
Presentation of results

Analysis of the Cooperation, Management and Funding Model of the Joint Study Information System of Universities

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Iceland 
Liechtenstein  Norway
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Purpose of the analysis

The aim of the analysis is to support the finding of a suitable cooperation and funding model for the development of the joint study information system (SIS) of universities, by analysing and describing other similar cooperation models both between universities and more broadly, in other fields

- What are the possible cooperation and funding models for creating a joint SIS for universities?
- How do the different models affect the potential benefits, system efficiency, costs, management and legal situation?
- What are the opportunities and risks for cooperation between large and small partners in different models?

Methodology

❑ Document analysis

- Research articles
- Previous studies
- Online materials for collaborative solutions, etc.

❑ Expert interviews

- Interviews with 9 experts in collaborative information systems development

❑ Case study

- collaborative information systems / shared services:
Tahvel, Stuudium, E-Notar, Funidata, Ladok, Example of Scotland

❑ Discussion seminar and personal interviews

- To get input from university business development and product development experts

Scope and focus

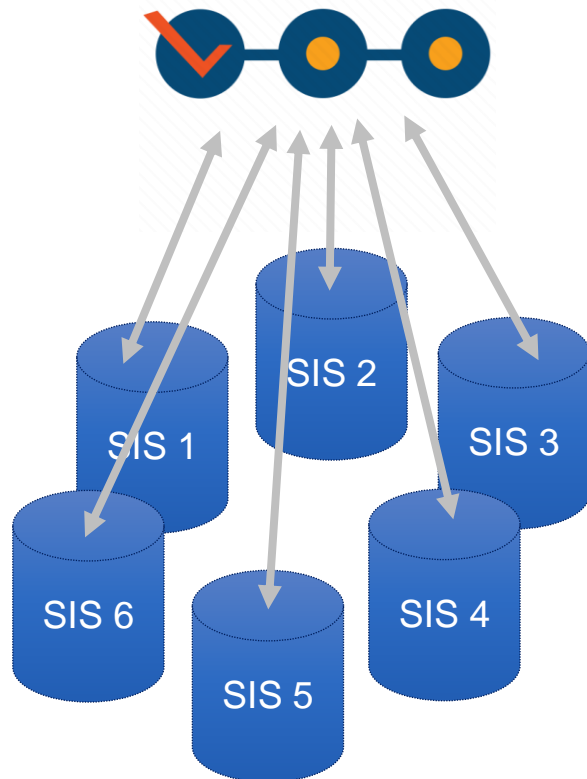
- Developing a joint SIS for universities is not an end in itself, but a means to support a high-quality and resource-efficient learning process.
- Joint study information system as a toolbox for the learning process
- We analyse the potential expectations and needs of universities as business process/service owners, rather than the product development perspective
- We deal with development topics as little as possible (e.g. we do not describe specific functionalities)

Current situation

University	SIS in use	Development Partner
University of Tartu	UT SIS2 (some SIS1 elements still in use)	Own development team
Tallinn University of Technology (TalTech)	TalTech SIS (old SIS still maintained)	Fujitsu
Tallinn University	Based on TalTech's old SIS	Fujitsu
Estonian University of Life Sciences	UT SIS1 (no longer developed)	No development
Estonian Academy of Arts	Tahvel	Fujitsu
Estonian Academy of Music and Theatre	Based on Estonian Entrepreneurship University of Applied Sciences (EUAS) SIS	EUAS

