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As a subfield of artificial intelligence, machine learning (ML) represents a key technology of the 21st century. Using the mathematical-statistical methods, technical systems can be developed that independently discover empirical patterns on the basis of data and thus adapt their behavior to solve business problems in the sense of a system-based learning. According to the complexity of planning, controlling and monitoring tasks in manufacturing value chains, ML applications are considered to be of high relevance for the support and autonomous operation of logistics decision-making processes. For this field of logistics management, the dissertation investigates central questions concerning the use of ML. By studying the current state of research and by intensively involving the practice, possible use cases, corresponding effects with potentials and limitations, as well as necessary requirements are identified. The result of the dissertation represents a design approach that shows suitable measures for the fulfillment of these domain- and technology-specific requirements which are structured according to several areas of action. These range from infrastructural activities for the integration of data to organizational and procedural measures for conducting ML projects up to the management of changed roles for employees. Due to its

interdisciplinary and practical orientation, the developed design approach is a useful tool for companies to cope with the challenges of implementing ML in logistics management. Together with other deliverables of the dissertation, which also include the technical characteristics and future developments of ML, managers can acquire the expertise to successfully design the adoption of the technology and, at the same time, implement important framework conditions for the digital transformation of their enterprises.