



IMMS: LIBRARY STORAGE MANAGEMENT BY INTELLIGENT MATERIAL MANAGEMENT SYSTEM

LIBRARY STORAGE MANAGEMENT BY IMMS

Library space is finite, and libraries are changing from being a collection of books to an active study, work and learning space, using space normally used for stacks. However, despite the worldwide decline, physical circulation is still the most used service in a library and the actual number of physical items is as high as ever.

This means that many libraries are looking to dedicated storage sites, where rent is cheaper, and items can be stored more efficiently. However, as storage collections are not dead collections, these sites still need to be part of the active library holdings, which makes it imperative that items can be easily located and quickly retrieved, and that intermittently required collections (reading list material or seasonal items) can be efficiently routed to the right place at the right time. IMMS close integration with the ILS/LMS enables storage space to be a part of the living collections.

[As Lyngsoe Systems has extensive experience in inventory management as well as control over large scale logistical processes](#) - the IMMS warehouse management is industry standard and capable of controlling the largest warehouse collections while being fully integrated with the ILS.

THE BENEFITS OF CHAOTIC STORAGE

FLEXIBILITY:

Empty storage space is filled up immediately, which means the storage site becomes pliable to the needs and demands of the fluctuation of requirements from library users.

SPACE:

Chaotic storage allows 15-30% as many items at storage sites than before.

SIMPLICITY:

For new employees, there is no learning where the "economics section" of the storage facility is, nor is there a need to worry about keeping certain book genres, authors or even titles together.

OPTIMIZATION:

Rather than having employees trek back and forth to fulfill an order with varied content, the system can compute an optimized fulfillment route.

HUMAN ELEMENT:

Most public employers value being job creators, and with chaotic storage there is no need to worry about a technology upgrade leading to a more impersonal work environment. Amazon finds that using human employees armed with barcode scanners is more profitable than relying on robots to store, sort and ship products.

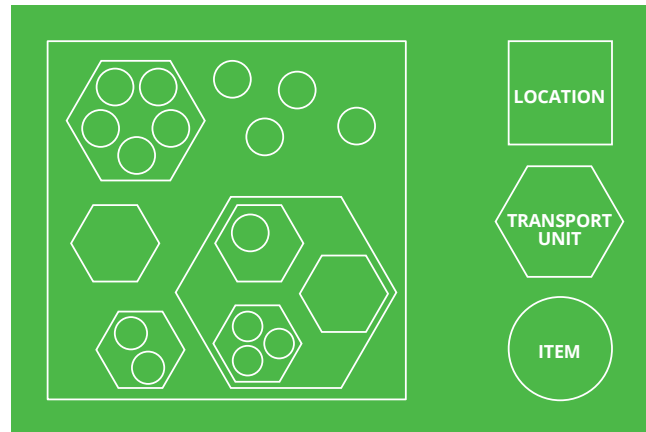


Figure 1: The figure above attempts to illustrate the principle of nesting

CHAOTIC STORAGE

IMMS uses a standard chaotic storage system, which makes warehouses around the world much more flexible than conventional library storage and can respond to changes much easier.

Chaotic storage is a system wherein incoming products are placed randomly on available shelving space within a given location with disregard for categorized/alphabetized locations. An example of Chaotic Storage Inventory management use is [Amazon](#), where it is the secret behind Amazon's astonishing fast order fulfillment, delivery capabilities, and accuracy. Thanks to the capabilities of inventory management software, staff knows exactly where every item is shelved (despite their random placements).

The IMMS software aggregates information about specific items and their locations by employing the use of RFID- or barcodes scanners. The location of items is always known whether nested in boxes and transport units or directly on the shelf.

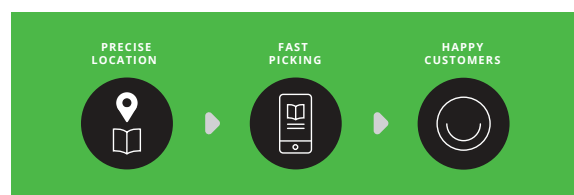
This reduces the amount of planning, because neither the range of materials as a whole, nor the volume of particular items need to be known or planned in advance. In practical terms, this means that instead of allocating a section of a storage facility to "chemistry" or "items bought in the period xx - yy" the employees just use the first available shelf space and scan the bin or tote content to that shelf tag.

FAST RETRIEVAL OF ITEMS

IMMS gives concise knowledge of item placement within the location, including registration of items in transport units. When storage items are requested by users through the main library ILS a picklist (for available items) is calculated and sent to the mobile client and sorted according to location and best walking order for retrieval.

IMMS creates walking order picklists by listing a number of criteria governing which orders the list should contain. The picklist exists in the IMMS client as a type of real-time search result, obtained for a particular location from searching all of the orders contained in the IMMS. As the orders get checked off as completed, they are no longer displayed when the picklist is updated or if another user chooses to pull up an equivalent picklist.

