VIPP VALUES CREATED IN
FIBRE-BASED PROCESSES
AND PRODUCTS

THE VIPP NEWSLETTER #5

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CROSS-OVER KNOWLEDGE FOR A COMPETITIVE WORLD

Thank you all who participated in the autumn meeting at Metso a few weeks ago. The meeting included an annual meeting, which approved the annual report for 2012, the half-year report for 2013, and information about VIPP +. Jenny Lathi- Samuelsson and Karl-Johan Tolfsson from Metso gave interesting presentations on co-operations and new products. Two doctoral students talked about their research and day was concluded with a guided tour. Metso shared their experience and thoughts in an interesting dialogue where two aspects became clear; (a) the need for a mature line of business in a highly competitive world to focus on both cost-efficiency and new solutions adding to customer value and (b) the need to promote the name, branding. Both aspects confirm my belief that VIPP Industrial Graduate School has a concept which is highly important and valuable to both academia and business. The role of the university in providing both research and highly educated next generation of staff was highlighted by the presenters from Metso. I am convinced that the combination of chemical engineering, energy and environment and service innovation within VIPP, giving our doctoral students cross-over knowledge, will meet these expectations. The ability to be flexible, to combine skills from different areas are becoming increasingly important in this highly competitive international sector. As Mr Tolfsson of Metso put it “We need to use new knowledge quicker and the ability to think outside the box is perhaps the most important challenge for Swedish industry”

Prof Lars Järnström, program director
of VIPP Industrial Graduate School

VIPP stands for Values created in fibre-based processes and products and is an interdisciplinary industrial graduate school located at Karlstad University.

KAU.SE/EN/VIPP

KK-stiftelsen

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VIPP AUTUMN MEETING LOOKS TO THE FUTURE

Hosted by Metso Paper in Karlstad, the Vipp autumn meeting offered updated information about the doctorate projects as well as the overall development of the graduate school. The Vipp group was also given an interesting insight to the success and challenges of Metso Paper as well as a guided tour of the premises.

Vipp chairman Louise Törnefalk Svanqvist introduced the autumn meeting with a few reflections. Karlstad University has qualified to an extended graduate school – Vipp plus, which means that approximately another four doctoral students will join and more partner companies will follow. The steering group and the board have also developed a more defined business process. Louise Törnefalk Svanqvist also pointed out three areas of improvement: Individual study plans for doctoral students must be updated and used as a working tool, the University needs to communicate what they offer in a more efficient way to participating companies and there is an unbalanced situation between technology and service oriented research.

Director Lars Järnström guided the meeting through the biannual report 2013 and the annual report 2012 as well as the financial status. The annual report of 2012 has been approved by the KK-foundation. Courses planned for 2014 were also presented and they are: Service management, Scientific Writing, Sustainable development followed by two potential courses – Mathematical modeling of forest industrial processes and Value added processes by coating and printing. The dates for the courses are yet to be decided.

During the autumn meeting, two doctoral students gave a presentation each. Åsa Nyflött told the group about her project where the main goal is to understand the mass transport through oxygen barriers and Asif Javed discussed the use of starch as a barrier in packaging.

New research to find the path forward
Jenny Lahti-Samuelsson, production manager of Metso Paper Sweden, gave an interesting presentation of Metso Paper in Karlstad, with its 565 employees and around 100 rented consultants. It's the company that makes the machines that make paper. She revealed that a change of name lies right around the corner. For the people of Karlstad – and for a number of long time customers- it will be a familiar name coming back: Valmet.

This is an extremely competitive line of business and over the years we have seen companies disappearing. Our biggest challenge is to find creative solutions adding to customer value and to promote our name. Branding is something we need to pay far more attention to, Jenny Lahti Samuelsson said.

Karl-Johan Tolfsson, R&D manager of Metso Paper Sweden, gave an overview of the world capacity today when it comes to machine manufacturers. He also discussed what qualifications – and qualities – the company is looking for in future employees.

The next generation of personnel must be skilled technicians; there is no doubt about that. But they must also be driven, have the ability to take initiatives and to find new solutions. They must see what needs to be done – and do it.

