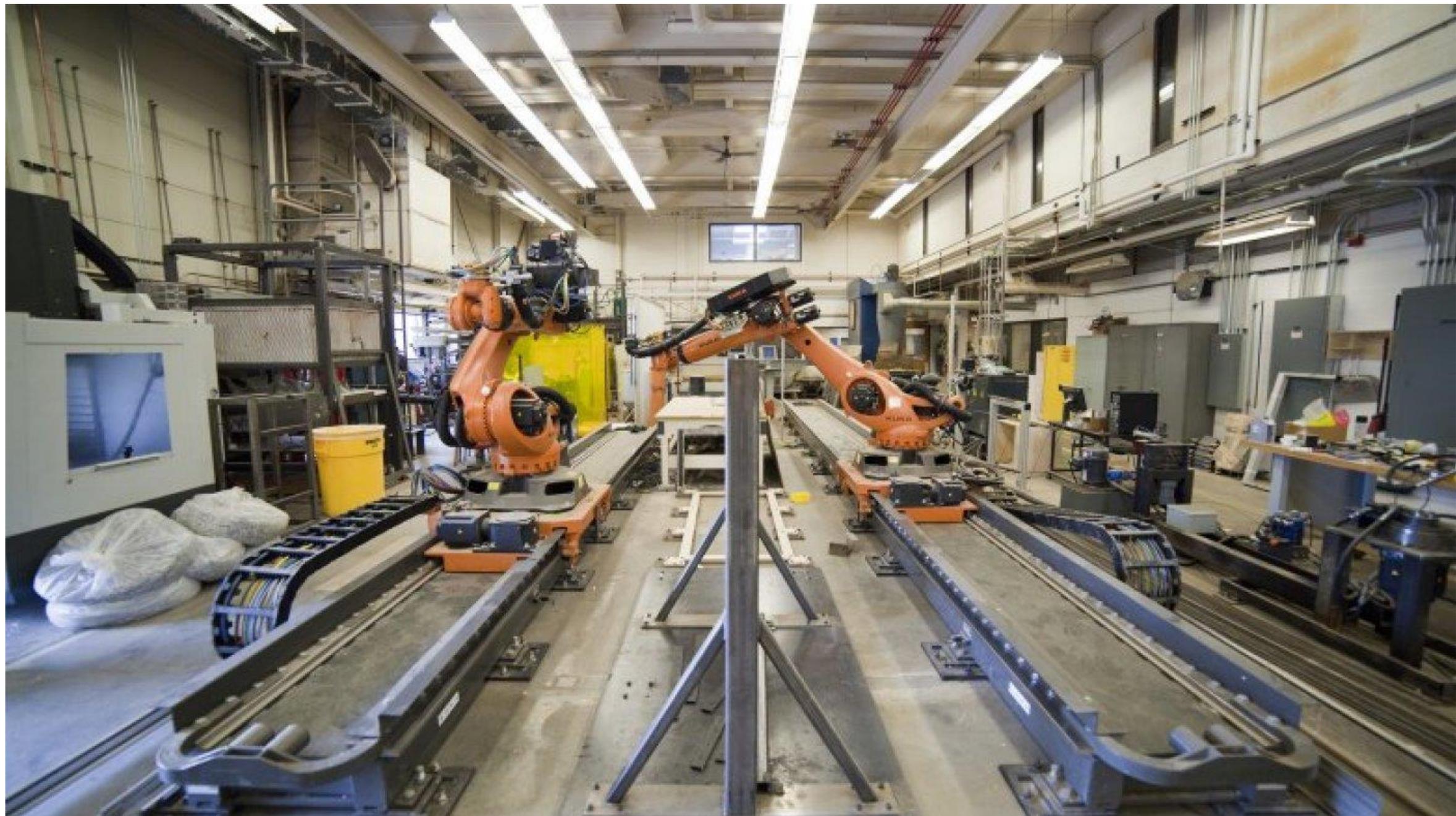


## Benefits of Prefabrication:

1. Impacts Technology Trends with Advanced Design Tools
2. Better Safety & Security
3. Cost-effectiveness
4. Consistency & Quality Control
5. Flexibility
6. Green Construction
7. Saving Time and Accelerating Construction Process









Some of the key industry transformational trends unfolding in the EPC industry over the recent years.

❑ **Industrialized Construction:**

❑ **Adoption of D**

- Automation,
- IoT,
- Analytics
- Industry learning

❑ **Value Chain C**

❑ **Safety and**

❑ **Talent Pipeline Creation:**

**IoT Keeps the Connection**

IoT is defined as connecting various tools and machinery to the internet in order to receive data and insights in real-time. This can be useful for drilling, milling, turning and lathe machines within the shop because you can review their performance and determine whether or not it's in need of maintenance. IoT can also be useful if you need to pinpoint the exact location of finished products. If you want to ensure your cameras arrive at a specific warehouse or store, you could install IoT in each camera or on the trucks the cameras are in to ensure you're meeting your distribution schedule while also staying on top of suspicious activity.

