



# New tools for construction management

ERNST² ARCHITEKTEN AG

Dipl.-Ing. Architect Stefan Ernst

**Brief introduction**

**Introduction**

**Time travel 1990/2025**

**Digital planning meets traditional execution**

**Conclusion**

**Recommendations for action**

# ERNST<sup>2</sup> ARCHITEKTEN AG

Aalen Augsburg Berlin Bremen Düsseldorf Erfurt Frankfurt  
Freiburg Hamburg Hannover Heidelberg Heilbronn Karlsruhe  
Köln Konstanz Leipzig München Münster Nürnberg  
Regensburg Stuttgart Tübingen Würzburg

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ARCHITEKTEN

# Über ERNST<sup>2</sup>

**1998 Foundation of ERNST<sup>2</sup>  
Stefan + Markus Ernst**

**2012 Transformation into  
ERNST<sup>2</sup> ARCHITEKTEN AG  
CEO Stefan Ernst  
CEO Markus Ernst**

**2022 Management Board Olaf Sachter**

**2025 Head office Stuttgart  
550 employees  
23 locations  
50 location managers +  
other managers**



CEO: Dipl.-Ing. Olaf Sachter,  
Dipl.-Ing. Architekten Markus and Stefan Ernst

Foto: Simon Gerlinger



# Our services

**Architectural office with focus on service phases 5-9 HOAI**

**Project supervision**

**Tendering + awarding**

**Cost calculation + control**

**Construction logistics**

**Work planning**

**Project management**



# Personal details

**57 Jahre, Diplom 1996 University Stuttgart**

**Dipl. Ing., Architect, Executive Board**

## **Important projects:**

Stuttgart, Robert-Bosch Hospital

Tübingen, Uni Mikrobiologie/Virologie

Hamburg, UKE, new build Klinik West

Munich, LMU, new build BMC

Hannover, KRH, new build Siloah

Hannover, BIVRC Boehringer Ingelheim

Arnstadt, new build Ersol/Bosch Solar

Munich, LMU, new build CIO

## **Actually**

Freiburg, new build Corum/Falk Pharma

Munich, LMU, new build Hauner



**Stefan Ernst**



# New tools for construction management

**Technological progress in many areas of everyday life and the professional world is changing at an unprecedented speed.**



# New tools for construction management

**Digital planning, analog construction?**



## telecommunications as a benchmark

1990

Landline telephones

Mobile telephones for “at home”

Mobile telephones for “everyone”

