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PROVINCIA AUTONOMA DI BOLZANO ALTO ADIGE

IGLC 2021
LIMA, PERÚ - 29TH ANNUAL CONFERENCE
INTERNATIONAL GROUP FOR LEAN CONSTRUCTION

THE ROLE OF COMMON DATA ENVIRONMENTS AS ENABLER FOR RELIABE DIGITAL LEAN CONSTRUCTION MANAGEMENT

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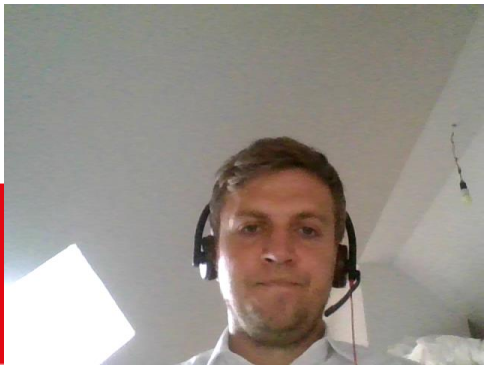
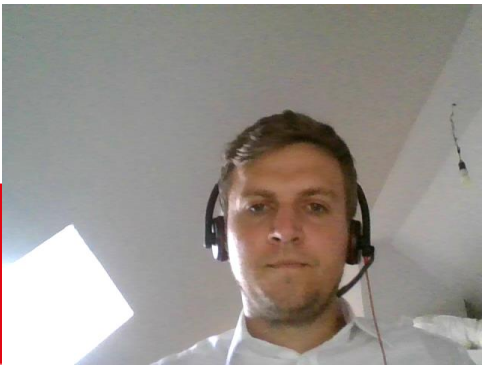


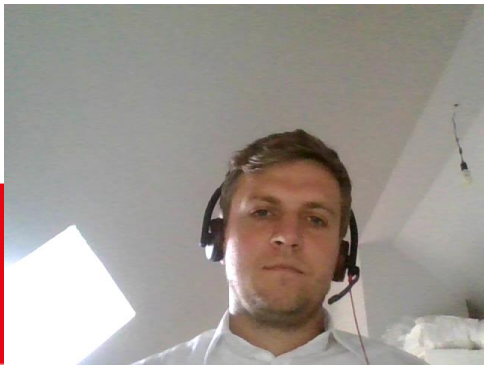
AGENDA

- Introduction & Motivation
- Research strategy
- Conduction & findings
- Conclusion



INTRODUCTION & MOTIVATION

- Face-to-face collaboration, as required in many lean methods, has been severely hampered by the COVID-19 pandemic
- Digital technologies and tools provide great opportunities to collaborate remotely
- Building Information Modeling (BIM) is at the center of digitalization in construction
- When information is managed and exchanged in a BIM process, Common Data Environments (CDE) as central information hubs come into play
- How Lean concepts can make use of a standardized CDE workflow to access reliable information remains unexplored



RESEARCH STRATEGY

Application of a Design Science Research Approach to develop an IT-artifact that integrates BIM with Lean

Secondary analysis

Integrative literature review

Problem statement

Using BIM data for construction process planning and control

Suggesting solution

BIM-LPS integration on data processing level

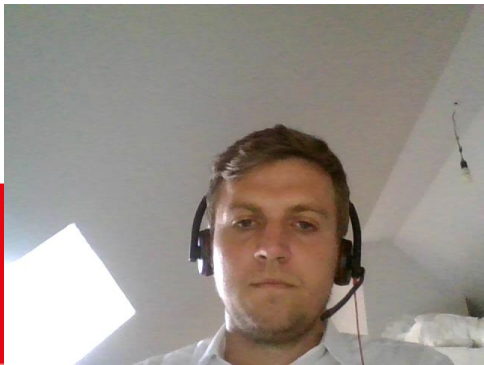
Developing solution

(i) Methodology for application in practice
(ii) Theoretical integration model
(iii) Set of requirements and use cases
(iv) Software prototyping

Evaluation

- Demonstrations / expert interviews
- Piloting

BeaM!



