A Comparative Historical Analysis of Sociotechnical Change in Germany and Japan:

Path Dependence and Institutional Complementarity in the Digital Infrastructure and Work Environment since 1950.

This project aims to reconstruct, on a sociohistorical level, the concepts of digitalization as a solution for the coordination problem in the company- and work-related organization of the automotive and electrical industry, and to compare Germany and Japan on an industrial-sociological level. This project’s methodology follows that of “Comparative Institutional Analysis.” The analysis of the path dependence aims to shed light on the change in digitalization and the work environment in Germany and Japan since the implementation of digitalization in the industry in the 1950s. The analysis of the institutional complementarity in the digital infrastructure aims to shed light, for both countries, on the relationships between the interdependent causalities leading to the stabilization or destabilization of the work environment as a result of digitalization. The project examines the systemic relationship on the macro and meso levels, in order to establish the continuity and change in digitalization and their effect on work organization.

The starting point of our research is an understanding of digitalization as spatio-temporally differentiated; on that basis, we seek to locate digitalization and the work environment within historical-diachronic change and topographic-synchronic continuity, for both the German and Japanese industries. Our study’s methodology is subdivided into a quantitative and qualitative area. For the quantitative research, we analyse and collect data via company surveys. In the qualitative section of our study, we use Qualitative Comparative Analysis (QCA) in order to determine specific German and Japanese configurations.

For our project, we focus on digitalization during four periods when certain production models were dominant, beginning in the 1950s.

1. Phase 1 (1950s–1960s): The beginnings of corporate digitalization

[Germany] Fordistic mass production

[Japan] Flow production

1. Phase 2 (1970s–1980s): Computerization / CIM vs. HdA

[Germany] Diversified quality production

[Japan] Lean production

3. Phase 3 (1990s‒2000s): Informatization and knowledge management

[Germany] Innovation-centred production

[Japan] Post-lean production

4. Phase 4 (2010s‒2020s): Digitalization und interconnectedness

[Germany] Industry 4.0

[Japan] Society 5.0

I define a “production model” as a system of interconnected institutions that tries to overcome the coordination problem in order to achieve efficient product manufacturing. A currently existing production model is made up of institutions that balance each other out, constituting the best solution at that particular moment; however, such a solution is constantly adapting and changing based on changes in the surrounding conditions. It is precisely these processes of transformation in digitalization that we examine from one period to another, in order to determine their causes and elucidate their effects on the work environment.