Mobile network 2G, SMS

2025

Voice over IP

Smartphone

5G Network, Internet





# New tools for construction management

**Why innovation in construction (often) works differently.**



**The construction site 1990.**



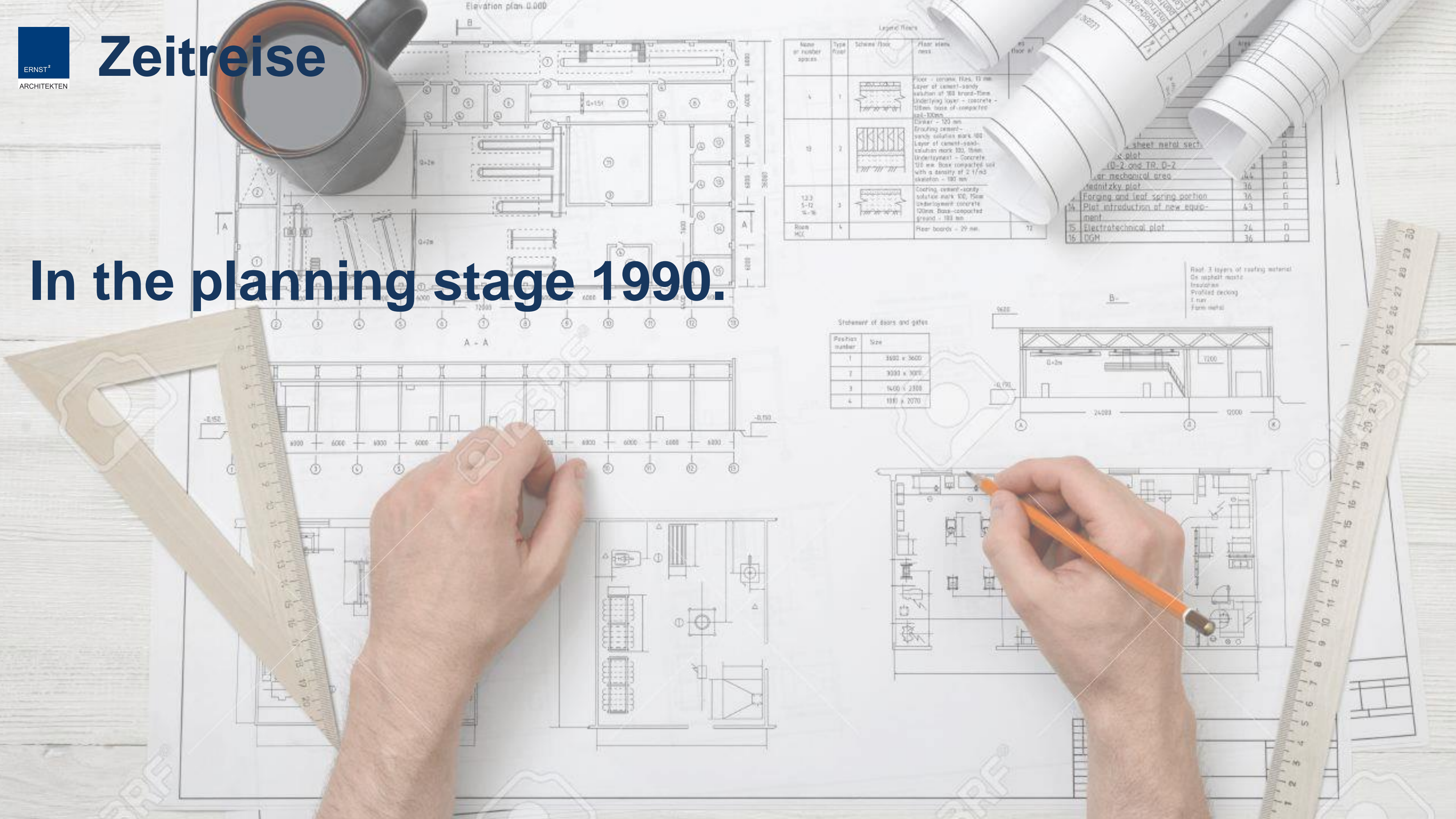




**The construction site 2025.**



## In the planning stage 1990.

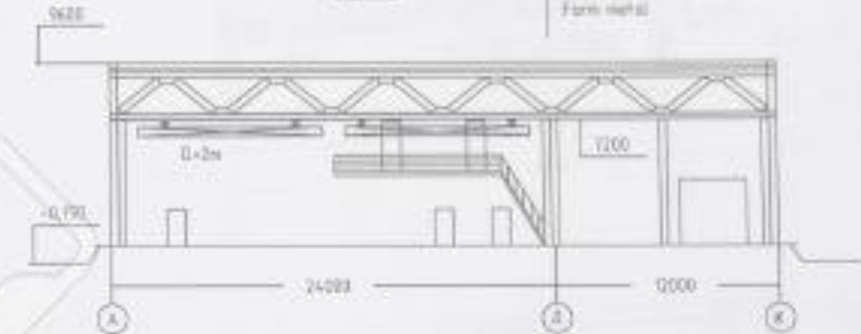


| Name or number spaces | Type floor | Scheme floor | Floor slabs   | Area floor m <sup>2</sup> |
|-----------------------|------------|--------------|---|---------------------------|
| 4                     | 1          |              | Floor - concrete, 15 mm layer of cement-sandy solution at 100 brand-flow underlying layer - concrete - 100mm. Base of compacted soil - 100mm. |                           |
| 13                    | 2          |              | Floor - concrete, 15 mm layer of cement-sandy solution at 100 brand-flow underlying layer - concrete - 100mm. Base of compacted soil - 100mm. |                           |
| 13.3<br>5-12<br>14-16 | 3          |              | Floor - concrete, 15 mm layer of cement-sandy solution at 100 brand-flow underlying layer - concrete - 100mm. Base of compacted soil - 100mm. |                           |
| Room HCL              | 4          |              | Floor boards - 29 mm  | 17                        |

|    |                                    |     |   |
|----|------------------------------------|-----|---|
| 14 | Plot introduction of new equipment | 4.3 | 0 |
| 15 | Electrotechnical plot              | 24  | 0 |
| 16 | DGM                                | 36  | 0 |