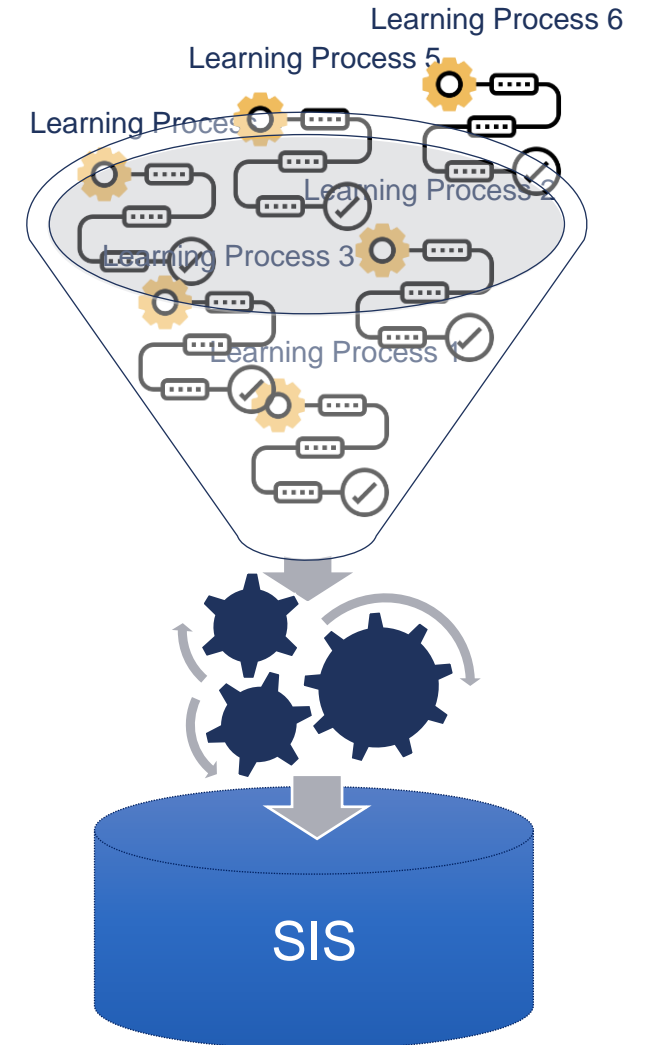
Collaborative model and perspectives

The learning processes vary from university to university, but they may seem quite similar (especially when compared to SIS)



Planning/developing a common SIS amplifies differences in the learning process and requires cooperation and time to harmonize requirements or resolve conflicts

A common solution that tries to accept and take into account all the differences between and within universities may not result in a win in terms of service quality or cost-effectiveness



Collaborative information system vs. single-client solution - opportunities

- ✓ The scale effect resulting from increased funding
- ✓ The synergy generated through partner collaboration for finding innovative solutions
- ✓ A decision-making process requiring consensus (at least in the consortium model) also helps prevent poorly thought-out and hasty development decisions
- ✓ Supporting partner cooperation and spreading best practices in the business process supported by the information system (in the case of universities' SIS, the study process)

Collaborative information system vs. single-client solution - threats

- ✓ The development of a collaborative information system is more complicated
- ✓ The need for flexibility for universities
- ✓ The biggest challenge: building consensus in decision-making processes
- ✓ For users, a collaborative information system may seem uncomfortable at first
- ✓ The interests and needs of smaller partners may be pushed into the background

For example, users may complain that certain functions used to exist, but now they no longer exist – an accountant may be dissatisfied if they no longer receive the student's information directly or if an important notification about non-payment of an invoice does not arrive. Similarly, different departments may have different expectations and needs. Finally, it can also affect smaller, but still important, day-to-day work processes. (Participant in the expert interview)

Cooperation models

**Centralized
management**

Consortium

**Selective
collaboration**

Service provider

**Equal
cooperation**

Centralized management

In the case of a centralized management model, the universities agree to appoint a single lead institution to be responsible for managing the system.

The lead organisation (e.g. one university, HARNO, a separate legal body, etc.) coordinates the development and maintenance of the system, while the other partners are involved through a consultative role.

This allows for centralized decision-making and effective management, but the problem may be that some parties have less influence.



Pros

- + Well-thought-out management leads to good results
- + Clearly defined owner
- + Faster development process

Disadvantages

- Lack of voting rights of the parties
- Process transparency may be low

Consortium

In the case of the consortium model, the universities jointly form a joint enterprise, foundation or NGO that is responsible for the development and management of the system.

