



# InnovationDays 2017

# Additive Fertigung in der Smart Factory

## Industrie 4.0 wird Realität

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\_ Fabian Zeulner, B. Eng., Teamleiter ESOP, Concept Laser GmbH

# Themen

\_ Concept Laser GmbH

\_ Additive Fertigung

\_ Smart Factory und  
Industrie 4.0

\_ HMI Project GmbH

\_ Aufgabenstellung

\_ Projektverlauf

\_ Projektvideo

\_ Systemarchitektur

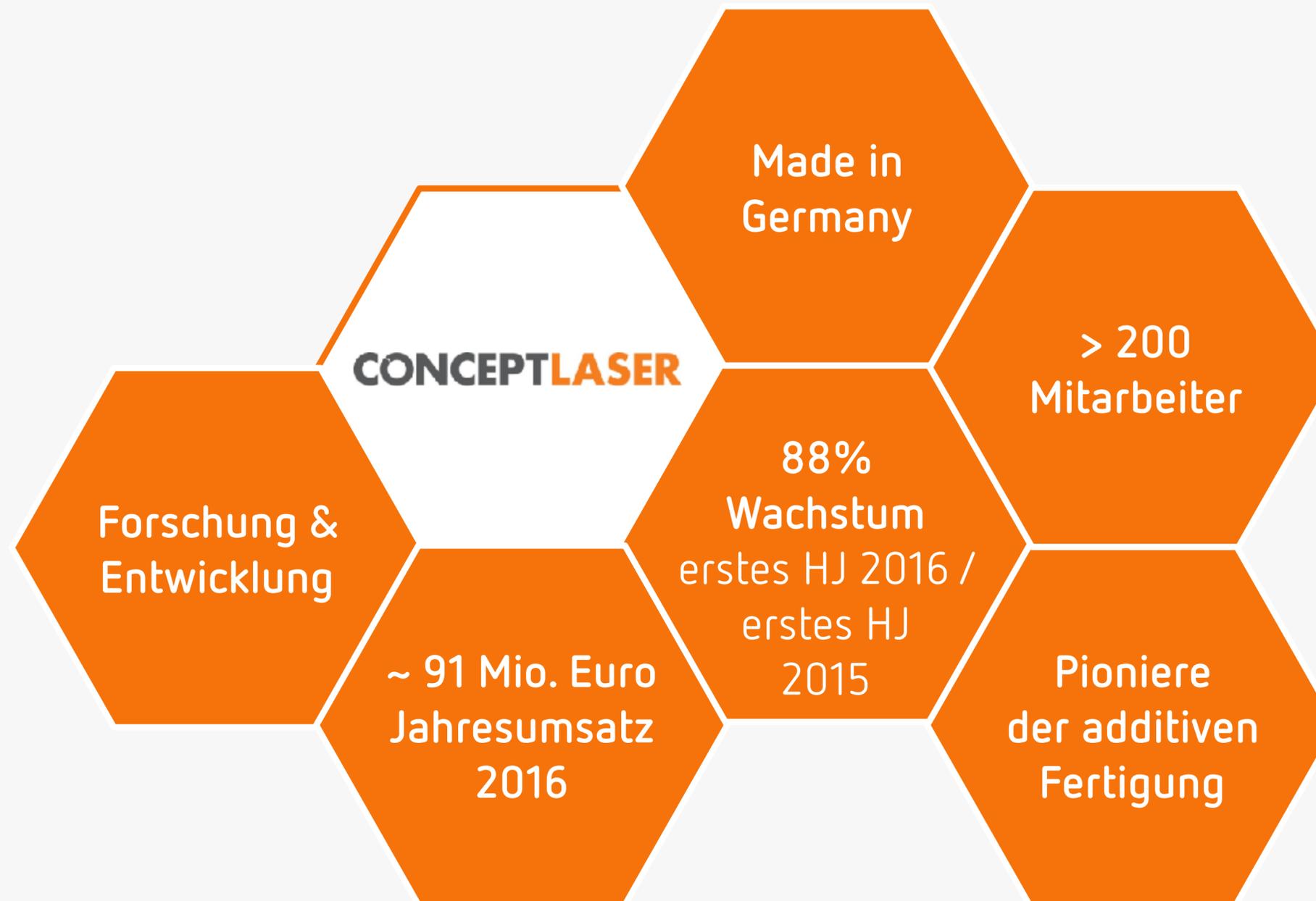
\_ Elektrotechnik

\_ Steuerungstechnik

\_ Kommunikation

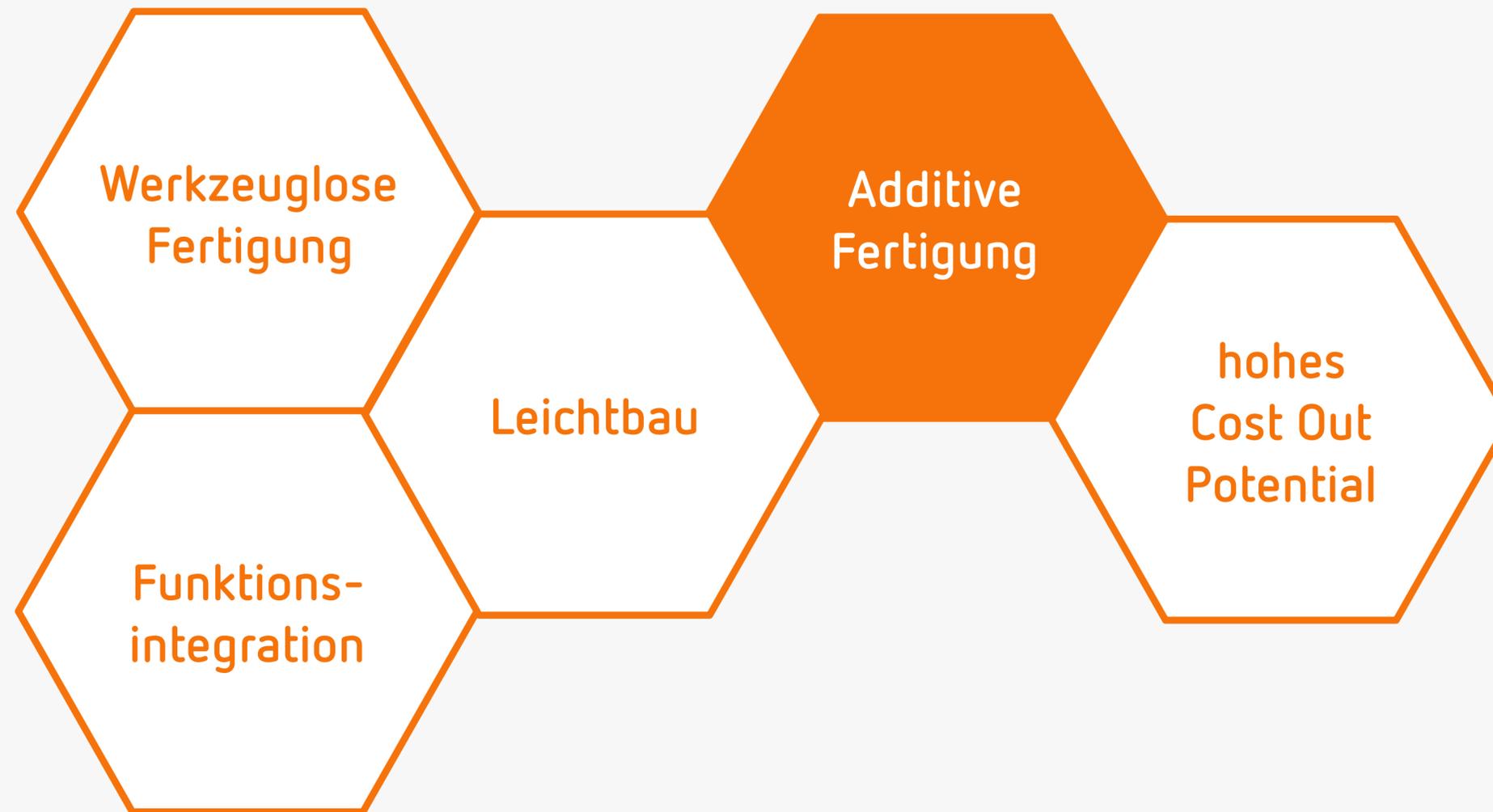
# Concept Laser GmbH

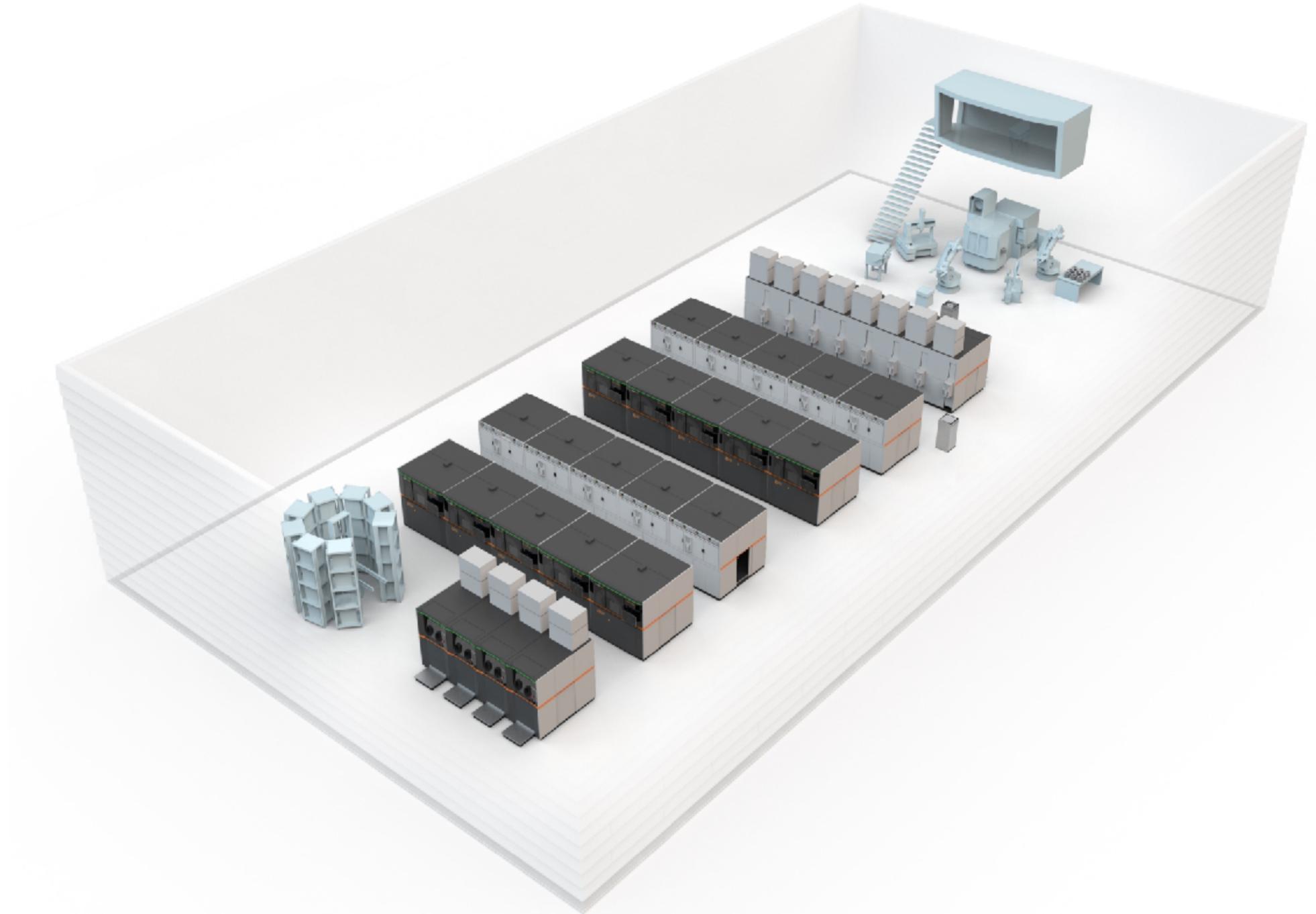