60% of enterprise executives feel that

# **IoT WILL PLAY AN IMPORTANT ROLE**

in their companies'  
digital business strategies.

*Data Source: IDG*



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**❑ Value Chain Control:**

**❑ Safety and Sustainability:**

**❑ Talent Pipeline Creation:**

# EPC Analytic Process

Collecting

Analyzing

Monitoring

Analytic Output

Real-time data

Automated  
construction Reports

Capital Project Outcome

Reduce risks

Uncover critical  
insights

**Analytic can help project teams assess market conditions, portfolio composition, and individual project performance.**

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# Industry Learning

The challenges regarding the transformation towards Industry 4.0 are requirements to re-skill the staff for the new work environment. The staff have to either adapt to the workplace transformation brought by digitalization, automation and robotics or face layoffs.

- 1.The intersection and engagement of theoretical and practice learning.**
- 2.The process of bringing together formal learning and productive work or theory and practice.**
- 3.Constructing one system using available knowledge from several separate sources.**

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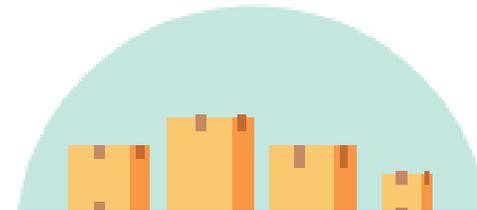
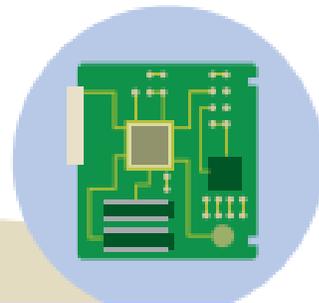
- ❑ Safety and Sustainability

- ❑ Talent Pipeline Creation



## What is a global value chain (GVC)?

*A global value chain breaks up the production process across countries. Firms specialize in a specific task and do not produce the whole product.*



**“Any slowdown in manufacturing in one part of the world will have a ripple effect in economic activity across the globe because of regional and global value chains.”**

# Global Value Chains in Light of COVID-19

Based on World Bank Publication March 2022

- *Global value chains (GVCs) played an essential role in driving a recovery from the COVID-19 induced global trade collapse.*
- *Reshoring production by high-income countries and China could hurt advanced and developing economies alike and push 52 million people into extreme poverty by 2030.*
- *On the other hand, deepening trade by removing barriers to movement of goods and services across borders, could lift almost 22 million people out of poverty by 2030, and improve the incomes of the bottom 40 percent.*

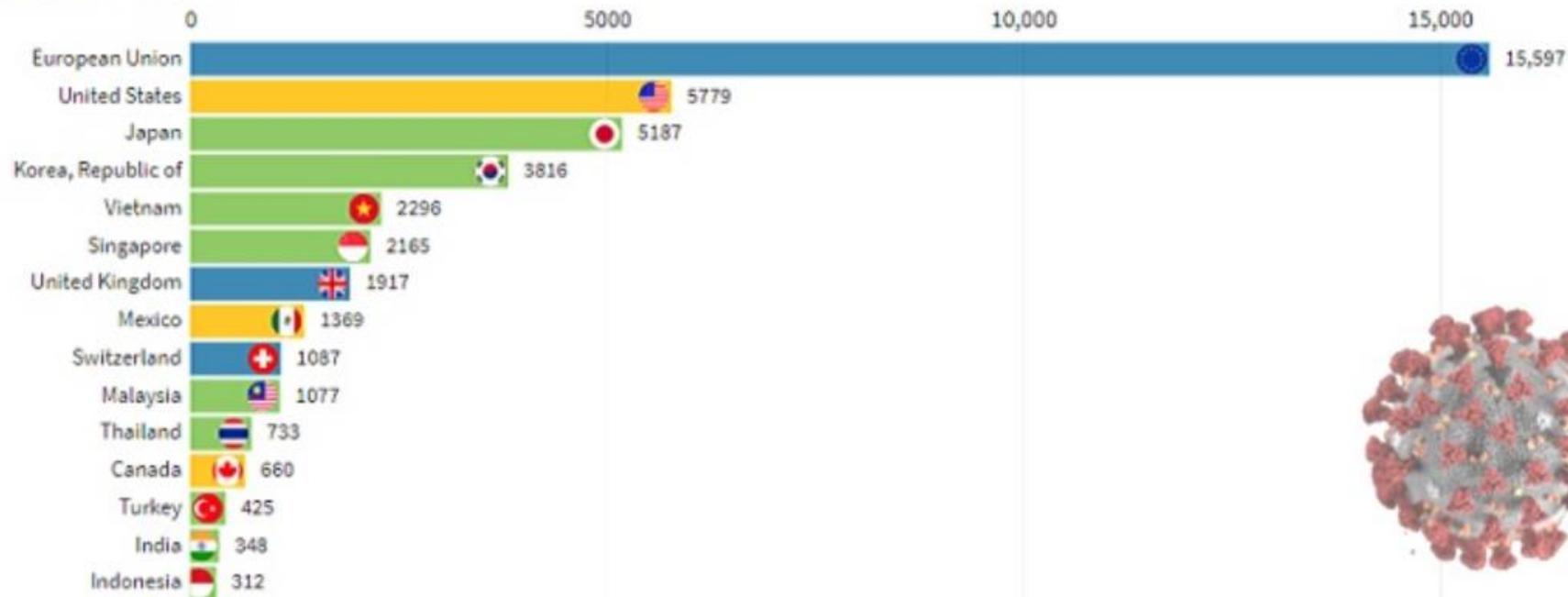
The estimated global effects of COVID-19 are subject to change depending on the containment of the virus and or changes in the sources of supply.