The consortium has its own steering committee that decides on important strategic issues such as budget, development priorities and service standards.

The advantages of a consortium are shared responsibility, greater influence and sharing of resources.

Pros

- + A common solution and shared responsibility
- + Sharing experience and knowledge
- + Easier interpretation of needs

Disadvantages

- Slow decision-making process
- Dispersion of responsibilities
- Funding

Selective collaboration

The model of selective collaboration is a framework for cooperation between organisations, where universities do not create a common centralised study information system, but develop and distribute specific services as needed (e.g. exchange of information for continuing education students).

The model is based on flexibility and allows each participant to choose which projects and services they want to participate in.

Pros

- + Flexibility in cooperation
- + Developing services according to needs
- + Efficient resource allocation

Disadvantages

- Unequal development
- Dependence on individual projects and technical solutions
- Lack of a clearly defined owner

Service provider

The development and management of the joint study information system will be outsourced to a third party. Universities act as clients and users of the service, while the service provider is responsible for the development and maintenance of the technical solution.

Pros

- + Decreased administrative burden

Disadvantages

- Increase in development and maintenance costs over time
- Dependence on external parties

Equal cooperation

All partners participate equally in decision-making and system development, sharing responsibility and leadership. This model requires a high level of cooperation and agreed processes for decision-making. Equal participation can strengthen partnerships, but it can be more difficult and time-consuming to manage.

It is important to constantly map and harmonize business processes.



Pros

- + More efficient use of resources and cost sharing
- + Sharing best and innovative practices

Disadvantages

- The complexity of coordination
- Customization limitations
- The risk that larger organisations have more influence

Financing models

**Project-based
funding**

Co-financing

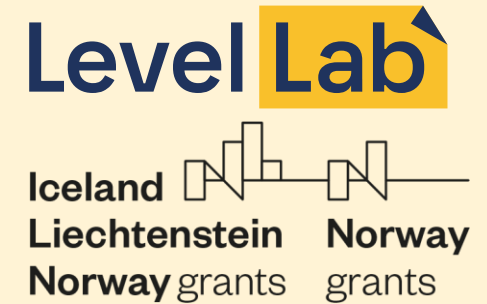
Central funding

Usage tax

According to the interviewees, a combined funding model is the most realistic and balanced solution for creating a joint study information system. In this case, project-based and public funding will be used in the initial phase of development, but subsequent management and development will be covered by a system based on co-financing or a user tax to ensure sustainability and a fair distribution of costs.

Funidata

- Consortium (company)
- Co-financing / usage tax



Funidata Oy manages the development and management of the SISU study information system. It is an in-house company, i.e. universities are both users and owners of the system, who contribute to the planning and financing of development. This makes it possible to avoid public procurements and ensures that development activities are directed to the needs of universities. At the same time, it restricts the provision of the service to other institutions that are not shareholders.

- ✓ Becoming a shareholder requires a financial obligation and the purchase of a stake in Funidata and gives the university the right to participate in decision-making processes. It is also possible to join with an annual usage fee, but this does not give you the right to decide.
- ✓ The development of new functions depends on the needs and funding of universities. In general, the completion of new developments (one development cycle) takes from 6 months to 2 years, depending on the complexity of the project
- ✓ Decisions are made by consensus to ensure that the interests of all parties are represented

Pros

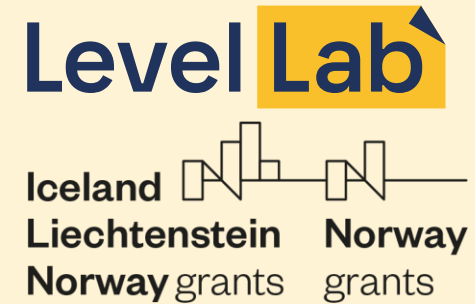
- + Ensures long-term stability and control over the development of the system. Universities, as business owners, can determine the directions of development and its compliance with their needs.
- + Through joint financing and development, the costs are shared, reducing the individual financial burden.
- + Enables better data exchange and collaboration between universities.

