(e.g., OAuth, multi-factor authentication). It is highly desirable to operate in accordance with DMARC, which supports SPF and DKIM. It can also support a configuration that mixes SaaS-based email services and on-premises email services.

G　The seminar room environment must be configured in at least three seminar rooms, each equipped with a sub-monitor (Full HD or higher, preferably 4K), wired LAN, and USB Type-C power supply for approximately 70 to 80 bring-your-own devices (BYOD devices), and must be capable of both sub-monitor and intermediate monitor functions (for displaying lecture materials from the teacher's area). Furthermore, at least three study rooms must be equipped with facilities to support a sub-monitor, wired LAN, and USB Type-C power supply, accommodating approximately 50 BYOD devices.

H　The shared portable devices for educational use are intended to serve as temporary replacements for BYOD devices. They must be at least 70 devices in number and be able to simultaneously perform security updates, install and update operating systems and software, reset user usage status, and run scripts on all devices while connected to the network. Administrators must be able to specify whether they are operational only when connected to the university network or in an offline mode. It is desirable to have control devices capable of maintaining and managing the rental of approximately 10 devices in each of the three seminar rooms. Furthermore, they must be able to conduct speaking tests for the university's English language training program and provide mathematical data science education using Python. They must also be available with both Windows 11 and Linux, and include at least Microsoft Office, antivirus functionality, online meeting functionality, a software development environment (Eclipse, Visual Studio Code), and a virtual machine execution environment (Oracle VM VirtualBox, VMware Academic Program, etc.). Basic applications must be licensed for use in lecture rooms or at home, and it is desirable that they run in a virtualized environment. Furthermore, it is desirable to be able to run Adobe Illustrator, Adobe Photoshop, PTC Creo, and Mathematica.

I　As an e-Learning infrastructure, Moodle LTS with the patches specified by the university should be able to run on the server infrastructure, withstand at least 300 users taking quizzes simultaneously, and deliver online materials to 300 users simultaneously. The system should be able to immediately reflect the pass／fail status of online tests set up for user training courses in the user sourcebook system as "service usage qualification information." The system also includes an online conference function that supports synchronous online lectures for 100 people and enables document sharing (PC screen, webcam, PDF documents), chatting, and two-way video calls. Furthermore, it is highly desirable to build a system that can be integrated with services such as Microsoft Teams via LTI (Learning Tools Interoperability) and provide operational support, including security measures.

J　As an electronic data repository infrastructure, it should be equipped with a file-sharing service equivalent to Nextcloud and a document-sharing service equivalent to XWiki or Atlassian's Confluence. It provides secure, convenient file-sharing with university members and users inside and outside the university, as well as an authenticated content management and sharing repository with flexible authorization based on user attributes. It can also perform full-text searches of stored data in both Japanese and English and prevent information leaks based on the information's rating. Even when building with open source software, it is highly desirable to provide operational support, including security measures.

K　The system should have a user registry system, a group registry system, and a provisioning mechanism that can provide account information to multiple authentication systems based on the registry information. The license system should account for the accumulation of accounts, such as KIT personal IDs. In addition, the system should be capable of importing student information from the academic affairs system and faculty information from the human resources system, and issuing and managing lifetime accounts that uniquely correspond to individuals and CIS accounts that correspond to academic and professional records. The CIS account and the lifetime account are linked via a personal ID (KIT Personal ID). Users can change their own passwords on the user portal. In addition, the registry data can be managed securely using an encrypted file system.

L　As a user portal function, it should be able to provide information according to the user's attributes and have a function to specify the service to be used in conjunction with the service usage qualification information on the e-learning infrastructure. It is desirable to have a smartphone UI.

M　As a security management system, it will be possible to operate a comprehensive security software management system (ESET from Canon Marketing Japan, procured separately by the university) that can be installed on devices of university members, including at least BYOD devices.

N　As a server management system infrastructure, the system shall be equipped with functions that enable the operation and management of devices within a specified range across multiple departments, including log analysis and configuration management. It is desirable that the configuration take into consideration not only the devices included in this procurement, but also the operation and management of devices already present within the university, including BYOD devices.

O　As a terminal management system infrastructure, the system should be equipped with functionality to comprehensively understand and visualize setting information, OS and application installation status, security update status, etc., for all terminals in the system, and to centrally manage security and software assets. It must also be possible to simultaneously distribute and apply OS and application updates, security patches, setting changes, etc., via the network. It is desirable to have a configuration that allows the unified management of not only new terminals procured by the university but also existing office terminals, which will be described later, to the greatest extent possible.

P　The software management system must be configured to enable centralized license management, including update management, for the licensed software included in this system and the Microsoft comprehensive licenses separately contracted by the university. It is desirable that the configuration take into consideration not only the license management of the devices included in this procurement, but also the license management of the licensed software on devices used by university members, including BYOD devices.