Name: Paulo Rúben LOPES QUEIRÓS
Level 2: Mathias VANNESTE

Summary:

In recent years, there has been significant progress in enhancing data integration within models, driven by both academic research and industry demands, reflected in tools and other adaptive methods – as advancements in technology have led to a continuous increase in the volume of data being generated. This data originates from various sources.

To facilitate the adaptation, explainable artificial intelligence (XAI) models have been developed. These models enable human users to comprehend and place trust in the outcomes generated by machine learning algorithms. XAI models are applied in tasks such as process mining (PM), which for example can involve binary classification, utilizing datasets for analysis and decision-making purposes.

Conversational Process Modeling (ConverMod) is a transformative approach where domain experts engage directly with models to create, analyze, and refine process models. ConverMod applications cover various stages of the Business Process Management (BPM) lifecycle, including process identification, discovery, analysis, monitoring, implementation, and redesign – and key activities within each stage, such as gathering process descriptions, generating and assessing process models. Studies also suggest a growing preference for chatbot-like models among users (webUI friendly).

Tools have also been deployed, such as the RAW-SYS framework, used for formalizing processes and data models in computer programs, enabling rigorous verification of system behavior. It identifies three types of bounded information: global data store size, local data store size, and the number of concurrent cases.

There are also frameworks (e.g. SHAMASH) who automates process modeling, organizing activities and allocating resources to meet user requirements. It comprises four subsystems: the author subsystem for defining standards and processes, the simulation subsystem for identifying issues and optimizing models, the text generation subsystem for ensuring consistency in representations, and the workflow for translating models into a compatible language – Natural language processing (NLP) models employ contiguous sequences of *n* (n-grams) items, words or characters, extracted from a text or dataset. They are used to analyze patterns and relationships within the data to transform event sequences into vectors suitable for conventional machine learning models.

Knowledge Management (KM) plays a pivotal role. Firms meticulously comprehend and document their operational procedures establishing repositories of knowledge and such integration necessitates the fusion of business regulations with the organizational knowledge already archived in process repositories. Frameworks often exemplify an adaptive object-oriented (AO-BPM) approach, requiring firms to adapt existing structures during implementation, which is often challenging due to its impact on all operations.

Other than practical solutions in incorporating data integration within models, theoretical knowledge management solutions have also been developed for firms and their processes. The Delphi Methodology serves as an approach used for gathering and establishing consensus on key issues and challenges in process modeling, particularly in areas lacking empirical evidence. There are similarities in perceived problems among the stakeholder groups regarding standardization and model management consistently ranking among the top concerns across all three groups.

Future developments in these NLP-based models are expected to focus on exploring multimodal capabilities to process a wider range of data types. Incorporating features such as image and video processing alongside text analysis. This shift towards multi-modal capabilities represents one of the most anticipated transformative approaches to BPM, with the potential to reshape models across various industries.