

The art of constructing a machine

Say the words “mechanical engineering” and many people think of cogwheels and bolts. If you ask researchers **Tobias Larsson** and **Sharon Kao-Walter**, they will give you a different picture of a field which is facing interesting challenges.

■ Mechanical engineering is not about the machine as such, but rather the engineering which allows it to work – regardless of whether it is an aeroplane or a tram. This is how professor Tobias Larsson describes his research field when we meet him and his colleague Sharon Kao-Walter in a laboratory environment at BTH.

“Research in mechanical engineering at BTH is unique within value-driven development, i.e. we focus on the perceived value for the end customer, which is not always the case in the industry”, says Tobias. “Our contribution to research is the ability to combine methodology for product and service innovation with computer-supported methods. These methods help manufacturing companies to work on product development using simulation”.



From challenge to result

Tobias Larsson describes a typical research project:

“The aviation industry is constantly testing new ideas and materials. Let’s say they want a new engine which weighs less and consumes less fuel. The solution is not obvious, but must be investigated. Together, we draw up a joint plan for how the research is to be conducted. Then we look for funding, implement the study and publish the research findings. Sometimes this can result in a new patent which the company wants to own. In that case we give them an opportunity to apply for it before we publish our results”.

Research for improvements

The research mainly studies general methods, as many industries are facing similar challenges.

“In individual projects we can get more product-specific”, explains Tobias. “One example is the laminating of carton material on which Sharon is working. This is about packaging, but the knowledge can still be applied in other areas”.

“We go into more depth on issues that companies do not have the opportunity to study in the same way”,

KARLSKRONA MAKERSPACE

Professor Tobias Larsson and research assistant Babak Kianian have created Karlskrona Makerspace, a research and education environment at BTH. Its aim is to promote creativity in an open learning environment where innovative solutions are found for some of today’s challenges.

Here both students and companies can experiment and rapidly build prototypes and test their ideas. It is an environment which quite simply allows space for creativity.

says reader Sharon Kao-Walter. “If the companies have a process which is not optimal, we try to identify solutions and improvements”.

The engineers of the future

Tobias Larsson emphasises that tough challenges await the engineers of the future.

“The customer wants to know the product’s service life, sustainability profile, what it costs to produce and to operate, whether it can be upgraded and so on”, he explains. The development time is to be reduced, the product is to be better than its predecessors and if possible cheaper. At the same time, the company has to be competitive. Previously, the engineer’s toolbox contained hammer and nails. Now it has to contain fact-based methods which help engineers to consider all aspects.

“Our research is to lead to improved manufacturing and, in the long term, to provide people with a better quality of life”, concludes Sharon. “In this job, I feel that we are actually delivering this. I don’t need to receive a Nobel Prize in order to feel that I am being useful”.

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