RESEARCH STRATEGY

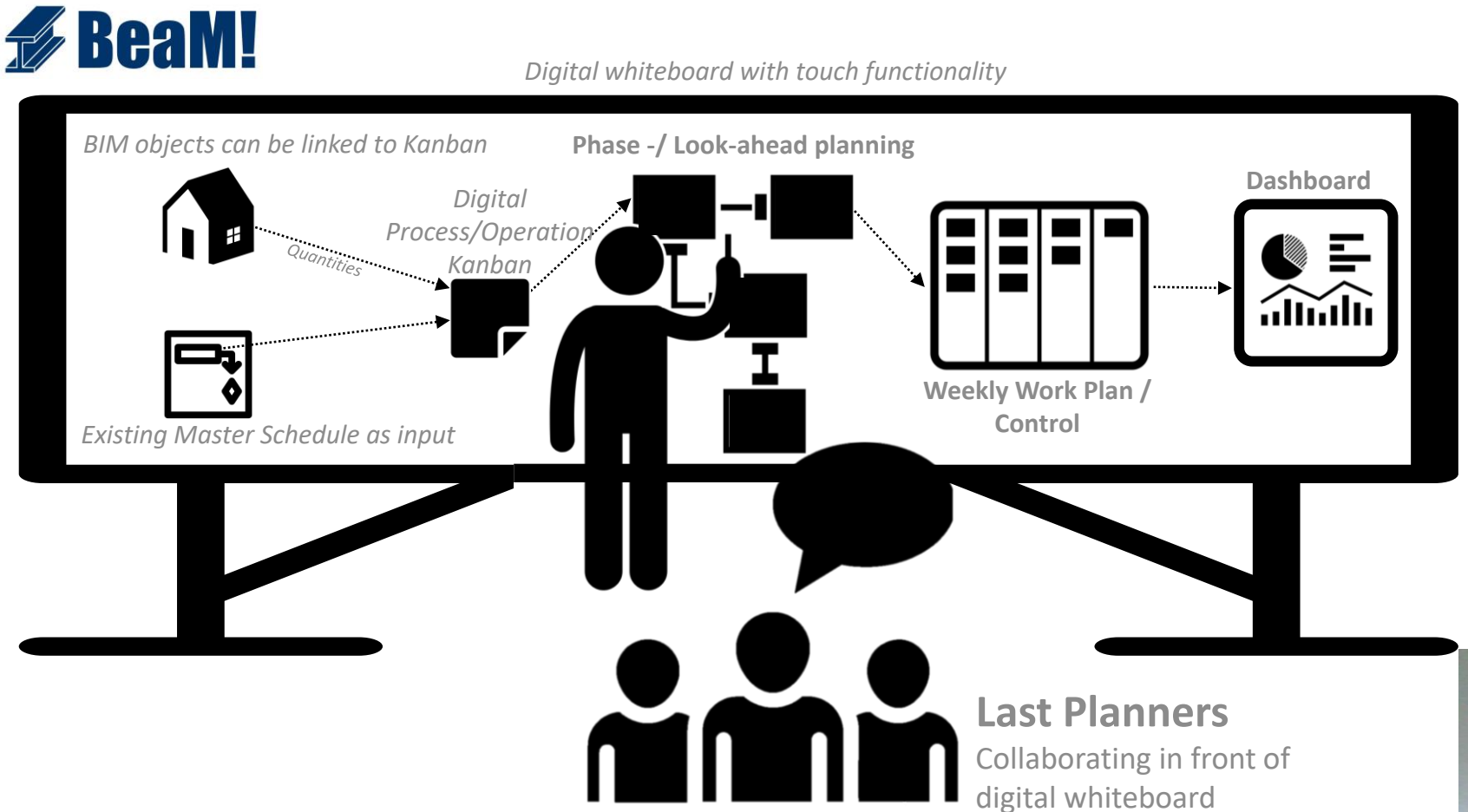


Figure 1. BeaM! – schematic representation of intended use *(Schimanski et al. 2019)*

