How a collaboration between 40+ government agencies drives development and efficiency in higher education in Sweden

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Abstract

The transformation to agile governance and development has enabled the Ladok Consortium to be more flexible and able to respond to changes in business requirements faster. Ladok is a student information system for higher education in Sweden with a common database, which provides students with easily accessible documentation from all Swedish universities in one place. During the last years, the organization has focused on continuous delivery, short feedback loops, innovation and agile governance.

1 Background

Ladok is a Swedish Student Information and Management System that supports the entire education process including planning, participation and diplomas. The system has integrations with other government agencies in Sweden and with local systems at each university. Roughly 600 000 students and 30 000 administrators use Ladok every year handling around 2 million registrations, 6 million results and 80 000 diplomas per year. The original system was developed in the 1980s by a few universities and the Ladok Consortium was formed in order to develop and manage the system. Over the years more universities have joined the consortium and started using Ladok and there is currently only one Swedish university that has another SIS system. In the early versions of Ladok each university managed their own installation of the software. In 2012 the work to develop a new version of Ladok was initiated with the ambition to have a more cost-effective and sustainable system. The latest version was launched in 2016 and by the end of 2018 the old version of the system had been phased out. The new version of Ladok has a common database for all universities and is a web-based solution with a service-oriented architecture. The Ladok Consortium is responsible for operation and development of the system and provides support to its members including system documentation and user support materials. Some data in the system is common for all universities, such as codes and student information, while information about each universities courses, diplomas and student participation is separated. Users can only access data relevant for the university they are employed at.

The Ladok Consortium is jointly owned by 40 higher education institutions/universities together with The Swedish Board of Student Finance. All members finance the organization, and the yearly fee is proportional to the number of active students of each member. Ladok's turnover is € 10M annually. The consortium is a virtual organization, but legally it is hosted as a department at Umeå University. The members agree on a yearly budget, a business plan and appoint members of the board at the annual meeting. The board appoints a CEO to run the daily business.

2   Agile governance

Until 2020 the organization was governed by yearly business plans which detailed the work for the coming year. This limited the organizations agility and possibility to respond quickly to new demands from the business. Since then, the yearly business plan has been replaced with a product backlog for the system and services that support it which has made the planning more agile. Every quarter the backlog is reprioritized and new work/goals are added if needed. The teams help each other out to ensure that the highest prioritized work can be finished on time. The board is regularly informed of the organizations product backlog and can provide input on the current prioritization. A group of representatives from the universities are also involved in reworking the product backlog quarterly. At the annual meeting the members decide the budget for the coming year and are presented with an outline of the areas to be improved, rather than a detailed list of functionality to be developed.

The shift from a detailed business plan to an agile product backlog was a change that took several years. Acceptance of the new way of working was quick within the organization as the advantages of becoming more flexible and agile were clear. It was a bigger step for the board and Ladok's owners not to be involved in the detailed planning. The new way of planning was accepted by the consortium members because of the trust in the organization's capability to deliver value that had been built over several years.

3   Distributed organization

How have we organized ourselves to be able to capture and meet the needs of so many different universities, each of which has control over its own decisions and processes? How do we get "buy in" on the choices we make in the IT system that is the backbone of higher education IT-infrastructure? Part of the strategy is that the Ladok Consortium is staffed by employees from its members. Currently, around 80 people work in the consortium. About one third of these are IT personnel from Umeå University, one third are consultants, and the last third are hired business experts from the universities' educational administrative departments. The hired business experts are still employed at their universities and have their physical workplace there. This means that the Ladok consortium has employees in nearly 20 locations in Sweden, from Malmö in the south to Luleå in the north. It also means that our employees have both breadth and depth in their knowledge and experience from different types of universities - large and small, old and new, research-intensive and education-intensive, universities and colleges.

4 Internal organization and processes

4.1 Working in teams

We use an agile approach in our work because we truly believe it is the best way to meet complex needs in a changing world. To maximize impact, we let the agile mindset permeate throughout our entire operations, including our development teams, management work, personnel management, and our relationship with governing bodies.

Complex problems require a probe - sense - respond approach to be solved, according to the CYNEFIN framework [1]. To manage this process all the relevant competences to solve the problem need to work together. Therefore, the consortium is organized into teams:

- Six development teams responsible for one or more of the Ladok services

- The tech team supports the development teams with technical infrastructure for development

- The operations team manages the operational environments for the universities

- The user support team supports the development teams with infrastructure for communication and user support

- The consortium management team

Our development teams are cross-functional, with the aim of having the prerequisites to take a holistic responsibility for their respective services. This includes developing their services based on the needs of the business, but also providing the universities with the conditions they need to be able to use the services effectively. The teams are therefore responsible for information about their services, user support materials, needs analysis, impact assessments, and support for the universities. Each team includes business experts from the universities, system developers, testers, usability experts, user support, and a scrum master.

