Trends and Concepts of Business Application Architecture

Course Introduction

Prof. Dr. Hasso Plattner, Dr. Michael Perscheid
Enterprise Platform and Integration Concepts
Hasso-Plattner-Institut

Dr. Michael Perscheid

Chair Representative of Prof. Dr. h.c. mult. Hasso Plattner

Born and grown up in Potsdam
Helmholtz Gymnasium

2003-2008 B.Sc. and M.Sc. in Software Engineering
Hasso-Plattner-Institute (HPI), University of Potsdam

2013 Dr.-Ing. (Ph.D.) in Computer Science
HPI Research School, Software Architecture Group
Thesis: Test-driven Fault Navigation for Debugging Reproducible Failures

2014 Software Developer and Researcher
SAP Innovation Center Potsdam

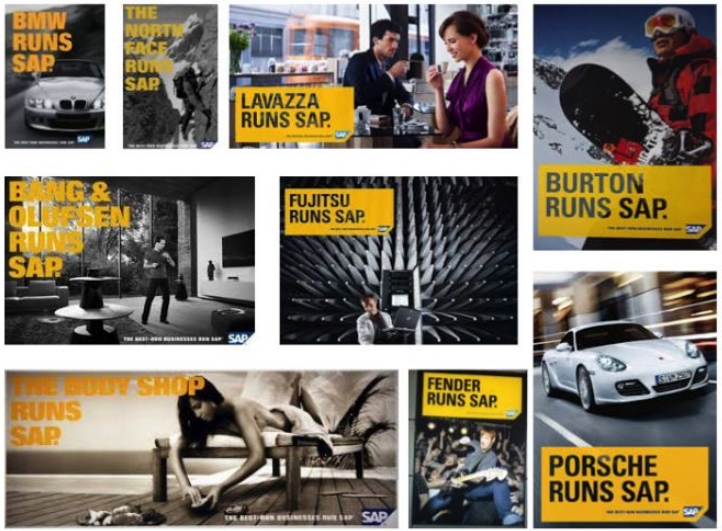
2015 Development Manager
Chairman Projects, SAP Innovation Center Network

Since 2019 Vice President
Strategic Projects, SAP Central Engineering/New Ventures and Technologies

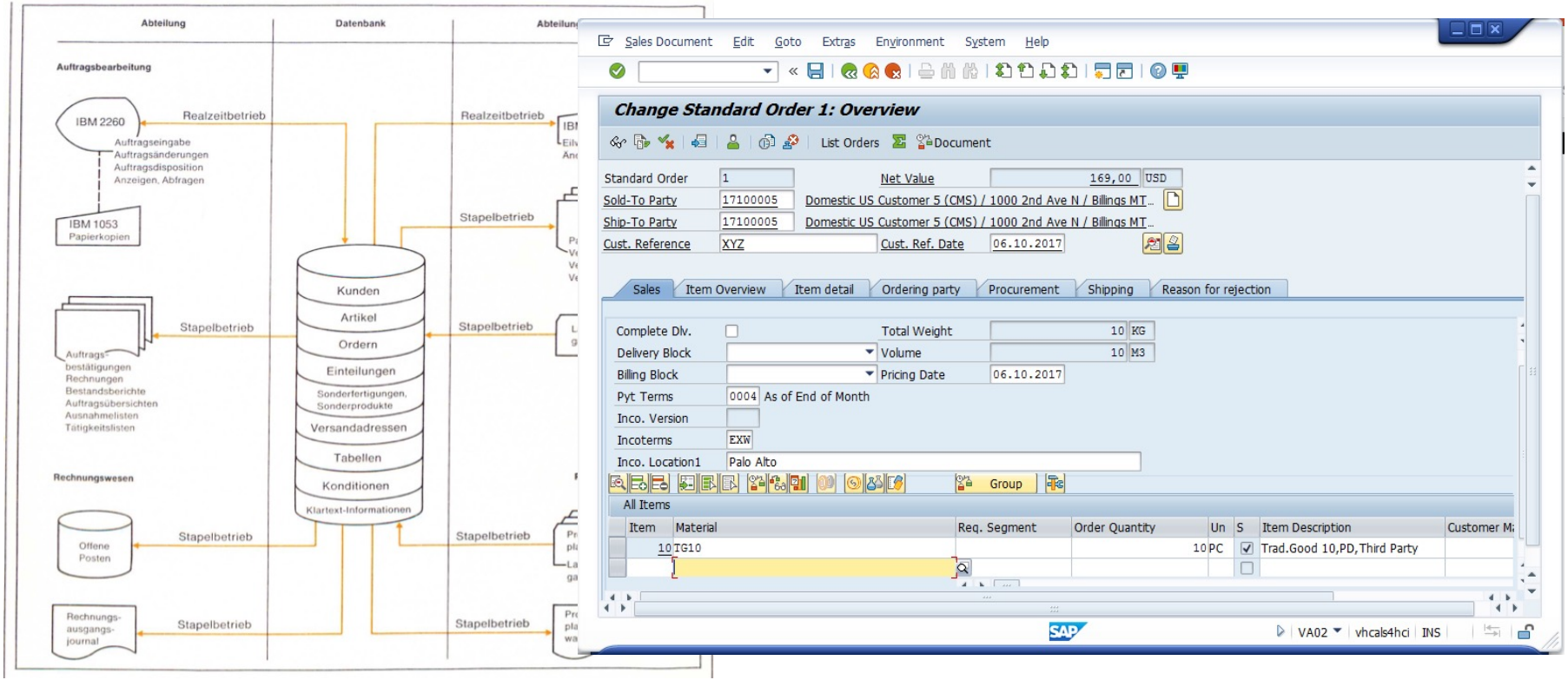
Since 2020 Chair Representative
Enterprise Platform and Integration Concepts (EPIC), HPI, University of Potsdam