CDE – BeaM! WORKFLOW

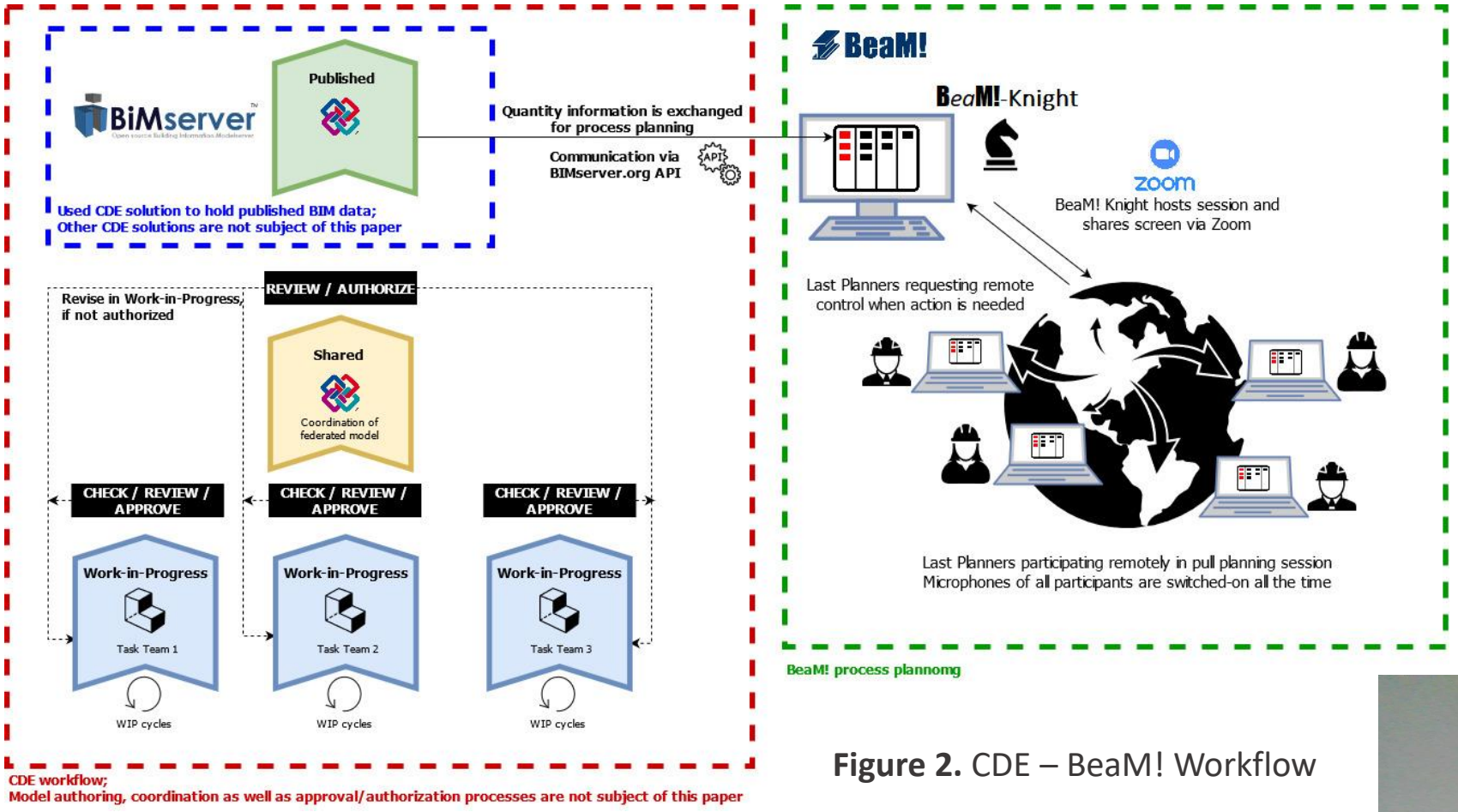
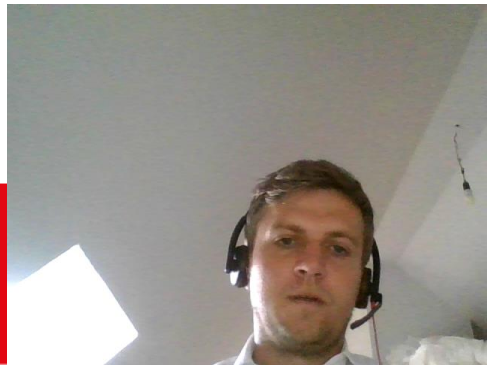