A team is autonomous within its assigned task. By that, we mean that each team has the mandate and is expected to take responsibility for the following:

- That the team is well and the team members feel safe in their work

- That the team knows its strengths and weaknesses and works to continuously develop and improve its abilities

- That the team delivers value within its task

- That the team's deliveries have sufficient quality

- That the team has knowledge of what other teams are working on, coordinates with each other and if necessary, helps other teams

- That the team follows the common frameworks that exist, such as design system, architecture, etc.

- That the team asks for help when they need it

4.2   Continuous delivery and short feedback loops

We want to deliver value to our universities as soon as possible. We also want to take advantage of the lessons we learn from feedback on what we have delivered. That is why we aim to deliver continuously. The development teams themselves make decisions about when and how they want to deliver. Through an automated process, every team member is able to deliver a new version to production the following morning.

Often we can deliver directly to production. When it is not possible to do so in a sufficiently safe way, we deliver in various ways in a safer environment where we can still get feedback, for example:

- Usage testing of prototypes or functionality in a test environment

- Delivery to production but access given only to a few universities

- Delivery to production but access given only to smaller user groups from different universities

- Delivery to a test environment, where some or all universities have the opportunity to try new functionality

4.3   Innovation and excellence

We want to attract the best coworkers and we want them to stay with us. We also want to be in the forefront of trying out new technology and ways of working. To accomplish this we invest in every ones mastery and time to explore and learn.

Two to three times a year we all engage together in "innovation days" where we put our ordinary work away and focus on innovation and learning. Anyone can suggest a workshop on any topic that has some connection to our work. The only requirement is that you welcome other colleagues to join in the workshop and that you present what you have learned for everyone at the end of the day. You do not have to accomplish a result that is directly useful in our work, but often that happens anyways. Some examples of what has come out of our innovation days are:

- The Ladok pod - a podcast where we share insights, advice from users, interviews with stakeholders etc. with our user community

- Establishing use of automated testing with Test-DSL

- A changed definition of the meaning of the term "decision" in Ladok

Whenever someone wants to learn more, for example by attending a course or a conference, purchasing a book etcetera, they can do this. You do not have to ask permission from someone. And if you or your team want to try a new way to do something it is encouraged.

5   Value for students and universities

The transformation to agile governance and development has enabled the Ladok organization to be more flexible and able to respond to changes in business requirements faster. The universities now see the Ladok Consortium as a reliable partner in developing IT-solutions that are used by many or all of the universities. In the last years the consortium has been asked to replace local systems with central

solutions available to all in several new areas. Some of the benefits of the Ladok system and organization are:

- University students in Sweden have all their documentation from higher education easily accessed in one place, which enables mobility.

- A cost-effective system for education administration with a yearly cost of around €20 per student.

- Using the same system provides a platform for common ways of working in education administration across all universities. It is possible to establish best practices and learn from each other. Common ways of working also lays the ground for more common IT-solutions.

- A driver for IT-security at the universities (for example AL2 certification).

- A driver for national standards for integrations between systems in the higher education sector.

- Our employees adapt a way of working with continuous improvement that they apply in their local organization.

6 Author biographies

Anna Åhnberg, Ladok Consortium, Sweden - Anna works within the Ladok Consortium as the responsible for business support and sits on the consortium's management team. As a trained computer scientist, Anna has worked with IT in the higher education sector since 2006, mainly in roles such as project manager, Scrum master, and also as a systems developer. She has a particular interest in leadership and work methods in systems development and early on adopted the agile approach. In her current role, Anna has personnel responsibility for Ladok Consortium's business experts and she also tries to adopt the agile approach there. Anna has a degree in Master of Computer Science from Stockholm University. See LinkedIn.
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Malin Zingmark, Ladok Consortium, Sweden - Since 2012 Malin Zingmark has worked in different roles with the Ladok Consortium. She has long experience of and interest in IT governance, project management, change management and systems maintenance. Her current responsibilities include handling new initiatives from Ladok's members and leading the work to build a new planning tool in Ladok. She was previously responsible for the roll-out of the new system to all of Ladok's members. Malin has a degree in Master of Science in Industrial Engineering from Linköping University. See LinkedIn.
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7 References

[1] CYNEFIN framework - https://en.wikipedia.org/wiki/Cynefin_framework