2021 ACM Senior Member

HPI Hasso Plattner Institut

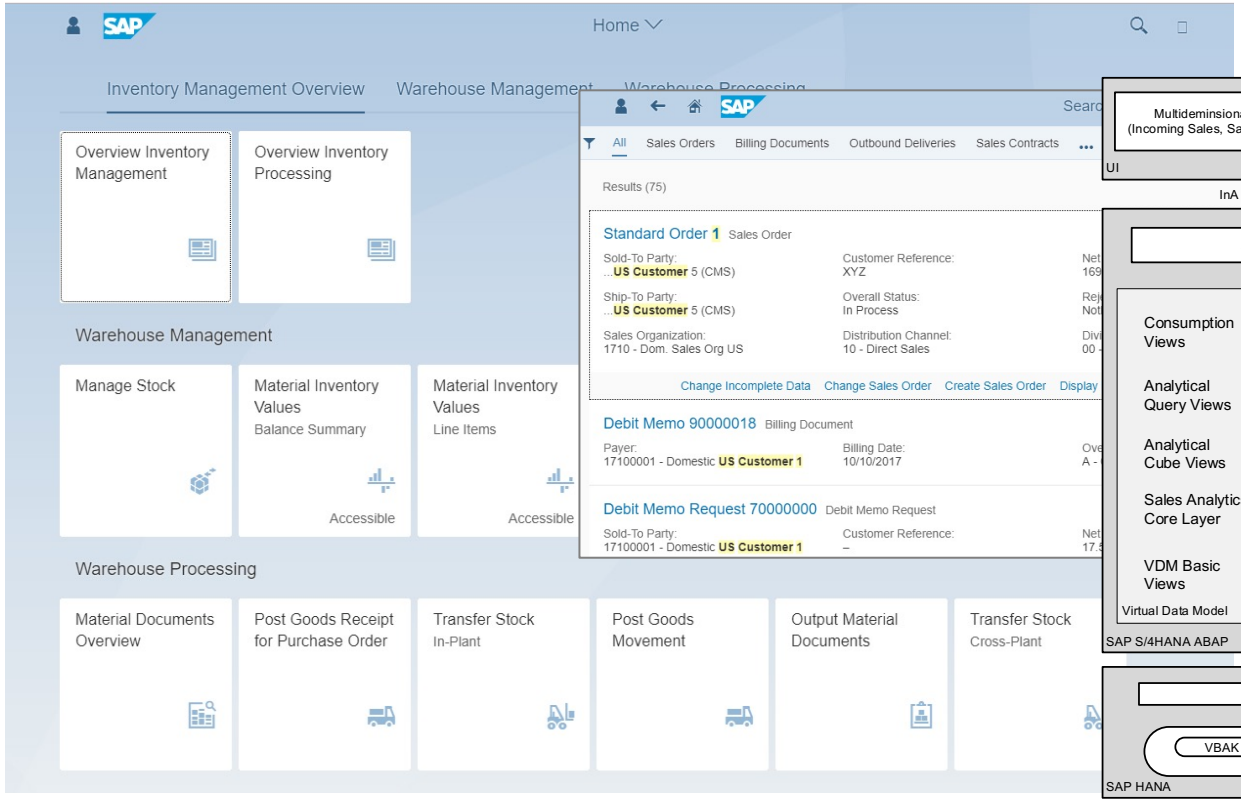


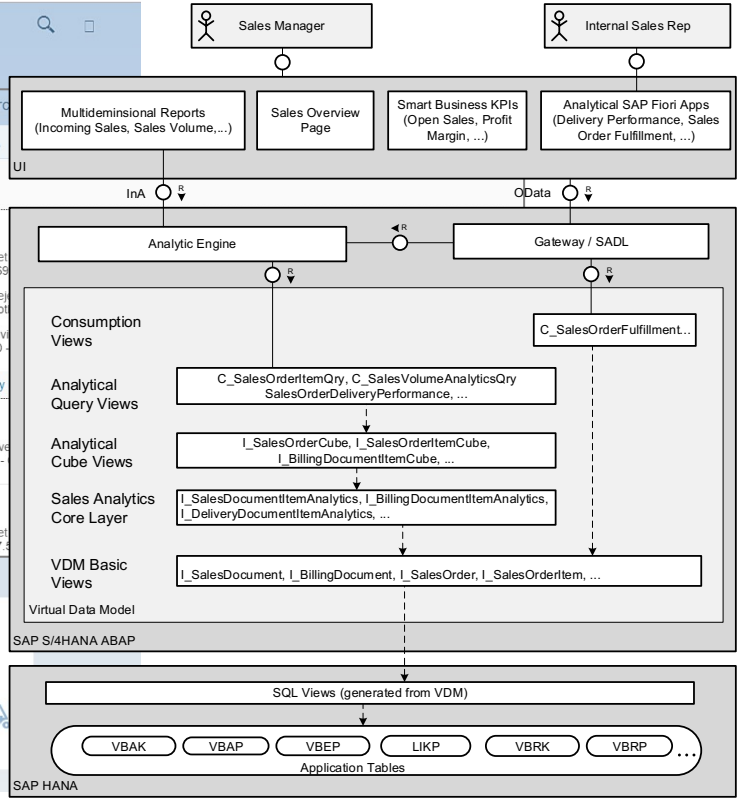
Motivation
In the Beginning



Source: H. Meier, D. Hopp und **H. Plattner**. Auftragsabwicklung, Disposition, und Versandsteuerung integriert im Realzeitbetrieb. IBM Beiträge zur Datenverarbeitung. 1972.

