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Summary on optimizing business processes with artificial intelligence: Maximizing benefits while controlling operational risks. »

This article explores the changing landscape of artificial intelligence (AI) and its profound impact on business processes. It highlights the rise of successful AI applications, attracting considerable interest due to their potential benefits and risks. AI not only improves the flexibility and efficiency of business operations, but also introduces entirely new business models. At the heart of this discussion is the essence of business processes, defined as interconnected activities aimed at achieving specific business objectives and delivering value to customers. Whether in creativity, education, commerce or manufacturing, every human endeavour can be modelled as a business process. These processes are triggered by events, such as a customer applying for a mortgage, and rely on data, such as the customer's credit history, to guide them towards their goals. The modernisation of business processes depends largely on advances in IT, enabling the integration of various data sources. This data is then processed, analyzed and condensed to predict future outcomes, such as the likelihood of a customer repaying a loan. These predictions inform decisions, leading to actions such as approving or refusing a loan, opening accounts or transferring funds. Historically, humans have played a crucial role in driving these processes, from data collection to decision making and action.

A **central model** presented in the article **illustrates the key activities in a business process, progressing from data to prediction, to decision, and finally to action.** These transitions build on each other, showing how predictions inform decisions that lead to action, while influencing future outcomes. This cyclical nature highlights the iterative and evolving nature of business processes.

Current trends in business process design focus on two key aspects: **case orientation and rules-based approaches, and the increasing reliance on Big Data.** Case-oriented processes enable dynamic progressions based on milestones, while rules serve as guidelines for decision-making and process automation. The adoption of Big Data, characterized by its volume, variety, velocity and veracity, provides invaluable information for improved decision-making and process optimization.

Artificial intelligence comes into play, a powerful suite of technologies perfectly suited to process re-engineering. AI can be seamlessly integrated into processes, either by supporting human decision-making through intelligent agents, or by completely automating tasks. The automation aspect has led to discussions about the potential for AI to replace jobs, a topic explored in the following sections. The article then focuses on three key AI technologies: **machine learning, decision/utility theory and search algorithms.** Machine learning aids prediction and automation, decision/utility theory offers insightful conclusions, and search algorithms optimise desired behaviors. These technologies, while powerful, also pose operational risks, a crucial consideration for companies venturing into AI integration. A **model is proposed for managing risk in various contexts, using control theory to establish stable AI-based business process designs.** The article concludes by summarizing the key concepts and benefits of each technology, paving the way for further exploration of the potential of AI in business process management.

In sum, this article provides a comprehensive overview of the role of AI in business process transformation, offering insights into its benefits, risks, and the strategic considerations necessary for successful integration.