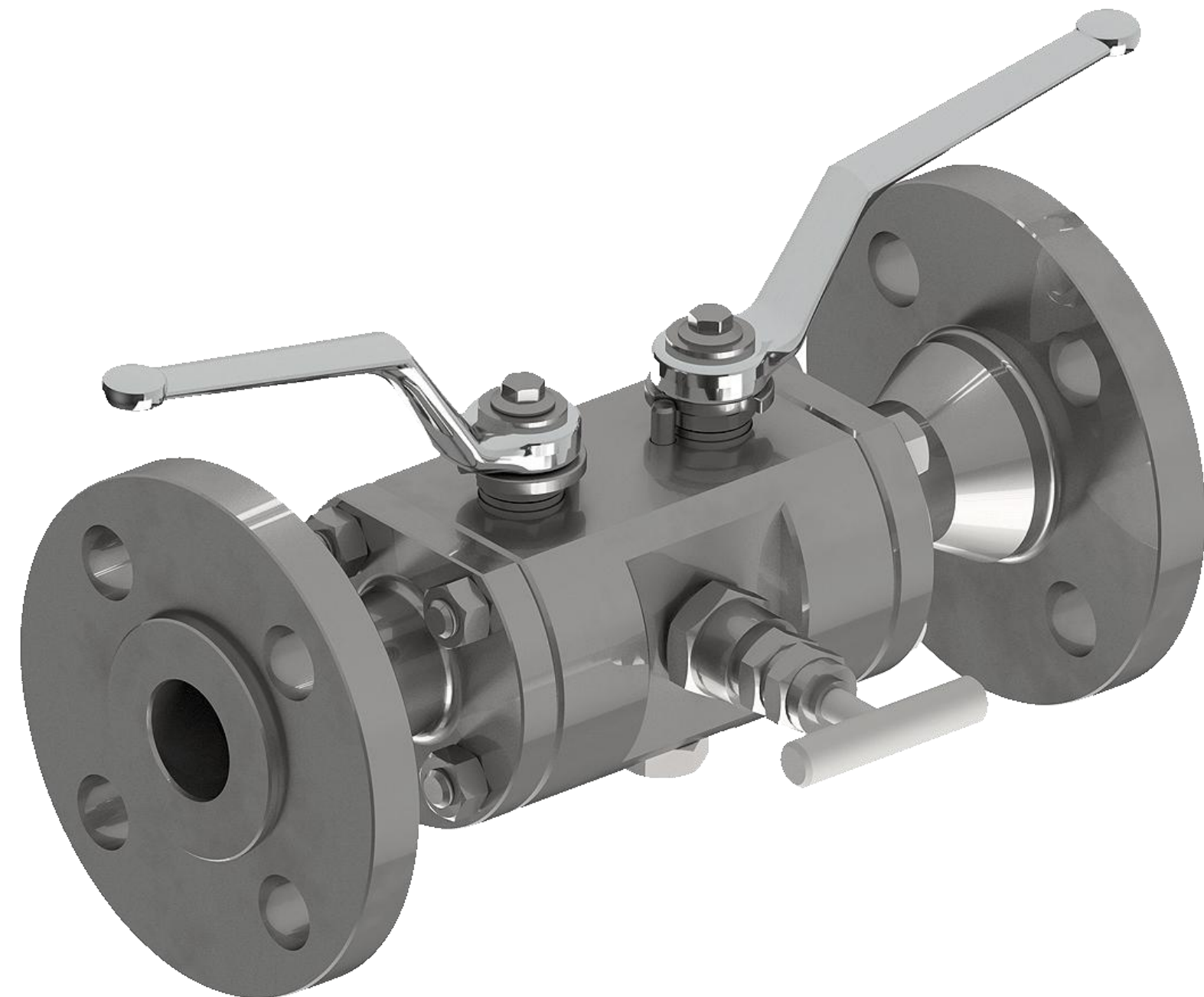


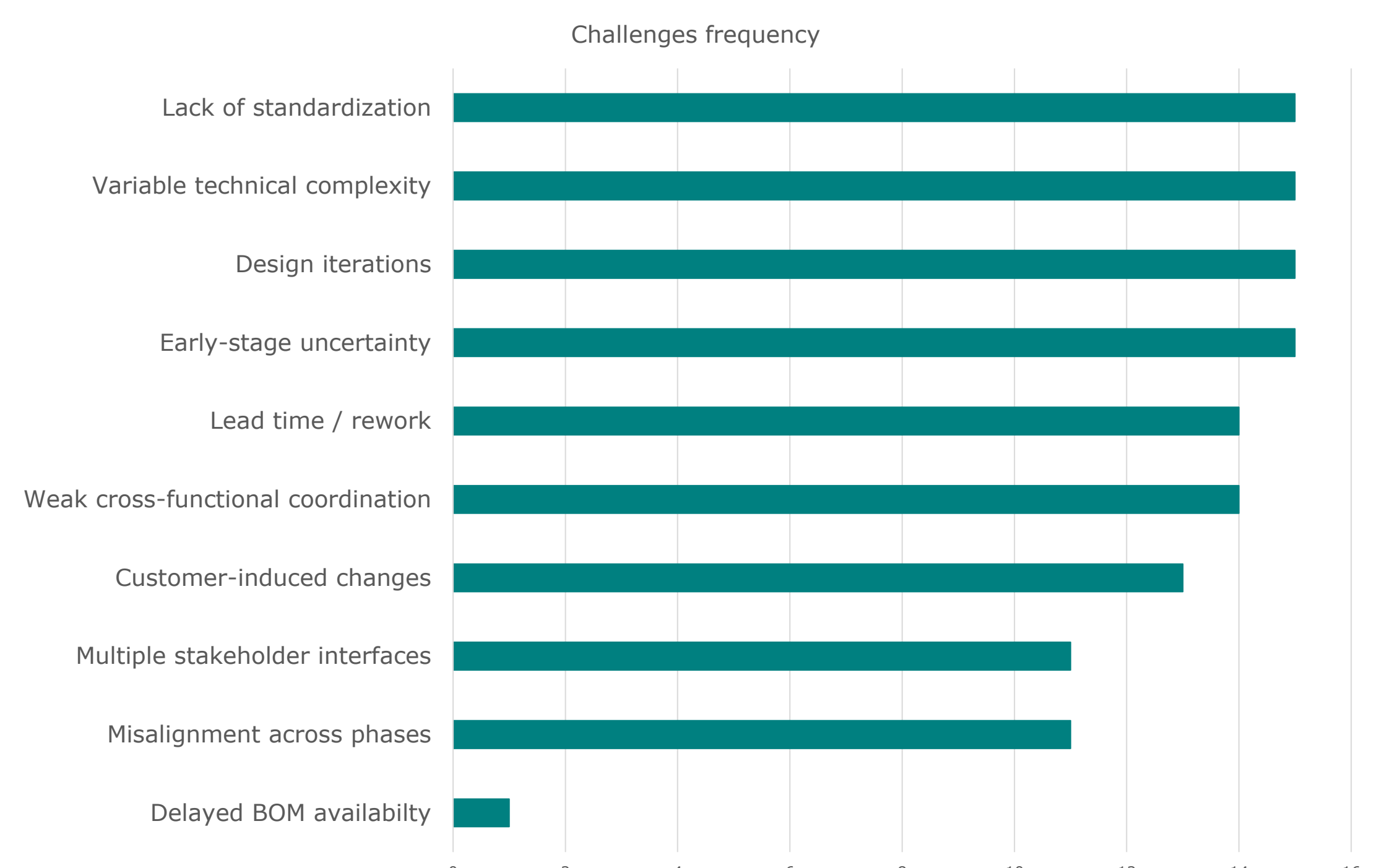
Master Thesis in Business Engineering

Enterprise change management in engineer-to-order environment

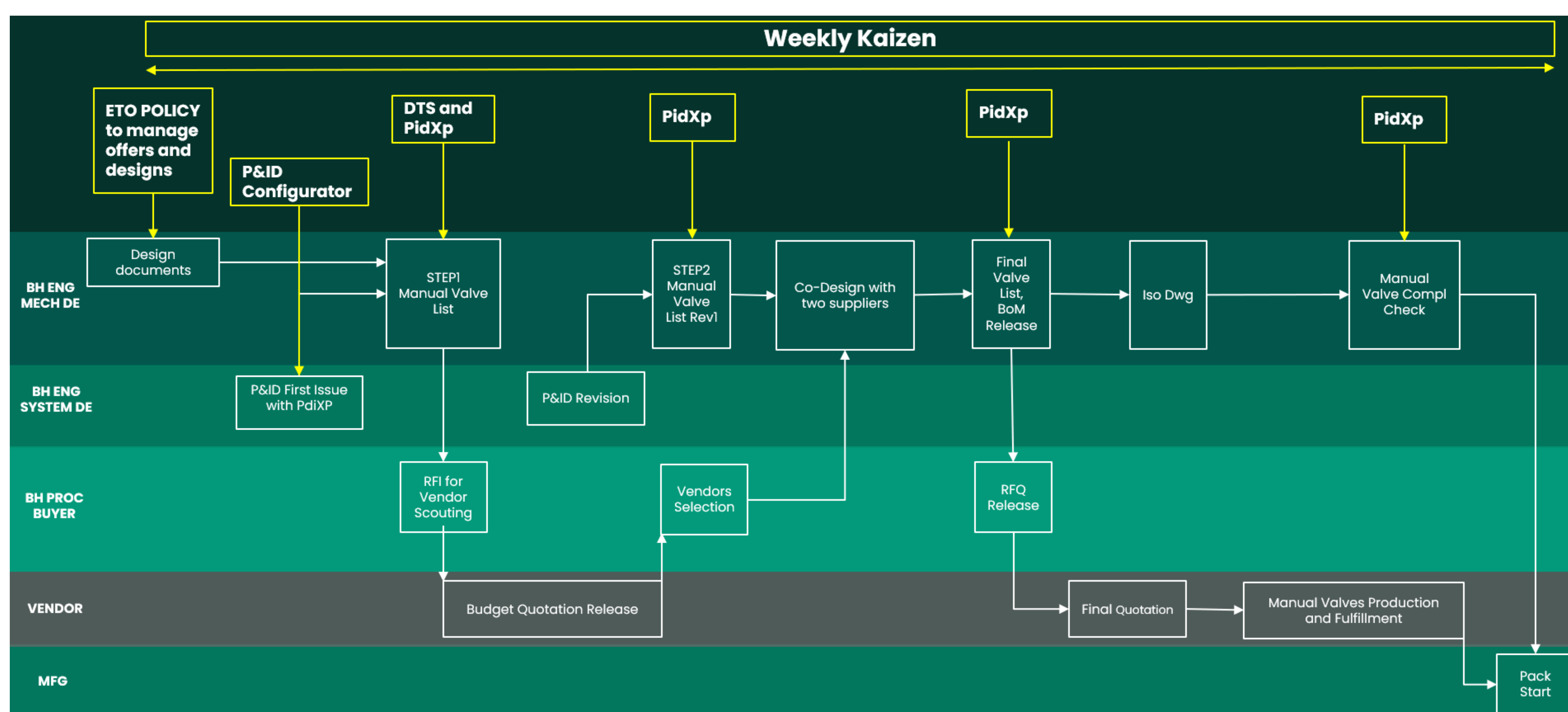
A Baker Hughes case study



Double block and bleed manual ball valve



Key challenges in ETO commodity selection from literature



Valve procurement process flow with highlighted improvement actions covering all phases

Problem statement

This thesis analyzes the causes of enterprise change requests (ECRs) related to manual valves and proposes solutions to reduce their occurrence. The project was developed in collaboration with Baker Hughes, a multinational energy and technology company. An analysis conducted by the Management of Change Cell in 2024 revealed that manual valves are among the most affected components, accounting for 58 critical ECRs, 47 of which were opened after the purchase