

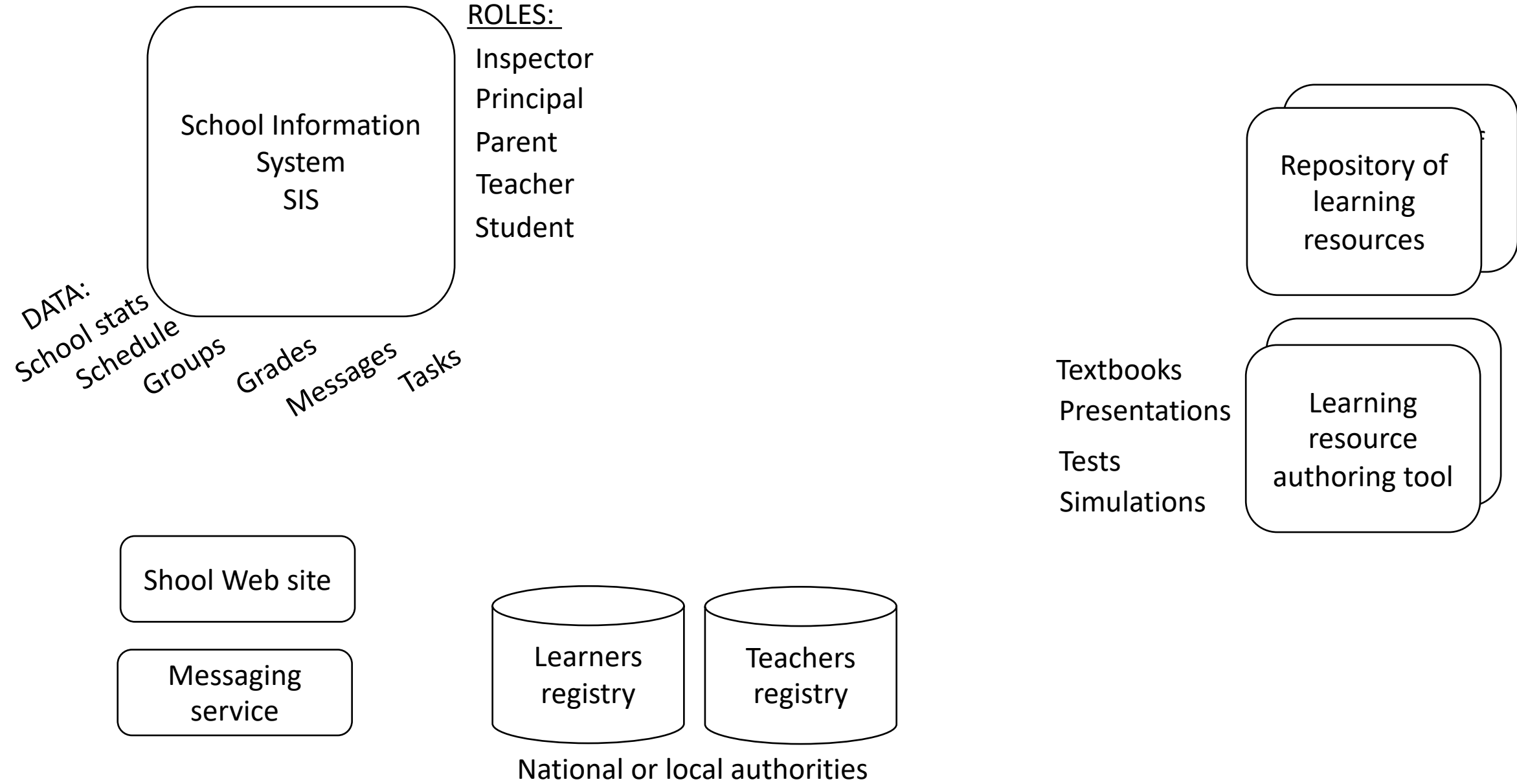
# Orchestrating multiple online learning services in a virtual classroom

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Tallinn University

# Situation in many schools around the world today



# Digital learning ecosystem in Estonia today

300 e-textbooks

**opiQ**



Inspector  
Principal  
Parent

Teacher  
Student

School Information  
System  
SIS

School stats  
Schedule

Groups

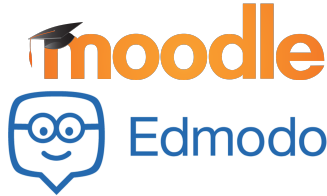
Grades

Messages

Tasks

Learning  
Management  
System  
LMS

Courses  
Small groups  
Forum, chat, video  
Homework submission  
Grading, feedback  
Course stats