Statement of doors and gates

| Position number | Size        |
|-----------------|-------------|
| 1               | 3000 x 3600 |
| 2               | 3000 x 3000 |
| 3               | 1400 x 2300 |
| 4               | 1800 x 2070 |



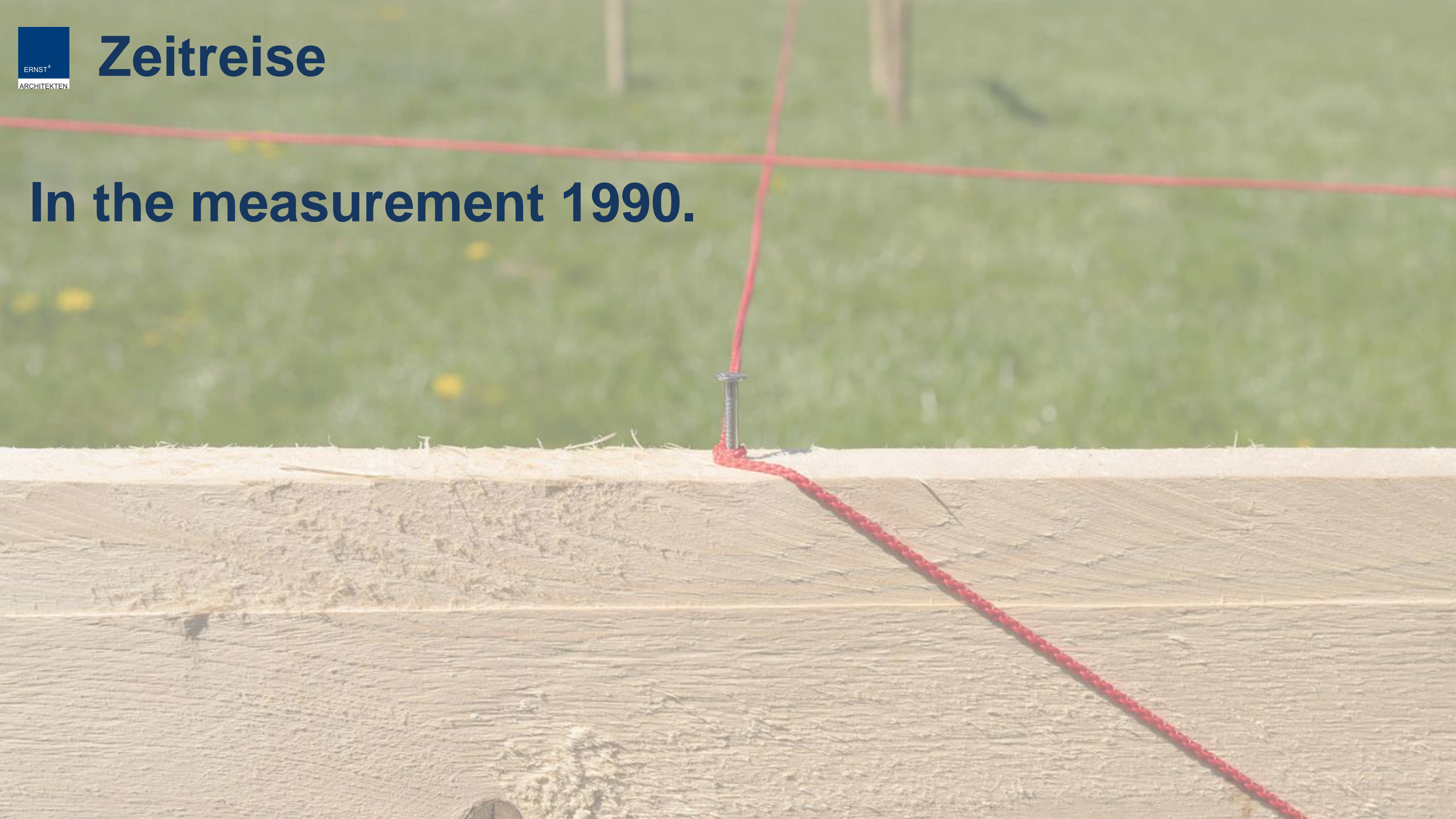


**In the planning stage 2025.**





**In the measurement 1990.**





## In the measurement 2025.





# New tools for construction management



**The reality:  
Digital planning meets traditional execution.**



# Time travel

**In the construction technology 1990 - 2025.**





# Time travel

## Concrete wall formwork 1968.

# PASCHAL



# Time travel

## Concrete wall formwork 1990?





# Time travel

**Ceiling formwork 1990?**





# Time travel

Ceiling formwork 1990?





