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INFORMATION SYSTEM OF METROLOGY FACILITIES IN SLOVENIA

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Abstract: In the paper the metrology information system is introduced. A small country such as Slovenia has a distributed system of metrological laboratories and therefore a strong need for efficient control of all relevant data exists. Data scheme is based on questionnaires that were delivered to calibration and test laboratories providing information on best measurement capabilities of a laboratory, calibration intervals, their activities, traceability schemes, etc. The computerised metrology information system uses client – server environment whereas the paper also deals with possibilities of Internet realisation and so promoting the Slovenian distributed metrology system in technical sense outside the country.

Keywords: metrology information system, distributed metrology system, traceability

1 INTRODUCTION

The purpose of reestablishment of the metrology information system is to enable undisturbed dataflow among laboratories involved, their clients and their partners. Data that were obtained by questionnaires contain important answers needed for creation of the laboratories' database. It enables a very effective insight into capabilities of laboratories that take an active part within the framework of the Slovenian calibration service. Data relevant to the national calibration service include information about the current situation of reference standards, their calibration intervals, traceability schemes, best measurement capabilities, etc. It is applicable to calibration laboratories as well as testing laboratories. The system is to be presented also on the Internet and the data will therefore be structured with accordance to their importance and confidentiality. For example, development plans of the laboratory will not be accessible to all their potential clients. The computer system described in the following section is based on the client – server environment and enables data managing through the prepared dialogs.

2 METROLOGY DISTRIBUTED SYSTEM

The need for efficient control of all metrology laboratories in Slovenia and their customers is manifested already for a certain time. Besides, from the point of fast and reliable access to relevant data it is of a great significance to implement computerised metrology information system (MIS). The system is meant to include all the calibration and testing laboratories in Slovenia and to be operated by the Standards and Metrology Institute of Slovenia (SMIS).

Data represent a very efficient way of insight into the capabilities of laboratories that operate in the scope of the Slovenian calibration service. Figure 1 presents the scheme of the Slovenian distributed system of standards.

3 DATABASE

Data of the metrology information system is a part of the relational database, which is divided into separate tables related to each other. As mentioned before, the structure is based on questionnaires that were distributed among metrological laboratories in Slovenia by the Standards and Metrology Institute of Slovenia in the summer of 1998. The structure can be seen in Figure 2.

Two types of data can be distinct: those concerning an overall situation of metrology in Slovenia and those referring to a particular laboratory and its activities. Authorised users can enter estimates about current and future Slovenian needs in number of calibrations and testing. These needs are classified according to industrial branches. Also, in the same manner estimates for the best measurement capabilities and needs for traceability can be entered. An authorised person can handle information about situation of certain metrological quantity as well.

