

Development of an ERP-Centric Web-Based Configurator for Aluminium Profiles

A Parametric Approach to Automating the Sales-to-Production Workflow

Graduate



Marco Oliveira

Introduction: The manufacturing of customized aluminium profiles at ODAN GmbH follows an Engineer-to-Order (ETO) approach and relies on manual processes. Unstructured customer requests, such as emails or sketches, must be manually interpreted and entered into the ERP system, resulting in repeated data entry. These media breaks increase effort, raise error risk and limit scalability. Due to the variable geometry of aluminium profiles, a classical Webshop approach is insufficient, creating the need for a consistent digital sales-to-production workflow with parametric product definitions and centralized ERP data.

Approach / Technology: Within this thesis, a web-based parametric configurator was developed and integrated with ERPNext. The configurator enables the geometric configuration of aluminium profiles directly in the browser while retrieving product and pricing data from the ERP system in real time via REST-based interfaces. Parametric modelling supports continuously variable parameters such as profile length and cutting angles.

The configurator was implemented using DynaMaker, code-driven parametric modelling platform for geometry generation and real-time visual feedback. Customer-defined configurations are translated into structured, ERP-compatible business data.

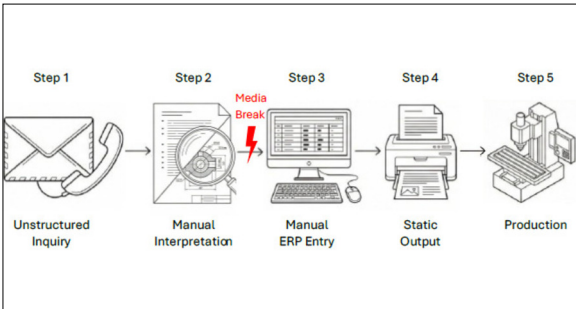
The system follows a strict Single Source of Truth principle, with all authoritative product and commercial data maintained in the ERP and the configurator acting as a passive client. Production-relevant information is provided digitally as structured task cards using a Kanban-based workflow system (Trello), replacing static, paper-based work instructions.

The configurator platform was selected based on a structured market and utility analysis focusing on technical flexibility, ERP integration capability and data ownership.

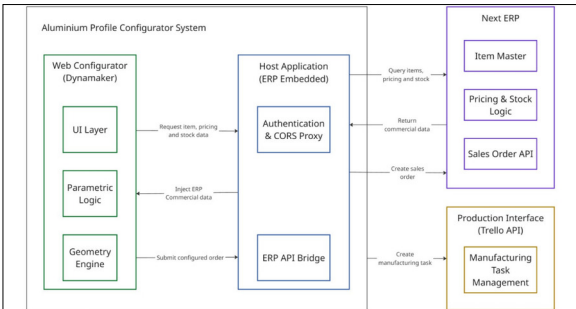
Result: The prototype demonstrates that customized aluminium profiles can be configured fully digitally and transferred automatically into ERP sales orders. Based on validated configuration parameters, structured production information is provided digitally to manufacturing, replacing manual drawings and paper-based instructions.

The results confirm the technical feasibility of an ERP-centric sales-to-production workflow for ETO products. While the prototype targets manual production, the underlying data structures are automation-ready, providing a scalable foundation for future production automation.

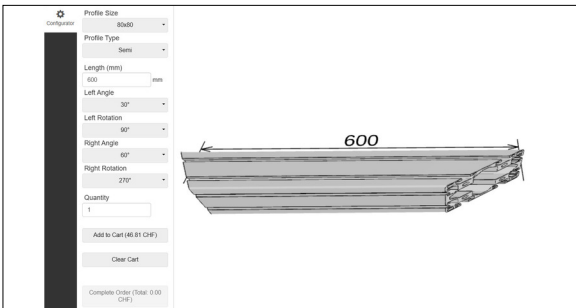
Manual sales-to-production workflow highlighting the media break between interpretation and ERP entry. Own presentation



Component diagram of the aluminium profile configurator and its integration with ERP and production systems. Own presentation



Configurator-Webpage showing configurator initialization and item resolution during startup. Own presentation



Advisor

Prof. Dr. Felix Nyffenegger

Co-Examiner

Marco Egli, Intellia AG

Subject Area

Product Development, Information Technology for Mechanical Engineering

Project Partner

ODAN GmbH, Mönchaltorf, ZH