Disadvantages

- Development and administrative costs can be an obstacle for smaller universities
- Slow decision-making process due to consensus requirement
- Restricts the financing of innovation, as the system cannot be freely sold outside the circle of shareholders of universities

Ladok

- Consortium
- Co financing



Ladok is a study information system administered by Swedish higher education institutions, which operates as a consortium model. All participating universities are both users and co-owners who contribute to the planning and financing of the development. The model avoids public procurements and ensures that development activities are focused only on the needs of the participating universities. At the same time, it restricts the provision of the service to other institutions that are not members of the consortium.

- ✓ Membership requires a financial commitment and participation in a consortium, which gives universities decision-making power. It is also possible to connect based on a user fee, but this does not give the right to make decisions.
- ✓ The development of new functions depends on the needs and funding of universities. The development cycle can last from 6 months to 2 years, depending on the complexity.
- ✓ Decisions are made by consensus to ensure that the interests of all participants are represented.
- ✓ Universities set development priorities and fund new functions either jointly or individually.
- ✓ If only one university wants a specific development, it can cover the costs itself, but later Ladok can offer the same functionality to other universities.

Pros

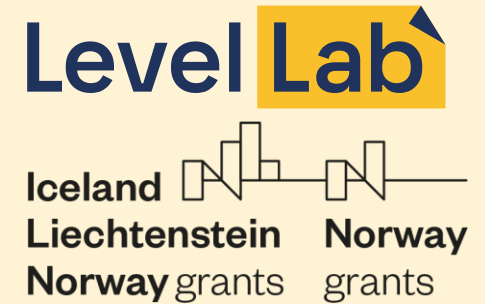
- + Provides long-term stability and control over system development
- + A more even distribution of the financial burden due to joint funding
- + Facilitates data exchange between universities and simplifies administrative processes

Disadvantages

- Participation and development costs can be a challenge for smaller universities
- Consensus-based decision-making can be slow
- Funding for innovation is limited, as the system cannot be freely sold outside the circle of consortium member universities

Tahvel

- Central control
- Central funding



The owner of the study information system is the Ministry of Education and Research, and the developer has been found through annual public procurements. The users include higher education institutions and vocational education institutions, and the learning processes are very different in some cases.

Pros

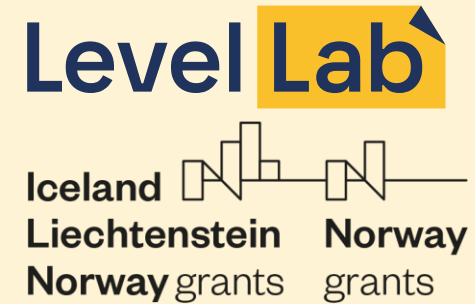
- + Free of charge for higher education institutions
- + Requires few resources

Disadvantages

- Slow development process
- It is not possible to add or order developments or additions yourself.

Stuudium

- Service provider
- Usage tax



General Education Schools Diary and Study Materials Management System. A company service provider. It is not intended to support the entire learning process, but primarily offers a diary service, the possibility of managing study materials and a communication module school-student-child-parent. Stuudium is used by more than 400 educational institutions all over Estonia.

Pros

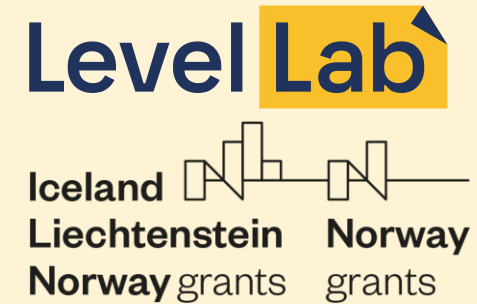
- + Simple and robust
- + Rather cheap for users

Disadvantages

- Non-transparent decision-making, development and management process
- Not very supportive of the differences in the learning process
- Lack of functionality and interfacing options

E-Notar

- Central control
- Co-financing (incl. state)



E-Notar is an electronic environment owned by the Chamber of Notaries and created by them, which supports the daily work of notaries and enables electronic communication between notaries and the state. The system is developed, managed and provided by the Centre of Registers and Information Systems. The model ensures the efficiency of notaries' work and the security of legal acts.