# Time travel



**Ceiling formwork 1990?**



# Time travel

**Plasterboard wall 2025?**





# Time travel



**Floor screed 1990?**



# Time travel



**Timber windows 1990 and 2025.**





# New tools for construction management

**While products and requirements are constantly evolving,  
the actual construction and joining process  
remains essentially the same - slow, localized,  
handcrafted.**



# New tools for construction management

**Positive developments and success factors.  
Where digitalization works.**





# New tools for construction management

Innovation approaches in individual cases Example 3D concrete printer from PERI





# New tools for construction management

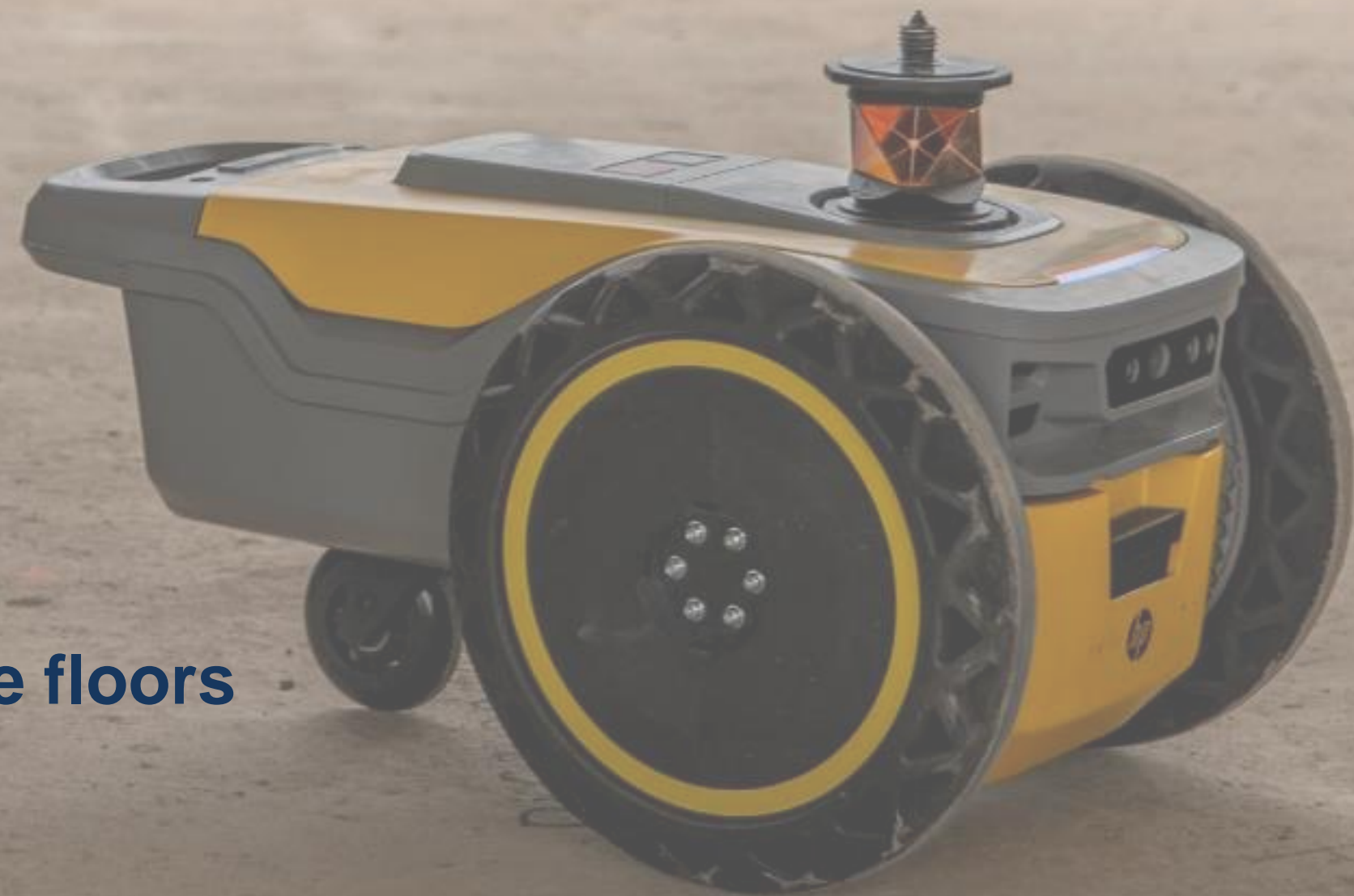
Innovation approaches in individual cases Example of drilling robots from HILTI





