

ENGAGE.EU Certificate — Joint Programme in Digital Transformation

Course Title: Cloud and Enterprise AI Transformation

Course Syllabus

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Institute of Information Systems and Digital Business (IWI-HSG), University of St.Gallen

Block 1: 28 – 29 May 2027

Block 2: 4 – 5 June 2027

Course Abstract

This course examines the cloud and compute infrastructure underlying enterprise artificial intelligence, and the managerial decisions that this infrastructure imposes on the firm during digital transformation processes.

Organizations deploying AI at scale confront a recurring set of decisions: the allocation of workloads across providers and deployment models; the choice between internal development, procurement, and partnership; the selection of use cases suitable for automation; the justification of multi-year commitments under uncertainty regarding future compute and inference costs; the transition from pilot implementations to production systems; and the degree of dependence on a limited number of providers and jurisdictions that the firm is prepared to accept. Such decisions are costly to reverse and constrain the organization over extended periods.

The course proceeds in four sessions:

- **Session 1** addresses the architecture of the cloud and AI stack, including emerging interoperability mechanisms such as MCP, and the economic mechanisms operating in infrastructure markets: economies of scale, learning effects, network effects, switching costs, data gravity, and commoditization.
- **Session 2** addresses the business case, covering sourcing arrangements, AI unit economics (including token economics and FinOps), and the assessment of automation candidates.
- **Session 3** addresses organizational implementation, including adaptation beyond adoption, MLOps and value streams, cloud/AI operating models, production scaling, and agentic AI.
- **Session 4** addresses digital sovereignty as a design dimension, covering concentration risk, exit costs, control points, and relevant architectural, contractual, compliance, risk, security, and operational-resilience considerations (including DORA).

Learning Objectives

Upon successful completion of this course, students will be able to:

LO1. Explain how the layers of the cloud and AI stack relate to one another, and **exemplify** the economic mechanisms operating on them — economies of scale, learning effects,

network effects, switching costs, data gravity, and commoditization — including cases in which a mechanism does not hold.

LO2. Classify sourcing and deployment arrangements according to their cost structure, reversibility, and dependency profile, and **interpret** digital sovereignty as a design and sourcing choice rather than as a compliance obligation.

LO3. Apply structured analytic instruments: a use case assessment model and a total cost of ownership calculation including AI unit economics to a proposed workload or automation candidate, and **execute** a sensitivity analysis on the variables that determine the outcome.

LO4. Attribute value capture and control across the layers of a stack to specific economic mechanisms, and **analyze** the resulting exposure of a firm to lock-in and concentration risk by **identifying** control points, switching costs, and exit conditions in its architecture and contracts.

LO5. Differentiate technical from organizational causes when diagnosing why a transformation program stalls between pilot and production.

LO6. Appraise claims made by vendors, consultants, and providers — including claims made for sovereignty measures — against empirical evidence, research findings, and criteria the student states and defends.

LO7. Formulate and defend a recommendation on a real cloud or AI transformation decision, **integrating** cost evidence, risk assessment, and research concepts, and **produce** a presentation of it appropriate to a non-technical executive audience.

Evaluation and Grading

Component	Weight	Format	Objectives
1. Voice-over presentation	60%	8–10 minute narrated slide deck, individual	LO3, LO4, LO5, LO6, LO7
2. Group sprints	30%	Two in-class team exercises, presented live	LO1, LO3, LO4, LO5
3. Individual decision responses	10%	One spoken individual response, given in session	LO2, LO6

Seventy percent of the grade is individually attributable. Components 2 and 3 are completed entirely within class hours.

Attendance. Students are expected to attend all four sessions. Attendance at a minimum of three is required to complete the course; a student who misses a second session submits a written substitute for the missed component, arranged with the lecturers.

1. Voice-over presentation (60%)

Each student produces a narrated slide deck of 8–10 minutes: roughly 8–12 slides, recorded with the student's own voice and submitted as a video file. The task is to take a real cloud or AI transformation decision at a firm of the student's choosing and make a recommendation to that firm's executive committee. The voice-over presentation is due one week after the last session of the course. Further details are communicated within the course on the content of the presentation.