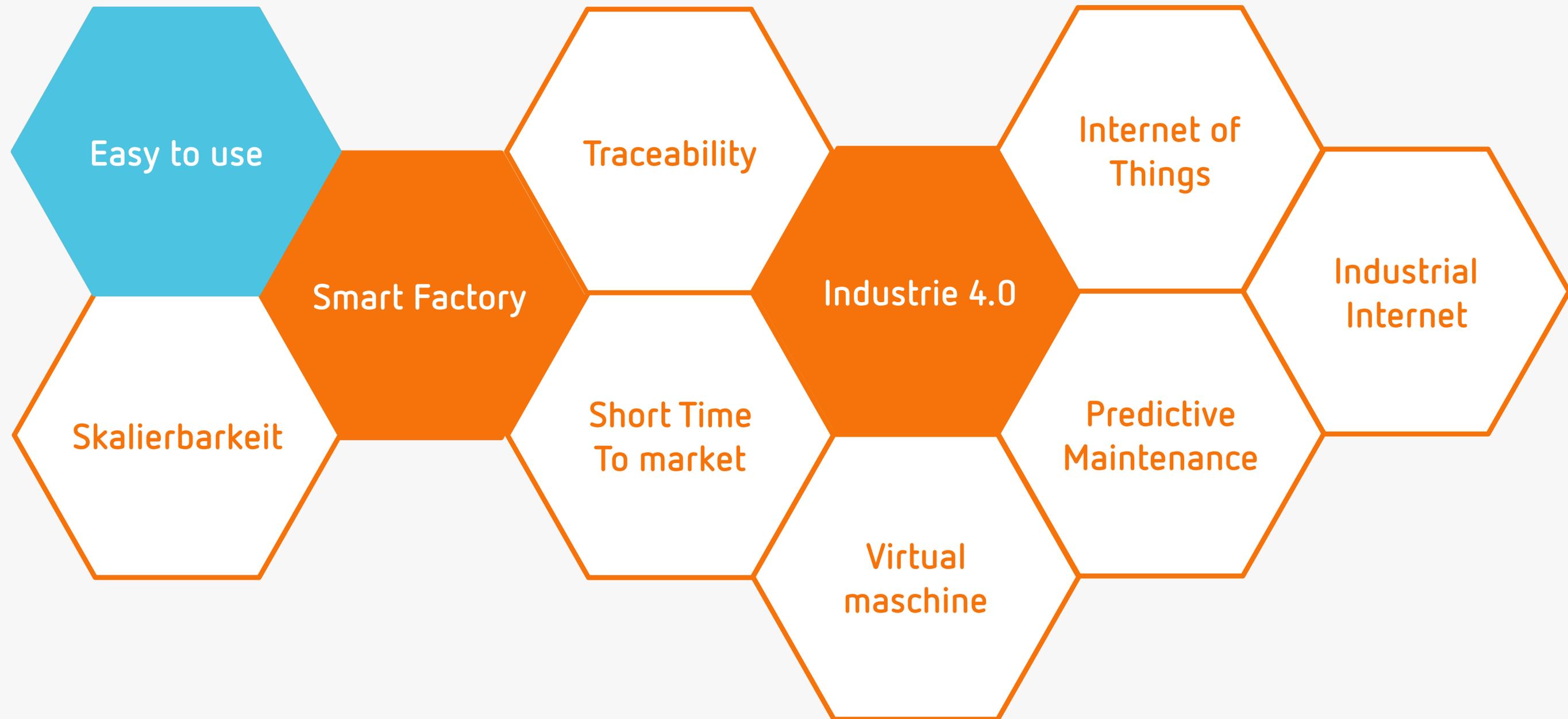












# HMI Project GmbH

- \_ Human Machine Interface Design
- \_ Usability Engineering (n. Fraunhofer)
- \_ Mitglied beim German UPA
- \_ 2011 gegründet
- \_ Team 15
- \_ Standort Würzburg
- \_ 180 qm Bürofläche

\_iF Design Award (4)



\_iF Design Award Gold (1)

\_Red Dot Design Award (4)



\_German Design Award Nominee (4)



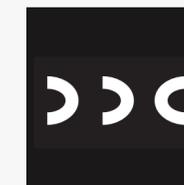
\_German Design Award Special Mention (2)

\_UX Design Award Nominee (2)

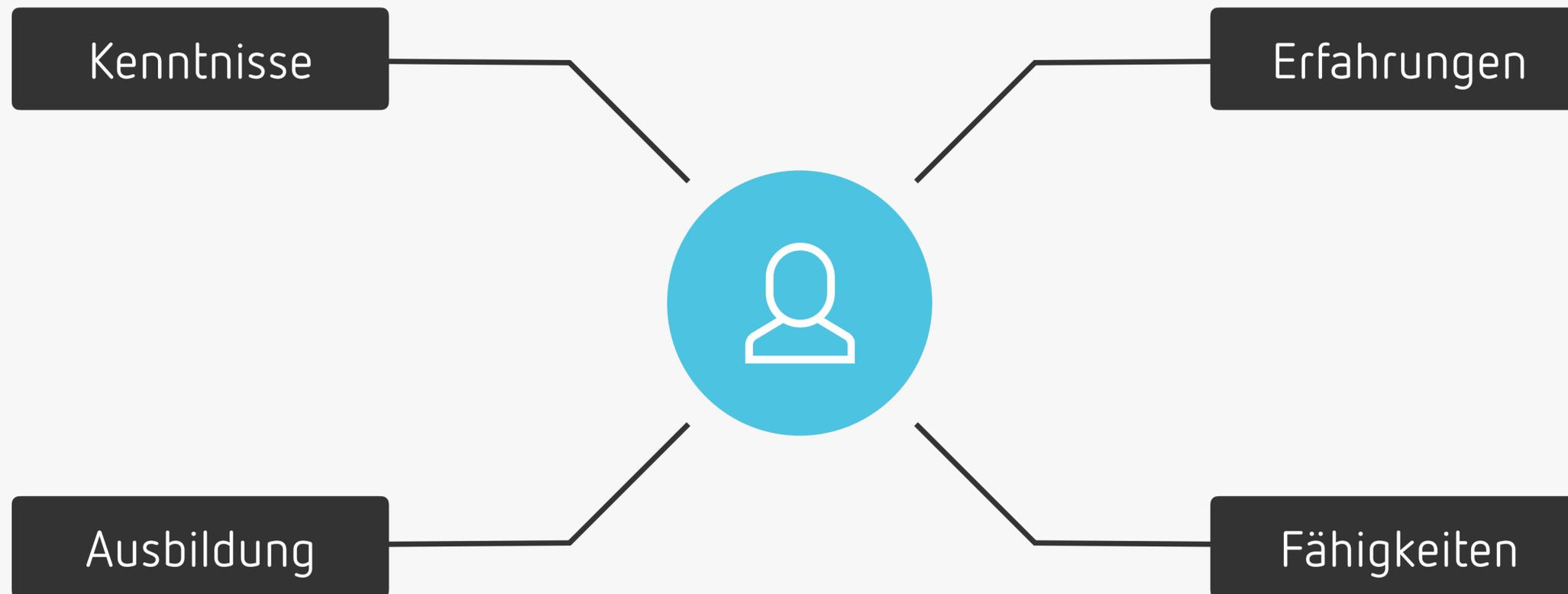


\_UX Design Award Winner (1)

