# Case study:

How we extended the capabilities of a medical university's infrastructure to meet new legal requirements and attract more students

**Part II**
**March 2021 - September 2021**

Expansion of existing Active Directory functionalities


## Background

Medical University - Pleven [MU-Pleven] is one of the four major medical universities in Bulgaria. The institution admits hundreds of new students every year, while thousands partake in intensive medical courses. MU-Pleven is an active member in the global academic exchange, and markets itself as an innovative institution offering added value to students and faculty alike.
In order to sustain its leading position and widen the learning toolset, MU-Pleven had to embark on a journey to digitize its IT infrastructure.

## Case

Our previous work with MU-Pleven set the foundation for a cloud-based infrastructure through the creation and integration of an Azure Active Directory. We successfully increased user productivity and enhanced information security. However, there were more challenges ahead. Following newly adopted normative requirements, the university had to integrate its student database with the National Centre for Information and Documentation [NCID], and its student registry, in particular.
To complete this task, the university's existing IT infrastructure had to be expanded and upgraded. Moreover, MU-Pleven's main strategic goal was the adoption of a digital approach to learning and collaboration.
In practice, this would mean an extended list of online services available to students. To achieve this objective, the institution's infrastructure needed to support remote student and staff access to university files and resources.

# Solution

During our initial collaboration with MU-Pleven, we refined the existing university infrastructure by building and implementing an Active Directory. The processes and outcomes of this stage are described in detail in another case study that you can discover on our website.

In the project's current phase, our activities focused on expanding the functionalities of the directory. As previously stated, the main reason for this expansion was the need to comply with certain legislation pertaining to student administration. We decided that the best way to meet these normative requirements was to integrate the Active Directory[AD] with the University Information System [UIS]. This enabled further integration with NCID via the student electronic identifier or EAN [European Academic Number].
As a result, information about MU-Pleven's current and past students could now be stored on the Active directory and fed directly to NCID and other internal and external systems. This transition was seamless and smooth, not least because of the choices we made during the setup of the architecture in the initial phase of our work with MU-Pleven.

# Integration between the AD and the UIS

To best represent the value of the integration between the AD and the UIS, it's necessary to examine the purpose of the UIS in the first place. In MU-Pleven's case, the University Information System assumes the role of an Enterprise resource planning software[ERP]. It stores data on all university processes, such as student applications, enrolments, exams, admissions, and more. The system also contains all administrative services that students can use during and after the completion of their studies, including digital libraries, credit hours, and others. The UIS had previously served as the primary system that generates and manages user identities for MU-Pleven. However, transferring this function to the Active Directory enabled other university systems, like eduGAIN and eduroam, to collaborate with the data initially stored on the UIS. By making the Active Directory the prime storage location for student identities, data could now be easily shared across both internal and external systems. We decided that the best way to meet these normative requirements was to integrate the Active Directory [AD] with the University Information System [UIS]. This enabled further integration with NCID via the student electronic identifier or EAN [European Academic Number]. As a result, information about MU-Pleven's current and past students could now be stored on the Active Directory and fed directly to NCID, as well as other internal and external systems. This transition was seamless and smooth, not least because of the choices we made during the setup of the architecture in the initial phase of our work with MU-Pleven.

# Effect of the integration

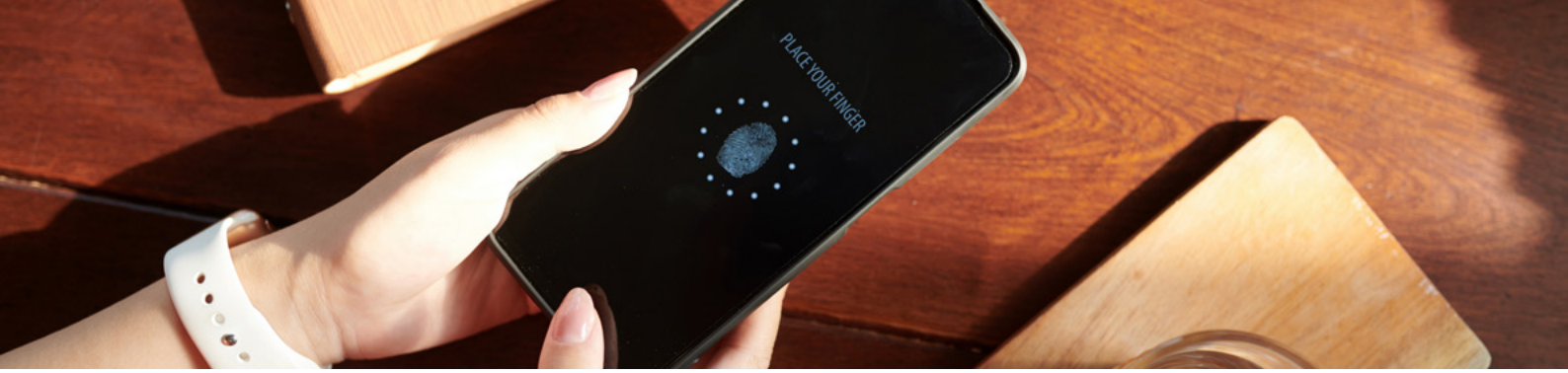
The synchronization between the AD and the UIS enables direct integration between MU-Pleven's student database and the national student registry run by NCID. Three components critical to student administration are at the core of this integration:

