Case Study

# PRODUCT LIFECYCLE MANAGEMENT SYSTEMS IN INDUSTRY 4.0 – A CASE OF AUSTRIA

**Keywords:** *Product Lifecycle Management, Production, Industry 4.0, Software, Automotive machine tools.*

## Background to Case Study

*In the last 30 years, Product Life-cycle Management (PLM) has been significantly transformed from a simple drawing management system into a cornerstone of enterprise IT. Before the rise of Industry 4.0., product management was a paper-based process. However, the huge amount of data produced with the rise of IT technologies and the emergence of CAD created the need of a new management system. Product Data Management, which is considered the ancestor of PLM was introduced in the 1980s. Although PDM was revolutionary for its time, it remained insufficient as it created an information silo, unavailable to be shared. These issues changed with the rapid development of Industry 4.0.*

*As the manufacturing process became much more complex, with the rise of Internet connected devices, leading companies started to adopt PLM methods and systems in order to ensure increased product lifecycle coverage and stronger integration of processes across the entire value-added chain. Nowadays, PLM is more efficient than ever, providing a centralized cloud-based system. (Spiegel, 2017)*

## Introduction to the Case Study and it's growth within Industry 4.0

*Product lifecycle management is the process of monitoring and managing the entire life cycle of a product from its conception to service and disposal. All products and services have certain life cycles. In industry, product lifecycle management (PLM) includes people, data, processes, and business systems and provides a product information backbone for companies and their extended enterprise.*

*The life cycle of the product refers to the period from the beginning of life to the end of life and its split up into nine major steps (see graph below). Each of the steps is of crucial importance for the design and development of a product.*

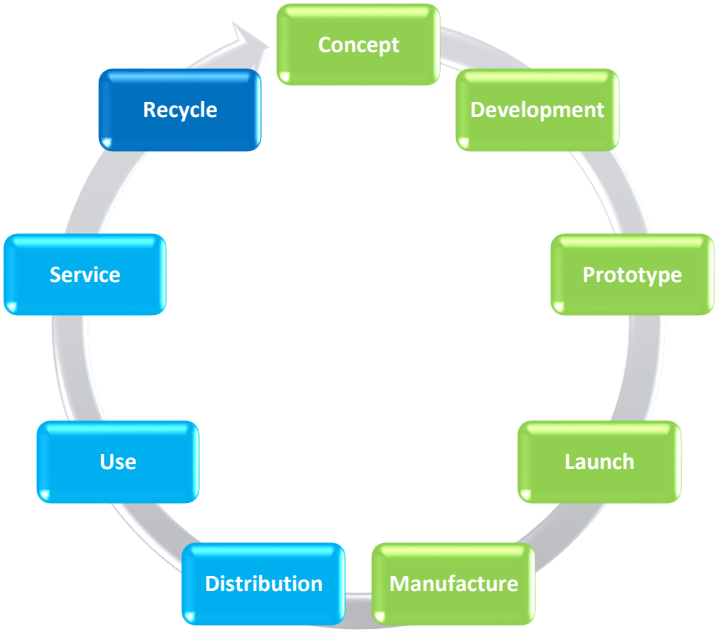
*It should also be stated that the lifecycle of a product changes continuously. These changes require continuous adjustments in the new data.*

*In today's challenging global market, people are looking for a way to use computer technology in order to solve complex problems in industry. PLM seeks to address these issues by minimizing the waste of information, resources, and materials. The PLM system supports the product development process by integrating people, processes, data, tools, and business systems and providing information about companies and their expanding businesses. (NTT Data, 2015)*

**Project No. 2019-1-PL01-KA202-064936**

## The Case Study and Industry 4.0 Elements: A Pictorial Overview

*The following graph shows the Product Lifecycle Management process. PLM has three overarching stages: The Beginning of life which includes the initial conceptualization and development, the Middle of Life, which is the post-manufacturing phase, when your product is distributed, used, and serviced and the End of Life which starts when users no longer have a need for the product.*

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| **The Element Explored within Industry 4.0 Application** | *Anger Machining is a company founded in 1982 and based in Austria, with subsidiaries around the globe (Germany, United States, and Japan). Its specialization is the development and production of Transfer Centers for the automotive and metalworking serial machining components. The company has faced several challenges over the years, as there was a demand for increased productivity and flexibility, along with precise market requirements and batch size reduction.*<br><br>*Therefore, the company acquired the right to use PLM technology by Siemens. Consequently, it managed to regulate transfer lines and machining centers in a faster and more flexible way, resulted in reduction in product cycle time due to their simultaneous function, thus saving space area of the facilities, energy, and maintenance and lifecycle costs. In its transfer centers, machine reconfiguration for new parts became easier by combining technology with investment protection in a maximum level. Moreover, machines and modules were designed using Solid Edge software and thus, protecting data consistency. The company also enabled the option of using bettered numerical control (NC) programs that detect and prevent collisions automatedly. Furthermore, the data are managed, processed and analyzed by Teamcenter PLM.*<br><br>*As Roland Haas, Head of Technology and R&D of Anger Machining, states, "with comprehensive simulation of the machining processes based on NX CAM from Siemens Digital Industries Software, we offer our customers improved efficiency and process reliability and were able to significantly improve our competitiveness".*<br><br>*The numerous results of using PLM technology are positive for Anger Machining. The company managed a 30% reduction in engineering cycles, a 20% reduction in design costs, and a 100% collision freedom. It also applied a design principle in forms of modules and reduced project lead time consumption (Siemens, 2021).* |
| **Application Target Audience** | *The results of the case-study are intended for use by SMEs, Enterprises and Entrepreneurs.* |

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| **Resources Used:** | *- "A Brief History of PLM", by R. Spiegel. (2017). Available here.*<br><br>*-"PLM as Enabler for Industry 4.0", by NTT Data. (2015) Available here.*<br><br>*- "Ultimate Product Life Cycle Management Guide", by Smartsheet. (2020). Available here.*<br><br>*- "Automotive machine tool maker uses Teamcenter to reduce engineering cycle time by 30 percent and to map engineering and manufacturing bills of materials", by Siemens. (2021). Available here.* |
| **Further Reading:** | *- "Product Life Cycle Management in Industry 4.0", by S. Salimbeni. (2020). Available here.* |

**Project No. 2019-1-PL01-KA202-064936**