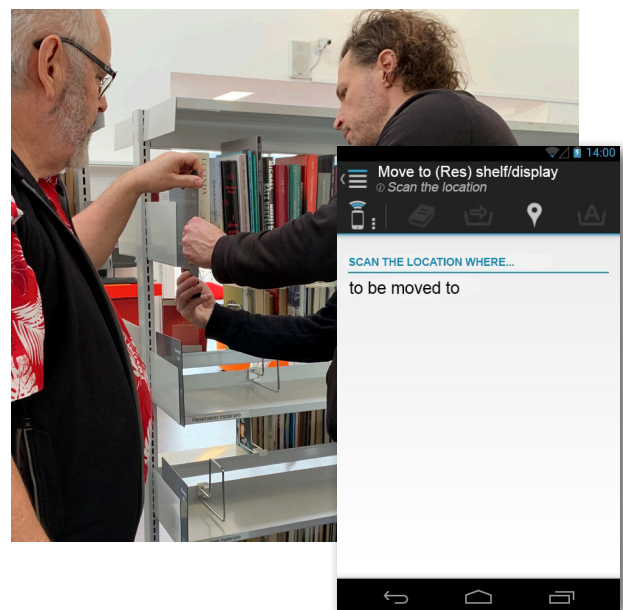
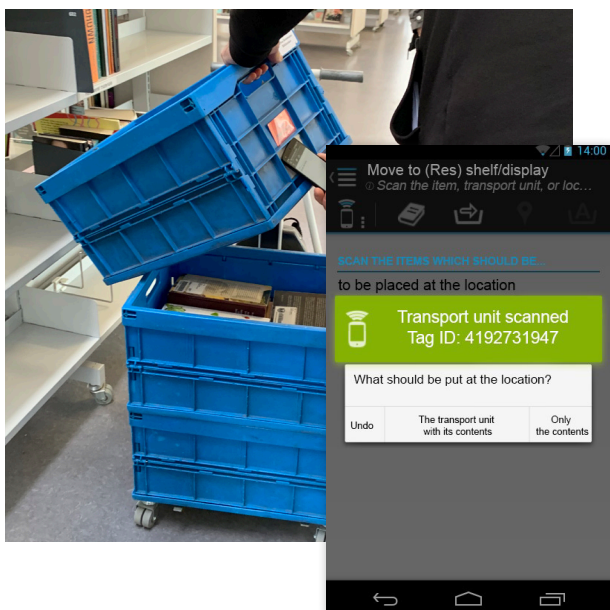
This means that several users can work at the same time without worrying about items being picked already. In the same way, new orders can be automatically added to the list while the picking is in progress. In this way, one person can pick almost 300/items/hour.



BATCH MANAGEMENT FOR FAST HANDLING

Batch management in the Media Hotel makes it possible to scan the content of a transport box directly to a shelf without scanning the individual items as IMMS knows exactly what is in each box.

The user determines where it is most convenient to offload transport unit content optimizing and compacting the available space. The aim is at all times to avoid scanning single items.



STORAGE IN COMBINATION WITH AN ACTIVE LIBRARY COLLECTION CAN BE HANDLED IN SEVERAL WAYS:

MEDIA HOTEL

One or more storage areas can be selected as a Media Hotel. This means that the storage area needs to receive items there is no room for at the ordinary branches. For a title, it may also be indicated that the items must always be stored in a Media Hotel when not loaned out.

The Media Hotel is a buffer storage site for active items not required on open shelves due to fluctuations¹ in demand. These items can be routed to a local/remote storage site which is organized using the chaotic storage principle. For the Danish public libraries, this gives double the item retrieval speed and between 15-30% more space². IMMS knows the dimensions of every item in its Media Hotel and the exact dimensions of vacant shelf

space in the entire library and is thus easily able to continuously and in real-time calculate and optimize the use of space, making sure that open shelves are tidy and filled with patron relevant material within the set parameters.

PERMANENT STORAGE

More permanent/remote storage sites can also benefit from the efficient storage and exact space and location control IMMS offer. Material can be stored in crates or directly on shelves and the system will know at all times where each item is located. Accurate statistics are managed either granularly through the IMMS interface or through tools in the ILS software. As with the Media Hotel, retrieval is efficient and fast, and status as well as present location is always updated in ILS.

¹ Fluctuations can be seasonal and for example manage decreased demand for gardening books in winter

² Please see IMS final report to the Fund for Welfare Technology

Lyngsoe Systems is one of the world's leading software developers and systems integrators of logistics solutions for a wide range of complex logistics chain environments within the library, postal, supply chain and airport markets. We have been designing, installing and maintaining control and track-and-trace systems for more than 40 years and are leaders within the radio frequency identification (RFID) technology market.

With more than 5,000 installations worldwide in more than 60 countries, the Lyngsoe team demonstrates extensive customer process knowledge and advanced expertise within solution design, software development, integration, service and maintenance. In addition, we provide complete project management and consultancy services for our installations worldwide.



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