## Trade impact of the Coronavirus (COVID-19) Epidemic (USD Millions)

Top 15 most affected economies



■ Europe ■ America ■ Asia



Source: UNCTAD estimates • Estimates are based on a drop of Chinese supply in February 2020 as measured by the Chinese PMI. The list does not include Taiwan Province of China and Hong Kong, SAR of China

## From

## To

- Export-oriented

- Export “plus plus”
  - Plus production for local markets
  - Plus infrastructure development

- Efficiency-seeking investment

- (Regional) Market-seeking investment

• If you see the success stories of famous E-commerce businesses launched by Amazon, Flipkart, Zomato, Swiggy, Domino’s and many other players, they are doing only and only delivery management. When we try to adopt delivery management in our businesses irrespective of sectors, success will kiss our feet.

- Cost-based competition for single-location investors

- Room for small-scale manufacturing facilities and services

- “Big infrastructure”

- “Lean infrastructure” – digital and sustainable

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Sustainability:****

**❑ Talent Pipeline Creation:**

Health and safety already ranks high on the EPC industry's agenda, though the actual impact on the ground has been low. The industry is now looking at wearable technologies such as smart helmets and watches to address some of the onsite Health, Safety and Environmental (HSE) concerns.



**Smart Helmet for leading industries to manage their workforce**

**An IoT-based digital helmet keeps the wearer safe in the work environment from various physical threats and also records data to manage the entire plant's workforce productivity. Witness the capabilities of the smart helmet in managing your staff, inventory, and other enterprise-related operations.**



## **Benefits of incorporating the smart helmet into your enterprise**

The smart helmet resolved all the workers' issues and then offered additional benefits, which increased their productivity and safety. Our smart IIoT helmet became a phenomenal success for all the organizations that adopted it in their workforce.

- You can check on the location, health condition, and surrounding environment statistics of any worker wearing the helmet.
- Get an SOS signal from any worker stuck in a dangerous situation.
- Easily handle resource management and improve work division across several workstations.
- Make sure no worker is sitting ideal at a single location or roaming around the regions they shouldn't be.
- Get workers' continuous body vitals, reducing cases of accidents, and increasing quick response time.
- Admin will receive a complete inventory list with tools and its current user at any given time.
- Get an automatic logging attendance and worksheet for every worker.

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# The pandemic has changed workplaces *forever.*

## Talent Pipeline.

Talent Pipeline is a typically a **large pool of potential candidates**, either an organization's current employees who are considered for promotion prospects or external candidates who can fill vacant positions in the future.



**1. Reduce Time to Hire**



**2. Strong Employer Brand**



**3. Increased Offer Acceptance**



**4. Benefit to Candidates**



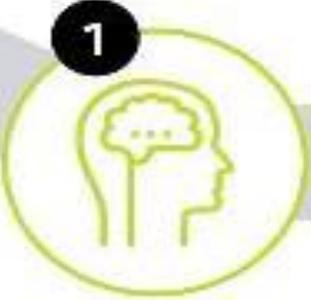
**5. Lesser Dropouts of Candidates.**



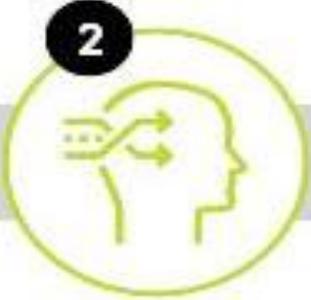
# Four Steps For Managing Talent Pools And Pipelines During Covid-19 And Beyond



New normal for the industry



1 Revisit your strategic workforce plan.



2 Creatively tap into broader talent pools.



3 Assess the composition of your internal talent pipeline.



4 Critical roles and high potentials:

Resilient



Flexible



Elastic



**With the application of data science and AI-powered solutions, EPC companies can predict future outcomes, take actionable decisions, minimize risks, determine the best possible managing strategies and control the work of numerous contractors.**

A man in a dark suit and tie is holding a glowing rectangular sign that says "THANK YOU!". The sign is surrounded by various business and technology icons, including a play button, a group of people, a bar chart, a line graph, a target, a mail icon, and a smartphone. The background is a vibrant, abstract digital landscape with blue and green tones, featuring bokeh light effects and a network of glowing lines and nodes.

**THANK YOU!**

