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Visual Representations in Financial Process Mining

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Process mining, introduced by Aalst in 2004, extracts process-related information from historical event logs and has become an essential tool for data-driven process improvements. Business process mining, an emerging and rapidly growing field of research, aims to analyse business processes by applying data mining and machine learning techniques to event data. Despite its novelty, process mining has quickly gained broad support due to its ability to provide fast, reliable, and ongoing insights for discovering, monitoring, and optimising business processes. Process mining enhances traditional Business Intelligence (BI) tools by offering detailed, micro-level analysis of process behaviour that complements the macro-level insights BI provides on overall business operations. Additionally, it plays a crucial role in digital transformation efforts, delivering deep insights that drive operational excellence. By bridging the gap between process science and data science, process mining has become an indispensable tool for fast-growing and ambitious manufacturing organisations. While modern business systems like CRM, Finance Management Systems and ERP capture extensive event data, visualising this data presents significant challenges. Translating complex, abstract process data into intuitive visual formats is critical but difficult, as it requires balancing clarity, accuracy, and comprehensiveness. Effective visualisations must highlight patterns, detect anomalies, and simplify interpretation for auditors and decision-makers, but the complexity of processes and volume of data can lead to misleading visuals. Aligning

visualisations with diverse stakeholder needs and ensuring they en-hance communication across teams is another challenge. Each task is designed based on the specific problem at hand, with a focus on the visual representation and comprehension of data. Process visualisation involves animating process executions in various formats. It can also be depicted through process cube operations, visualising dimensions of financial data, displaying process models as process maps, or using statistical diagrams and other visual techniques. This research explores these challenges by presenting examples of process mining visualisa-tions derived from historical event logs and discusses how visualisations can better support business decision-making.