



The BiblioChip-System in a Library - Some Economic Figures

The economic efficiency to use an RFID system in a library depends mainly on two factors: the completeness of the library's functional units and their allocation inside the building.

The self-check-out, the circulation with stack mode at the counter, the book return station and the use of the Sensor Gates are well suited to demonstrate the efficiency. In the future other components like the sorting units, the inventory wand, the payment machine (ATM), should also be included in the estimation in order to quantify possible synergies.

These synergies are for example:

- Self-check-out in combination with an Automatic Book Return, which is located in a lobby room with 24 hours access: the patron returns his items before he enters the library. In this case the patron will not think "I have to go to the counter anyway later to return my books, so I can check out the new items then as well". The effect is that the frequency of use of the self check out station will increase to nearly 100 % of the total checked out items, if the patron will "drop" his items before he enters the library.
- Sorter System: this system has to be customized. Determining factors for the efficiency are numbers of sorting categories, available space, number and kind of audio-visual media, etc.
- Payment machine (ATM) in the lobby (open 24 hours): again this work is being totally taken away from the counter.



- Also positive effects can be expected from using the Inventory Wand: Stocktaking will be much easier and can be done more often than before.
- The identification of stolen media (Gate Tracking): this function offers even more information right now, e.g. regarding reordering items and matching it with the list from the data base.

In the text below only some of the aspects can be quantified. The figures given are meant as an orientation and need to be adapted accordingly in each individual library.

1. Security

Information about the number of stolen material ranges from 5 to 15 percent – including both the most popular stolen items (CDs and DVDs) and the “less popular” items (books).

Various producers of security gates verify that using a security system reduces the amount of stolen items about 80 percent. The RFID-system does not differ significantly in its security function for books. Concerning CDs the new Secure-it Label must be regarded as superior: it is the first label that allows a direct protection at a requested reading distance in the sensor gate.

If there is an RFID system in use for security only it will cover the costs within 2 years. We calculate the following: The time for attaching the labels on the media is being ignored. With an inventory of 200,000 media and a theft rate of five percent a library has to compensate a loss of 10,000 items. Considering that every item costs about 20 EUR it comes to an amount of 200,000 EUR per year.

This has to be compared with the following investment costs:



Price per Label 0.60 EUR x 200,000 items = 120,000 EUR
plus the appropriate system units (RFID-Sensor Gates) for
15,000 EUR = 135,000 EUR.

If there were 8,000 media less stolen than before, the number of stock that has to be replaced will be as low as 2,000 ($20 \times 2,000 = 40,000$ EUR). This means savings of 160,000 EUR in the first year and amortization in the second year.

2. Requirements of personnel for circulation at the counter

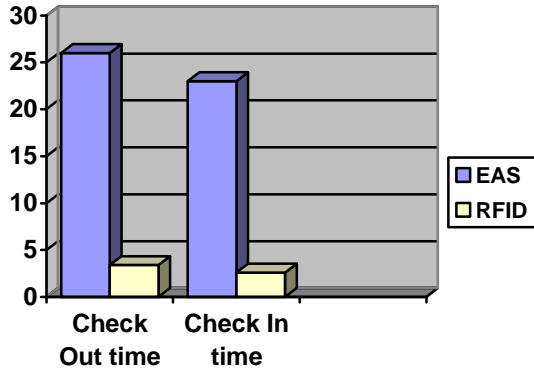
Usually 600 media can be checked out per person and hour. The labor costs are 38,000 EUR per workplace.

Using an RFID system with a stack mode reading capability means that at least 1,200 media can be checked out at the counter a one place. That means twice as much than without RFID. The savings are corresponding with the costs of one workplace.

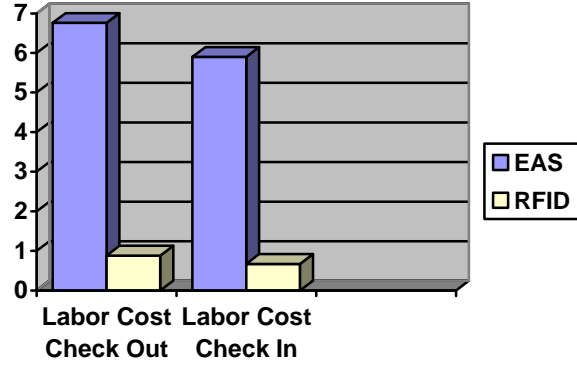
The time needed (which was investigated in a U.S. library, Mastics-Moriches Shirley Community Library, NY) was measured in comparison with the normal checkout procedure with the barcode reader. The result showed that the time needed was not only cut in half but even much less (see figure below).

All time measurements and cost analysis were done during the circulation and return of Video and DVD materials. The figures relate to 177 items being checked out and checked in.

Time analysis in minutes

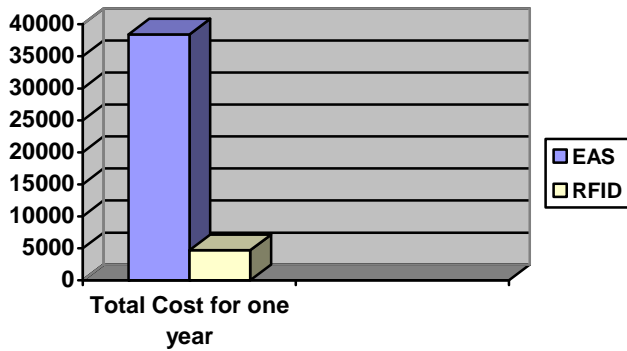


Cost analysis in USD



The average Circulation Clerk salary is US\$ 15.88 / hour or US\$ 0.26 / minute.

In total 536,950 Videos and DVDs were checked out or checked in from January 2003 till December 2003.



Analysis total Cost for one year USD 1

The anticipated annual savings with RFID versus EAS are projected US\$ 33,703.00 per year.

3. Requirements of personnel with a Self Check-out station

To keep the counter well attended will cost 57,000 EUR considering having 1.5 skilled personnel at disposal per workplace. The Self Check-out station is used up to 80 percent with no times of idling. The utilization of 100 percent seems to be realistic. In this case, the work at the counter corresponds to 1 to 1.5 workplaces.

4. Requirements of personnel for stocktaking

Considering that labor costs are 22 EUR / hour and the stocktaking with four people needs ten working days expenses will be 7,040 EUR. 90 percent of these costs can be saved when using an Inventory Wand (remaining costs are 700 EUR).

5. Increase of circulation

This is only quantifiable when the circulation data from the library management system are available to compare data "before" and "after". The better arrangement of the items in the shelf will help to reduce search times.

6. Requirements of personnel for Check In

This corresponds to the savings for the check out, since it is done by the patron. As such it would not be relevant if it was using a stack mode (stack mode cannot be used for the sorting, but would be possible for a self check station used for check-in and not for check-out).



7. Requirements of personnel for sorting

Because of the fact that every library is different, this is again very difficult to quantify. To quantify means to check the necessary labor time before and after the installation of a sorting unit.

The above given estimations show that it is necessary to break down the system to its single processes. All the advantages sum up to a pay off period of the system which is below two years.