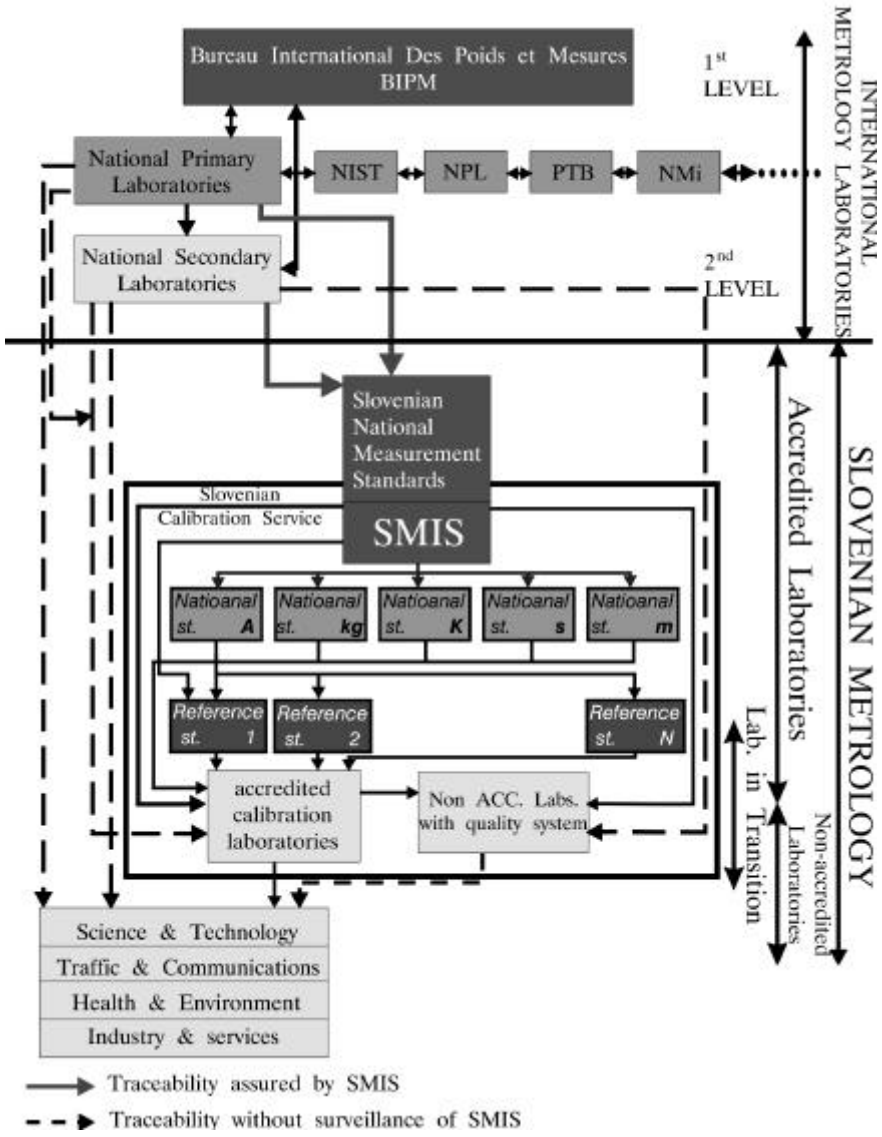

Figure 1. Traceability chart of the Slovenian metrology system

On the other hand each participating laboratory in the system can add its own specific data like:

- laboratory description: organisation, under which it operates, official name, address, organisation scheme, location scheme etc.;
- its employees: information such as personal data, qualifications, responsibilities, working experience, working experience in metrology etc.
- metrological quantities: quantities for which laboratory performs (non)accredited calibrations and/or testing;
- quality system
- best measurement capabilities: maximum measuring ranges for each quantity, best measurement uncertainties, traceability institution etc.
- traceability schemes
- equipment: manufacturer, measurement range, uncertainty and other technical specifications, year of purchase, current situation, last calibration, recalibration period, issued certificates etc.
- activities: calibrations, testing (extent), most important clients, inter-laboratory comparisons, research, investments etc.

Different participating users have different levels of access to the database in order to assure that certain data are available only to certain users. For instance, laboratory clients can read information of

best measurement capabilities of the laboratory but can not see the list of other clients. Each laboratory can add or change only its own data. An administrator who possesses all the privileges supervises all activities over the database.