Karl-Johan Tolfsson also wanted to see more innovative research within this mature and developed business line.

New research must be done and old "truths" questioned. We rely on very old knowledge which may or may not be accurate today. New ideas are needed, ideas that take into consideration all the development that has been forward. I look forward to the next leap – what is our path forward?

The Vipp group outside Metso Paper in Karlstad

Jenny Lahti-Samuelsson gave an interesting presentation of Metso paper

The poster exhibition, presented by the doctoral students, gave updated information on the projects

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SERVICE INNOVATIONS IN INDUSTRIAL NETWORKS

Standard Solutions Group AB
SSG Standard Solutions Group AB works with standardization, recommendations, information and training as well as information and transaction management within the business areas Technology, Logistics & Purchasing plus Health, Safety & Environment. Ten different fields of expertise are established, where about 500 experts from the forest industry work actively on more than 60 committees and working groups. Their objectives are to strategically and operatively identify important, cost-efficient solutions that heighten quality and are applicable to the entire international process industry.

As an example, within the field of Surface protections a committee of experts from the forest industry and paint manufacturers jointly works on different standards and guidelines for paint and coating to protect buildings and machinery from corrosion etc. in the process industry.

The research
My Ph.D-thesis can be divided into three phases: 1) How service innovations emerge and evolve in industrial networks, from idea to a commercial service; 2) Map the important factors and areas central for the development of service innovations and 3) How the value in use for the customer is created. During spring 2013 I´ve collected data for phase 1. In total 45 in-depth interviews with actors active in the SSG committee network were made, 6 video recorded observations from committee meetings and finally I´ve conducted a survey. This data is now analyzed to form the foundation for my first article. During 2013 I´ve also been a co-author to a book chapter called Servitization in Pulp and Paper in the book Crossroads of Servitization (Springer).

Tina Berggren, project manager at SSG, responsible for the Surface protection committee on top of the recovery boiler at Södra Cell Mönsterås looking at a blind test sample of water-based painting. The results from the test will be used as part of the basis for a standard on water-based painting in process industry.

Name:	**Per Myhrén**
Project start:	**February 2012**
Supervisor SSG:	**Development Manager Johan Engman**
Supervisor KAU:	**Professor Lars Witell, Professor Bo Edvardsson, Anders Gustafsson**

STANDARD SOLUTIONS GROUP

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IMPACT OF COATING LAYER ON FLEXOGRAPHIC PRINT QUALITY

- CHARACTERISATION METHODS AND INFLUENCE OF STRUCTURAL AND PHYSICOCHEMICAL PROPERTIES ON INK DISTRIBUTION

Flexographic print quality on coated boards is influenced by several factors related to board and ink properties as well as print settings. A key to high print quality is to achieve a sufficient ink-transfer which is known to strongly depend on the smoothness of the board surface. However, other board properties can also come into play, especially when considering the interaction between ink and coating layer, as for example non-uniformity in absorption. The absorption characteristics can be of importance and need to be studied in a way relevant to water-based flexographic printing.

A new technique has been developed to study the non-uniformity of liquid absorption. This technique is based on the short-time absorption of a coloured liquid (blue-dyed water) which creates a stain on the substrate. The evenness of the stain's reflectance is closely connected to the absorption uniformity. On the other hand, optical non-uniformity of the board itself, known as white-top mottle, may also add to the non-uniform appearance of the semi-transparent stains. The impact from white-top mottle needs to be reduced to get an accurate measure of absorption non-uniformity.

The description of the staining technique was published in the Nordic Pulp and Paper Research Journal in 2012 [1]. Later on, the analysis of the stains was greatly improved going from grey-scale to RGB images. This made it possible to simultaneously determine and separate absorption non-uniformities and white-top mottle in the same area. This improvement has been presented at the Iarigai conference in 2013 [2]. In addition to absorption and white-top mottle data, this approach also makes images of absorption patterns available. Being able to separate the contribution of white-top mottle from that associated with absorption non-uniformity, enables us to pinpoint the board properties responsible for the respective contributions. Furthermore, a Round Robin test including three separate laboratories indicated that the reproducibility of the staining technique is promising [3].