2. Group sprints (30%)

Teams of three to four, formed in the first session and fixed for the course, complete two timed exercises: one in Session 1 and one in Session 3. Each sprint runs 45–60 minutes, produces **a single slide or flipchart page**, and ends with a four-minute group presentation to the class.

- **Sprint 1 (Session 1): Value capture analysis**
- **Sprint 2 (Session 3): Use case assessment**

Each sprint accounts for 15%. All members of a team receive the same mark. Each team member holds a defined part of the analysis, is identified on the team's slide, and contributes to its presentation. Specific roles are assigned at the start of each sprint. Members not identified on the slide, or not contributing to the presentation, do not receive the sprint mark.

3. Engagement and decision responses (10%)

Sessions 2 and 4 each close with a decision put to the group: a concrete call, with a position to take and defend. Students have three minutes to think, then students give a spoken response of 60 to 90 seconds. Students are randomly drawn for their response to either session 2 or 4.

Policy on generative AI. Generative AI may be used throughout the course and is required for parts of the course that are later specified. Alongside the voice-over presentation, students submit a short note stating which systems they used, for what purpose, together with the prompts used.

Readings

Mandatory readings are marked **M** and should be completed before the session under which they are listed.

Session 1 — The Cloud and Enterprise AI Stack

- **M** Constantinides, P., Henfridsson, O., & Parker, G. G. (2018). Introduction—Platforms and Infrastructures in the Digital Age. *Information Systems Research*, 29(2), 381–400.
- **M** Benlian, A., Kettinger, W. J., Sunyaev, A., & Winkler, T. J. (2018). Special Section: The Transformative Value of Cloud Computing — A Decoupling, Platformization, and Recombination Theoretical Framework. *Journal of Management Information Systems*, 35(3), 719–739.
- Tilson, D., Lyytinen, K., & Sørensen, C. (2010). Digital Infrastructures: The Missing IS Research Agenda. *Information Systems Research*, 21(5), 748–759.
- Tiwana, A., Konsynski, B., & Bush, A. A. (2010). Platform Evolution: Coevolution of Platform Architecture, Governance, and Environmental Dynamics. *Information Systems Research*, 21(4), 675–687.
- de Reuver, M., Sørensen, C., & Basole, R. C. (2018). The Digital Platform: A Research Agenda. *Journal of Information Technology*, 33(2), 124–135.
- Iyer, B., & Henderson, J. C. (2010). Preparing for the Future: Understanding the Seven Capabilities of Cloud Computing. *MIS Quarterly Executive*, 9(2), 117–131.

Session 2 — The business case

- **M** Schneider, S., & Sunyaev, A. (2016). Determinant Factors of Cloud-Sourcing Decisions: Reflecting on the IT Outsourcing Literature in the Era of Cloud Computing. *Journal of Information Technology*, 31(1), 1–31.
- **M** Engel, C., Elshan, E., Ebel, P., & Leimeister, J. M. (2024). Stairway to Heaven or Highway to Hell: A Model for Assessing Cognitive Automation Use Cases. *Journal of Information Technology*, 39(1), 94–122.
- Venters, W., & Whitley, E. A. (2012). A Critical Review of Cloud Computing: Researching Desires and Realities. *Journal of Information Technology*, 27(3), 179–197.
- Winkler, T. J., & Brown, C. V. (2013). Horizontal Allocation of Decision Rights for On-Premise Applications and Software-as-a-Service. *Journal of Management Information Systems*, 30(3), 13–48.
- Bhattacharjee, A., & Park, S. C. (2014). Why End-Users Move to the Cloud: A Migration-Theoretic Analysis. *European Journal of Information Systems*, 23(3), 357–372.
- Iyer, B., & Henderson, J. C. (2012). Business Value from Clouds: Learning from Users. *MIS Quarterly Executive*, 11(1), 51–60.

