

Introduction to the Minitrack on Federated Industrial Platform Ecosystems: Technologies, Business Models, and Data-Driven Artifacts

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Abstract

Federated Industrial Platform Ecosystems include several different topics of high research interest. This minitrack allows reporting on novel insights and groundbreaking developments such as data spaces or generative AI.

Keywords: Federated Platform Ecosystems, Data Spaces, Data Products, Generative AI

1. Introduction

Several federated platform ecosystems emerged in the last years and included the development of a plethora of data-driven artifacts for manufacturing, logistics, or energy management. Using novel technologies and approaches lowers the entry barriers for industrial companies to participate in the federated platform economy and spurs digitization. For example, open-source technologies (e.g., Apache Kafka, Eclipse Vorto) and data-driven artifacts (e.g., smart services, distributed ledger technologies, or digital twins) help monitor, analyze, and optimize production and logistical operations. Furthermore, these tools provide an excellent level of transparency and foster trust. Yet, much research needs to be conducted on implementing and operating federated ecosystems based on platform technologies. Furthermore, the concepts directly affect the technical architectures and the underlying business models.

This track emerged from last year's HICSS minitrack 'Platform Ecosystems in Production and Logistics: Technologies, Business Models, and Data-Driven Artifacts' and was further refined to consider up-to-date developments, emerging from the research projects Silicon Economy, funded by the German Federal Ministry for Digital and Transport, and DIONA and GRIPSS-X.

A particular emphasis of this minitrack is the inclusion of novel technologies, such as distributed ledger technologies or digital twins, to facilitate digital business models or applications and foster the growth of sustainable and prosperous federated platform ecosystems. This minitrack aims to research innovative progress in digitization regarding industrial environments like production or supply chain systems. The first focus is on innovative approaches, such as open-source development as a strategic tool to conceptualize platform ecosystems and data-driven artifacts. The second focus emphasizes innovative business models to enable their development and instantiation. This includes papers on empirical studies from industrial contexts and theoretical works, further enhancing the overall canon of research. Additionally, reviews are welcomed under the condition that they provide novel insights.

The challenges of federated platform ecosystems and their data-driven artifacts include questions about the underlying concepts and architectures, data sharing and interoperability, data analysis and system optimization processes, data sovereignty, and data governance. Hence, this minitrack searches for papers that tackle these challenges and provide novel and innovative insights on open-federated platform ecosystems and data-driven artifacts in industrial contexts. Consequently, topics of interest included, but were not limited to smart service systems and federated platform concepts in industrial operations, business models for federated platform ecosystems and data-driven artifacts, open source strategies, data trustees and data sovereignty in digital ecosystems, design principles and procedure models for the industrial usage or the assessment, integration, and use of novel technologies (e.g., digital twins, generative AI) in industrial platform ecosystems

2. Federated Industrial Platform Ecosystems: Technologies, Business Models, and Data-Driven Artifacts

The track received eleven submissions, of which one submission was moved to another track as there was a better thematic fit. Of the remaining ten submissions, six were accepted for publication. Thus, the track achieved an acceptance rate of 60%. One accepted contribution was handled by the track chairs of the track ‘Internet and the Digital Economy’ for a potential conflict of interest. All six accepted submissions offer novel insights into different aspects of platform ecosystems.

The first accepted paper, ‘Openness Indicators for the Evaluation of Digital Platforms between the Launch and Maturity Phase’ by Rojahn and Gronau (2024), reports on influential indicators that drive changes in digital platforms and proposes a procedure for analyzing, categorizing, selecting and evaluating these indicators.

The second paper, ‘The Interplay of Data-Driven Organizations and Data Spaces: Unlocking Capabilities for Transforming Organizations in the Era of Data Spaces’ by Hupperz and Gieß (2024), focusses on the relationship between data-driven organizations and data spaces while focusing on current literature. The paper illustrates the capabilities required for organizations to participate in data spaces using the TOE framework.

The third paper, ‘The Adoption of Data Spaces: Drivers toward Federated Data Sharing’ by Hutterer and Krumay (2024), also addresses data spaces. They conducted an interview study identifying 12 data space integration and adoption drivers.

The fourth paper, ‘Integrating blockchain technology in supply chain management – a process model with evidence from current implementation projects’ by Gürpınar et al. (2024), identifies process models for the integration of information technologies in supply chains and develops a synthesized process model for the integration of blockchain solutions in supply chains.

The fifth paper, ‘Exploring Generative Artificial Intelligence: A Taxonomy and Types’ by Strobel et al. (2024), displays a morphological approach to the start-ups’ nature, which uses generative AI technology. Five types of generative AI, namely generator, reimaginator, synthesizer, assistant, and enabler, are identified.

The last paper, ‘Design Principles for Quality Scoring—Coping with Information Asymmetry of Data Products’ by Guggenberger et al. (2024), investigates data products, especially the related data

quality aspects. The authors identify meta-requirements from the literature and develop design principles for data scoring systems coping with information asymmetry for data products to enable efficient data markets.

3. Conclusion

All six accepted papers highly contribute to our understanding of federated platform ecosystems. They cover several aspects of industrial usage of platform-driven ecosystems and provide in-depth analyses. The contributions highlight the significance of data spaces, technologies such as generative AI, or data products.

This track was offered for the second time and continues successfully the endeavor of researching and displaying innovative results on information systems.

The submissions offer exciting and fast-developing topics that will transform the industry in the future. Hence, we look forward to adjusting this track and re-offering it for next year’s edition of HICSS.

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References

- Guggenberger, T. M., Altendeitering, M., Schlüter Langdon, C. (2024). Design Principles for Quality Scoring—Coping with Information Asymmetry of Data Products. In Proceedings of the 57th Hawaii International Conference on System Sciences.
- Gürpınar, T., Henke, M., Ashraf, R. (2024). Integrating Blockchain Technology in Supply Chain Management – A Process Model with Evidence from Current Implementation Projects. In Proceedings of the 57th Hawaii International Conference on System Sciences.
- Hupperz, M., & Gieß, A. (2024). The Interplay of Data-Driven Organizations and Data Spaces: Unlocking Capabilities for Transforming Organizations in the Era of Data Spaces. In Proceedings of the 57th Hawaii International Conference on System Sciences.
- Hutterer, A., & Krumay, B. (2024). The adoption of data spaces: Drivers toward federated data sharing. In

Proceedings of the 57th Hawaii International Conference on System Sciences.

Rojahn, M., & Gronau, N. (2024). Openness Indicators for the Evaluation of Digital Platforms between the Launch and Maturity Phase. In Proceedings of the 57th Hawaii International Conference on System Sciences.

Strobel, G., Banh, L., Möller, F., Schoormann, T. (2024). Exploring Generative Artificial Intelligence: A Taxonomy and Types. In Proceedings of the 57th Hawaii International Conference on System Sciences.