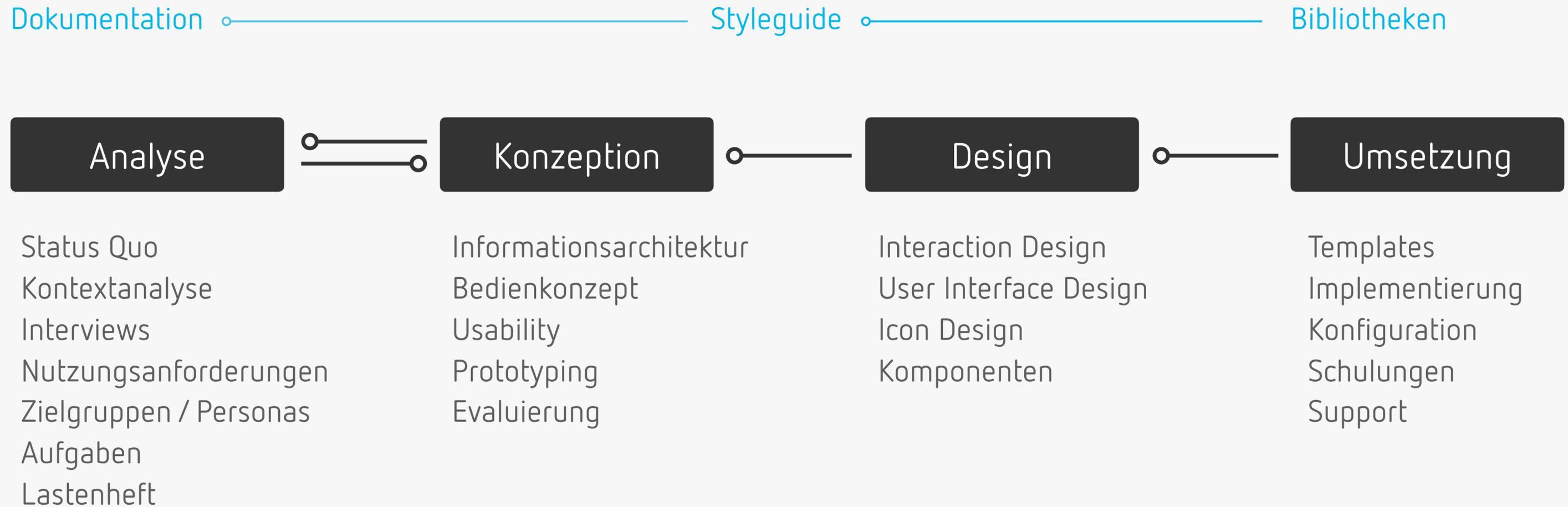
\_DDC Gute Gestaltung Bronze (1)