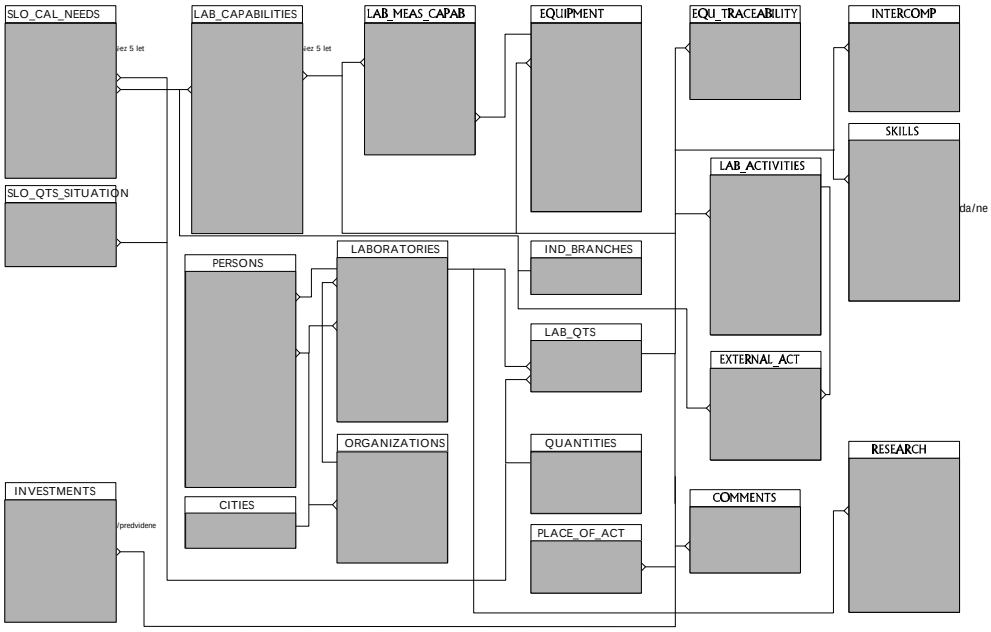

Figure 2. Database structure

4 USER INTERFACE - CLIENT

The client program is designed with the Delphi software. It is fully aware of the database structure (described in the prior section) and so enables us to handle the data of metrological laboratories through the pre-designed dialogs. As the relational database consists of many tables, the program offers an access to data through many of these forms to enter, read and also change the data.

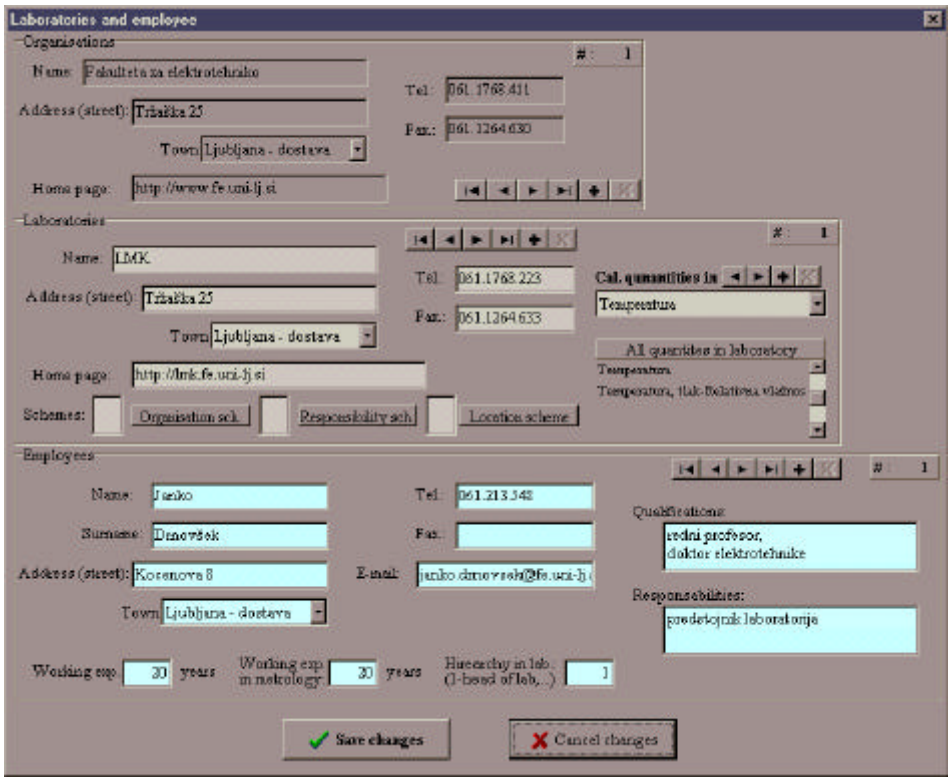

Figure 3. Dialog for managing data in the metrology field in Slovenia concerning specific physical quantity

An example of the form for obtaining information about basic information on laboratories and their employees can be seen in Figure 3.

Client programs and database server can communicate locally or through a computer network but even more important is that a database server is independent of a type of the client program. That means that client programs can be designed by any of commercially available tools that include standard interface to a database. This also means that the system can be fully opened to an extensive use by the customers all around Slovenia and abroad. The Internet infrastructure makes it even more accessible and easier to implement.

5 CONCLUSIONS

Development of metrology information system in such a short time is a very pretentious work but it is also a chance. Promoting the system from a client-server environment to the Internet offers even more efficient co-operation among Slovenian metrological laboratories and clients as well as partners outside Slovenia. Doing so it would need almost no intervention on the level of database structure. The change would only concern the client program, which in that case would become spreadly used by the Internet browser.

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