Why do we make wrong decisions and which are the consequences? How should we deal with uncertainties in an industrial concept phase in order to ease our colleagues’ daily life? These were questions which Ingrid Kihlander thought a lot of when she was accepted as industrial PhD student at Volvo Car Corporation in 2007. This autumn she will defend her thesis at the KTH Royal Institute of Technology, within the framework of PIEp.

“During the concept phase a lot of things happen. The situation is often uncertain and abstract, nothing is clear, you have shaky background material and perhaps the technologies are not yet fully developed. Also, the customer demands must be respected. At the same time, there are a lot of regulations from the authorities to be considered.”

As presented by Ingrid Kihlander, the concept phase of a complex product development seems extremely difficult to approach. Ingrid started as industrial PhD student at Volvo Cars in Gothenburg 2007, with the aim to improve the decision-making process during the concept phase. She describes her own experiences from operational work: “I had a top team of colleagues, but still it was hard to know if you had done the right thing! I started to think that there must be a way to improve the way of working. A few percent in the right direction could be worth a lot.” If you can make reflected and sound decisions already at the idea/concept stage you have a lot to gain, Ingrid explains. Then one does not have to make costly adjustments and additions during the following phases of the product development, at least not to the same extent as before. Regarding cars, there is a lot of money to be saved.
When she started her PhD studies, Ingrid’s driving force was to better understand the decision-making process: what was decided, how was it done, and what influenced the decisions? Which were the alternatives, and which were not thought of? At her workplace, various types of support for this were available, but apparently they were not sufficient. “The focus question is: How do I ease the development team’s daily life?” says Ingrid, regarding the connection to Volvo Cars. She continues: “The questions and problems you face in the concept development phase are often hard to catch, soft and informal, so in order to continue, they must be made visible. It must be possible to make better decisions.”

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Ingrid’s professional background is MSc in Mechanical Engineering at KTH Royal Institute of Technology, focusing on integrated product development. She made her master thesis at Volvo Cars in Gothenburg during spring 2000, shortly after the company had been bought by Ford. Her essay had various working processes in focus. Ingrid enjoyed working at Volvo Cars and was employed as an internal change leader immediately after completion of the thesis. After a few years she changed direction and worked with more hands-on engineering in a development department, primarily with the popular car models V70 and XC70.

“There I became aware of the tough restrictions connected to the work”, says Ingrid. She exemplifies: “It’s about legal requirements, but also that you are controlled by a particular technology, and the need to take into account the logic of completely different systems, beyond your control. For example, some systems in the car developed now should be used in the cars that will be developed in two years. This makes it extremely complex!” Ingrid is happy that her interest in these issues was also shared by her department director. This meant that she had great support of her application to become an industrial PhD student. At Volvo Cars, this is a selection process where both the project and the individual are evaluated. Her application was approved 2006, and in early 2007 she began her doctoral studies at KTH and the Division of Integrated Product Development, IPU.

"IPU at KTH was the obvious choice, they were interested in the question and I knew they had a bottom up as a central approach in their research. This suited my issue well", says Ingrid. "It also coincided with the start of PIEp, so one can say that I have been involved in the programme from the very beginning".

According to Ingrid, PIEp has been a great support during her time as an industrial PhD student: “The people of PIEp and the network of senior researchers and PhD students I have gained access to have meant a lot to me. The other aspect is all rewarding activities I have experienced: the research school with extensive and interesting courses, the training in article writing, and especially all the interesting conferences and visits abroad. I am very grateful to Martin Grimheden, at the time head of the PIEp research school, who helped me to get an invitation from Larry Leifer so I could study at the Center for Design Research at Stanford University.” This was in...
autumn 2009. Ingrid’s journey began with the ICED conference (International Conference on Engineering Design) in August and ended a few weeks after New Year at the Volvo Cars’ Concept Center in California. “It was worth very much! It will be of great use for the rest of my life”, says Ingrid.

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Soon Ingrid will defend her thesis, and one has to ask: How have the research and results been received at Volvo Cars? Ingrid has been giving feedback of the results of her studies in various ways, both briefly in the form of seminars, and in depth with a limited crowd. She concludes: “When I have tried to work with the issues on a smaller scale at seminars, it has generally been well received, with several insights among colleagues. Comments like "can we talk more about this?" and "knowledge is power" have appeared. It is clear that it becomes like a mirror and that you become conscious of your own way of working. When I worked more in depth with what you, as an employee, can get into your daily processes, the result has been largely positive. Even if it has been done on an extremely small scale, it is clear that just being able to control the ability to stop and reflect in everyday life is worth a lot. I have noticed that on both my industrial supervisor and my managers. I just scratch the surface but it may still have a considerable impact in an organization as large as Volvo Cars. Just by being there you create a ripple effect.”

Since Ingrid’s work is so applied, and hopefully will give concrete results in a large company, one may wonder how to measure the impact of her work. Is it possible? Ingrid explains: “For example, one could continuously measure the change money, i.e. the resources you need to adjust the previously taken decisions and actions, and see whether it decreases. But it would be naive to think that we could get accurate numbers there. It would be more interesting to measure the increased number of reflected decisions in order to obtain a kind of quality indicator. It ensures in itself no positive results but it would still be able to give a kind of probability indication.”

According to Ingrid there is no concrete plan for her work after the defense, but there are different ways to go, depending on her own motivation and possibilities within the company. Either she will become a specialist and support operational managers in their daily lives, or she could go into more depth, have an operational role and work through concrete examples. It is much up to her how it should be, but as she says that is also what is expected of an industrial PhD student. She will keep her contacts with PIEp. “After my dissertation, I will try to find a way to continue being a part of the network, because it gives a lot”, concludes Ingrid.

Volvo Car Corporation has its headquarters in Torslanda outside Gothenburg, Sweden. The units for product development, marketing and administration is also situated there. After being a part of Ford Motor Company for about ten years, the company was bought in 2010 by the Chinese Zhejiang Geely Holding Group. The number of employees is about 19,500, with just about 13,000 in Sweden. During 2010, the company sold over 370,000 cars. Source: Volvo Cars Corporation (2010), Företagsrapport med hållbarhet (in Swedish).