Intelligent Shelves

The fastest check-in for libraries.
Intelligent Returns Shelving

**Automated Materials Handling 2.0**

More libraries are moving away from acting like a conventional 'book factory'. Instead they emphasize on providing added value through increased patron-interaction. In this scenario, it is key to have staff on the library floor to guide and inform patrons when they need it.

By using RFID-based intelligent returns shelves, all returned items remain on the actual library floor until these are checked out again. This implies that a maximum number of staff can remain in the proximity of where the patrons are at all times.

Apart from creating an environment in which staff is available on the library floor, the use of intelligent returns shelves also has other advantages.
Intelligent Returns Shelving

Deal with peaks

With intelligent returns trolleys, patrons can return multiple items at the same time, just like one would put items on a regular shelf. When on average, patrons return 4 items per visit, depending on the Library Management System performance, check-in rates of less than 1 second per item can be achieved.

When considering an investment in materials handling solutions, the number of stations in which a library invests, is determined by the check-in peaks one sees in a library. In most cases, these peaks lie on very specific days and/or just after the morning or afternoon library opening. These peaks can be three times as high as the peaks

Scalable solutions

The SIP2 licenses and the greater part of the investment in self-service hardware and software are connected to the terminals which are used to provide the item check-in functionality. With conventional solutions, this would mean that every AMH entry or standard check-in desk requires a SIP2 connection and the required RFID hardware and software.

In the case of intelligent shelving solutions, the investments mentioned above are directly linked to the infoterminal to which the trolleys are connected. This implies that by connecting two XL trolleys to one infoterminal, the static check-in capacity can be doubled (200 items to 400 items) with a very small investment.

Save over a thousand* hours a year

The just returned items are often also the fast-moving items: fellow-patrons are always very interested to see and read the items that are just returned by others. With conventional solutions this phenomenon is not supported as items are moved to the back office as soon as they are returned by the patron.

With intelligent shelving nonetheless, all returned items, which are not flagged for other actions by the ILS, are directly available for other patrons to be checked out. This has a very positive effect on the turnaround time of popular items. Also, as a result, around 25% of all checked-in items are checked out on the same day; straight off the shelf.

*In the case displayed above ([500,000 check-ins / year]), this saves reshelving 125,000 items per year which approximately equals 1,000 hours of work.

Source: www.librixonline.com (Public library with 560,000 check-ins, 2012)
“What about items which require special attention?”

As with other RFID self-check solutions, it is very important that staff are notified when items which require specific actions are returned. Although these items are blocked by the ILS and cannot be checked out by patrons as a result, enabling staff to take these items from the intelligent shelves is very beneficial for the internal process.

For this use, all intelligent shelving solutions can be equipped with a so-called ‘reserved-item printing’ module. This module can be set to print a ticket at the staff desk whenever an item is returned which is on hold, or for example must be taken out of the collection or has received a specific sorting category through the ILS (Hold queue and/or CI-field in SIP2).

Alternatively, these items can also be separated by the use of on-screen messages which can request patrons to place these items in dedicated slots which can contain a simple box or dedicated RFID-enabled letterbox.

“Save over one thousand hours every single year...”
When using RFID, the handling of RFID-enabled AV-material might require special handling (for more information also see the Nedap label quality document). This is also the case for intelligent trolleys.

**Media check-in box**

The greater the number of items containing CD/DVDs which are returned in the trolley, the greater the amount of metal in the trolley which absorb the energy that is transmitted by the RFID antennas. For this purpose, a dedicated RFID media check-in box has been developed to facilitate checking-in media items.

During the process, by using the sorting categories available in your ILS, the patron can be notified to only use Media check-in box for all media items. Once the patron has checked-in the item, he/she can place the item on the non-intelligent part of the shelf, maintain optimal performance of the RFID process as such.

**RFID-enabled letterbox**

Alternatively, Media items can be sorted from the general flow by enabling the patron to return these items in an RFID-enabled letterbox. This sorting can be done by using the sorting messages available in the ILS. With these sorting messages, items can be refused in the trolley whilst notifying the patron on-screen that the item needs to be inserted in the Media RFID-enabled letterbox.

* Nedap components built into a bespoke furniture solution
Generally speaking, when considering investing in RFID self-check solutions, a number of fixed and variable factors determine the investment level one has to take into account.

**Project-based costs**

Due to the standard setup of the shelving trolleys, one can opt to install an intelligent shelving solution without having to perform any type of refurbishment or construction. With a network cable and power from the net the trolley / info terminal combination is already fully functional.

Due to the easy nature of installing these standard solutions, installation cost for the intelligent trolley are comparable to installing a standard self-check solution. No specific hardware installations have to be done on-site, as the standard solutions can be installed out-of-the-box.

**Hardware**

The investment in RFID hardware for a standard info terminal is somewhat higher than that of a standard selfcheck. When one nevertheless connects two trolleys to the same info terminal, the relative hardware investment per check-in trolley is lowered considerably and comes close to that of a standard selfcheck solution. Apart from the furniture which accommodates the shelves (trolley) and RFID hardware / user interface (info column), no additional hardware is needed.

**LMS and software**

Depending on the LMS vendor, with every check-in station SIP2 licenses are charged by the LMS vendor to the library. As one connect multiple check-in trolleys to a single info terminal, the intelligent trolleys can accommodate multiple check-in stations over a single SIP2 license.