Figure 2. CDE – BeaM! Workflow



FOCUS GROUP WITH DOMAIN EXPERTS

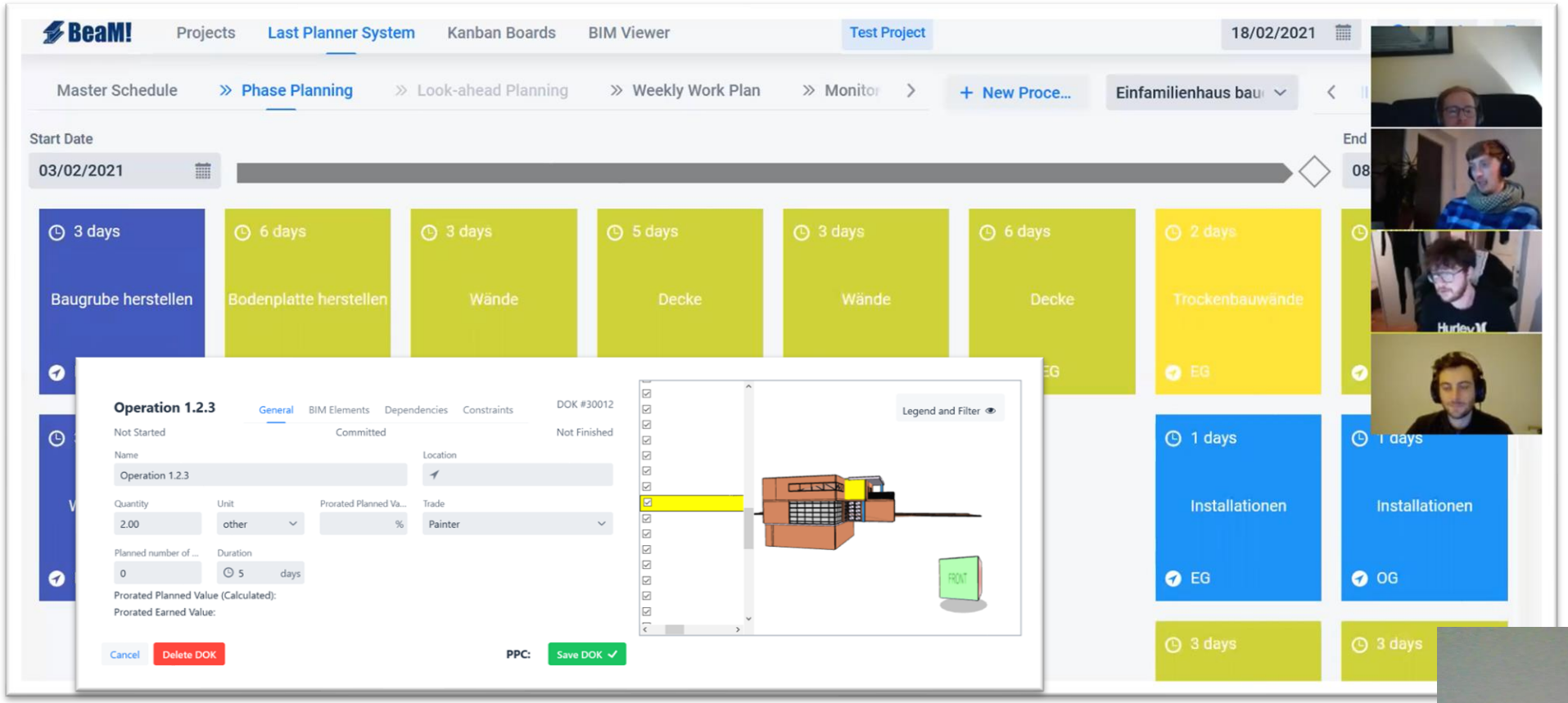
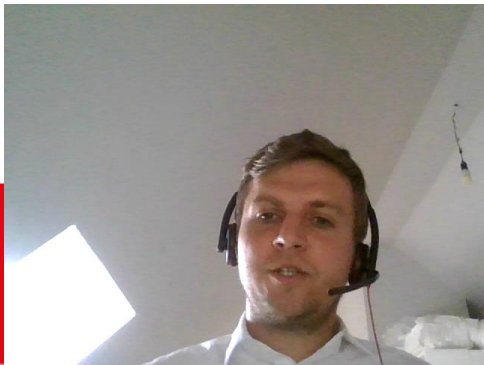


