Case study:

How a registry digitalization task turned into a nation-wide integration of critical healthcare systems

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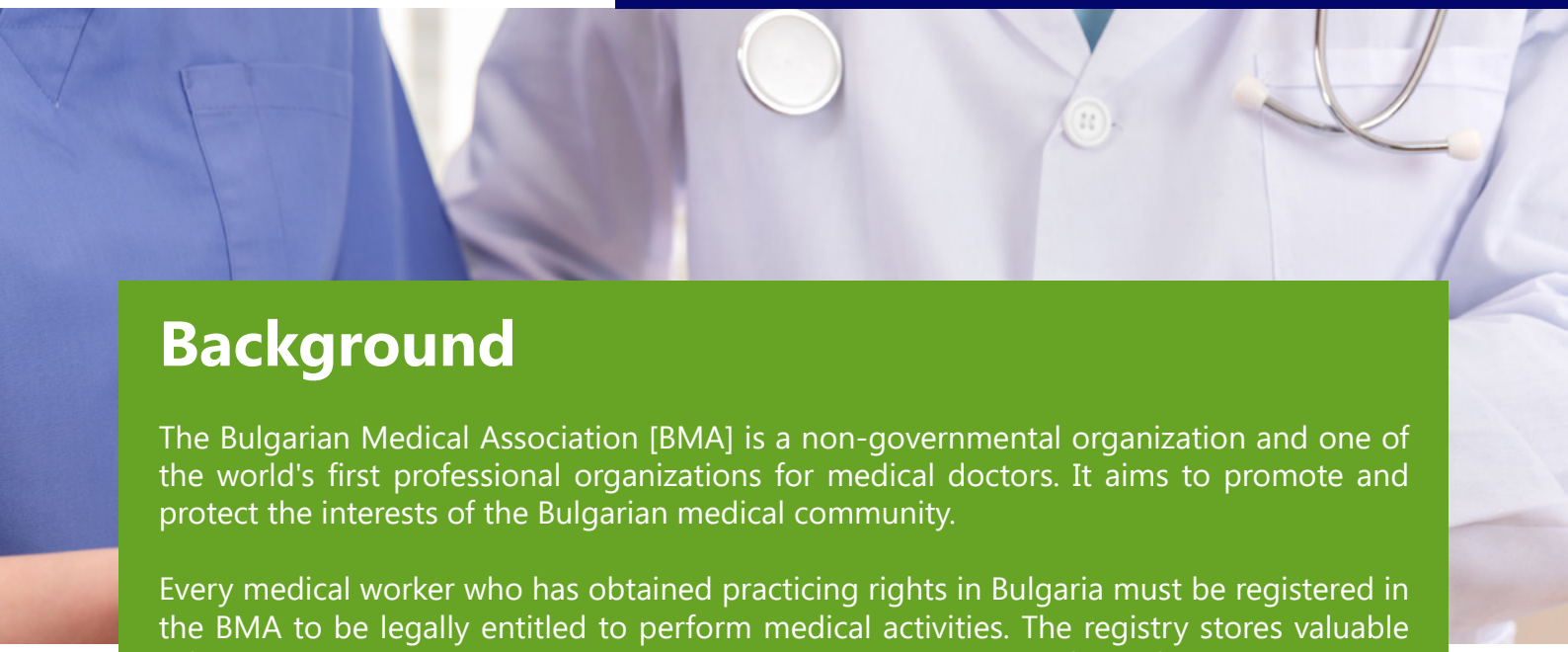

Background

The Bulgarian Medical Association [BMA] is a non-governmental organization and one of the world's first professional organizations for medical doctors. It aims to promote and protect the interests of the Bulgarian medical community.

Every medical worker who has obtained practicing rights in Bulgaria must be registered in the BMA to be legally entitled to perform medical activities. The registry stores valuable information such as the practitioner's education, experience, and field of expertise.

Case

Bulgaria's National Health Insurance Fund [NHIF] uses the BMA registry to track all medical activities and payments associated with medical professionals. The assigned doctor with the right to handle the corresponding disease endorses patient treatment. That is to say, a gastroenterologist must be registered with the BMA to legally issue a medical prescription for a stomach ulcer or order hospitalization in case the patient's condition worsens. The National Health Information System [NHIS] monitors these processes, but the BMA registry certifies their legality.

In addition, medical universities must be able to efficiently feed information into the BMA to legitimize the right of newly graduated doctors to practice their profession. The traditional way of submitting this critical but disparate information to the registry requires manual work and top-down validation. Furthermore, feeding it into the relevant institutions can often be riddled with inconsistencies. As a result, such activities require time and attention and are therefore prone to human error.

Some of the main risks were:

- Human error in inputting data - inaccuracies, misunderstandings, spelling mistakes
- Data manipulation [intentional data alteration]
- Failed validation - cases related to misplaced data or delayed verification duties

To ensure a reliable, risk-free process of recording and sharing data, the BMA requires a digital solution to secure integration with universities and external national resources.

