

# HOW SUKL MAKES PROGRESS



## CENTRAL REPOSITORY OF ELECTRONIC PRESCRIPTIONS, STATE INSTITUTE FOR DRUG CONTROL

The central repository of electronic prescriptions, as established in the Czech law by the Medical Preparations Act (No. 378/2007 Coll.), should be predominantly used by patients for keeping their personal medication records. For the sake of simplicity, let us imagine that patients will use the central repository similar to using a bank account. Medication records can be utilized both in the pharmaco-therapeutical sense (as an overview of individual medical preparations, dosage, duration of treatment, overlapping therapies, pointing out the risk of simultaneously taking other drugs or foods, etc.), and the „bookkeeping“ sense (overall and detailed views of paid fees and surcharges for drugs issued, the total value of the drugs issued including the payment from the health-insurance system, i.e., from the basic insurance and – possibly in the future – from individual additional insurance).

The area of protection and security of data and access thereto is also similar to a personal bank account.

## IMPLEMENTATION STAGES OF CENTRAL REPOSITORY

The implementation of the central repository in State Institute for Drug Control (SUKL, i.e., Statni ustav pro kontrolu lecv) was divided into three stages.



### TASK

*Make information about patient medication available to doctors, pharmacies, and patients, and make prescribing, issue and use of medical preparations more transparent.*

### SOLUTION

*HW & OS: Cisco and Dell,  
VMWare ESX and 64bit RHEL;  
Integration: Progress Sonic ESB;  
SOA control: SOA Governance:  
Progress Actional;  
BAM/CEP: Progress Apama*

## BENEFITS

*Automatic storage of personal medication records, maintenance of information about medication, reduction of error rate, and automatic reporting of drug issuing.*

The first stage was started by the preparation of the transmission infrastructure and its security. This stage includes API, the fundamental range of services to be called up by doctors, pharmacists, and patients, together with journaling of all access to the medication records. An integral part of the first stage was the provision of necessary information to the public, with a specific focus on suppliers of information systems to pharmacies and dispensaries.

By the end of 2008, test operation of the central repository was launched, using electronic prescriptions of human medical preparations and issue of such preparations on the basis of electronic prescriptions.

At the second stage, which began in September 2009, connections of the prescribing doctors were made. The connection of a doctor to the central repository is *voluntary*; nevertheless, it is expected that the motivation to make efficient prescriptions, observe the costs, patient compliance vs. noncompliance, and effects on the therapy of the generic drug substitution, and other advantages, will make most doctors use the central repository.

The third and longest stage will predominantly be focused on the use of the medication records by patients and their growing participation in the care of their own health. Thanks to this aspect, use of the central repository, full development can be expected for the doctor using electronic prescriptions.

## SCOPE OF THE PROVIDED DATA AND THE METHOD OF PROVISION

For pharmacies, the connection to the central repository is mandatory by law. Without it, a patient with an electronic prescription could effortlessly look for a pharmacy which would be able to issue the prescribed drug. Moreover, there would not be a risk of system abuse in the sense of exclusively sending patients to selected pharmacies only.

The scope of data given on an electronic prescription corresponds to the usual scope of medical prescription data. The electronic prescription enables the doctor to record information for the patient and pharmacist. The method of disclosing the data is stipulated by the Medical Preparations Act and its implementation regulations (Decree No. 54/2008 Coll., concerning the method of prescribing medical preparations and about medical prescriptions, and Decree o. 84/2008 Coll., concerning the proper pharmaceutical practices and the conditions of dealing with medical preparations).

In order to stipulate the method of data disclosure, the legislative approach is not rigidly binding but, to the maximum extent, flexible and changeable, dependent on the rapid development of communication technology and the European medication environment.

## TECHNICAL SOLUTION

The hardware infrastructure of the central repository is built on the basis of Cisco technology (active elements, firewalls, IDS systems, routers, MARS, ACS). The data center is equipped with Dell products (servers, disk arrays and backup devices). The operational system of the servers is predominantly Red Hat Linux Enterprise. The environment of the central repository is physically separated from the remaining systems of the State Institute for Drug Control.