1. Student creation
2. Student editing
3. Student verification

When a new candidate extends their application to become a student at MU-Pleven, they are registered with a temporary identity in the Azure Active Directory B2C [Business to Customers]. If the student is accepted and completes the university enrolment process, a permanent student identity is generated in the Active Directory based on the temporary version. This process begins once the UIS requests the creation of a new identity in the AD and unfolds in five stages:

1. Check whether the student already possesses an EAN in NCID's student registry. In case there's no EAN, a new EAN is issued and the student's details are recorded;
2. Verify whether the student exists in the university's database as an individual;
3. Synchronization of student data between the UIS and the NCID;
4. Student registration with a new account in the Active Directory. If an account already exists, the details are updated and recorded;
5. The student account is assigned a certain level of access based on faculty, specialty, or student year;

By following this journey for student identity creation and verification, MU-Pleven can enjoy enhanced security and accurate data records. This applies to both internal and external systems and databases.




# AAA identification enablement

On the topic of security, one of the standalone benefits of implementing an AD is that the directory can be utilized to perform Triple A identification. This is a must in an institution of such size and scope.
With thousands of registered students attempting to access university resources and services, guaranteeing security and administering correct access rights becomes challenging. The Active Directory's capabilities prevent such risks by enabling AAA identification. Every time a student attempts to access a university service or resource online, they are confronted with the following verification steps:

1. Authentication - checks the validity of login data
2. Authorization - specifies access rights to specific resources or services
3. Accounting - tracks user activity and records audit logs for breach detection

Storing student identities in the Active Directory facilitates secure access to UIS services and student records. It also enables the UIS to send updated information to students, based on their access rights.

# RADIUS server enablement

To further strengthen MU-Pleven's position as a digital education institution, we also took advantage of the opportunities provided by eduroam. Eduroam is a university hotspot solution that provides WiFi roaming outside the institution's geographical borders via a universal identity. Eduroam is available in more than 100 countries and provides Internet on the premises of universities taking part in the eduroam network. We registered two RADIUS servers for high network availability and employed them in MU-Pleven's service. As a result, students can now access university resources and personal data via more than 150 WiFi hotspots on campus.

This is possible as the RADIUS servers connect with the Active Directory and the student's uniform identity. Furthermore, MU-Pleven servers are connected to a tree network of other eduroam servers, which function nationally and internationally. Consequently, MU-Pleven faculty members and students can take advantage of hotspots outside the university's territory.

The identification attempt will be returned to the two university servers and redirected to the Active Directory. In other words, MU-Pleven data files and student records can be accessed remotely with guaranteed security and appropriate access rights for different users.


## Impact

### Guaranteed

compliance with normative requirements due to AD-UIS integration

### Increase

in security due to AAA authentication

### Expansion

in student and faculty connectivity due to EduROAM adoption

MYSYNERGY
Value Digital Health & Care


# Conclusion

The current second phase of the project perfectly complements the initial stage of Active Directory creation. By integrating the AD with the UIS, MU Pleven benefits from secure and multifactor authentication when identifying student logins to university resources and files. Moreover, a secure network can access this data from any geographic location. Additionally, MU-Pleven now abides by the new NCID integration requirements, which are obligatory for all educational institutions.
The project is a perfect example of a structured approach to reshaping an organization's IT infrastructure, thereby increasing functionalities and creating new capabilities. This supports MU-Pleven's strategic goal of positioning itself as a digital, modern medical university.

Visit our website for more solutions

Our community: