Nordic Testbed Network

Supporting digital transformation in the Nordic bioeconomy

Digitalisation plays a vital role in the rapid development of the Nordic bioeconomy. Access to **cutting edge platforms for development, so-called testbeds,** where new digital knowledge and technology can be developed is fundamental. Managing a testbed is however a complex task.

To facilitate the development of new and existing testbeds, the Nordic Testbed Network aims to **unite and strengthen testbeds** aimed at supporting the digital transformation of the bioeconomy.

The Nordic Testbed Network is managed by **Nordic Forest Research** and **Nordic Agri Research** and aligned with initiatives such as the North Digital Declaration and the Nordic Bioeconomy Program.

How to improve user experience and usability?

Join us online:

Virtual meeting

WHEN: October 8, 10-12 CET. Connection and remote coffee from 9.30

WHERE: Online via *Zoom*, link will be sent out a couple of days before the meeting

FOCUS: Highlighting the end user perspective and sharing reflections in the areas of user experience, usability and user involvement

AGENDA

- **Challenges from the perspective of testbeds**, *Claus Aage Grøn Sørensen, Aarhus University, Centre for Smart Farming*

- **User involvement during innovation,** *Mireille van Hilten, Wageningen University & Research*

- **Virtual field visits** – we visit two testbeds, Gigacow and OuluZone+, to learn more about their challenges and solutions with regards to involving the end user in the testbed activities

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SNS Nordic Forest Research

NKJ Nordic Agri Research

What's on the agenda?

Programme

10.00	**Welcome** and some words from SNS and NKJ
10:10	**Challenges from the perspective of testbeds** *Claus Aage Grøn Sørensen, Aarhus University, Centre for Smart Farming*
10:25	**User involvement during innovation** *Mireille van Hilten, Wageningen University & Research*
10:40	**Short break**
10:45	**Virtual field visits -** learning about challenges and solutions with regards to involving the end user in the testbed activities

- **Gigacow**
  Tomas Klingström & Natalie von Der Lehr, Swedish University of Agricultural Sciences
  - **Group discussion** – participants are encouraged to share reflections evoked by the Gigacow example
- **OuluZone+**
  Rauno Heikkilä & Tanja Kolli, University of Oulu
  - **Group discussion** – participants are encouraged to share reflections evoked by the OuluZone+ example

11.55	**Summing up the day**

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Speaker biographies and Testbed information

Claus Aage Grøn Sørensen is a professor at the Department of Engineering at Aarhus University and Head of AU Centre for Smart Farming. The aim of the centre is to increase farm productivity within areas such as crop production and through the use of intelligent machines, big data analysis and IoT type of connectivity. Claus' research focuses on system technology/operations management, including topics such as evaluation of innovative agricultural production systems and the feasibility of introducing robotic systems in agriculture.

Mireille van Hilten is a researcher at Wageningen Research, working on 'data driven' and digital innovation projects in agri-food (Blockchain, Digital Twin, 5G in Agri-Food, Robotics). She has a background in Information Technology and has worked in both higher education and the private sector. In EU projects IOF2020 and AgROBOfood she is involved in the Business Support and User Acceptance Testing. As an IT expert her focus is on the improvement of business processes and the impact of technology on the user.

Gigacow is organised by the Swedish University of Agricultural Sciences (SLU). By creating a platform for data collection, the testbed aims to facilitate the exchange between researchers and farmers in the area of precision dairy farming using genomic breeding and production optimisation. The testbed has started to build a platform for data collection that can be connected to existing dairy farm systems. Moreover, the platform will be used as a base for projects where new sensors or cameras are connected.

https://www.slu.se/institutioner/husdjursgenetik/forskning/gigacow/

The key idea of **OuluZone+** is to combine high-class infrastructure with world-class research activities. It offers different tracks for technology research, testing and education activities. The University of Oulu utilises the centre for research and education of Open Infra Building Information Modelling (BIM) as the basis for automation and robotics in construction of new infrastructures. The test centre further offers the possibility to perform highly multidisciplinary testing, such as forestry machine and agriculture machine testing.

https://www.ouluzoneplus.com/

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How can we ensure that solutions developed at testbeds are user friendly and easily adopted by end users?

Approaching this question leads us to concepts such as user experience and usability.

A short introduction to user experience and usability

User experience, sometimes referred to as UX, can be described to encompass all aspects of the end-user's interaction with a product or service. Offering a pleasant user experience is closely linked to understanding the users and their needs.

In turn, the usability of a product or service could be understood as one of the components impacting the overall user experience. One way to define the term usability is as *"a measure of how well a specific user in a specific context can use a product/design to achieve a defined goal, efficiently and satisfactorily"*. To illustrate, these are some questions that can be asked to capture usability:

- How easy is it for users to accomplish basic tasks the first time they use the product/design?
- How many errors do users make?
- How pleasant is it to use the product/design?

Why is user experience and usability important?

For a solution to be attractive from the perspective of users, it needs to have more than just the right technical specifications. The solution does also need to provide an enjoyable user experience and be easy to use for the target audience to adopt the solution.

Involving the end user in the process

There are different methods to work with user experience and usability. Some examples involve focus groups, questionnaires and user tests. One aspect that these methods could be seen to have in common is aiming to involve the user in the process, from ideation to design and implementation. Thereby discovering user needs, understanding user expectations, as well as observing how users interact with the solution.

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References

Interaction Design Foundation, *Usability.* https://www.interaction-design.org/literature/topics/usability

Nielsen Norman Group, *The Definition of User Experience (UX).* https://www.nngroup.com/articles/definition-user-experience/

Nielsen Norman Group, *Usability 101: Introduction to usability.* https://www.nngroup.com/articles/usability-101-introduction-to-usability/

RISE, *User studies for increased user experience and usability.* https://www.ri.se/en/what-we-do/expertises/ux-and-usability

Want to learn more?
Tips for further reading and listening:

- Learn more about usability: https://www.nngroup.com/articles/usability-101-introduction-to-usability/

- Different ways to understand the concept "UX Design": https://www.usertesting.com/blog/what-is-ux-design-15-user-experience-experts-weigh-in

- Learn more about usability testing: https://xd.adobe.com/ideas/process/user-testing/usability-testing-questions-tips-examples/

- Webinar on best practice and tools to evaluate user acceptance – IoF Work Package 4: https://www.iof2020.eu/latest/education

- Mistel (Linked to the City of Västerås) works to involve the target group in the different steps of the innovation process: https://mistelinnovation.se/en/innovation-process/