order. Their high number, customization, and widespread use make them vulnerable to late technical changes. This fragility is amplified by early co-design with suppliers, which allows engineering and procurement to begin simultaneously to meet deadlines. However, evolving technical requirements can conflict with initial selections, triggering critical ECRs. Consequences include overloaded engineering teams, inefficiencies in the supply chain, delivery delays, and reduced customer satisfaction.

Solution concept

Two actions were introduced to improve the creation of valve lists and reduce ECRs on manual valves: a standard template that recommends types, sizes, and ratings of valves installed on piping, and a digital tool called PidXp that automates the filling of valve attributes and list generation from P&ID, reducing manual errors and inconsistencies.

Results

The project resulted in a standardized process for managing manual valves. This process is supported by a digital tool that automates the extraction and verification of valve lists, thereby reducing errors and inconsistencies. KPIs were defined using the ANP method and tailored to the operational context to monitor effectiveness. Although the reduction in ECR is not yet measurable, control actions have been implemented to ensure long-term sustainability. These include formalizing roles, updating tools, and reinforcing Kaizen routines.

Now, an ETO document supports bidding and design in line with the DTS, and a P&ID configurator guides valve selection based on standardized criteria. Additionally, work instructions for PidXp have been published. A weekly Kaizen routine monitors all process stages. The goal is to reduce ECRs by 50%, and these concrete improvements make this target appear realistic and achievable.

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