

Title: Prescriptive Process Monitoring in Intelligent Process Automation with Chatbot Orchestration

Keywords: Business Process Management, chatbots, Robotic Process Automation, prescriptive process monitoring

This document presents a comprehensive exploration of Intelligent Process Automation (IPA) and Prescriptive Process Monitoring (PPM), focusing on their applications, methodologies, and challenges. It delves into the intricacies of IPA, which amalgamates various cutting-edge technologies like Robotic Process Automation (RPA), Natural Language Processing (NLP), Machine Learning (ML), and Artificial Intelligence (AI) to create digital workers capable of handling complex process automation tasks. The integration of these technologies promises enhanced process automation capabilities, enabling seamless interaction between humans and bots across diverse industries such as finance, human resources, operations, and sales.

The paper discusses Prescriptive Process Monitoring (PPM) methods aimed at optimizing processes in real-time. Techniques such as machine learning, deep learning, and reinforcement learning have been employed in this domain. The importance of explainability and causal inference in predictive business process monitoring is highlighted, along with the relevance of these techniques in conversational recommendation systems.

The MIP dataset, inspired by an internal IBM application in compensation and promotion, is described. It involves a multi-person business process with chatbot interactions, incorporating case ID and session ID for process identification. The use case involves team leaders and department managers in a software engineering organization, determining salary increases based on performance metrics.

Crowd-wisdom methods are explored to guide new users through IPA systems, leveraging the experience of advanced users to recommend actions. The focus is on predicting the next activity for users based on past interactions, excluding undesirable activities like fallbacks or disambiguations from recommendations.

Complementing crowd-wisdom, goal-driven prescription aims to optimize processes based on predefined goals. Using binary prediction techniques, the paper addresses deadline violations in the MIP dataset, showcasing the effectiveness of process-aware approaches in prediction accuracy.

The paper concludes by summarizing the contributions, including the introduction of the HR MIP dataset and implementations of crowd-wisdom and goal-driven prescriptions. Future research challenges, such as concept drift and handling complex utterances, are highlighted, paving the way for further advancements in IPA systems. Overall, the paper provides valuable insights into IPA and PPM, offering a comprehensive understanding of their applications and challenges in modern business processes.