Research and Development of Components
Using Additive Manufacturing

Overview
Since many components in axles and transmissions require expensive cost of material, energy and time due to complex machining, Volvo wanted to use additive manufacturing method to reduce the cost and improve the performance such as durability, quality assurance and organizational knowledge. The aim of the project is to design both a novel component as well as a development of an existing design for media transfer using AM. This project will include the design and structural evaluation of a novel as well as improved media transfer component using different AM methods with respect to cost and quality. The outcome of the project should be a chosen design, defined requirements on the selected AM process and business case calculations to be used as decision support.

Objectives
- To minimize number of parts in the transmission by using AM method
- To redesign the shapes and internal canals to minimize the cost along with providing the best performance

Approach
- Analyze the existing components by breaking down the component to each small part
- Research different materials we can use for Additive Manufacturing method
- Research different types of Additive Manufacturing methods
- Using concept generation and selection create different structural and canal designs
- Performed computational fluid dynamics on original and redesigned canals

Outcomes
- We were able to reduce the number of parts such as the number of screws, since we print the finalized part on a single base plate
- We were able to minimize the complexity of the design using Additive Manufacturing method
- The performance of the system was improved, since we shortened and minimized the length of the canals and number of turns of the canals