

Servitization in Machine and Plant Engineering: Leveraging Generative AI for Effective Product Portfolio Management Amidst Disruptive Innovations

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Abstract : In the dynamic world of machine and plant engineering, stagnation in the growth of new product sales compels companies to reconsider their business models. The increasing shift toward service orientation, known as "servitization," along with challenges posed by digitalization and sustainability, necessitates an adaptation of product portfolio management (PPM). Against this backdrop, this study investigates the current challenges and requirements of PPM in this industrial context and develops a framework for the application of generative artificial intelligence (AI) to enhance agility and efficiency in PPM processes. The research approach of this study is based on a mixed-method design. Initially, qualitative interviews with industry experts were conducted to gain a deep understanding of the specific challenges and requirements in PPM. These interviews were analyzed using the Gioia method, painting a detailed picture of the existing issues and needs within the sector. This was complemented by a quantitative online survey. The combination of qualitative and quantitative research enabled a comprehensive understanding of the current challenges in the practical application of machine and plant engineering PPM. Based on these insights, a specific framework for the application of generative AI in PPM was developed. This framework aims to assist companies in implementing faster and more agile processes, systematically integrating dynamic requirements from trends such as digitalization and sustainability into their PPM process. Utilizing generative AI technologies, companies can more quickly identify and respond to trends and market changes, allowing for a more efficient and targeted adaptation of the product portfolio. The study emphasizes the importance of an agile and reactive approach to PPM in a rapidly changing environment. It demonstrates how generative AI can serve as a powerful tool to manage the complexity of a diversified and continually evolving product portfolio. The developed framework offers practical guidelines and strategies for companies to improve their PPM processes by leveraging the latest technological advancements while maintaining ecological and social responsibility. This paper significantly contributes to deepening the understanding of the application of generative AI in PPM and provides a framework for companies to manage their product portfolios more effectively and adapt to changing market conditions. The findings underscore the relevance of continuous adaptation and innovation in PPM strategies and demonstrate the potential of generative AI for proactive and future-oriented business management.

Keywords : servitization, product portfolio management, generative AI, disruptive innovation, machine and plant engineering

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