Session 3 — Scaling Enterprise Cloud and AI

- **M** van Giffen, B., & Ludwig, H. (2023). How Siemens Democratized Artificial Intelligence. *MIS Quarterly Executive*, 22(1), Article 3.
- **M** Berente, N., Gu, B., Recker, J., & Santhanam, R. (2021). Managing Artificial Intelligence. *MIS Quarterly*, 45(3), 1433–1450.
- Sagodi, A., van Giffen, B., Schniertshauer, J., Niehues, K., & vom Brocke, J. (2024). How Audi Scales Artificial Intelligence in Manufacturing. *MIS Quarterly Executive*, 23(2), 185–204.
- Hutzschenreuter, T., Lämmermann, T., Sake, A., & Ludwig, H. (2025). Successfully Mitigating AI Management Risks to Scale AI Globally. *MIS Quarterly Executive*, 24(3), Article 3.
- Benbya, H., Davenport, T. H., & Pachidi, S. (2020). Special Issue Editorial: Artificial Intelligence in Organizations — Current State and Future Opportunities. *MIS Quarterly Executive*, 19(4), Article 4.
- Bygstad, B. (2017). Generative Innovation: A Comparison of Lightweight and Heavyweight IT. *Journal of Information Technology*, 32(2).

Session 4 — Sovereignty as a design dimension

- **M** Hanseth, O., & Lyytinen, K. (2010). Design Theory for Dynamic Complexity in Information Infrastructures: The Case of Building Internet. *Journal of Information Technology*, 25(1).
- **M** Fratini, S., Hine, E., Novelli, C., Roberts, H., & Floridi, L. (2024). Digital Sovereignty: A Descriptive Analysis and a Critical Evaluation of Existing Models. *Digital Society*, 3(3), Article 59.

- Henfridsson, O., & Bygstad, B. (2013). The Generative Mechanisms of Digital Infrastructure Evolution. *MIS Quarterly*, 37(3), 907–931.
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FIRST SESSION: The Cloud and Enterprise AI Stack

Topic 1: AI architecture and the cloud/AI stack - service models, layers, MCP and related interoperability mechanisms, and the cost of abstraction

Topic 2: Economic mechanisms in infrastructure markets — scale, network effects, switching costs, data gravity, commoditization

SECOND SESSION: The Business Case

Topic 3: Sourcing arrangements —development, procurement, partnership, and rental; migration; contract provisions

Topic 4: AI unit economics and cost management — token economics, FinOps, cost per inference.

Topic 5: Use case assessment and total cost of ownership — automation suitability, cost structure, sensitivity analysis

THIRD SESSION: Scaling Enterprise Cloud and AI

Topic 6: Barriers to production deployment — data foundations, architectural constraints, lightweight and heavyweight IT

Topic 7: Operating models and production operations - working in cloud and AI companies; MLOps, value streams, scaling, monitoring, and cost ownership

Topic 8: Organizational adaptation beyond adoption - work-system and task redesign, augmentation and automation, organizational trust, agentic AI, and the agentic enterprise

FOURTH SESSION: Sovereignty as a Design Dimension

Topic 9: Dependence as a design variable —concentration risk, exit costs, control points

Topic 10: Jurisdiction and sovereign service offerings — data residency, access, cost, and assessment criteria

Topic 11: Regulatory and supply-side constraints - compliance, risk, security, and operational resilience (including the Digital Operational Resilience Act (DORA) where relevant); supplier contracts and compute supply

About the Lecturers

Jan Marco Leimeister is a Full Professor of Information Management and Director at the Institute of Information Systems and Digital Business (IWI-HSG), University of St.Gallen. He holds a doctorate and habilitation in Information Systems, obtained at the University of Hohenheim and the Technical University of Munich respectively. His research covers digital business and digital transformation, strategic IT management including cloud computing, service engineering and service innovation, collaboration engineering, crowdsourcing and digital work, and platform-based value creation. He is a Co-Editor of the *Journal of Information Technology* and serves on the editorial boards of *Information Systems Research* and the *Journal of Management Information Systems*. He has been ranked among the most

research-active business administration professors in the German-speaking region for over a decade.

Andreas Janson is a Research Group Leader at the Institute of Information Systems and Digital Business (IWI-HSG), University of St.Gallen. He obtained his doctorate in Information Systems from the University of Kassel with highest distinction. His research concerns the design of digital services and digital work, and enterprise cloud transformation in the context of digital sovereignty. His work has appeared in top journals such as *Information Systems Research*, the *Journal of the AIS*, the *Journal of Information Technology*, and the *European Journal of Information Systems*, among others.