

Introducing additive manufacturing in a product development process

Additive manufacturing (AM), is developing at an exponential rate and is today a mature technology for prototyping. Introducing AM as an alternative for prototyping in a product development process increases the need for a decision-making model for prototype realization. As AM has the possibility to cover the gap between prototyping and serial-manufacturing, it allows new ways of thinking during the planning process in a product development process.

This thesis project is focusing on introducing additive manufacturing in a product development process at Atlas Copco Construction Tools. In Kalmar, Atlas Copco is developing, manufacturing and markets hydraulic, pneumatic, and petrol driven equipment for demolition, compaction, rock drilling and concrete applications. Initially during this thesis project, interviews were conducted with employees from different areas within the organization in order to explore needs when prototyping to use as a foundation to the research method Design thinking¹. In an iterative process, a decision-making model was developed where needs from employees and inspiration from case studies were integrated in the model.

Making trade-off decisions

When making decisions on using AM in a product development process it is important to consider both quantitative and qualitative factors. For some components and materials, using AM will be costly but increase the flexibility during a product development process. By combining proven

qualitative and quantitative decision-models, the intangible factors as flexibility can be put against costs in order to make decisions and find the relative advantage of using the technology.

“We want to test prototypes that are as close to the final result as possible. That is, what is going to be produced in serial-manufacturing” – Pontus Andersson, Lab Manager, Atlas Copco Construction Tools.

When introducing AM in a product development process, some needs are not possible to meet and the requirement that only test the components produced with the methods associated to the final part production has to be eased on. By using the technology strategically, it has the possibility to cover the gap between prototyping and serial-manufacturing in order to decrease the time-to-market for injection molded components, cast components and complex metal components which requires CNC-machining.

Future research

As AM is stepping towards industrialization, the need for a decision-making model for final part production will be interesting for many industries and companies in the near future. Future research within the area, with this thesis project as starting point, has the possibility to generate a decision-making model adapted for future needs.

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¹ Brown, T. Design thinking, Harvard Business Review hbr.org, (2008).