Motivation
Today

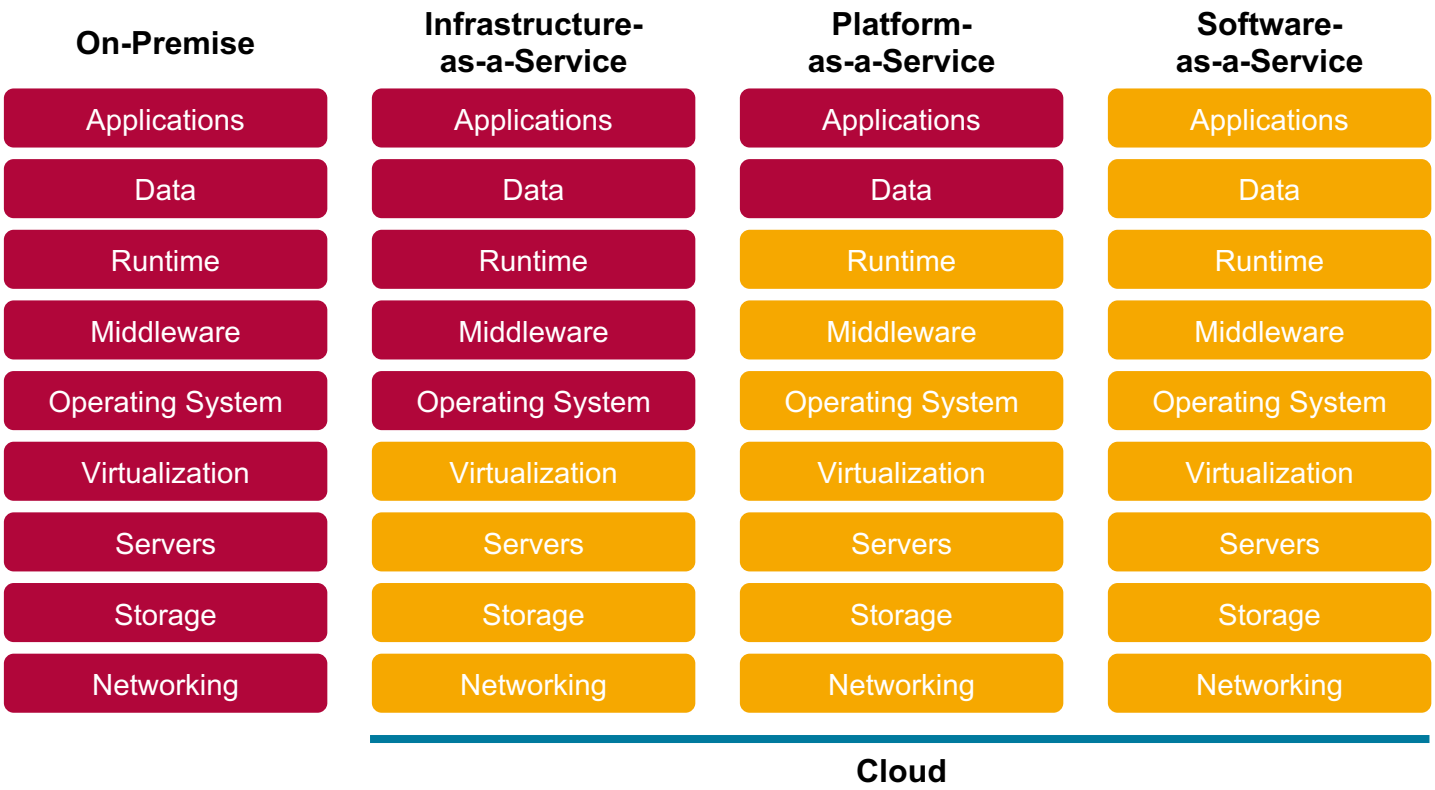




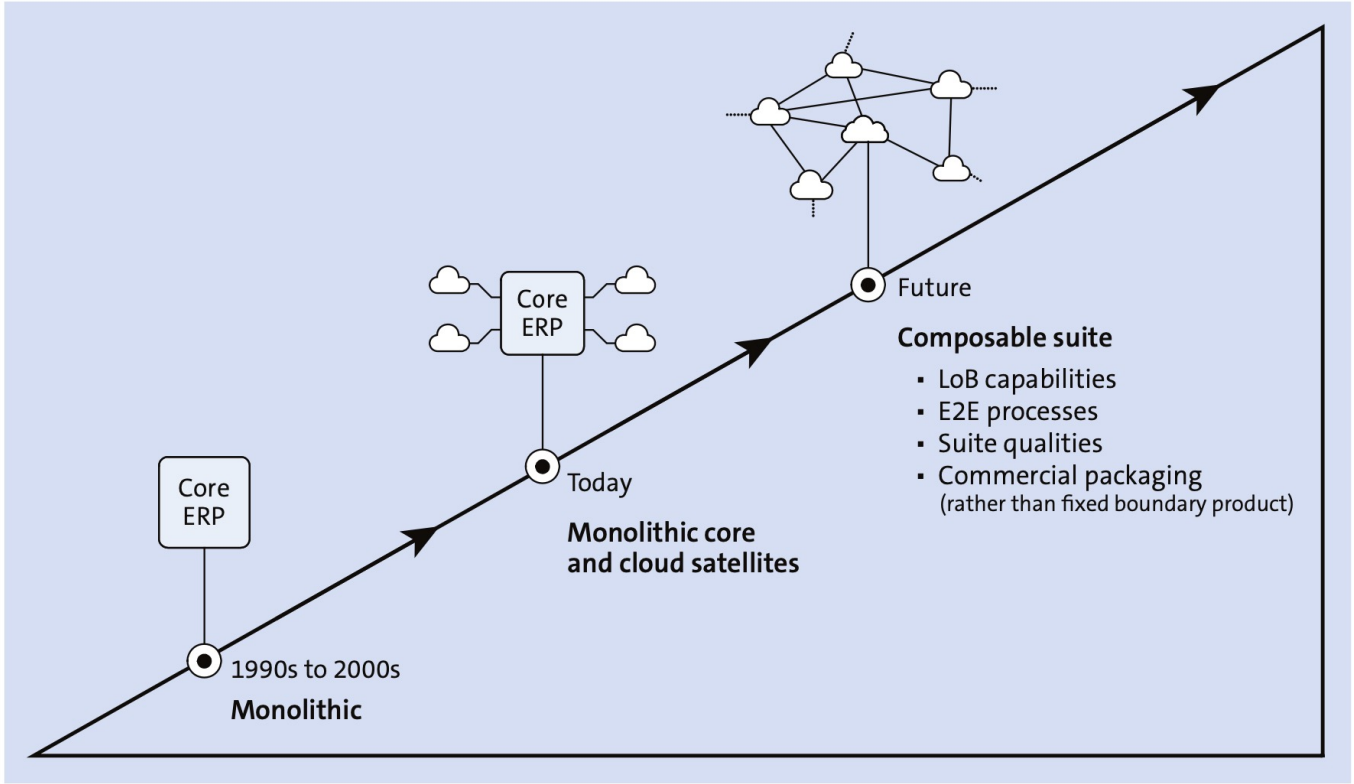
Source: Saueressig, Stein, Boeder und Kleis. SAP S/4HANA Architecture. Rheinwerk Publishing. 2021.