- ✓ The membership of notaries is mandatory and guarantees the right to decide on the development of the system. Customers can use the self-service portal, but it does not give them the right to make decisions.
- ✓ The development of new functions depends on the needs of notaries and the funding of the system. The implementation of developments can take several years, depending on the complexity.
- ✓ Decisions are made by the Chamber of Notaries and the development team, user proposals are analysed, but priorities are determined centrally.
- ✓ The Chamber of Notaries determines the priorities of the developments and finances the new functions from the membership fees of notaries.
- ✓ If one notary wishes to have a specific development, he or she must finance it himself, but later the functionality of the system can be extended to other notaries.

Pros

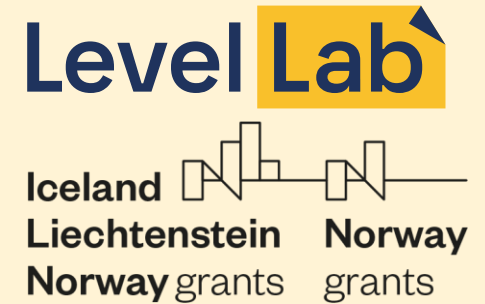
- + Ensures a legally secure and standardised notarial system
- + Notaries' membership fees ensure the financing of the system and its independence from the state budget
- + Integration with national registers simplifies the work of notaries and speeds up operations.

Disadvantages

- Notary membership and development costs can be a challenge for smaller firms
- Funding for innovation is limited, as notary membership fees do not allow for large technological investments
- The development of the system is slow, as priorities are determined on the basis of legislative changes

APUC/ISC

- Selective collaboration
- Project-based funding



Advanced Procurement for Universities and Colleges (APUC) is the central procurement consortium for Scottish universities and colleges, aiming to coordinate the development of IT and learning information systems, carry out procurements, and manage central contracts. APUC operates on behalf of all Scottish universities and colleges, optimising their costs and ensuring the standardisation of technological solutions.

Shared ICT services between Scottish universities and colleges cover a range of areas and services for collaboration and more efficient use of resources. In 2014, the Shared Information Services Catalyst (ISC) for universities and colleges was created.

Examples of shared services:

- ✓ A learning data retention center, which contains data from institutions, including students (supports multiple tools and layers, e.g. for learning analytics)
- ✓ virtual learning environment (VLE) with hosting
- ✓ Digital Skills Training Register
- ✓ data center service (ultra-low CO solutions)

Pros

- + More efficient use of resources and cost sharing
- + Sharing best and innovative practices

Disadvantages

- The complexity of coordination
- Customization limitations

Possible involvement and role of the state



- **The state as a financier and framework creator** - The state can be the main financier, in which case it has a significant impact on the development of the project. It is important for universities to maintain autonomy so that they can manage development activities according to their needs.
- **Clear accountability and governance structure** - As the project requires long-term maintenance, a specific responsible body should be appointed to ensure clear management and decision-making processes. The state could be a so-called neutral party.
- **The state as a guarantor of stability** - The project needs a secure owner, transparent decision-making processes and stable financing to ensure the long-term sustainability and functionality of the system. The state could support strategic decision-making and ensure the involvement and information of all parties
- **Integration of external information systems** - The state can help organise smooth cooperation and integration of external information systems in order to improve the efficiency and development of the system.

The initiative for cooperation with the state must come from universities - Experts emphasise that universities must take the initiative to cooperate if they are interested, in order to avoid the expectation that the public sector will lead the cooperation.