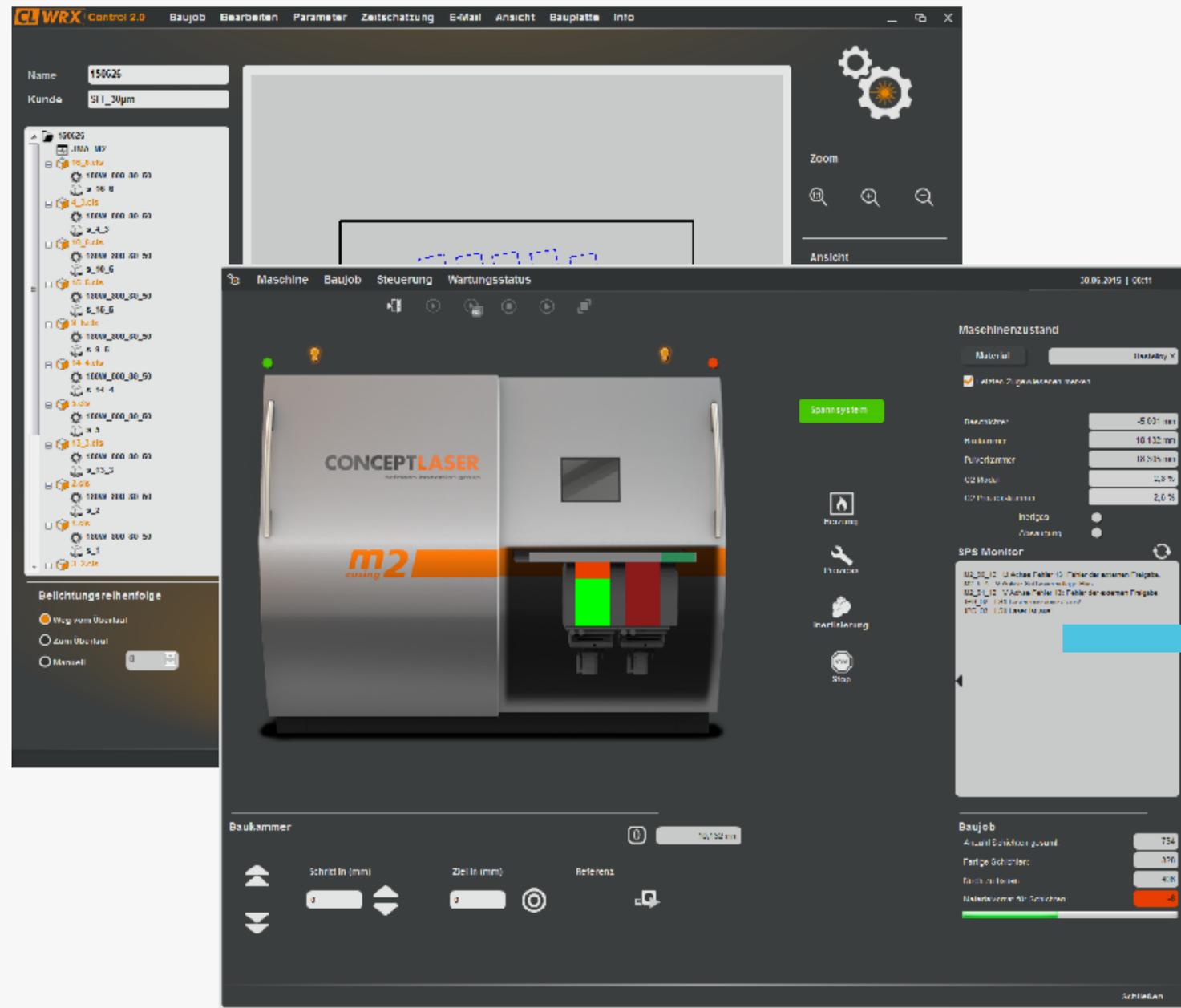


# User Centered Design

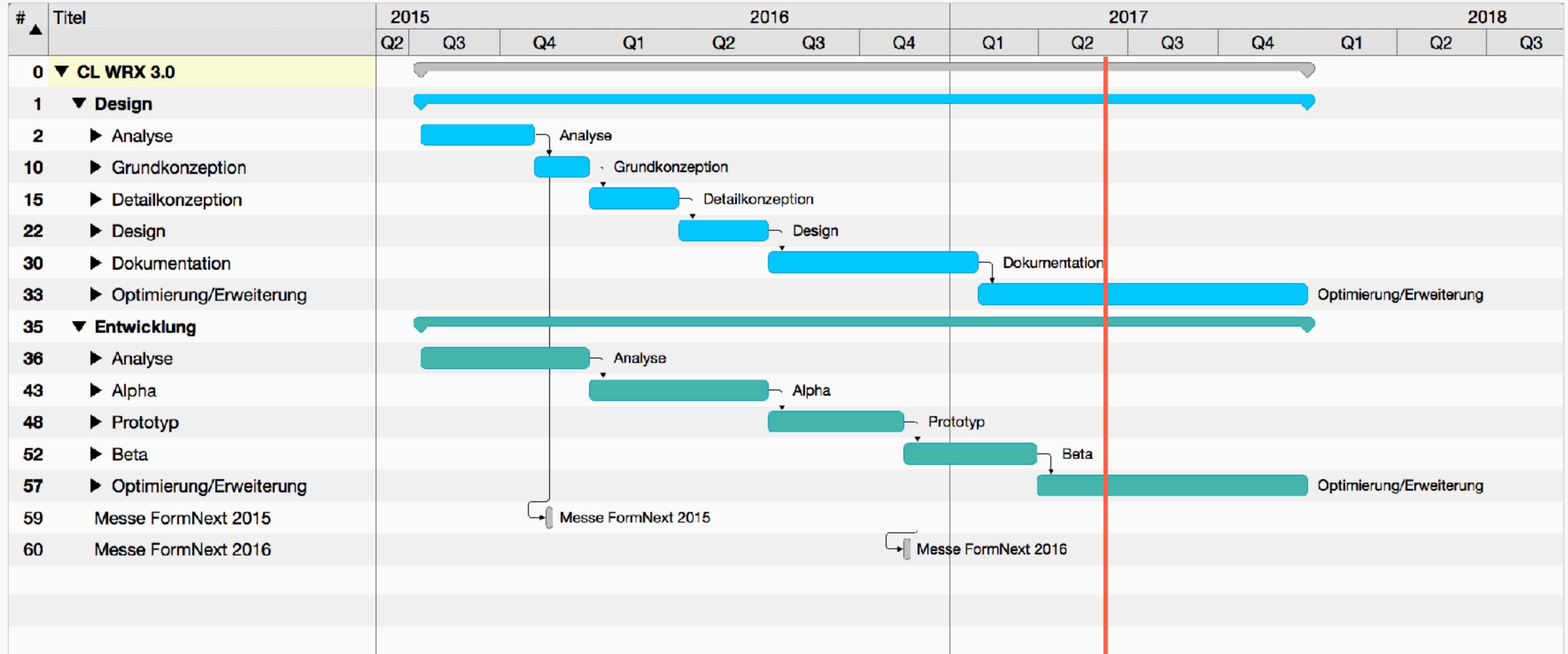


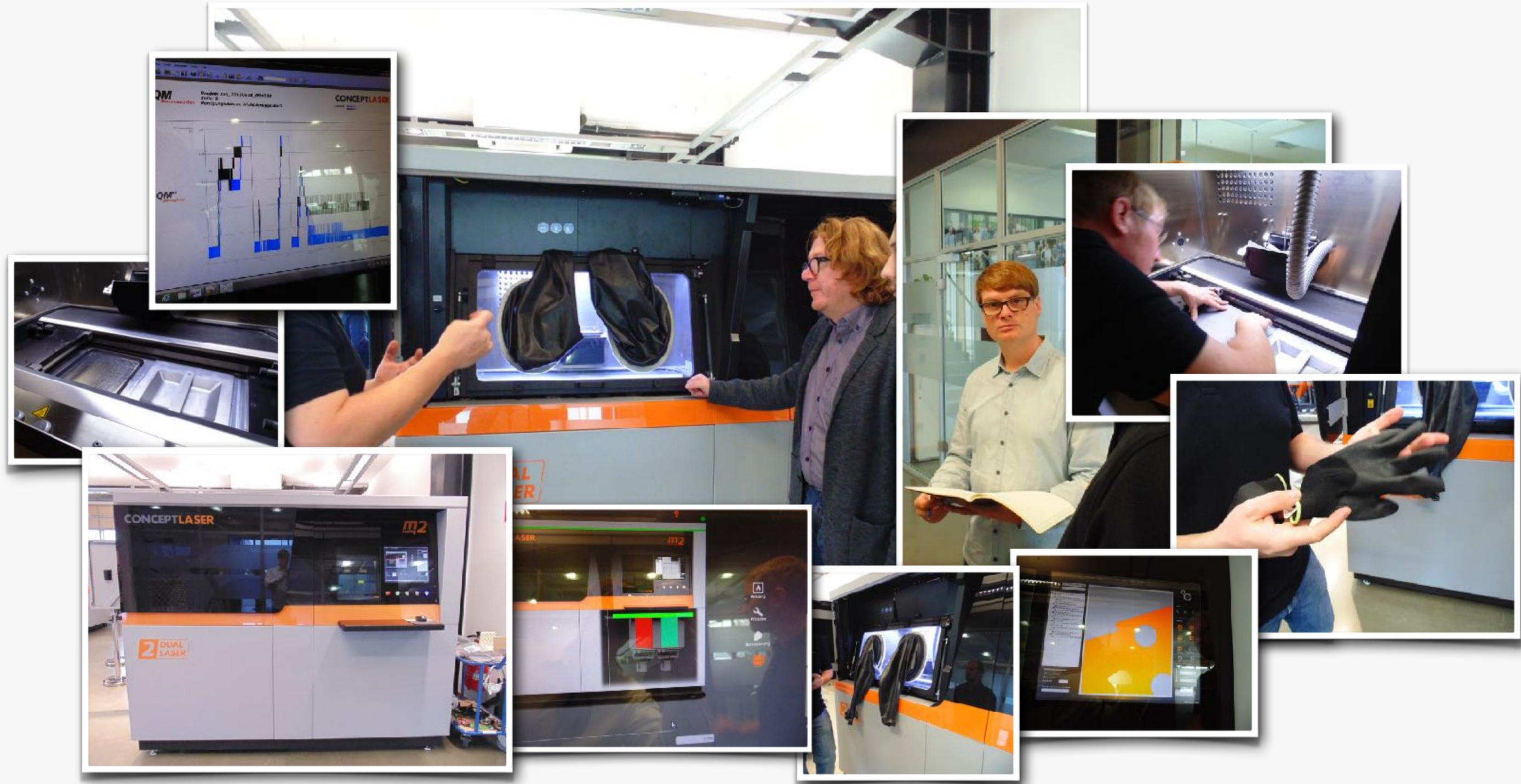
# Prozess

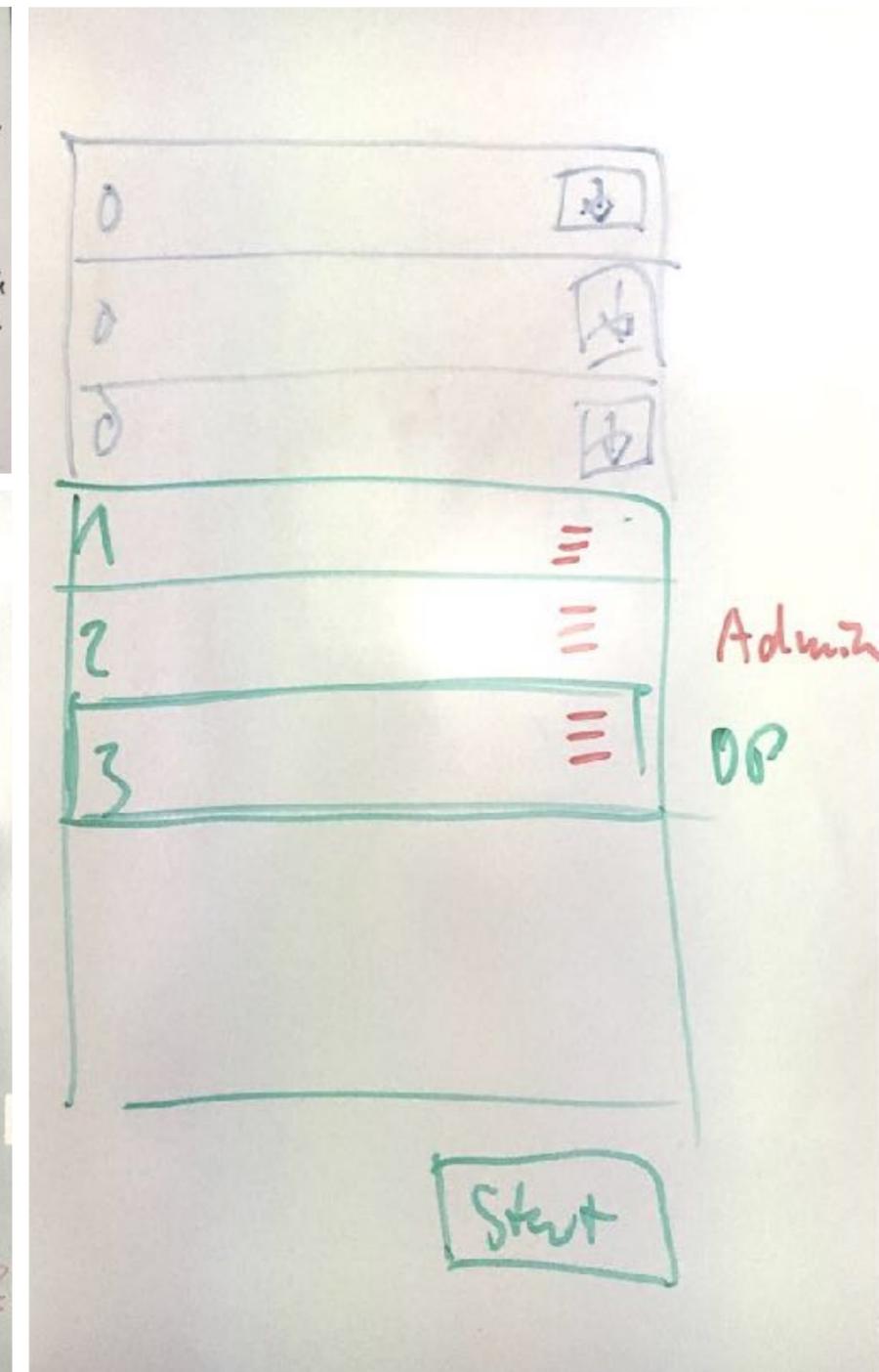