Motivation

From On-Premise to the Cloud



Motivation
The Future



Source: Saueressig, Gilg, Betz und Homann. SAP S/4HANA Cloud – An Introduction. Rheinwerk Publishing. 2021.

Learning Goals

Trends and Concepts of Business Application Architecture

- Understanding of ...
  - Complexity and use cases of business applications, incl. a general vocabulary (e.g., ERP, FI/CO, SD, CRM...)
  - How business requirements are implemented in applications
  - The basics of modern columnar in-memory database systems
  - Architectural challenges of and solutions for business applications on-premise and in the cloud

- Hands-on experience with …
  - Enterprise Resource Planning Software (SAP S/4HANA)
  - Database systems (SAP HANA, PostgreSQL, Hyrise) and a data schema from practice
  - Development on an enterprise cloud platform (SAP Business Technology Platform)

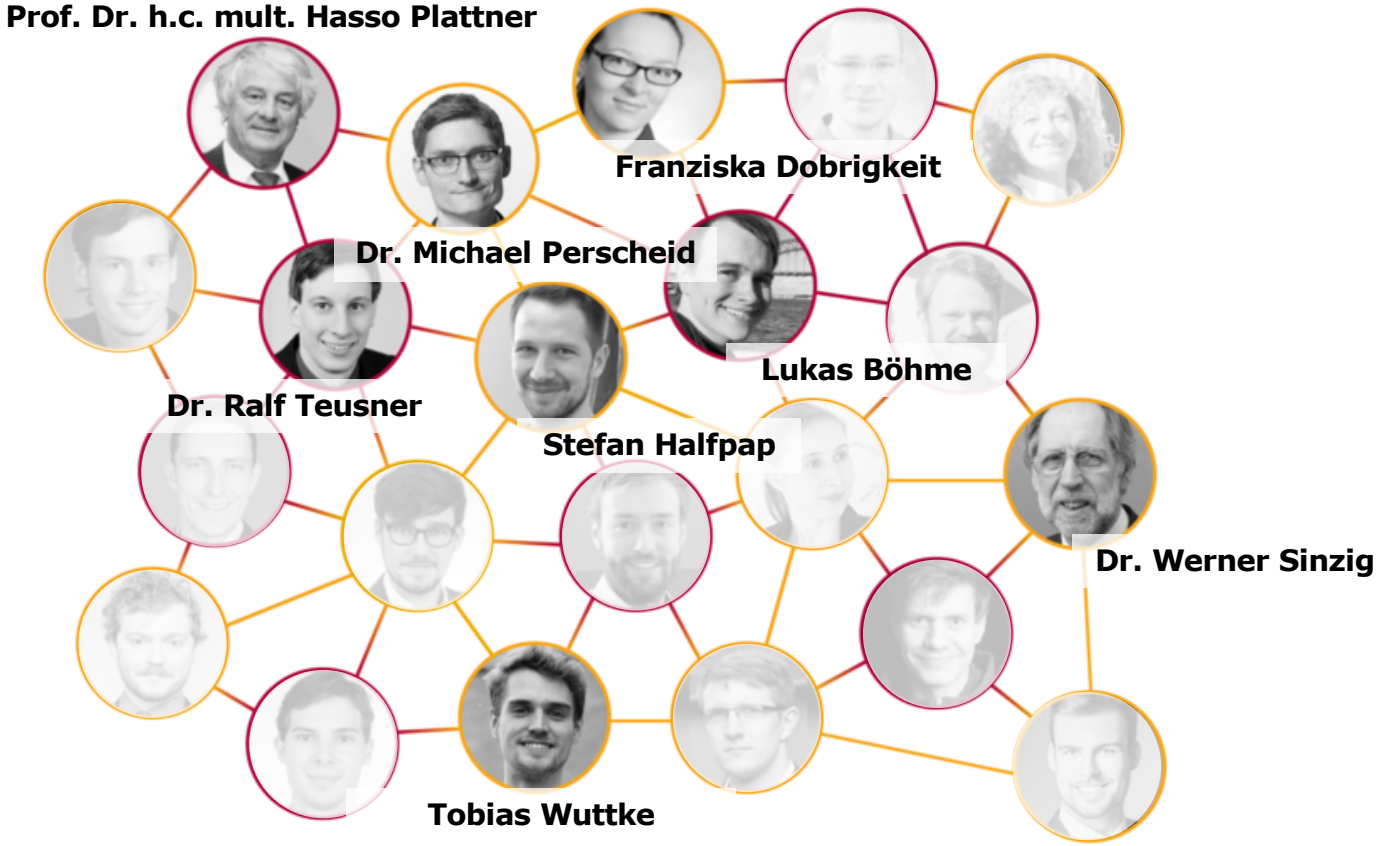
Remarks

Trends and Concepts of Business Application Architecture

- **We want to reach a foundational understanding of business requirements, concepts, their applications and technical architecture**
- Even if SAP systems are used in the lecture, the concepts and architectures will be **general-purpose**
- Compared to the Trends and Concepts I lecture of last years, we included 95% new content. **You are allowed to attend again**