# New tools for construction management

Innovation approaches in individual cases  
Digital printer from HP for TB marking on concrete floors






# New tools for construction management

**Why good ideas often don't make it to the construction site.**





# New tools for construction management

- 
- The background of the slide is a faded image of a construction site. A large, white, articulated robotic arm is the central focus, positioned as if it's about to place or move a component. In the background, the skeletal steel framework of a building under construction is visible against a hazy sky.
- 1. Interests hinder innovation**
  - 2. Lack of willingness to cooperate**
  - 3. Structural separation in the construction industry**
  - 4. Bureaucratic approval barriers**
  - 5. Risk shifting to subcontractors**



# New tools for construction management

- 
- The background of the slide is a grayscale image of a construction site. A large, white, humanoid robotic excavator is the central focus, with its arms raised. In the background, the steel framework of a building under construction is visible against a hazy sky.
- 6. Small-scale supplier structure**
  - 7. Complexity and user-friendliness**
  - 8. Inadequate training and knowledge transfer**
  - 9. Discrepancy between digital planning and construction site reality**
  - 10. isolated product development**



# New tools for construction management

**Innovation needs cooperation.**





# New tools for construction management

**Digitalisation of construction management can only succeed where the tools offer real added value. Structural hurdles must be overcome, and where planning, execution and all parties involved work together in an integrated manner.**



# New tools for construction management



**Building for the future - what is needed now.**



# New tools for construction management

- 1. Creation of incentive systems for interdisciplinary cooperation**
- 2. Improving communication between manufacturers and contractors**
- 3. Simplification of approval procedures for innovative construction products**
- 4. Incentive structures for subcontractors to use new tools**