A similar comparison can be made regarding RFID self-check software licenses. Due to the fact that one can connect multiple stations to a single info terminal, on just a single software license, two check-in trolleys can be connected.

**Maintenance**

The yearly recurring cost for maintenance of RFID solutions, is connected to hardware and software. In general, components which are subjected to movement and are subjected to wear-and-tear as a result also need to be maintained and/or changed periodically. As it is a fully static RFID-solution, just like the standard self-check solutions, intelligent trolleys do not contain moving parts. This implies that periodic checks and maintenance can be kept to a minimum, which obviously has a positive effect on the yearly support and maintenance fees.

**Investment per product:**

<table>
<thead>
<tr>
<th>Investment</th>
<th>Sorter</th>
<th>Selfcheck</th>
<th>Intelligent Shelving</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction / Refurbishment</td>
<td>★★★★☆</td>
<td>★★★★★</td>
<td>★★★★★★</td>
</tr>
<tr>
<td>Installation cost</td>
<td>★★★★★</td>
<td>★★★★★</td>
<td>★★★★★★</td>
</tr>
<tr>
<td>RFID hardware</td>
<td>★★★★★</td>
<td>★★★★★</td>
<td>★★★★★★</td>
</tr>
<tr>
<td>Additional hardware</td>
<td>★★★★★</td>
<td>★★★★★</td>
<td>★★★★★★</td>
</tr>
<tr>
<td>SIP2 Licenses</td>
<td>★★★★★</td>
<td>★★★★★</td>
<td>★★★★★★</td>
</tr>
<tr>
<td>Software licenses</td>
<td>★★★★★</td>
<td>★★★★★</td>
<td>★★★★★★</td>
</tr>
<tr>
<td>Annual maintenance</td>
<td>★★★★★</td>
<td>★★★★★</td>
<td>★★★★★★</td>
</tr>
</tbody>
</table>

**Performance per product:**

<table>
<thead>
<tr>
<th>Performance</th>
<th>Sorter</th>
<th>Selfcheck</th>
<th>Intelligent Shelving</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mobility</td>
<td>★★★★☆</td>
<td>★★★★★</td>
<td>★★★★★★</td>
</tr>
<tr>
<td>Scalability</td>
<td>★★★★★</td>
<td>★★★★★</td>
<td>★★★★★★</td>
</tr>
<tr>
<td>Peek handling</td>
<td>★★★★★</td>
<td>★★★★★</td>
<td>★★★★★★</td>
</tr>
<tr>
<td>Check-in capacity (per info unit)</td>
<td>★★★★☆</td>
<td>★★★★★</td>
<td>★★★★★★</td>
</tr>
<tr>
<td>Sorting</td>
<td>★★★★★</td>
<td>★★★★★</td>
<td>★★★★★★</td>
</tr>
<tr>
<td>Software licenses</td>
<td>★★★★★</td>
<td>★★★★★</td>
<td>★★★★★★</td>
</tr>
<tr>
<td>Annual maintenance</td>
<td>★★★★★</td>
<td>★★★★★</td>
<td>★★★★★★</td>
</tr>
</tbody>
</table>
“Describe the setup of the intelligent return trolley solution.”

All trolleys are connected to an info terminal that consists of an RFID reader, PC and a screen. To this info terminal, up to two trolleys can be connected at the same time. The info column can be power connected through a wall socket. For connection to the ILS, a UTP cable is connected to the info column.

“Describe the capacity of the intelligent trolley concept.”

The XL intelligent trolley has a capacity of approximately 175 books. Up to 2 trolleys can be connected to a info terminal simultaneously. By replacing full trolleys with empty ones to accommodate peaks in item return, easily more than 600 items per hour can be returned per info column. Depending on the library layout and/or the height of the check-in peaks, libraries obviously can choose to use multiple info columns or replace trolleys more frequently.

“Describe the process for handling reserved or hold items.”

There are several ways to handle reserved or hold items. These options are discussed below:

- The intelligent shelf software can be equipped with a reserved-item module, which prints a ticket at the staff desk whenever a reserved item is returned. This way the staff can immediately take the book from the trolley and make it available again. The reserved-item printing is triggered by QL (sorting)- or Hold Queue fields from the ILS.

- With the information from the LMS (QL- or Hold Queue fields), the intelligent shelf software can be configured to inform the patron to move the reserved items to specific shelves or bins.

“Describe how full trolleys can be disconnected and moved into the library.”

All trolleys are equipped with an easy-click connector which allows for easy connection and disconnection of empty and full trolleys. This way any staff member is able to easily change full trolleys for empty ones.
"Over 100 libraries worldwide use intelligent trolleys..."

Intelligent shelving has been first implemented by Nedap in 2005 as a Retail concept. Shortly after, the first libraries in the Netherlands have started using the solution as a library-friendly alternative to the available alternatives.

Since then, over 100 libraries worldwide have implemented the intelligent trolley solutions. Below a number of references with contact details are listed. More references are available on request.

- **UK**
  - East Sussex Coast College

- **The Netherlands**
  - Amstelveen Public Library

- **Belgium**
  - Bree Public Library

- **Russia**
  - Moscow Business School

- **Canada**
  - Trois-Rivières Public Library

- **Norway**
  - Bergen Public Library

- **Spain**
  - Cantabria Public Library

- **India**
  - VNMKV Agricultural University
We’d love to see you again at
www.nedaplibrary.com