Figure 5. Conducting the Focus Group

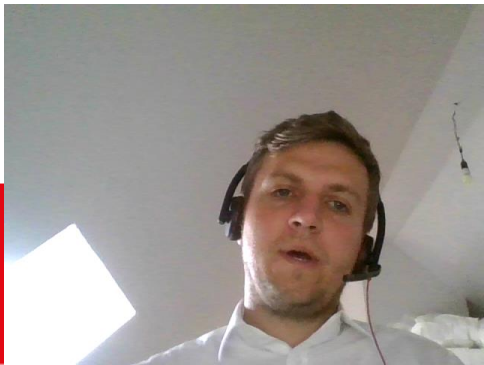
FOCUS GROUP QUESTIONS (excerpt)

- Were the type/quality of discussions in the digital pull planning sessions comparable to traditional sessions?
- Could hand-offs and prerequisites between trades appropriately be addressed?
- Were you able to gather all the information you needed?
- Did the CDE workflow increase confidence in the reliability of the design basis?
- Have you felt any limitations/improvements in communication?
- Was the used video-conferencing system adequate?



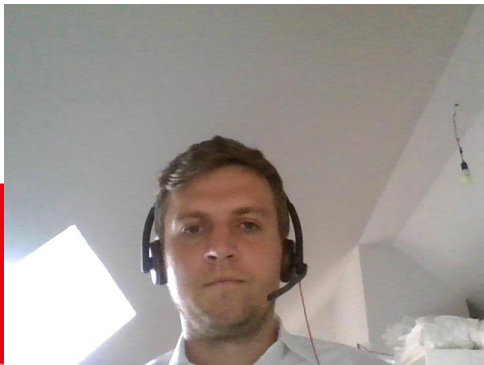
FINDINGS (1)

- The digital conduction of pull planning following the proposed concept was generally well possible → **no major technical drawbacks**
- The participants confirmed that remote session **in terms of efficiency** did not differ from the traditional way for pull planning
- Confirmed also for crucial points such as **hand-offs discussions**
- However, **not quite as free,** spontaneous, and intuitive as compared to personal interaction
- This forced the planning to take place in a **more disciplined manner** compared to the traditional way



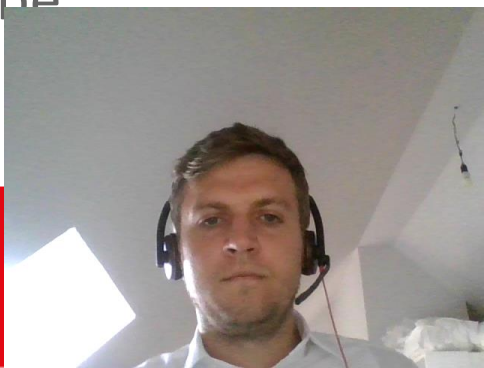
FINDINGS (2)

- Confidence in the **reliability of the information** in the BIM model provided by the CDE workflow was generally rated as high
- Positively evaluated: **independence of physical location**
- **No transfer of information** from paper-based sticky notes to an Excel spreadsheet needed afterwards
- **No increased fatigue** due to Video-Conferencing
- **Complete replacement** of physical pull planning sessions **was not advocated** by the participants, since some points could have been discussed better in face-to-face discussions on-site
- **Hybrid variants** of using digital tools in an on-site environment **were evaluated as promising**



CONCLUSIONS

- Remote collaborative planning can be a useful addition or even alternative to the preferred physical sessions
- Video-conferencing could not transport all subliminal and interpersonal elements of personal discussions
- Remote collaboration gives the moderator a more important role in → a high degree of methodological competence and interpersonal sensitivity are required
- A CDE workflow in line with ISO 19650 can increase trust in reliability and suitability of BIM information relevant for process planning
- Number of required physical meetings during execution phase might be reducible through digital tools as presented in this study
  → highly relevant in pandemic times



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THANK YOU!

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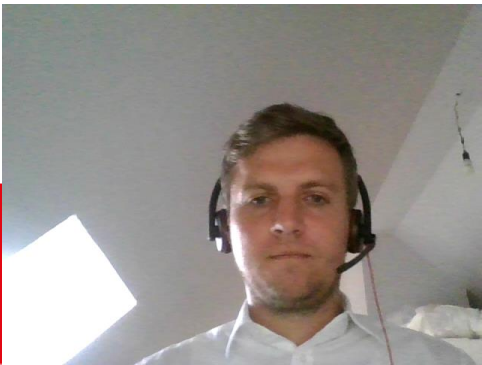

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