Appendix 3: Customer technical platform

> This appendix will be finalized in dialogue with the chosen contractor after the contract has been signed.

This appendix describes the Customer's architecture and the system landscape in which the software being procured will interact.

The Agreement, clause 2.3.2 Interaction with equipment and other software

The Contractor is responsible for the integration of the new Test and Examination system with several of the Customer's systems. The main systems, which the new system will integrate with, are PAS-Eksamen, PAS-Prøver and Påloggingssystemet. These systems are described in detail below.

PAS-Eksamen (PASX)

PAS-Eksamen is the Customer's examination management system. The system was new in 2017 and is developed in ASP.NET. It is a fully customized solution built in a modular way and complies with relevant rules and regulations. It offers a user friendly front-end to its end users. PASX is integrated with the PGSA and PGSD, with School Administrative Systems and other systems as depicted in the application landscape diagram below. Integrations are built using custom REST API's and WCF towards some of the older systems. PASX uses Påloggingssystemet for authentication and API security. PASX deploys weekly new and improved functionality to production. When working on integrations with other systems the systems are integrated at an early stage using an iterative approach. There are deploys multiple times per week. Professional vendors handle the application operations and the application maintenance for PASX. There are some components being maintained in Azure. The Customer expects more use of Azure and cloud-based solutions in the future.

PAS-Prøver (PASP)

PAS-Prøver is the Customer's test management system. The system was new in 2017 and is developed in ASP.NET. It is a fully customized solution built in a modular way, and which comply with relevant rules and regulations. It offers a user-friendly front-end to its end users. PASX is integrated with the PGSC, with School Administrative Systems and other systems as depicted in the application landscape diagram below. PASP offers integration with schools and assessment test system through custom REST API's. PASP uses Påloggingssystemet for authentication and API security. PASP deploys weekly new and improved functionality to production. When working on integrations with other systems the systems are integrated at an early stage using an iterative approach. There are deploys multiple times per week. Professional vendors handle the application operations and the application maintenance for PASP. There are some components being maintained in Azure. The Customer expects more use of Azure and cloud-based solutions in the future.

Påloggingssystemet

Påloggingsystemet (directly translated: Log-on-system) is an identity provider and access control system that handles authentication of users and API security. It offers authentication of users through OpenID Connect and API security by issuing OAuth 2 Bearer tokens. It also offers a REST JSON API for managing users and roles. Påloggingssystemet utilizes Identity Server, which is an open source .Net security framework and proven as the industry standard for Identity In the .Net environment. Påloggingssystemet supports three different identity providers: Feide, ID-porten and a local solution where the users only lie within Påloggingssystemet. The local solution is utilized for students who do not use Feide. Påloggingssystemet deploys weekly/biweekly new and improved functionality to production. Professional vendors handle the application operations and the application maintenance for Påloggingssystemet. There are several components being maintained in Azure. The Customer expects more use of Azure and cloud-based solutions in the future.

