



Barcodes: a solution to all the needs of the health services?

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INVENTED OVER 50 YEARS AGO, BARCODES AND RADIO FREQUENCY IDENTIFICATION (RFID) CHIPS ENABLE INFORMATION TO BE “TRANSPORTED” WHICH IS THEN READ BY ELECTRONIC DEVICES.

THE TWO SOLUTIONS HAVE CHARACTERISTICS IN COMMON. SOMETIMES, THEY ARE THOUGHT OF AS COMPETING WITH ONE ANOTHER, AS IF BARCODES ARE GOING TO BE REPLACED BY RFID CHIPS. THERE ARE MANY REASONS TO AFFIRM THAT THE COMPLEMENTARITY OF THE TWO VECTORS IN THE HEALTH WORLD HAS A GOOD FUTURE.

BARCODES AND RFID CHIPS: TRANSPORT SYSTEMS FOR STANDARDISED INFORMATION?

When a hospital supplier suggests a software solution to manage the linen, for the traceability of tray meals or perhaps to manage the follow-up of goods produced by the sterilisation unit, he will frequently suggest the use of barcodes or RFID chips. He will tell you he is offering a “standard” solution, which has been tested in other hospitals or in other applications.

Standard: the word has been pronounced! It is true that all barcodes and all RFID chips cannot be read by any old scanner. The price of a scanner goes up in line with the growing number of types of barcodes readable. Regarding RFID chips, the reading modules correspond at the best to two wavelengths at a time.

With the appropriate equipment, the reading is easy. You obviously have to use the technique best fitted to your needs in order to limit the variety of data capture devices in a determined process. RFID chips are tiny - sometimes as small as 0.4 mm in diameter - and of course do not have batteries. Instead, they are powered by the radio signal that wakes them up and requests an answer. Barcodes - for which the costs of printing and reading are very low - are currently best suited to operations such as the logistics of medicines supply, medical or food devices together with the distribution of these within hospitals.

BARCODES AND RFID CHIPS: WHAT INFORMATION IS TO BE TRANSPORTED?

We have seen that both solutions enable *information* to be transported. For them to be used, a further requirement is that the transmitter of the information uses the same “language” as the device to which it is being sent!

Over the last 30 years, users have developed “identification systems”, the best known of them being the EAN.UCC system, the origin of which is common to North America and Europe. Used today by more than a million organisations in the world, in more than 24 sectors of different activity, this consists of the identification system that will best meet the new needs for identification and traceability in the food distribution and health chains (Regulation EU 178/2002). This system is managed by a not-for-profit organisation, present in 103 countries in the world.

The EAN.UCC system reposes on the unequivocal identification of objects, logistical units, service relationships (e.g. a patient’s stay in hospital), the premises and functions. Complementary concepts have been defined, such as for example dates (of manufacture, of expiry, etc.) or attributes (batch /series numbers, references to orders, weight, dimensions, etc.). The information is carried in barcodes, RFID chips or in electronic messages. Independently of the computer hardware or the working language of the users, the information can be captured and processed according to the processes that have been developed to rationalise and secure the circulation of merchandise from the supplier to the patient, passing through intermediate storage in the hospital.

SOME PRACTICAL EXAMPLES OF USE

We would like to illustrate our remarks by some examples, in the light of observations we have performed on the ground.

Goods produced in the sterilisation unit and barcodes

An effective software package has been installed in a hospital of approximately 2000 beds, to manage the goods produced in the sterilisation unit. Each sterile set corresponds to an appropriate description in the database of the software package, and bears a label with a standard barcode created by the software package and that contains the information neces-



sary to ensure the traceability of the sterilisation processes.

The software package could use the EAN.UCC system without additional costs; interoperability would be improved.

Re-useable surgical instruments: RFID chips or barcodes?

A university hospital destroyed all the ophthalmic surgery trays of a certain type after it became aware that a patient who had had an operation has been suffering from a variant of Creutzfeldt-Jacob disease, because it was impossible to know which individual surgical instruments had been used on this patient. The necessity of tracing the instruments surgical individually and of being able to relate them to patients with whom they have been used is a challenge that several hospitals have now tackled.

Software solutions to this sort of problem are available on the market; they are able to identify each instrument individually with a "data matrix" barcode. A supplier of chips (RFID 125 MHz patented to operate within metal structures or other difficult environments) offers for its part the possibility of carrying the identity in a chip incorporated into the instrument. In both these cases, the structure of the identification is governed by the solution software package.

A large hospital centre in France launched an open appeal for tenders in the month of May 2004 to equip its central sterilisation department with a software package solution that included the identification of surgical instruments, making use of the EAN.UCC system. The hospital managers have recognised the importance of using an "identification system" in preference to an isolated solution, because interoperability, being able to perform unique identifications and pre-defined data structures would facilitate the other developments necessary for the setting up a system for tracing external and internal supplies made available to the hospital.

Monitoring of professional clothing and RFID chips

Individual items of professional clothing in a hospital of approximately 1000 beds are identified individually by a RFID chip. An automatic distributor ensures the management of the professional clothing; garments are recognised at the time when they are distributed or surrendered which enables individual quotas to be managed. The RFID chip presents the advantage of being easy to read whatever the position if the garment, and of being able to withstand the washing processes over a long period. The use of the EAN.UCC system here would offer the advantage of integration.

Management of the reception of goods and barcodes

A large hospital in the South of England has found a solution to improve the reception of its supplies modelled on those used by large supermarket chains. It consists of adopting EAN.UCC identifiers with the suppliers for the deliveries, in conjunction with electronic messages transporting the detailed information about each delivery (total or partial, with the order reference number).

Similar practices are already in place in large hospitals in Spain, with some good examples in Catalonia and Galicia.

WHAT OF EPC ?

EPC, that is to say Electronic Product Codes, are a unique way of identifying each individual object. As a rule, this identification is carried in a 64 or 96 bit RFID chip. The identification corresponds to a type of unique address which the information systems access by Internet by means of a particular language. With this method we can find the indications individualised by object on the expiry date, the contra-indications, etc. EPC is an innovative element of the EAN.UCC system.

RFID CHIP OR BARCODES:

A COST/BENEFIT ANALYSIS

Chips or barcodes, we recognise that the key is not so much in the means of transmitting the information as in the information itself. It is this information that we want to read and incorporate into the information system that is decisive, and the advantage of an "information system" is that it enables us to prepare the databases to hold what is required to be in them, then to work effectively with these new parameters.

An example of the cost/benefit of the next step we are recommending? A nurse in charge of the cardiology sector of a large hospital manages her stock of more than 600 different catheters using a manual system. She spends half her time doing this. With a system based on barcodes placed on the items by the suppliers, her skills would be available for her patients 95% of the time. All she would need was a scanner and access to the stock management system in the same way as her colleagues in the orthopaedic or the pharmacy department.

WHAT IS YOUR NEXT STEP?

First step: Set up a computerised stock system and use a EAN.UCC-compatible data system. We are convinced here that the investment would be worthwhile if it were able to trace and improve the processes in the hospital sector; and that it would be possible within budgetary constraints.

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