UNIVERSITÄT LIECHTENSTEIN

Process Science: Conceptual foundation for the interdisciplinary study of continuous change

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What we did

- **Processes** are sequences of actions and events, which take effect over time and in context. They guide our **everyday activities**, and they **dynamically change** over **time**.
- Since everything we do, see or experience unfolds in processes, the emerging field of **Process Science** aims to synthesize efforts from various disciplines to understand and design processes.

The studies in this project relied on a Process Science approach to gather novel insights on a broad range of process-related research questions.

Outcomes of this project

- Digital trace data served as a key instrument to develop new methodological approaches, uncover underlying drivers of process change as well as analyze and improve business processes.
- Results of this research project provide important contributions and implications for research in the fields of process science, business process management, routine dynamics, and for digital trace data research and they offer valuable practical contributions that can make an impact in the real world.
- Today, innovative technology makes it possible to visualize changes in real time – and Process Science uses this data to make important contributions to better managing change in business and society.

This is us

Process Science is based on four key principles; it (1) puts **processes at the center of attention**, (2) investigates **processes scientifically**, (3) embraces **perspectives of multiple disciplines**, and (4) aims to **create impact** by actively shaping the unfolding of processes.

Building on these principles, the studies in this project relied on a **Process Science approach to gather novel insights** on a broad range of process-related research questions.

Foundations for Process Science (examples)

	Question	Example
Prescriptive Process Science	How to "do" something?	How to design a process?
Predictive Process Science	What "will be"?	What effects are caused by a given process?.
Explanatory Process Science	"Why" is something?	Why has a process not been followed by users?
Descriptive Process Science	"What" is and "How" is something.	Describe processes in context and over time.

Some Publications

Paper presented at the European Conference for Information Systems (ECIS) 2023

STUDYING DYNAMICS AND CHANGE WITH DIGITAL TRACE DATA: A SYSTEMATIC LITERATURE REVIEW

Research Paper

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Abstract

Digital trace data offer promising opportunities to study dynamics and change of various socio-technical phenomena over time. While we see a surge of empirical and conceptual articles, we lack a systematic understanding of why, how, and when digital trace data are or can be used to study dynamics and change. In this article, we present the findings of a systematic literature review to uncover common approaches, motivations, findings, and general themes in the existing literature. We systematically reviewed 40 studies that were published in premium outlets in the information systems field. Our review sheds light on (1) underlying purposes of such studies, (2) utilized data sources, (3) research contexts, (4) socio-technical phenomena of interest, (5) applied analytical methods, and (6) measures that are being used. Building on our findings, we point to several implications for research and shed light on avenues to advance this field in the future.

Paper presented at the Hawaii International Conference on System Sciences (HICSS) 2023

Explaining Change with Digital Trace Data: A Framework for Temporal Bracketing

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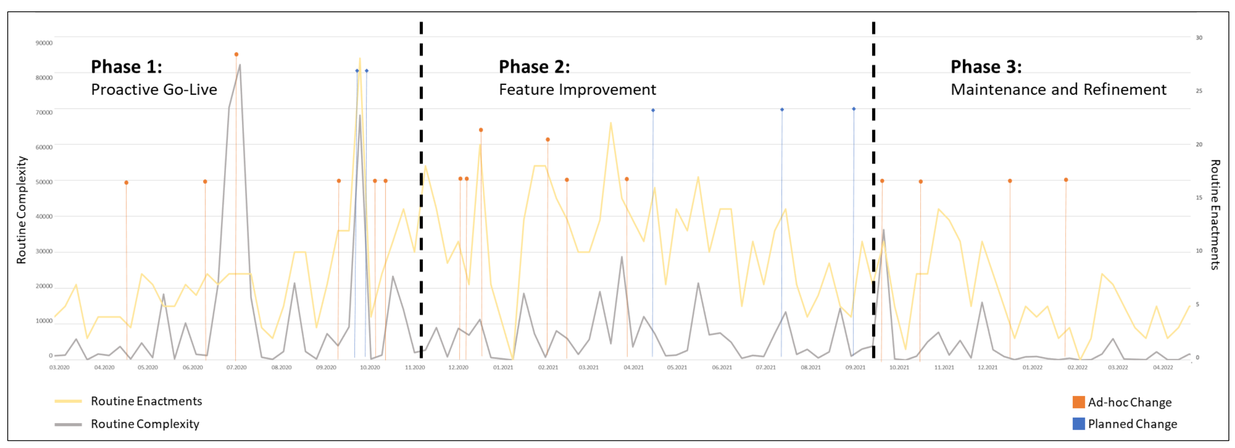
Abstract

Digital trace data, along with computational techniques to analyze them, provide novel means to study how organizational phenomena change over time. Yet, as digital traces typically lack context, it is challenging to explain why and how such changes take place. In this paper, we discuss temporal bracketing as an approach to integrate context into digital trace data-based research. We conceptualize a framework to apply temporal bracketing in the analysis of digital trace data. We showcase our framework on the grounds of data from an onboarding process of a financial institution in Central Europe. We point to several implications for computationally intensive theory development around change with digital trace data.

et al., 2020). While it is possible to obtain insights and identify patterns in digital trace data that might remain hidden in traditional manual-driven research approaches, what is often missing is contextual information to make sense of actors' reasons, motives, and decisions that drive change (Pentland et al., 2021). Recent studies indicate that one way to do so is to apply *temporal bracketing* (e.g., Pentland et al., 2020; Wurm et al., 2021). Grounded in traditional, manual-driven process research (Langley, 1999), temporal bracketing centers around the identification of stages, i.e., distinct temporal dynamics that are related to each other, as well as events that explain why and how these dynamics occurred. When applying temporal bracketing, "a shapeless mass of process data is transformed into a series of more discrete but connected blocks" (Langley

Drivers of Complexity in Organizational Routines

with Sophie Hartl, Thomas Grisold, and Jan vom Brocke



We look at **design interventions** on an **IS** (low-code platform) as **drivers of complexity** in organizational **routines**.

- **Financial institution**
- **Onboarding routine**
- > 2 years
- **Computational** (e.g., process mining) and **qualitative** techniques (e.g., interviews)

We find that complexity is mainly driven by **planned changes** (e.g., a new feature is added to the process) and **ad-hoc changes** (e.g., an issue in the software code is resolved with a bug fix).

Forschungsförderungsfonds

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