Potential involvement and role of the private sector

- **The private sector as a technical partner** - The private sector can support the development of joint study information system by offering solutions for data storage, processing and software updates.
- **Maintenance and administration for the private sector** – The maintenance of the base software may remain the responsibility of the private sector, but the management of the data is the responsibility of the universities.
- **Clear expectations and responsibility** - Cooperation with the private sector works better when expectations and responsibilities are clearly defined and the sustainability of development is thought through.
- **The importance of university involvement** – Users need to feel "theirs" to the system and actively contribute to ensure that it meets their expectations and is long-term.

Critical success factors

- **Clear governance structure and division of responsibilities** – Each party must have a specific role and responsibility to avoid confusion and fragmentation of interests. It is particularly important to determine who is responsible for developing and managing the system.
- **Trust and cooperation between universities** – Cooperation between universities and a common interest in the development of the system is of critical importance in order to avoid a situation where individual parties feel that their needs are not sufficiently taken into account.
- **Sustainable financing model** – Long-term and stable funding is necessary for the successful functioning of the system, which can be based on state support, co-financing or user taxes. Instability of funding may cause problems in the development and maintenance of the system.
- **Effective user engagement and feedback mechanisms** - If the end users of the system (lecturers, students and administrative staff) do not feel that they are part of the development process, dissatisfaction may arise and the implementation of the system may be difficult
- **Technical flexibility and scalability** – The Study Information System must be modular and adaptable so that it can evolve with the needs of universities and integrate with other important information systems, such as national registers and digital platforms supporting learning activities

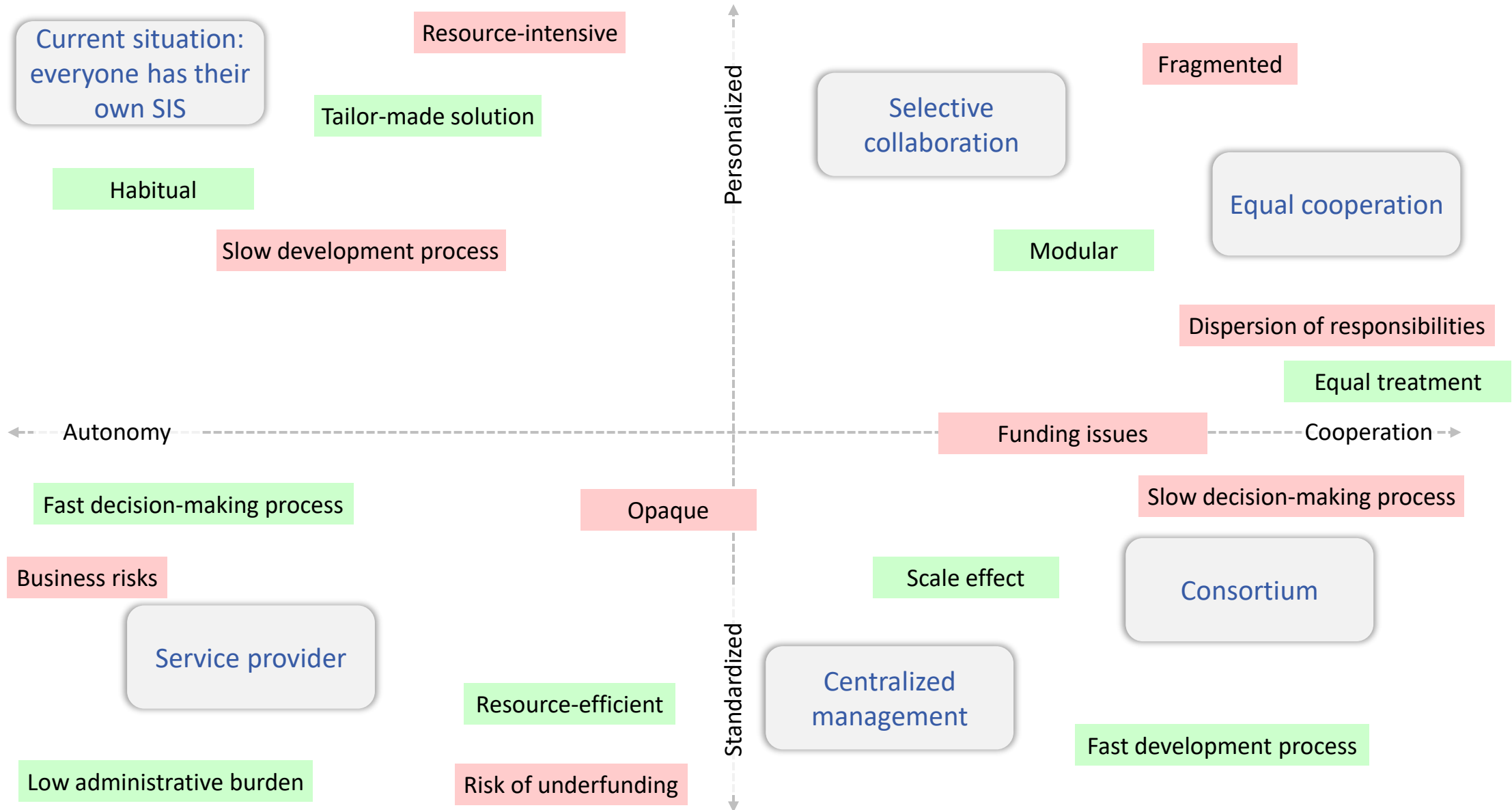
The entire amount of work and tasks must be visible to everyone, so that everyone can understand what has been done, what is still to be done, and when the work is expected to be completed. Feedback must be continuous and easily accessible to everyone. This helps to prevent a situation where certain parties do not receive the necessary information, which may lead to a misunderstanding of the development work.