The central repository, application logic and access points of communications are based on advanced software technology and use a number of standard specifications. The database is an Oracle relational database. The application logic utilizes Oracle application servers.

The environment of the central repository and access points is an pattern implementation of SOA layered architecture. The integration environment is the Sonic ESB (Enterprise Service Bus) from the Progress Software company. This bus guarantees an interconnection of all subsystems of the repository via native JMS communications based on JMS 1.1 standard.

SOA Governance is driven by Progress Actional technology. It also includes the entry points of the central repository's interface, which enables applications used by pharmacies and doctors to communicate with the repository in two basic modes (APIs):

[web services \(HTTP, SOAP/XML, WSDL\); or](#)

[native Java Message Service XML API \(JMS XML API\).](#)

The data interfaces remain identical for both communication interfaces. Access to these interfaces is via the Internet. Secured connection to the central repository for all participants takes place in the form of a virtual private network (VPN) – encrypted connection which prevents „wiretapping“. No access to the repository is possible without this connection.

Online (24x7) supervision over the operation of the entire system is solved via the SOA governance technology by Progress Actional. This technology makes it possible to govern the operation of SOA architecture's individual layers and elements (services, service groups, applications, and nodes) and their mutual relationships; it also makes it possible to define SLA policies and inform the administrators about any policy break, should they occur..

The Progress Apama technology is applied in the pilot mode for the BAM and CEP areas. At this stage of the project, the only source of incoming real-time events is represented by calls from external consumers (pharmacies, doctors, and patients). An analysis of events and possible warnings are made on the basis of continuous assessment of the statistical deviations from long-term average values. However, suspicious business transactions can be defined in a more sophisticated way, using other internal and external sources of real-time events.

## BENEFITS

The central repository as an organizational department of the State Institute for Drug Control will, among other functions, facilitate the work of doctors and pharmacists. When connected to the central repository, a doctor will be able to prescribe medical preparations really present on the market. In this way, an unpleasant situation can be avoided in which the doctor may choose a drug that he is used to prescribing but which is not available on the market at that particular moment. In such circumstances, patients have often had to seek pharmacies in which their drugs were available. This aspect will become a significant advantage when the registration process of medical preparations is amended, and the availability of drugs on the market will consequently be subject to more frequent changes.

Another advantage for the doctor will be the availability of information about the medication prescribed to the patient by other doctors (provided that the patient has given consent to this doctor to see his/her personal medication records). With the aid of the central repository, the doctor will get an overview of drugs taken by the patient and also possible replacements by a less expensive drug in the pharmacy. This aspect eliminates the unfounded apprehension felt by some doctors that they would lose competency to formulate and control the therapeutic profiles of their patients.

A significant benefit for doctors is the possibility, when formulating the pharmacotherapeutic intention for a patient (i.e., the type, duration and intensity of the therapy), to verify the patient's cooperation with the doctor in the sense of accepting and adhering to the therapeutic intentions in the past for certain types of diseases and/or therapies. The assessment of the compliance extent cannot be realized within the existing system of paper prescriptions.

Connection to the central repository will help pharmacists in the elimination of defective prescriptions which health insurance companies cannot pay. In the future, the central repository is expected to be used as a clearing center within the relationship between pharmacies and health insurance companies. Pharmacies will thus be relieved of part of the operational costs of administrative activities, which take time at the expense of patient care.

The central repository will preserve the information about the drugs issued without prescriptions, but with restrictions, for which the pharmacist must have information to verify the conditions of such restrictions. This category, to date, includes drugs containing pseudoephedrine, due to the well-known risk of their abuse. It should become an important category not only for open availability of medicines for acute diseases, but also to make medical preparations available for therapy of chronic diseases.

## PROGRESS SOFTWARE

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