The application landscape that new Test and Examination system will be part of

In the figure below the new Test and Examination system is referred to as PES. The lines between the systems represents an integration. An integration may represent a single interface or multiple interfaces.
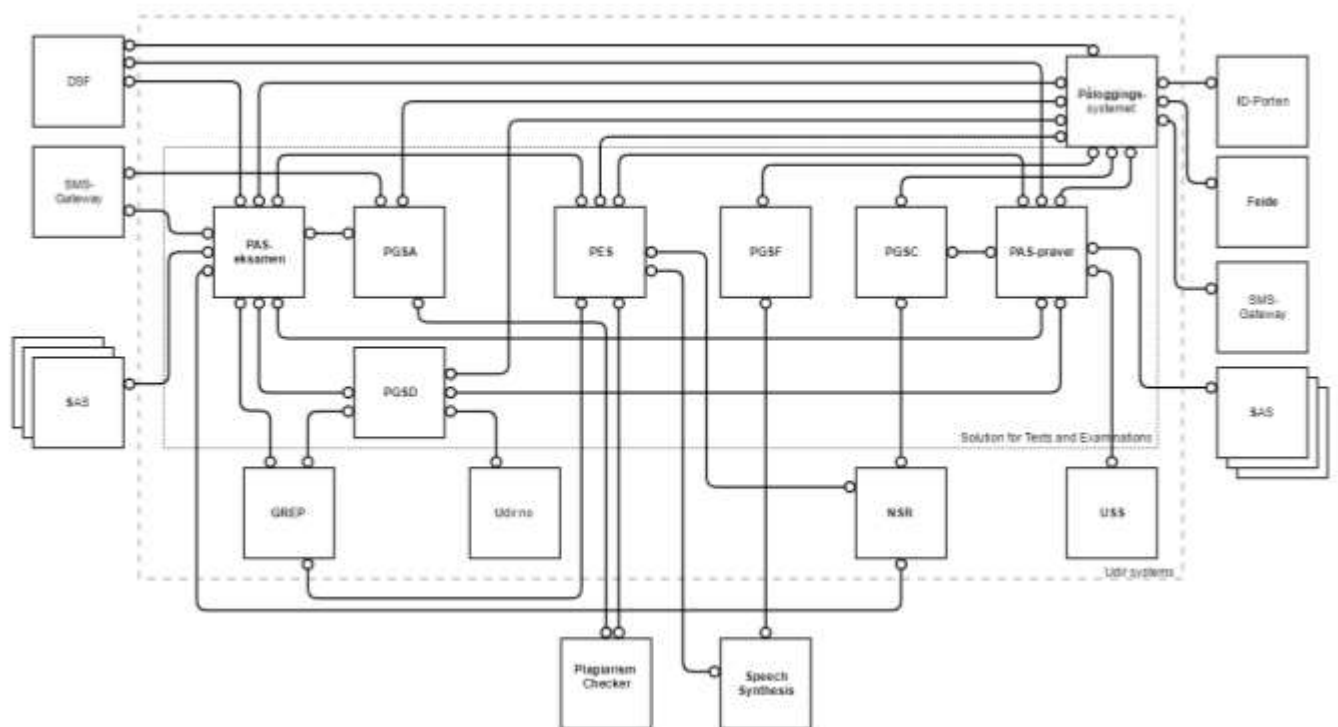
Short description of other systems

System	Description
PGSA	The Customer's current exam management system.
PGSC	The Customer's current test management system. Also used for test authoring.

PGSD	The Customer's current system for authoring exams. A SharePoint solution which supports the process of creating pdf-based examination papers.
PGSF	The Current system for preparation material for lower secondary school.
Grep	The Customer's system for subject, subject curriculum and subject codes. See http://grepwiki.udir.no/
NSR	The Customer's National School Register for primary and lower secondary school. See https://nsr.udir.no/innhold/om
Udir.no	The Customer's official website. See https://www.udir.no
USS	The Customer's system for statistics.
Plagiarism Checker	External service used for plagiarism checks of exams. The current vendor is Prio Infocenter AB (Urkund).
Speech Synthesis	External service used for speech synthesis. Currently the service is used by PGSF. The current vendor is Voice ASP AS.
ID-porten	The ID-porten is a common log-in system used for logging into Norwegian public e-services. See https://eid.difi.no/en/what-id-porten
Feide	Common Digital Identity/FEIDE is the Ministry of Educations chosen solution for safe digital identification in the education sector. FEIDE uses the concept federated identity handling. See https://www.feide.no/om-feide
DSF	The national registry contains information of everyone that resides or have resided in Norway. Used to set correct names for users for the solution for test an examination. See https://www.skatteetaten.no/en/person/national-registry/
SMS-Gateway	External Service used for sending SMS. Used mainly for sending out one-time login code.
SAS	School management systems. Integrated with PASX and PASP in order to simplify registration for tests and exams for schools and for retrieving exam results. There is currently 5 vendors that the Customer integrates with.