RFID Technology in Treasury Business

We present you a technical solution which can, precisely and reliably, provide the information about:

1. which good/goods are located on a certain shelf
2. which goods are located on all of the shelves (inventory)

Technological basis of the presented solution is smart shelf, based on a application of RFID technology.

Main element of the smart shelf is a RFID reader.

The RFID reader is fixed on a forehead of the shelf, vertically. Its dimensions are the same as the height and the width of the shelf. All the readers placed on one locker are connected to the TCP/IP infrastructure of the bank/control computer, over the concentrator. The control computer can be placed randomly within the IP bank's area. All of the shelves are connected to the system, supervised and controlled from the network PC computer (LAN), in accordance with the access rights, defined by the system administrator.

In order for the RFID reader to recognize the objects placed on the shelf, following conditions must be fulfilled:

- Information bearer (RFID labels) are placed on the foils (10.000 pieces of banknotes package), original Institute for issuing of the banknotes and coins packaging, with the smallest size area faced down, to the ground,
- objects of the recognition are foils with banknotes,
- each foil, marked with RFID label is previously introduced into the data base. This is conducted by use of desktop or hand RFID reader/writer connected to the PC computer. The lable is personaliyed for certain foly (data such as what specific foly contains, optionally signature of the person who creatted it, date of creation etc.). (Note: each RFID label contans fixed identification number entered during label's production process and electronic memory readable by RFID reader, and writtable by desktop reader/writer),
- *foil* is placed on a shelf with the side equipped with the label placed close to the RFID reader.

Fig. 1

On the picture above, you can see standard version of the smart shelf, equipped with the RFID reader (brown panel behind the banknote packages)

Each movement or taking away of the foil from the shelf is registered. The data registered is time when the change occurred. If combined with the access control system and video surveillance it offers complete reconstruction of the events.
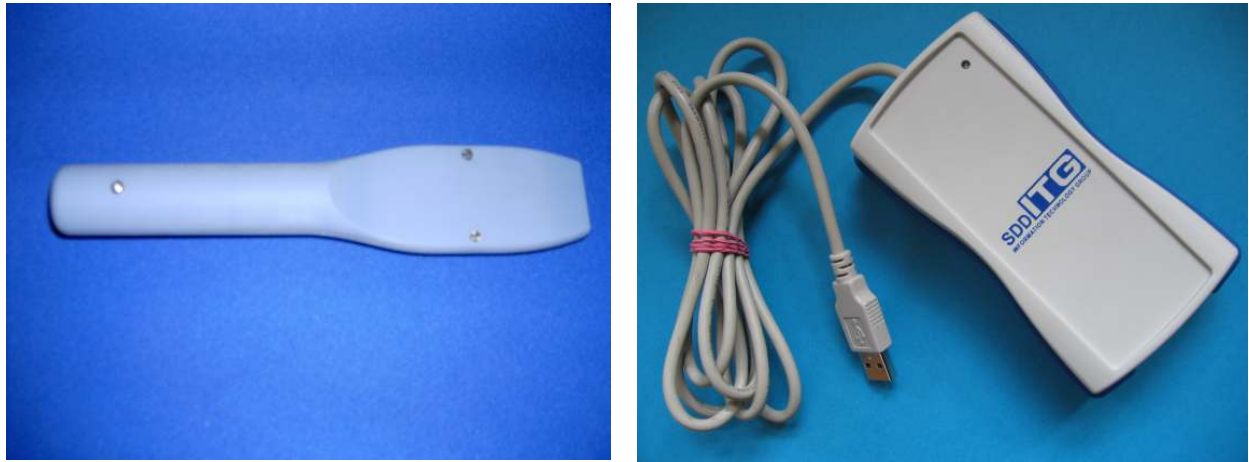

Fig.2 Hand (left) and desktop (right) RFID readers with the USB interface

Fig. 3

Fig.3 shows the contest of one shelf, presented on the screen of the control PC. You can see the position of the marked follies, sum by certain denomination and total sum on the shelf.

The entering and the issuing of the banknotes, packed and market as described above, would be significantly faster, more precise and more certain. The technology would enable you to conduct an inventory in much shorter period of time. Never the less, since the information about the shelves content is available at any moment, inventory is no longer a process. It is a moment in time and it supplies you with the accurate and up-to-date content of all of the shelves (lockers) in a particular moment in time.

If there is a possibility to utilize bank's information system, you would be able to monitor state and flow of the values in the treasures of the bank's branch office by shelves and shelves' sections, by type and category of the value, in real time.

Combined use of RFID labels and other methods of surveillance (video surveillance of treasure chambers and sub-treasure rooms), tracking of the issued commissions and technical systems of access control (combined RFID and biometry systems) would improve the level of the security of protection and manipulation of the values in the treasure.

Note: described system was presented to the top management of the Treasury of the National Bank of Serbia. The above conclusions are interpretation of their judgment of the offered system, taken from their written report.