(Participant in the expert interview)

Saving resources in the case of a collaborative information system

- **Joint activities and standardisation increase efficiency** - Universities share similar processes and needs, which is why an information system developed in cooperation allows for standardisation of activities, reducing duplication and increasing the efficiency of work organisation
- **Long-term savings are evident during the use of the system** - Although starting a collaboration requires a large initial investment and may temporarily increase costs, a jointly managed system will lead to greater efficiency and potential resource savings over time
- **Sharing costs reduces the individual financial burden** - The individual investments of universities in information systems overlap in many ways. A joint study information system enables the sharing of maintenance and development costs, helps avoid duplication, and reduces the burden on each institution.
- **Improvement of the quality of services and data** - Jointly created information systems ensure better data management and quality, which simplifies decision-making and improves the user experience, although financial savings may not always be directly manifested

Opportunities and risks associated with cooperation models



Conclusions and observations

- ✓ The functioning of cooperation and financing models depends mostly on the willingness to cooperate, trust between partners and the quality of project management, i.e. the "individual differences" in the implementation of the models may be significantly greater than the "generalised group differences" arising from the model.
- ✓ The view of business development (e.g. the Office of Academic Affairs) and product development on the development and management process of SIS is inevitably somewhat different.
- ✓ Planning and developing a joint study information system amplifies the differences between universities in the learning process and requires cooperation and time to harmonise requirements and resolve conflicts. A solution that tries to accept and take into account all the differences between and within universities does not necessarily result in a win in terms of service quality or cost-effectiveness.
- ✓ The development of a collaborative information system is significantly more complicated than a single-client solution, and a collaborative information system may seem uncomfortable to users at first. The challenges are achieving consensus in decision-making processes, breaking the scepticism within the university and starting the process in general.

Recommendations

Consortium model

- Stage I - Preparation (4-6 years)
 - ✓ Preparation of a Memorandum of Understanding, including agreeing on the terms of joining
 - ✓ Conducting a business analysis, including defining the functionality of the SIS (e.g. "narrow" vs "broad" SIS)
 - ✓ Establishment of a joint company or foundation of universities
 - ✓ Preparation of an invoice strategy and action plan before development, including the selection of a financing model for the development phase and for the later SIS life cycle
 - ✓ Preparation of the terms of reference and formation of the development team (or choice of development service provider)
- Stage II – development and implementation (3-4 years)
- Stage III – usage, improvements

Thank you for your attention!