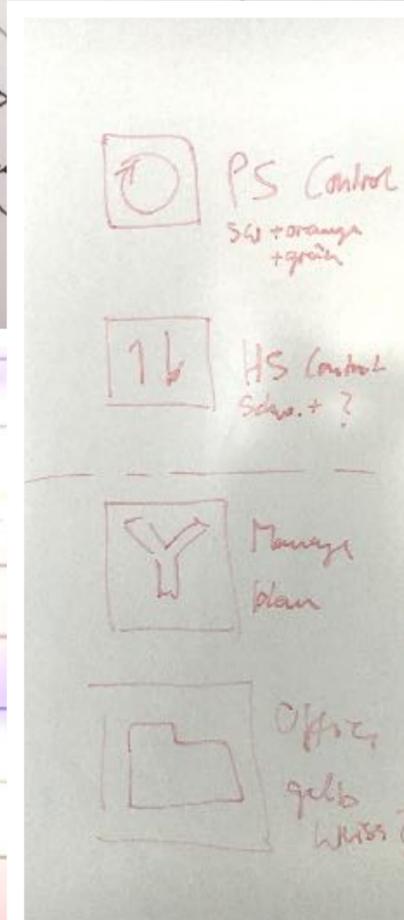
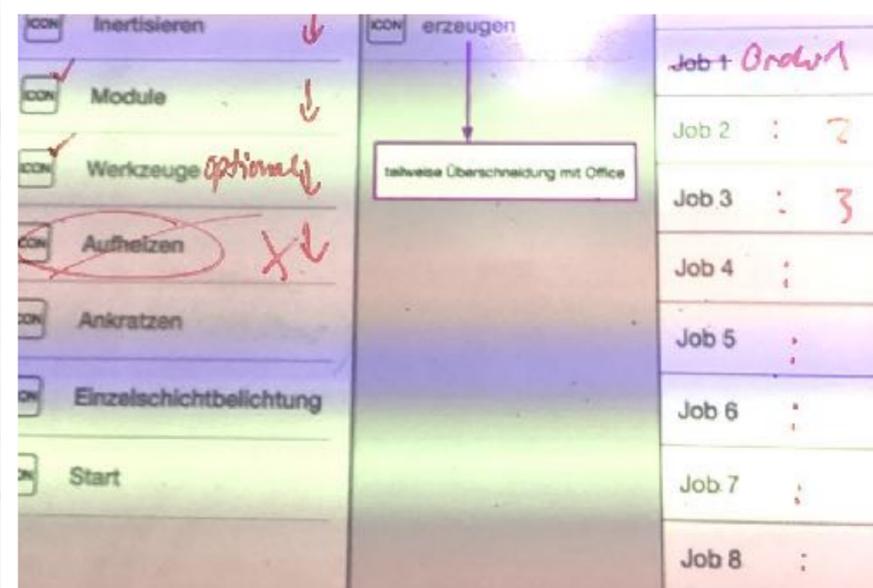
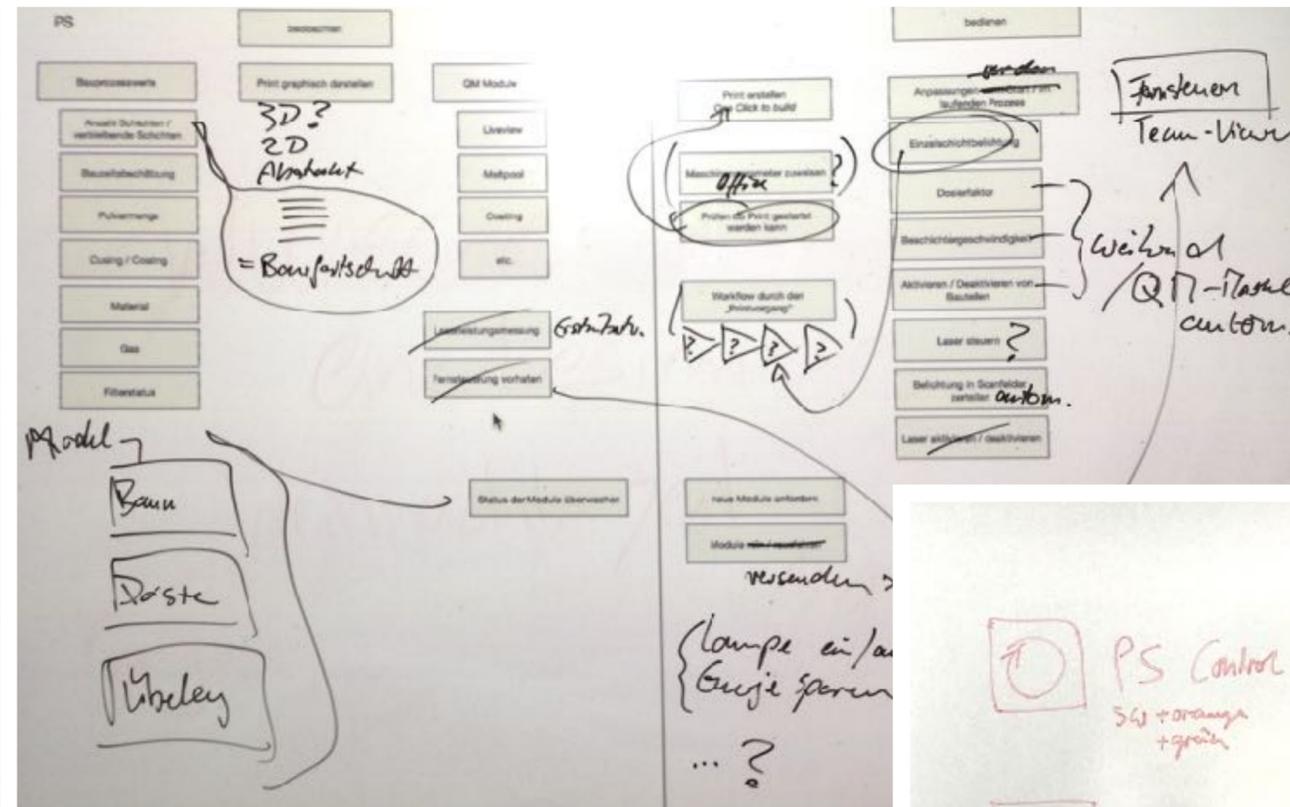
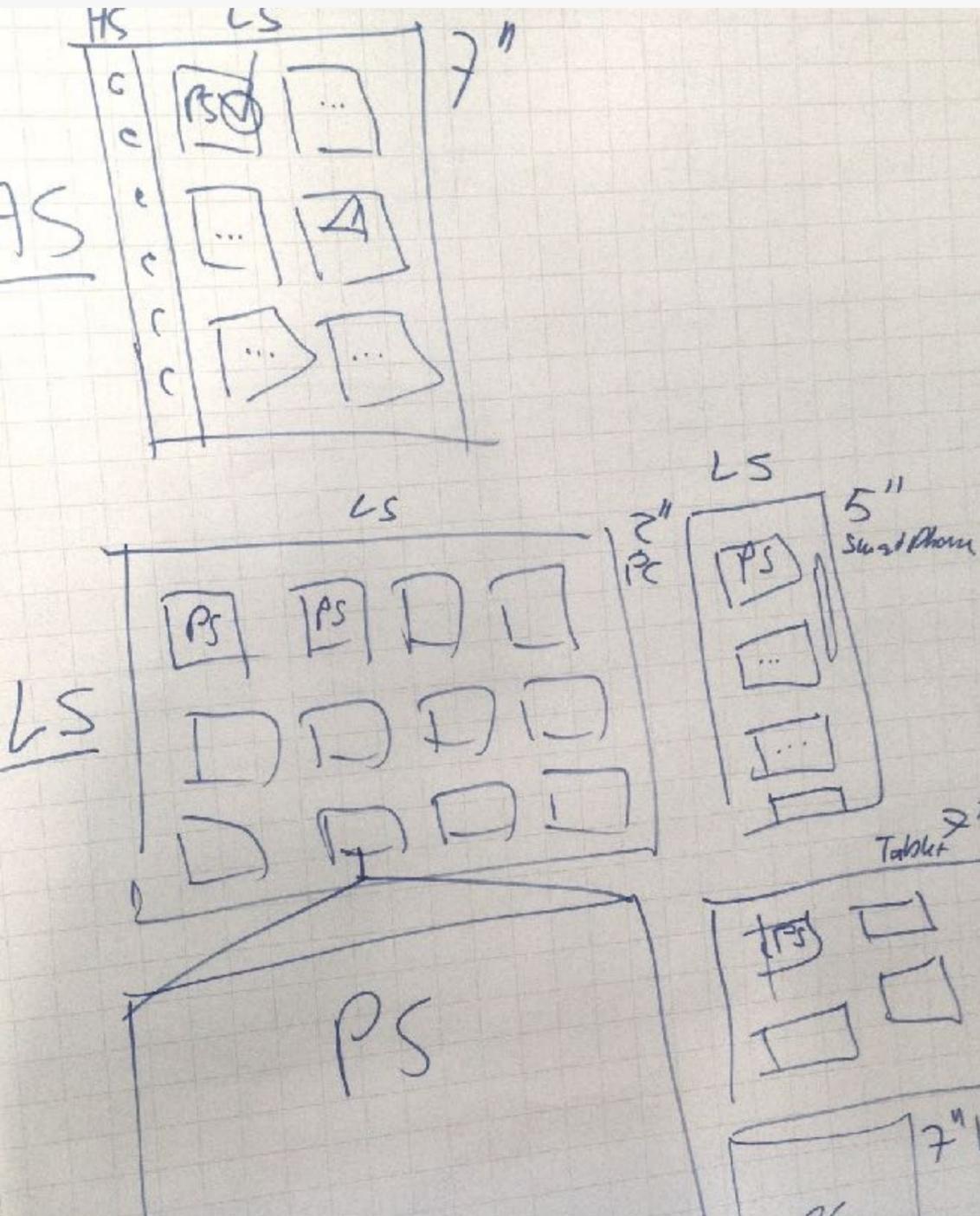