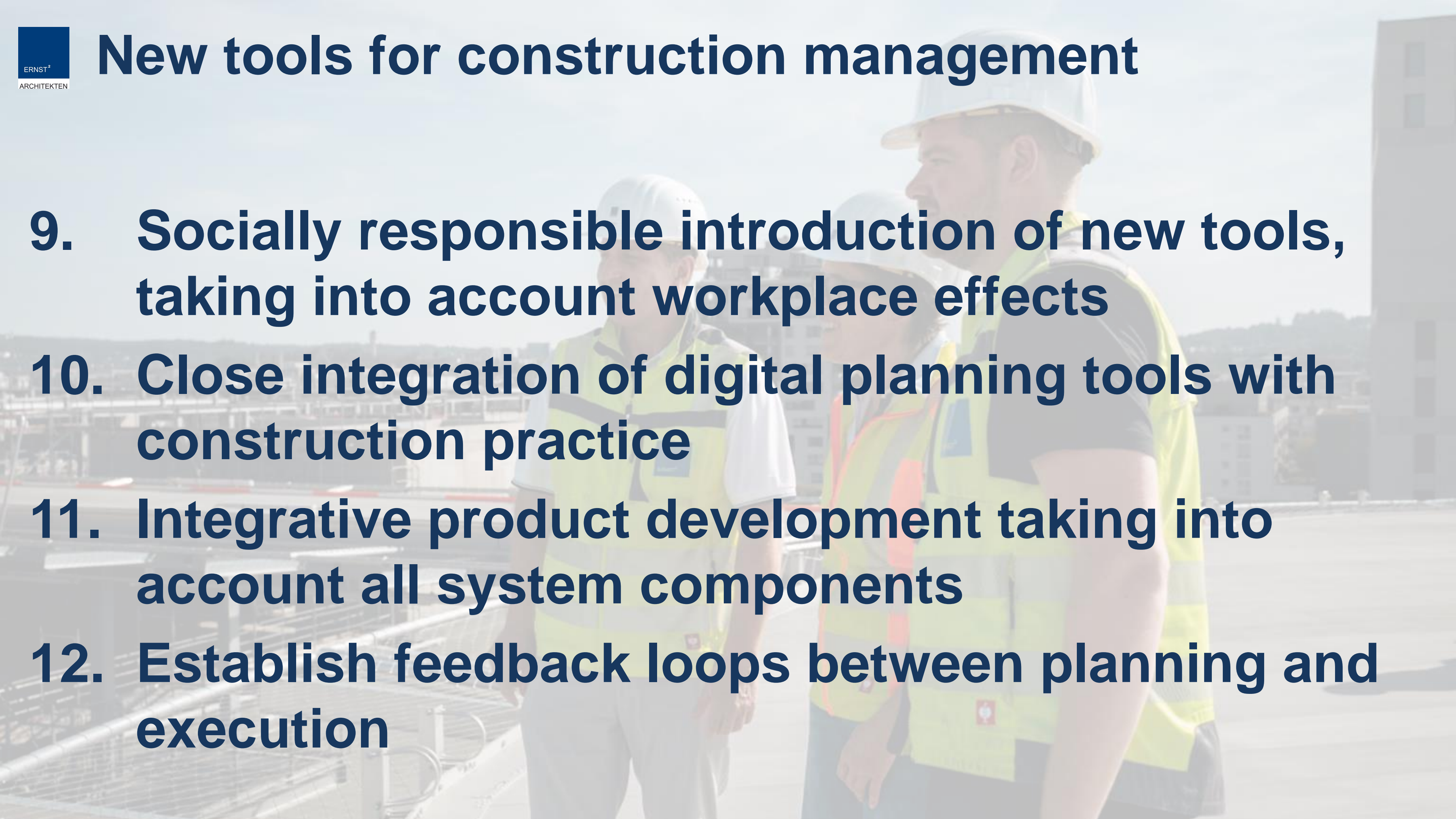


# New tools for construction management

- 
- The background image shows three construction workers on a site. They are wearing white hard hats and high-visibility yellow safety vests over their work clothes. They are standing and looking towards the right side of the frame. The background is a blurred construction site with various structures and equipment under a clear sky.
- 5. Strengthening supplier cooperation through consortia and partnerships**
  - 6. User-friendly product development with ease of use**
  - 7. Participatory development with the involvement of construction workers Expertise**
  - 8. Comprehensive training programs for new technologies**



# New tools for construction management

- 
- A background image showing three construction workers wearing white hard hats and high-visibility yellow safety vests. They are standing on a construction site with various materials and structures visible in the background. The image is slightly faded to allow the text to be prominent.
- 9. Socially responsible introduction of new tools, taking into account workplace effects**
  - 10. Close integration of digital planning tools with construction practice**
  - 11. Integrative product development taking into account all system components**
  - 12. Establish feedback loops between planning and execution**



# New tools for construction management

- 13. Focus on measurable cost-benefit advantages for tool development**
- 14. Error reduction as a sales argument for new construction site technologies**
- 15. Development of common standards and interfaces**



Thank you very much for your attention.

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