1. Thorman, S., Ström, G., Hagberg, A. and Johansson, P.Å. (2012): *Uniformity of liquid absorption by coatings-Technique and impact of coating composition*, Nord. Pulp Paper Res. J., 27:2 pp. 456-465.
2. Thorman, S., Yang, L., Hagberg, A. (2013): *Simultaneous determination of absorption mottle and white-top mottle in the same area on coated boards*, in: Proceedings from iarigai conferences, Chemnitz, Germany, Sep 8-11, 2013.
3. The author wish to thank BillerudKorsnäs, Stora Enso and Tetra Pak for supporting development of this technique.

Name:	**Sofia Thorman**
Company:	**Innventia AB**
Supervisors:	**Associate Professor Göran Ström (Innventia),** **Associate Professor Li Yang (Innventia),** **Professor Magnus Lestelius (Karlstad University)**
Mentor:	**Associate Professor Anita Teleman (Innventia)**
Examiner:	**Professor Magnus Lestelius (Karlstad University)**

INNVENTIA

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JUST A MOMENT, PER KRISTENSSON…

You've been appointed assistant director for Vipp Industrial graduate school as from January 1st 2014. Why is a professor in Psychology interested in industrial research in general and the forestry industry in particular?
– I do research in psychology with business implications - among other things user innovation, creative organizations, service innovation and management. These are aspects that are highly interesting for the forestry industry – and needed in a mature line of business as this industry is.

Do you have any previous experience from the forestry industry?
– I have worked with several companies in this line of business, Nordic Paper, Mölnlycke and Stora to name but a few. In my research I also collaborate with fellow researchers Helen Williams and Fredrik Wikström in projects concerning packaging and sustainability in the food chain. My role is to add a psychological aspects as to why customers make decisions in the way they do.

Vipp Industrial graduate school offer their doctoral students courses in service management and service innovation. Why?
– The forestry industry is a mature line of business, where processes, productivity, efficiency and paper quality has been developed and refined over the years. An interest in these fields comes naturally for this business. With service innovation, we adopt a perspective that instead starts out from the value-creating processes that occurs for customers. The aim is to identify, analyze and see how value creating processes can be offered in an convenient way and that is what we mean by employing a service perspective.

Can you give any examples?
– For instance, this type of research has contributed to developing new business models such as Metro – the free newspaper financed by third parties, i.e. advertisers. Another example where customers are co-producers and part of the innovative process is of course Apple and their way of offering a platform for people to develop their own apps. Whenever I visit a pulp- and papermill, I see the plant and the machines as labs for inventions. Why not open up parts previously closed off for the public – bring in a class of say chemistry students and see what thoughts and ideas come up when the take a look at this environment?

So what's in it for the Vipp doctoral students?
– We have previously been rather traditional within the academic world, where each doctoral student focuses on their particular field – often quite narrow. Our aim in Vipp Industrial graduate school is to mix doctoral students and partners with a technical, engineering, background with doctoral students and partners with a background in business administration or management. Interesting ideas will come when these technicians encounter marketing and organization and service management and innovation knowledge. And - not least - interesting ideas will also arise when doctoral students with a society and business perspective learn more about the forestry industry? We strongly believe in cross-over research to find new innovative solutions and here Karlstad University stands out in the competition with other higher education institutions.

Doctoral student Aron Tysén of Innventia participated in the 15th Pulp and Paper Fundamental Research symposium in September. The symposium was held at Robinson College in Cambridge, UK, the venue for two previous successful symposia.

For the second time a "Fundamental Research Communications" poster session was included in the 15th Symposium. The concept was very short, very tightly chaired presentations followed by discussion around posters. Aron Tysén's contribution was "Investigation of nonuniform drying of paper using IR and NIR imaging".

– It was the most intense poster session I've experienced - not a quiet moment during the whole scheduled time! I received a lot of questions and interesting thoughts about the work I presented. I enjoyed it and my impression is that it went very well, says Aron Tysén.

The symposium was organized by the FRC, The Pulp and Paper Fundamental Research Symposium.

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