Edmodo



schoology

**ekoolikott** OER

Catalogue  
of learning  
resources

Repository of  
learning  
resources



nearpod



desmos

Learning  
resource  
authoring tool



Textbooks  
Presentations  
Tests  
Simulations

School Web site

Messaging  
service

Learners  
registry

Teachers  
registry



Eesti Hariduse  
Infosüsteem

Social  
Media



zoom

G Suite



Office 365 Education  
Enhancing collaboration and productivity



kialo



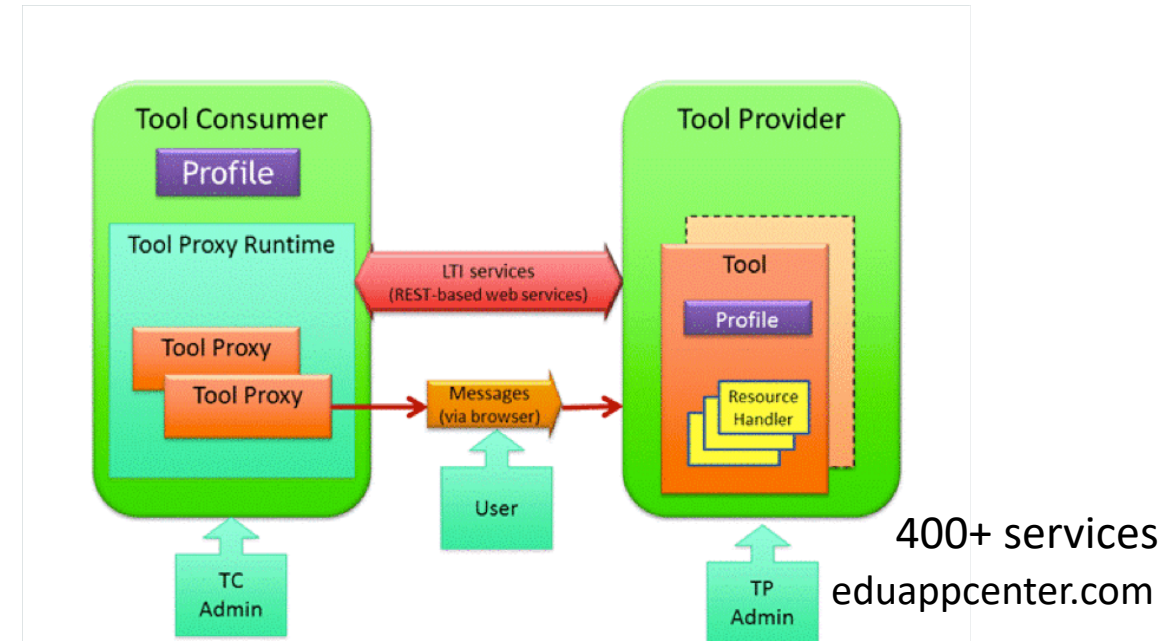
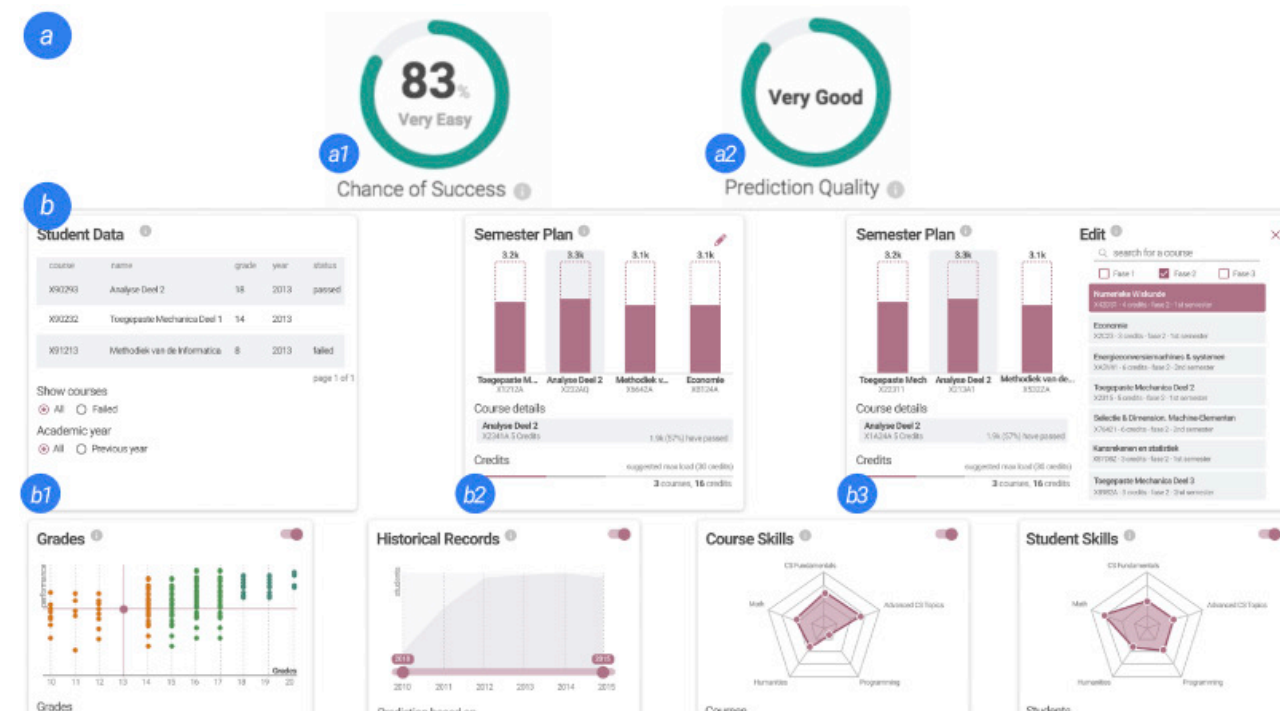
# Two important EdTech innovations

## xAPI: Experience API

- Common language for learning analytics
- Allows collecting learners' digital footprint data from various environments for learning analytics purposes

## IMS LTI: Learning Tools Interoperability

- Integration interface for services
- Allows connecting an external Learning Service (eg. NearPod) to LMS and avoid sharing personal data with service provider, plus harvesting the interaction data




# Lessons learned during Distance Education 2020




- Low or no interoperability between digital learning services, school leaders don't know what is actually going on and cannot manage/improve processes; a good example: eKool + Opiq integration
- Innovative teachers (and their students) have escaped to “another digital space”, inaccessible to majority of their colleagues who lose the opportunity to observe their advanced practices
- Many external services are actually considered as a threat to learners' privacy (by Data Protection Authority) and their content is not relevant to our national curriculum
- Education Strategy 2035 aims at smart learning infrastructure, AI analysis of personal learning paths, recommender systems etc - difficult to do if the data is locked in the service providers' servers abroad
- The most popular Learning Management Systems (Moodle, Canvas, Schoology) are able to “speak LTI and xAPI”, but these are too complicated






# The concept of Schoolaby: a next-gen LMS


- Cloud-based, “thin” Learning Management System that any teacher can learn to use within 15 min
- Single Sign-On (SSO) with HarID or eKool/Stuudium
- Allows the orchestration of tens of integrated learning services without sharing the student data with service providers (LTI)
- Allows any teacher, school leader, school owner to monitor the learning activities in the ecosystem of integrated services
- Allows automation of some teaching tasks (recommender system)
- Suits for “normal” and “emergency” learning modes (up to 50-100% online)
- The main units are learning tasks (not lessons, tools or rooms)
- Research-based concept from Tallinn University, developed by NetGroup, ready for piloting from 26 October 2020 in 10 Estonian schools

# Designing a learning journey




 Schoolaby

 School
  Classes
  **My Journeys**
 Conversations
  Calendar



## Heavy metals and reactions in chemistry

 Journey
  Backpack
  Students

15 February 2020

Introduction to heavy metals and reactions in chemistry

The earliest known metals—common metals such as iron, copper, and tin, and precious metals such as silver, gold, and platinum—are heavy metals.

Completed 25.05.2021

Multiple equation excercises. Exponentiation. Percent excercises, percent point. Multiple equation excercises. Exponentiation.

✓

Proportionality, inverse proportionality and linear dependency.

✓

Linear equation.

✓

Polygon. Quadrilateral and rhombus.

✓

Operations with single member. Standard form of numbers.

✓

+ add task

28 February 2020

Havy metals and reactions in chemistry

The earliest known metals—common metals such as iron, copper, and tin, and precious metals such as silver, gold, and platinum—are heavy metals.

Deadline 25.05.2021

Multiple equation excercises. Exponentiation. Percent excercises, percent point. Multiple equation excercises. Exponentiation.

✓

Proportionality, inverse proportionality and linear dependency.

✓

Polygon. Quadrilateral and rhombus.

✓

Operations with single member. Standard form of numbers.

✓

+ add task

March 2020

Introduction to heavy metals and reactions in chemistry

The earliest known metals—common metals such as iron, copper, and tin, and precious metals such as silver, gold, and platinum—are heavy metals.

Deadline 25.05.2021

Multiple equation excercises. Exponentiation. Percent excercises, percent point. Multiple equation excercises. Exponentiation.

✓

Proportionality, inverse proportionality and linear dependency.

✓

Linear equation.

✓

Polygon. Quadrilateral and rhombus.

✓

Operations with single member. Standard form of numbers.

✓

+ add task

April 2020

Introduction to heavy metals and reactions in chemistry and real life

The earliest known metals—common metals such as iron, copper, and tin, and precious metals such as silver, gold, and platinum—are heavy metals.

Deadline 25.05.2021

Proportionality, inverse proportionality and linear dependency.

✓

Polygon. Quadrilateral and rhombus.

✓

Operations with single member. Standard form of numbers.

✓

+ add task

Edit

Duplicate

Archive


Delete

Edit


Duplicate


Archive


Delete


 Settings


# Adding new milestone to journey


 Schoolaby


 School

 Classes

 My Journeys

 Conversations

 Calendar

 Settings

New milestone ⋮

Add details

Title

Introduction to heavy metals and reactions in chemistry

Description

The earliest known metals—common metals such as iron, copper, and tin, and precious metals such as silver, gold, and platinum—are heavy metals.

Deadline

06.05.2020

Curriculum binding

Search

SAVE











Choose assets

EmbedLinkOther




Search assets


Search


Suggested


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 Firstname Lastname	<input type="checkbox"/>	3 MB	
 Firstname Lastname	<input type="checkbox"/>	1 MB	
 Firstname Lastname	<input type="checkbox"/>	5 MB	

SAVE AND PUBLISH



 Journey

 Backpack








 Students








# Teacher's dashboard

## My Journeys :













### Ongoing

 Chemistry <b>11b</b> 26 Deadline <b>25.05.2021</b>	 Physics <b>12a</b> 23 Deadline <b>25.05.2021</b>	 Mathematics <b>11b</b> 26 Deadline <b>25.05.2021</b>
 Literature <b>9a</b> 29 Deadline <b>25.05.2021</b>	 Chemistry <b>11b</b> 26 Deadline <b>25.05.2021</b>	 Physics <b>12a</b> 25 Deadline <b>25.05.2021</b>
 Mathematics <b>11b</b> 30 <div><div>Edit</div><div>Duplicate</div><div>Archive</div><div>Delete</div></div>	<div><div>+</div><div>add course</div></div>	

### Completed

 Chemistry <b>11b</b> 26 Ended <b>25.05.2021</b>	 Physics <b>12a</b> 23 Ended <b>25.05.2021</b>	 Mathematics <b>11b</b> 26 Ended <b>25.05.2021</b>
 Literature <b>9a</b> Deadline <b>25.05.2021</b>	 Chemistry <b>11b</b> Deadline <b>25.05.2021</b>	

# Student roster

Student name	Class	Average grade	Send message	Process	Last login
 Firstname Lastname	7b	4,3	<input type="checkbox"/>	0 / 6	03.05.2020
 Firstname Lastname	7b	4,2	<input type="checkbox"/>	1 / 6	03.05.2020
 Firstname Lastname	7b	4,0	<input type="checkbox"/>	1 / 6	03.05.2020
 Firstname Lastname	7b	4,7	<input type="checkbox"/>	2 / 6	03.05.2020
 Firstname Lastname	7b	3,8	<input type="checkbox"/>	2 / 6	03.05.2020
 Firstname Lastname	7b	4,1	<input type="checkbox"/>	6 / 6	03.05.2020
 Firstname Lastname	7b	4,0	<input type="checkbox"/>	2 / 6	03.05.2020
 Firstname Lastname	7b	4,3	<input type="checkbox"/>	5 / 6	03.05.2020
 Firstname Lastname	7b	4,2	<input type="checkbox"/>	6 / 6	03.05.2020
 Firstname Lastname	7b	4,0	<input type="checkbox"/>	6 / 6	03.05.2020
 Firstname Lastname	7b	4,7	<input type="checkbox"/>	5 / 6	03.05.2020
 Firstname Lastname	7b	3,8	<input type="checkbox"/>	6 / 6	03.05.2020

## Conversations

### Classes

Add a new group  
Write to whole class  
Find people



Mathematics Grade 8a



**Mathematics Grade 4b**



Physics Grade 11a



Mathematics Grade 8a



Mathematics Grade 4b



Physics Grade 11k

### Pupils



Firstname Lastname



**Firstname Lastname**



Firstname Lastname



Firstname Lastname



Firstname Lastname



Firstname Lastname



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Send

# Communication

# Conclusion

- COVID-19 pandemic and Emergency Distance Education pointed out the weakness of our existing digital learning ecosystem
- The new generation of learning tools will emerge, aiming at better interoperability, automation, data protection, manageability
- Don't wait for the next crisis, make use of the lessons learned in 2020