- However, if you have heard **„Foundations of Business Applications 2021" (Bachelor Course, Only 2021!)** there will be much overlap

Teaching Team
General Information



General Information

Trends and Concepts of Business Application Architecture

- 6 ECTS (graded)/4 (semester periods per week)
- Course format: Lecture with exercises + block week
- Enrollment period: 01.04.2022 - 30.04.2022
- Language: German preferred / English possible (+SAPisch)
- Specialization areas: https://hpi.de/studium/im-studium/lehrveranstaltungen/it-systems-engineering-ma/lehrveranstaltung/sose-22-3418-trends-and-concepts-in-the-software-industry-i.html

- First meeting: 20.04.2022 13:30 - 15:00, **L-E.03**
- **We encourage you to join us in the lecture hall**, but we also offer Zoom (Meeting ID: 973 3946 5373; Passcode: 796558)
- Contact: michael.perscheid@hpi.de

Course Overview

Part I: Lecture – Foundations of Business Applications

- **Weekly Lecture: Every Wednesday, 13:30 - 15:00, L-E.03**
- **Please check website for dates (subject to change)**
- Digitalization of Business Processes
- Enterprise Resource Planning
  - Sales and Distribution
  - Finance, Accounting, and Controlling
  - Human Resources
  - Material Management and Production Planning
- Columnar In-Memory Database Systems for Business Applications
- Customer Relationship Management
- Enterprise Cloud Platforms for Integration and Extensions
- (Block Week: Architecture Deep Dives)