Solution

The interwoven nature of the challenge required us to take a multi-layered approach. The main objective was to digitize the registry. However, optimizing data transfer between the BMA and the NHIF, NHIS, and the country's medical universities was equally important. We applied four main solutions.

4 Main Solutions:

Digitalization of the BMA registry

Integration with medical universities

Web application for tracking medical workers across the country

Integration with external national resources - NHIF, NHIS

Digitalization of the BMA registry

The first step was to consult the BMA about the architecture required for the digitization of the registry. These talks resulted in a design concept that guaranteed a reliable base to handle all the tasks involved. The project began with the end-to-end digitization of the registry's data input process. This way, the BMA registry could successfully manage the statuses of medical doctors across the country with negligible risk to the accuracy of the data. The solution had to accomplish two major goals. First, it had to instantly verify the medical worker's right to practice their specialized field of medicine in Bulgaria. Second, it had to track the membership fee payments, another prerequisite for medical activity in the country. Lastly, we ensured that the data input process did not rely on human interaction, manual data verification, or any manual work. As a result, the BMA registry is now a reliable and secure interface for submitting, storing, and transferring valuable information.

Integration with medical universities

The project's next iteration was to integrate the BMA with medical universities across Bulgaria. This integration was made possible by the utilization of a common approach. Through universal identity, data about graduating doctors can be freely and easily transferred to the registry. This universal identity enables access to timely and accurate information regarding medical degrees, fields of expertise of individual doctors, and other valuable records. As a result, data from medical universities across Bulgaria and Europe could now be fed directly to the BMA registry.

Web application for tracking medical workers nationwide

The project also consists of the creation of the eBMA. This online portal provides free access to users searching for medical practitioners based on region. Through the eBMA, patients can verify if the medical worker is part of the registry and has the legal right to provide specific medical services. The eBMA reveals information such as the location where the specialist practices their profession, their area of expertise, and more. The eBMA can also be utilized by medical practitioners. Doctors, who have registered with the eBMA, are provided with login credentials, which allow them to submit administrative queries. Those include, but are not limited to, membership status checks, membership certificates, documents confirming the lack of penalties, and more. Administrative information can also be requested about monthly doctor status reports, deceased members or name changes, statistical references, and others. Doctors can also manage their user profiles, pay membership fees, and update personal details through their login credentials.

Integration with external national resources - NHIF, NHIS

The project's next phase was integrating the BMA and external healthcare resources. Instant and efficient data flow between the BMA registry and national systems, such as the NHIF and the NHIS, was our main priority during this stage. Integration between the NHIF and the BMA verifies whether clinical pathway payments are legitimate regarding the practitioner's right to issue them and whether they are used appropriately. The NHIS relies on the BMA registry to validate the practitioners' rights obtained by doctors in the country. Further activities enabled by the integration between the NHIS and the BMA registry include the following:

- Issuance of medical prescriptions - verifications related to a doctor's right to prescribe medications to a patient and the origins of the medicine
- Patient records - real-time updates and validation of electronic patient records through the system, which determines whether medical activities have been performed by an authorized professional
- Electronic hospitalization - digital tracking and control over hospitalization activities
- Electronic medical referrals - digital verifications of electronic medical referrals

Utilizating Azure's Platform as a Service

We used Microsoft Azure's platform-as-a-service capabilities [PaaS] to achieve the above. In particular, we took advantage of the system to build the two active directories behind the eBMA:

- Internal Active Directory [Azure AD] - for employees of BMA
- External Active Directory [Azure AD B2C] - for medical workers

Utilizing internal and external active directories for BMA employees and medical workers helped us guarantee a maximum level of security. Active directories make it possible to trace access to the information requested by different users. It consists of two-factor and risk-based authentication, which use sophisticated AI algorithms to determine the risk level of a login attempt. Furthermore, Azure empowered us to build the registry's components, such as its database, web access, and integrations with external systems, on a platform-as-a-service solution. By developing these elements on a PaaS, we could guarantee they exist on a secure foundation. This resulted in reduced administrative costs and the optimization of computational resources. Overall, basing the project on a cloud computing platform like Azure has enabled us to provide a solution that is not limited to location. It also provides data availability and offers maximum security. Crucially, this makes disaster recovery much easier, ensuring business continuity. It's also a scalable solution that can provide flexibility based on different demand levels.

Statistics & Impact

90%
improvement in data accuracy

80%
reduction in administration burden

1200
serviced requests/hour between the national healthcare resources

MYSYNERGY
Value Digital Health & Care

Conclusion

The BMA project required a multi-layered approach. It aimed to improve registry-related processes but also create new opportunities on a national level. We addressed the challenge with a structured approach and a mindset for innovation to achieve these objectives. We enabled the digitization of the BMA registry, created an online portal that tracks medical workers across the country, and assisted in integrating the BMA with medical universities and external national resources. These solutions were designed and made accessible using Microsoft Azure's capabilities. As a result, vital medical institutions and organizations can now enjoy a flawless transfer of data and access to accurate information with minimal error risks.

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