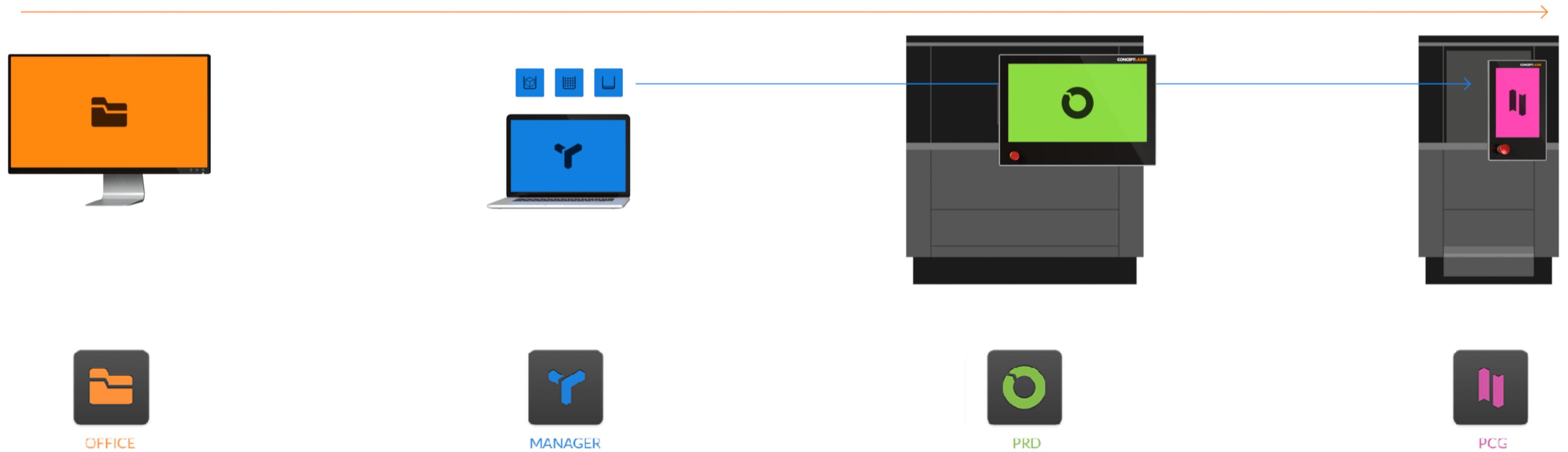






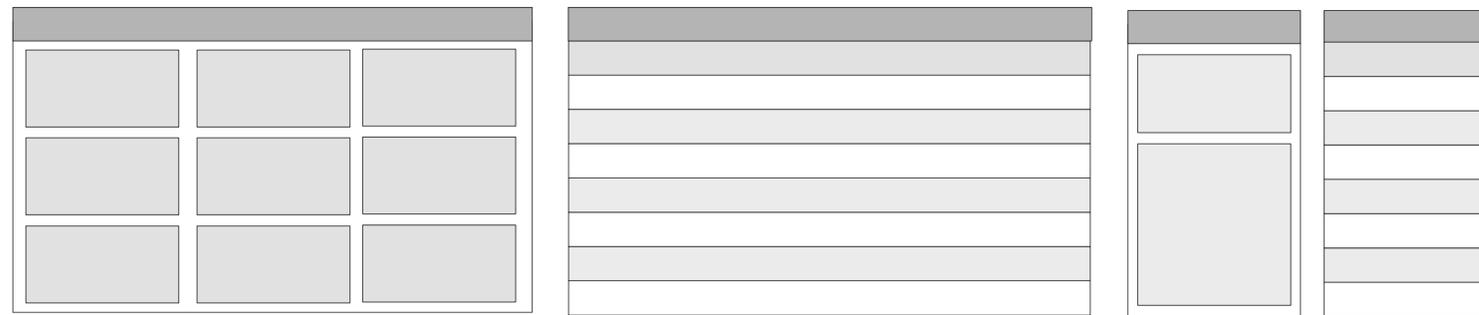




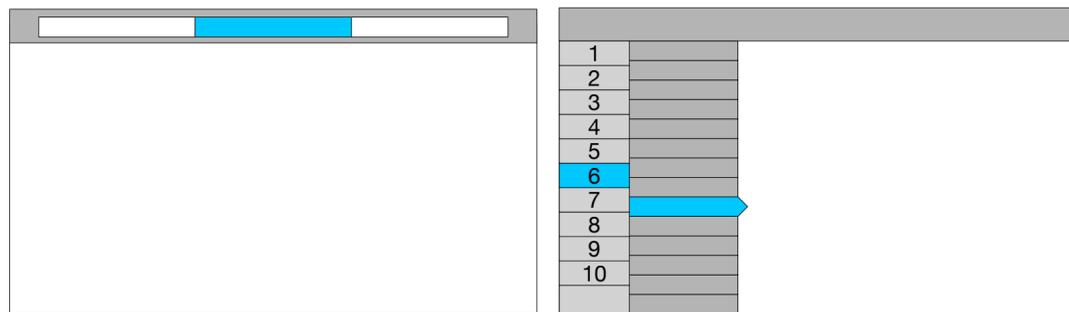




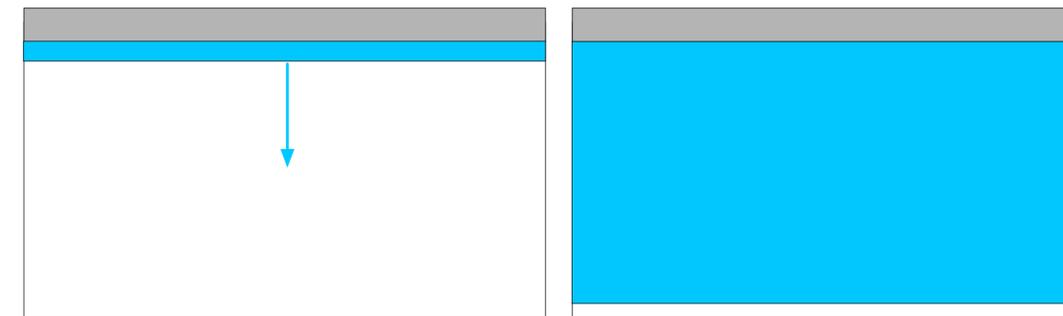
Bildschirmaufteilung  
Header, Content, Footer



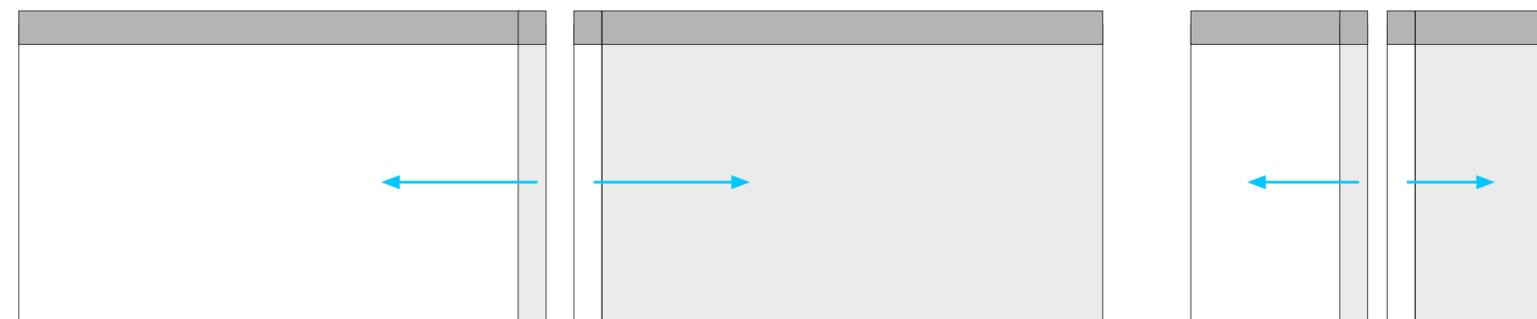
Inhalte  
Kacheln und Listen



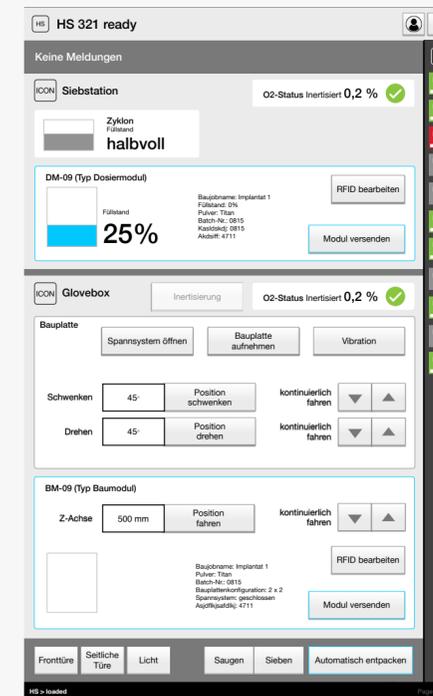
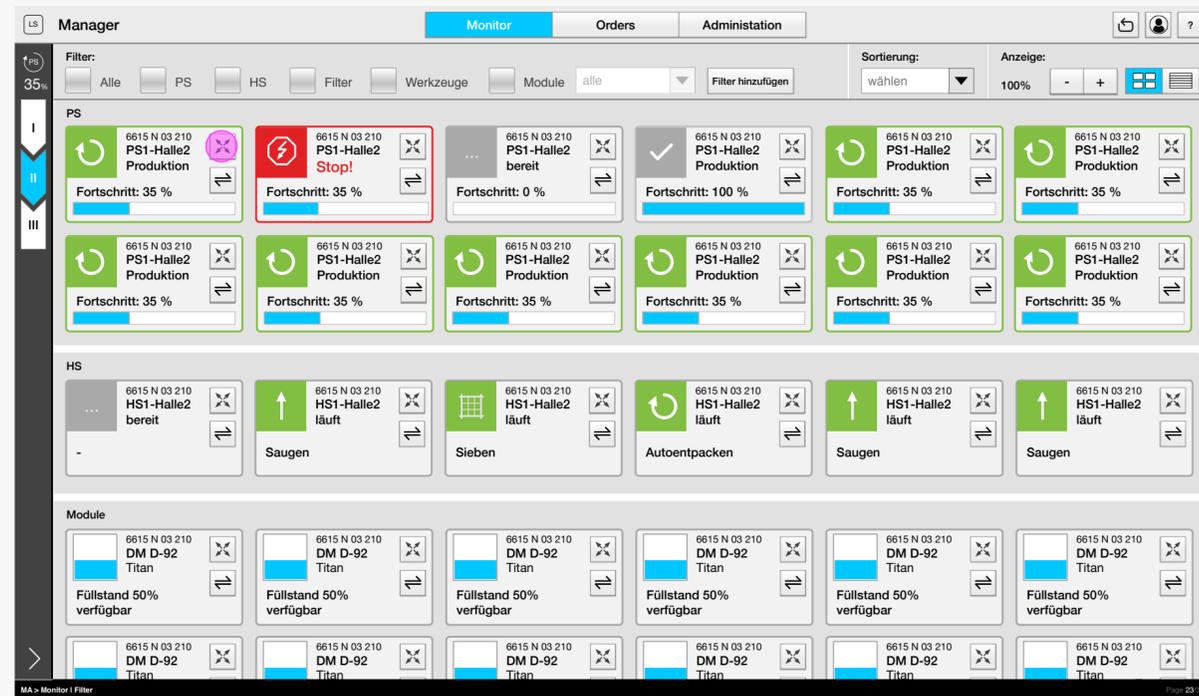
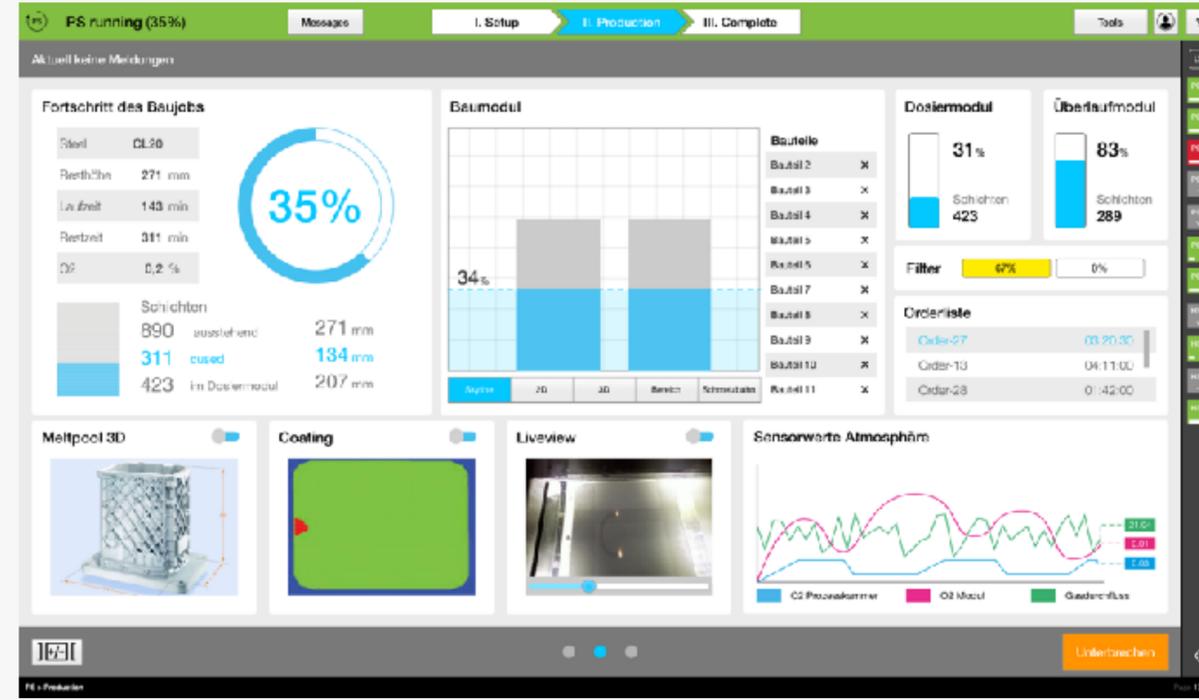
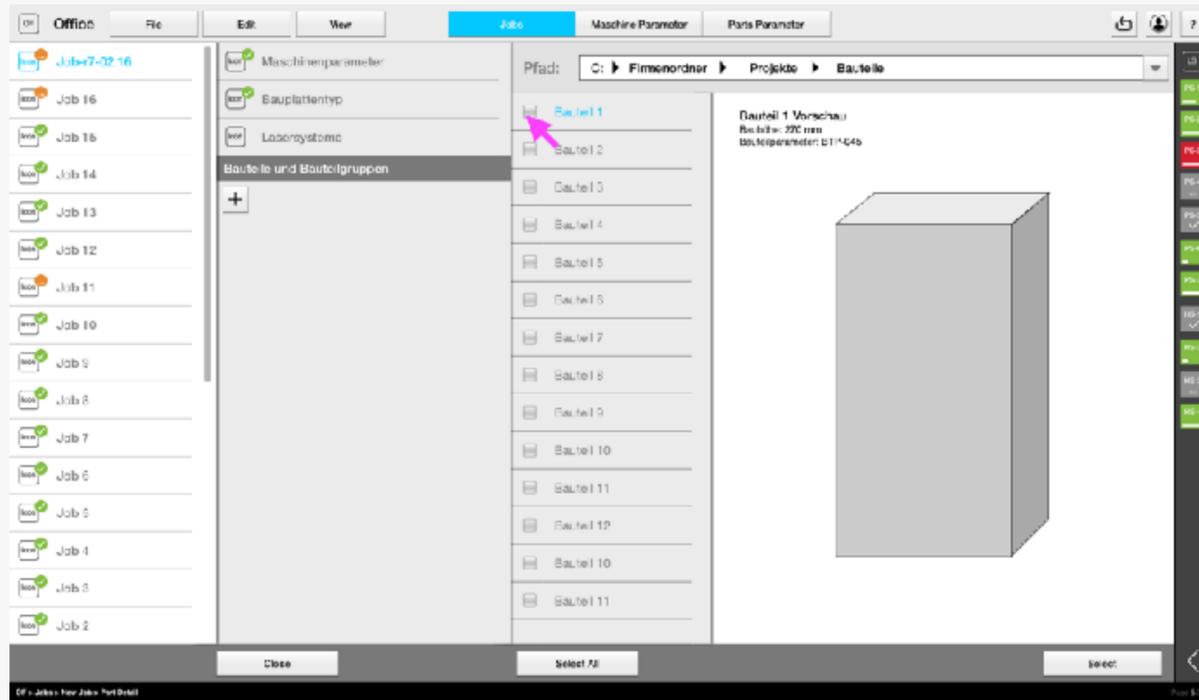
Navigationen  
Funktionsbereiche und Workflows

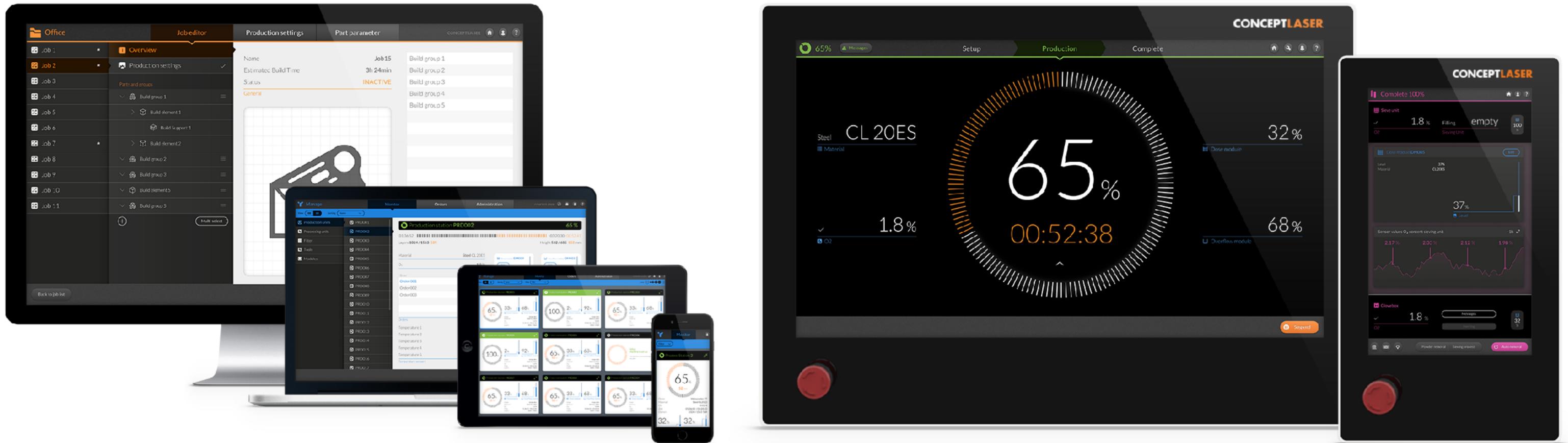


Meldungen + Hilfe



App-Wechsel







# CL WRX 3.0

Software Suite for M LINE FACTORY

# Systemarchitektur

Office Manager

Module  
Warehouse

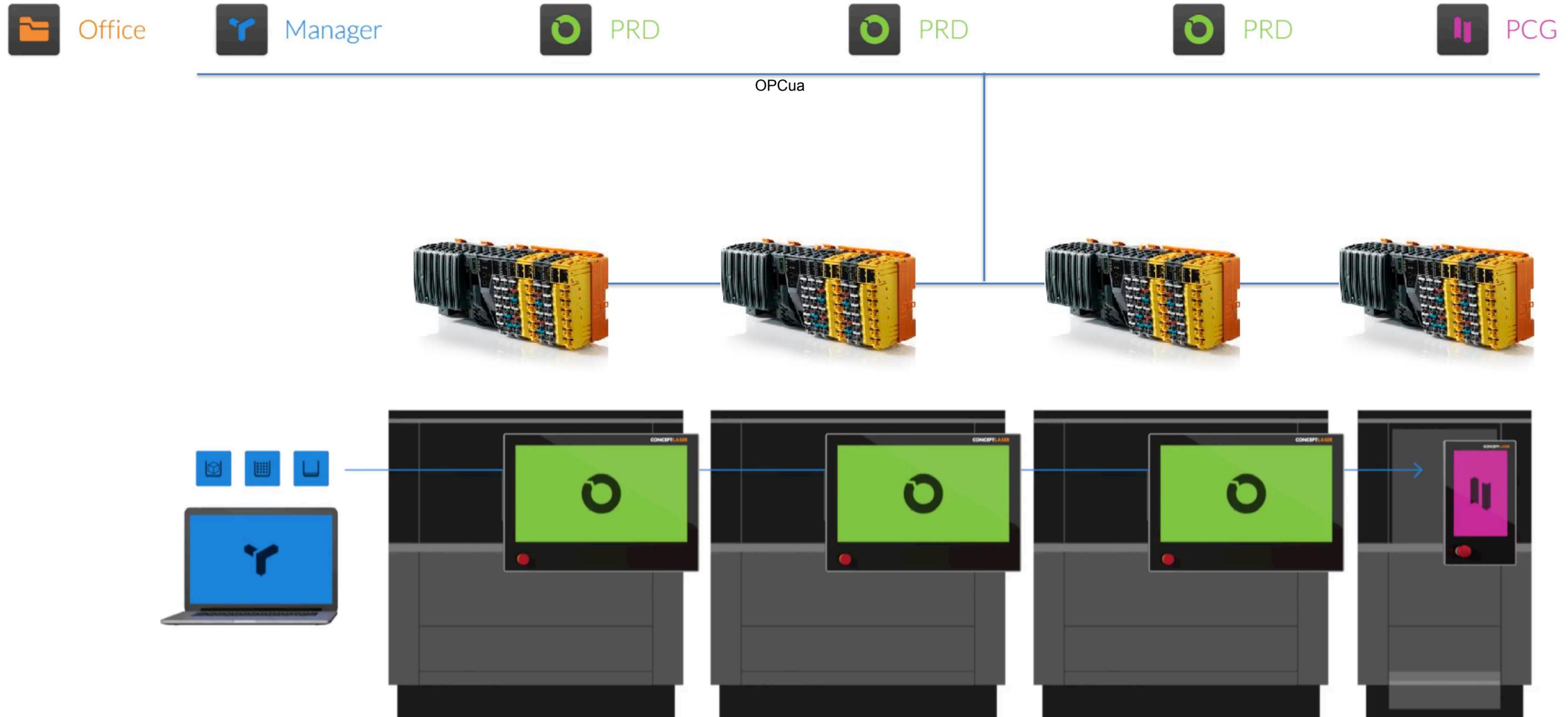
PRD

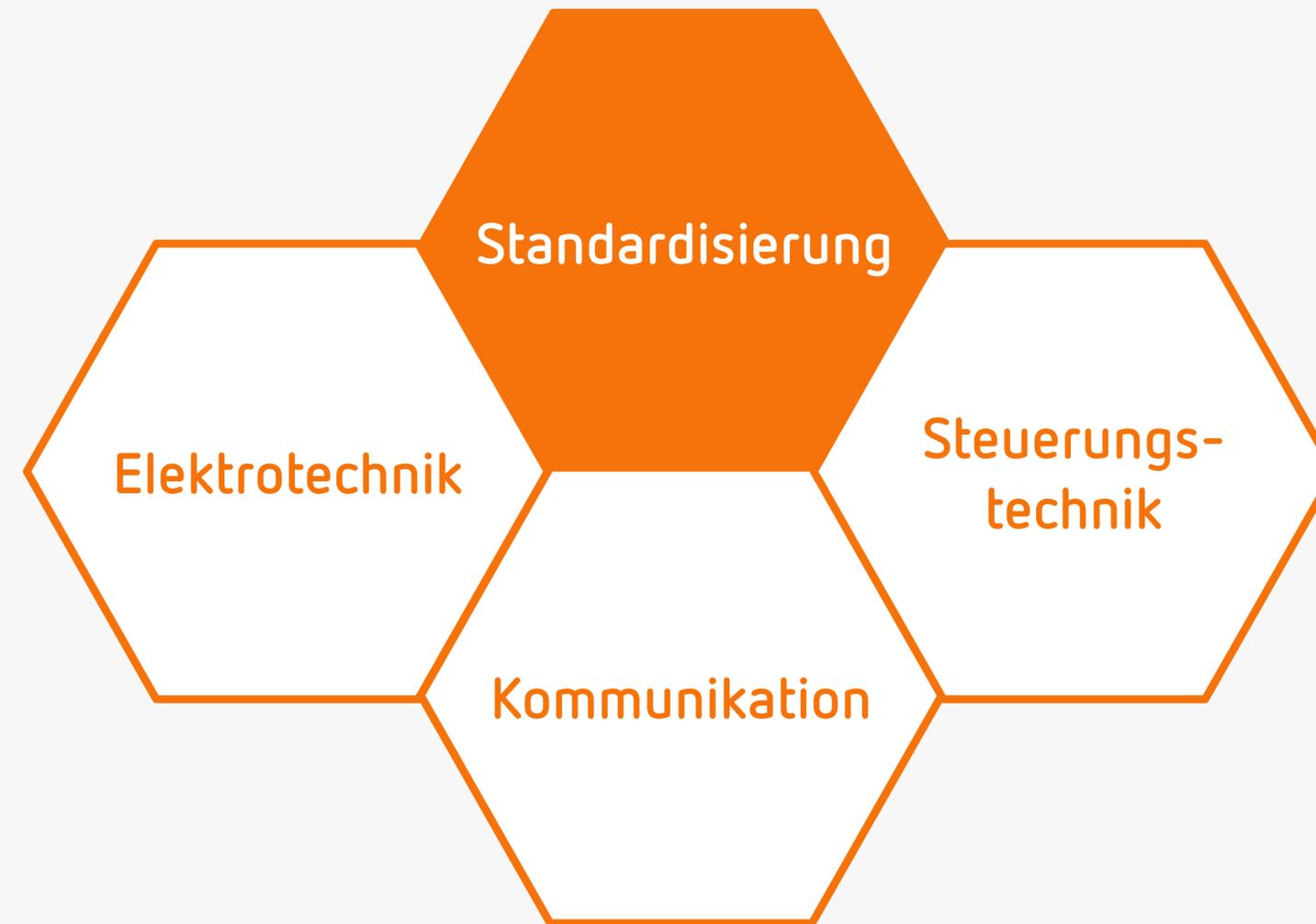
PCG

Dismantling  
and post  
processing

AM process

Build job preparation





# Aspekte

- \_ Generierung des Eplans aus getesteten Makros
- \_ Funktionsidentifikation durch symbolische Betriebsmittelkennzeichen
- \_ Durchgängigkeit der Dokumentation über alle Maschinentypen hin weg



# Aspekte

- \_ Kapselung der Funktionalität in validierte Objekte
- \_ Funktionsentwicklung durch Simulation
- \_ Cliententwicklung gegen Simulationsschnittstelle



## Aspekte

- \_ OPCua in allen Ebenen
- \_ Eindeutigkeit durch Methoden
- \_ unabhängige Schnittstellenerweiterung
- \_ Einfache Integration weiterer Systeme (MES/PES, Cloud)



Vielen Dank!

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