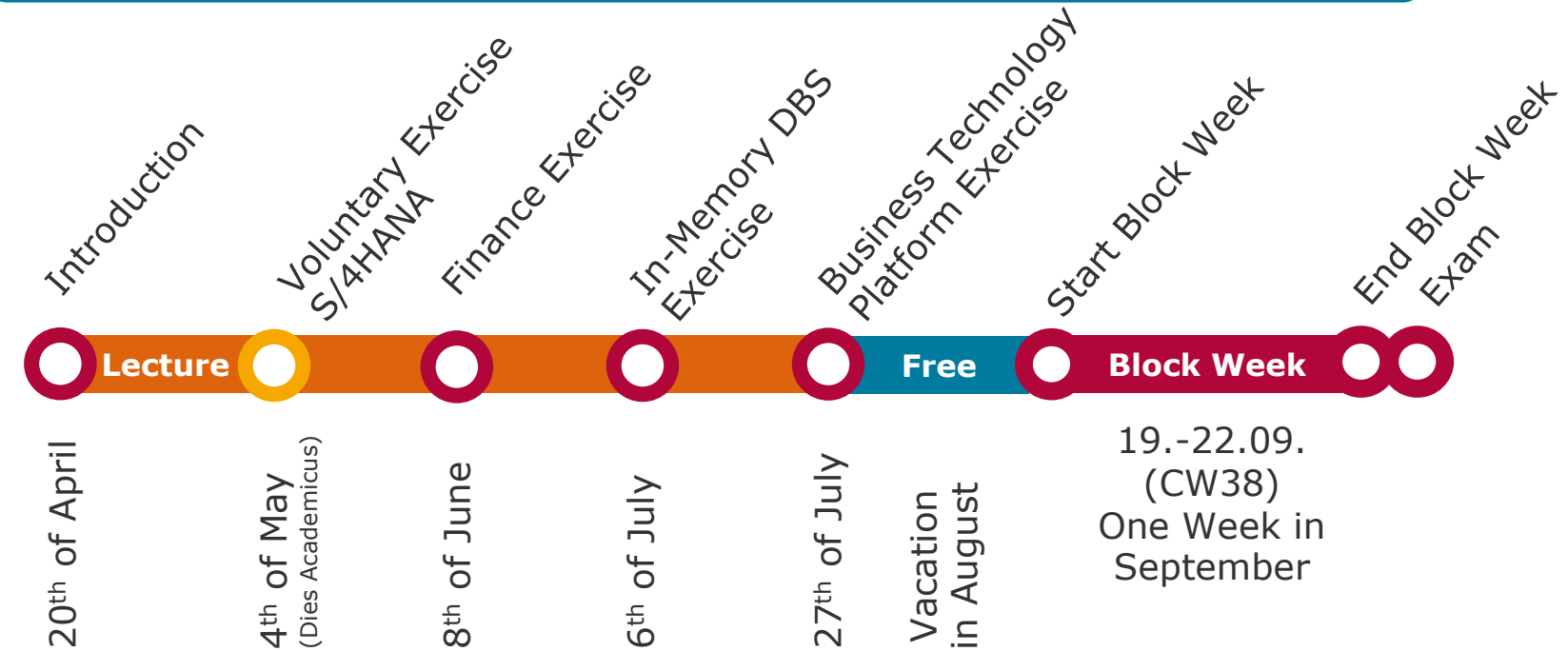
Course Overview

Part II: Block Week – September 2022 (TBA)

- **General information**
  - When: 19.-22. September (CW 38)
  - Lectures given by Prof. Plattner
  - Additional lectures by guests from industry
  - Discussions about open questions in enterprise computing with knowledgeable experts are a vital part of the lecture!
- **Focus areas**
  - Trends and challenges in enterprise computing
  - Technical architecture of business applications
  - Advanced principles of in-memory databases
  - Influence of cloud-native development
  - Experience reports from industry

Course Overview
Schedule

Every Wednesday, 13:30 - 15:00
+ a 4-day block week with Prof. Plattner and guests from industry



Prerequisites and Grading

Trends and Concepts of Business Application Architecture

Hasso Plattner Institut

- **Prerequisites**
  - None
  - Business economics (BWL I and II) and database knowledge (DB I) are advantageous for the lecture, but not mandatory
- **Grading**
  - All exercises need to be passed
  - The final grade consists of an **oral exam** (or written exam depending on the number of participants)
  - Exam date: TBA (after block week)

Preparation
Further Reading

Plattner & Leukert:
The In-Memory Revolution
How SAP HANA Enables Business of the Future

Saueressig, Stein, Boeder & Kleis:
SAP S/4HANA Architecture

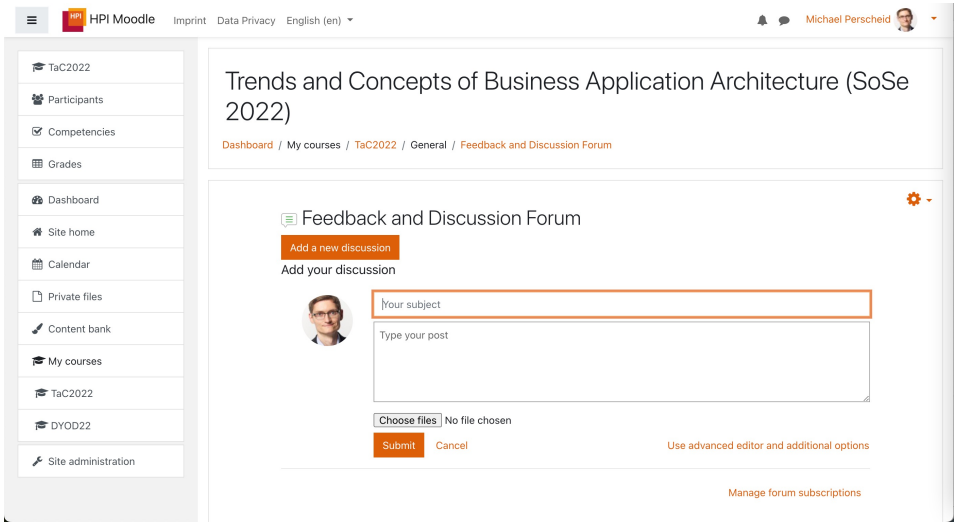
Saueressig, Gilg, Betz & Homann:
SAP S/4HANA Cloud – An Introduction

Reznik, Dobson & Gienow:
Cloud Native Transformation:
Practical Patterns for Innovation

Material, Feedback and Questions

Trends and Concepts of Business Application Architecture

- Website: https://hpi.de/plattner/teaching/summer-term-2022/trends-and-concepts-of-business-application-architecture.html
- Exercise submissions, announcements and offline discussions via https://moodle.hpi.de/course/view.php?id=302
  - All Moodle posts are anonymized
  - Please, use also the lecture for Q&A



Commercial Break

Develop Your Own Database (DYOD)

Do you want to…

- better understand how in-memory databases work?
- gain experience in systems development?
- improve your C++20 skills?
- work in small teams on a larger in-memory data management project?

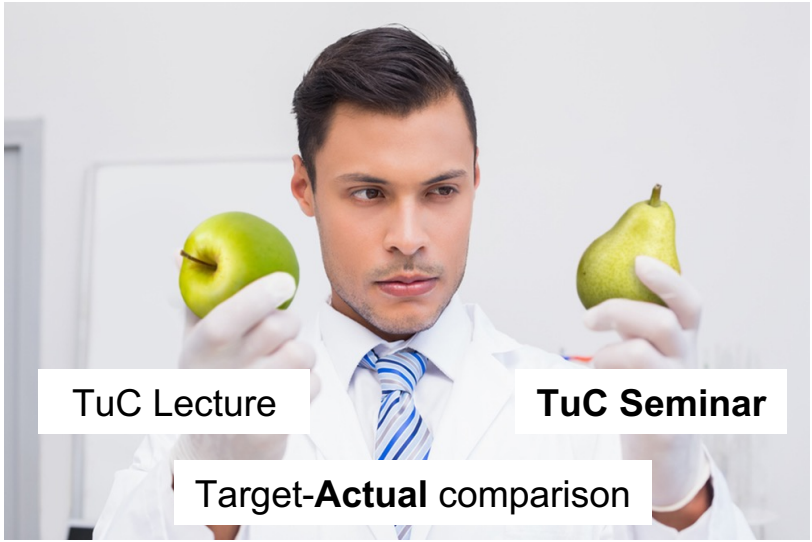
If this sounds interesting to you, DYOD might be the right project seminar for you. You can work on

- **small engineering tasks** with **accompanying lectures** to learn about basic concepts of in-memory databases.
- **complex database topics** in the context of our research systems **Hyrise** and **Skyrise** during the project phase.

https://hpi.de/plattner/teaching/summer-term-2022/develop-your-own-database.html

Commercial Break

Trends and Concepts in the Software Industry II



Your task is to analyze how customers currently develop with SAP cloud technology. Based on that, you rethink how they can improve their efficiency when developing with cloud technology under the assumption that any data is available globally with (almost) zero response time.

https://www.der-postillon.com/2017/05/aepfel-birnen.html

Enterprise Platform and Integration Concepts (EPIC)

Research Group of Prof. Dr. h.c. mult. Hasso Plattner

Visit us (epic.hpi.de; @HPI_EPIC)

HPI Campus II

Villa, Second Floor

Dr. Michael Perscheid

Chair Representative

Hasso-Plattner-Institut