

RFID - Technology and Applications in Libraries

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Outline

- ***Basic aspects***
 - History of RFID in libraries
 - RFID principle
 - RFID label
- ***System overview***
 - Potential applications
 - Scenarios
 - RFID advantages
- ***Experiences at EPFL***
 - Current status
 - Benefits
 - Difficulties encountered

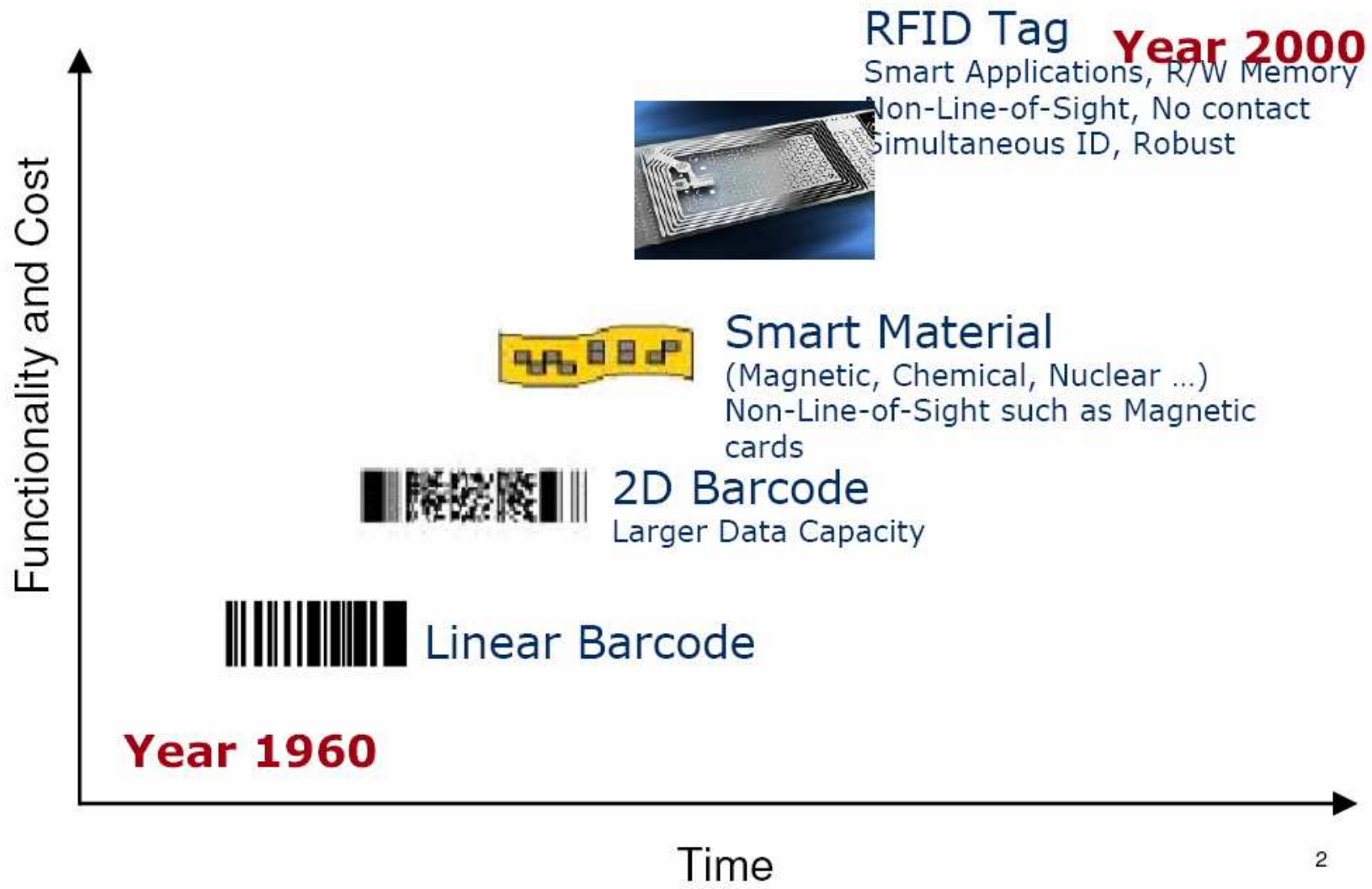
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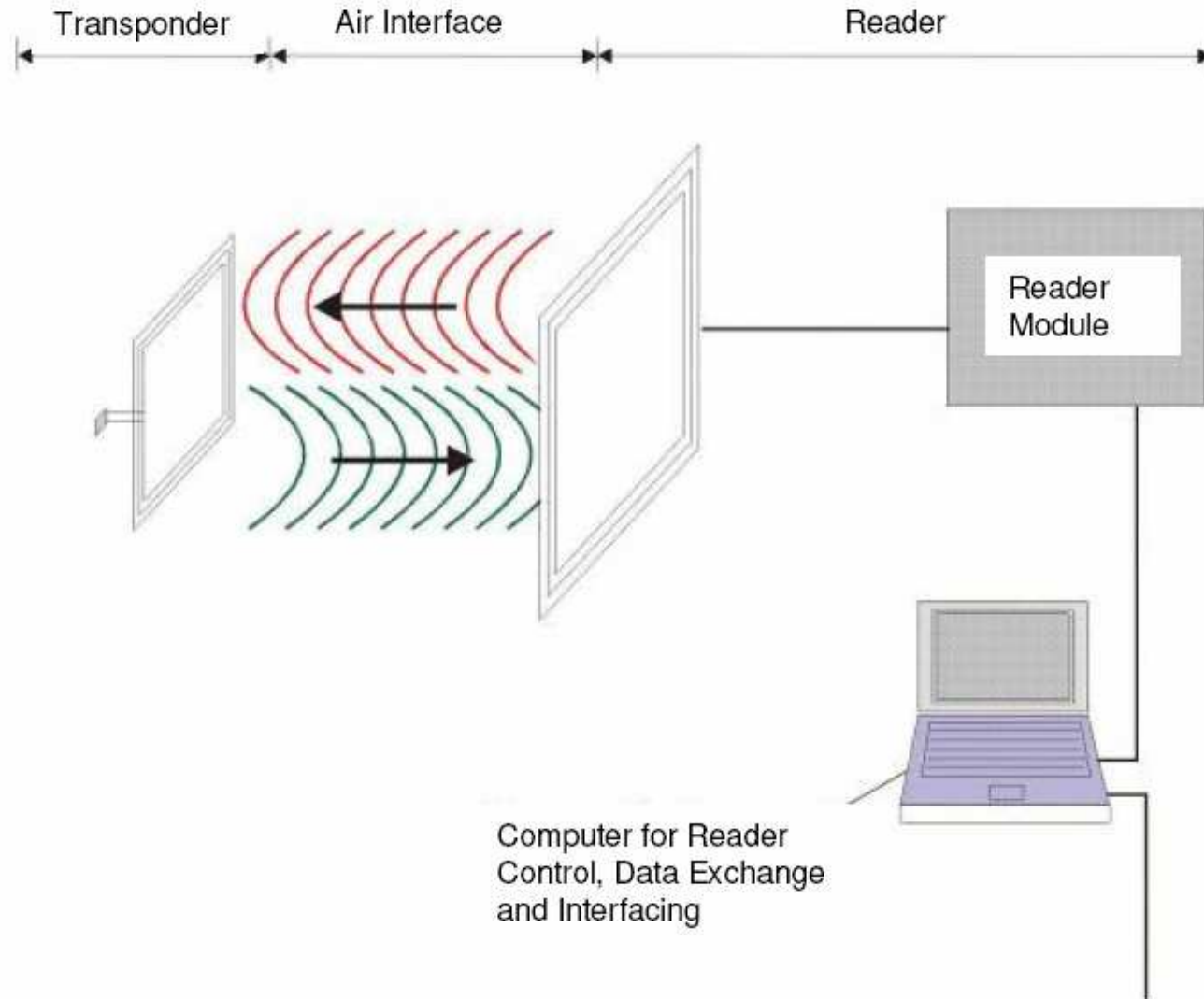
History

Development of Auto-ID-Systems

Estimation : 8% of worldwide libraries implement RFID

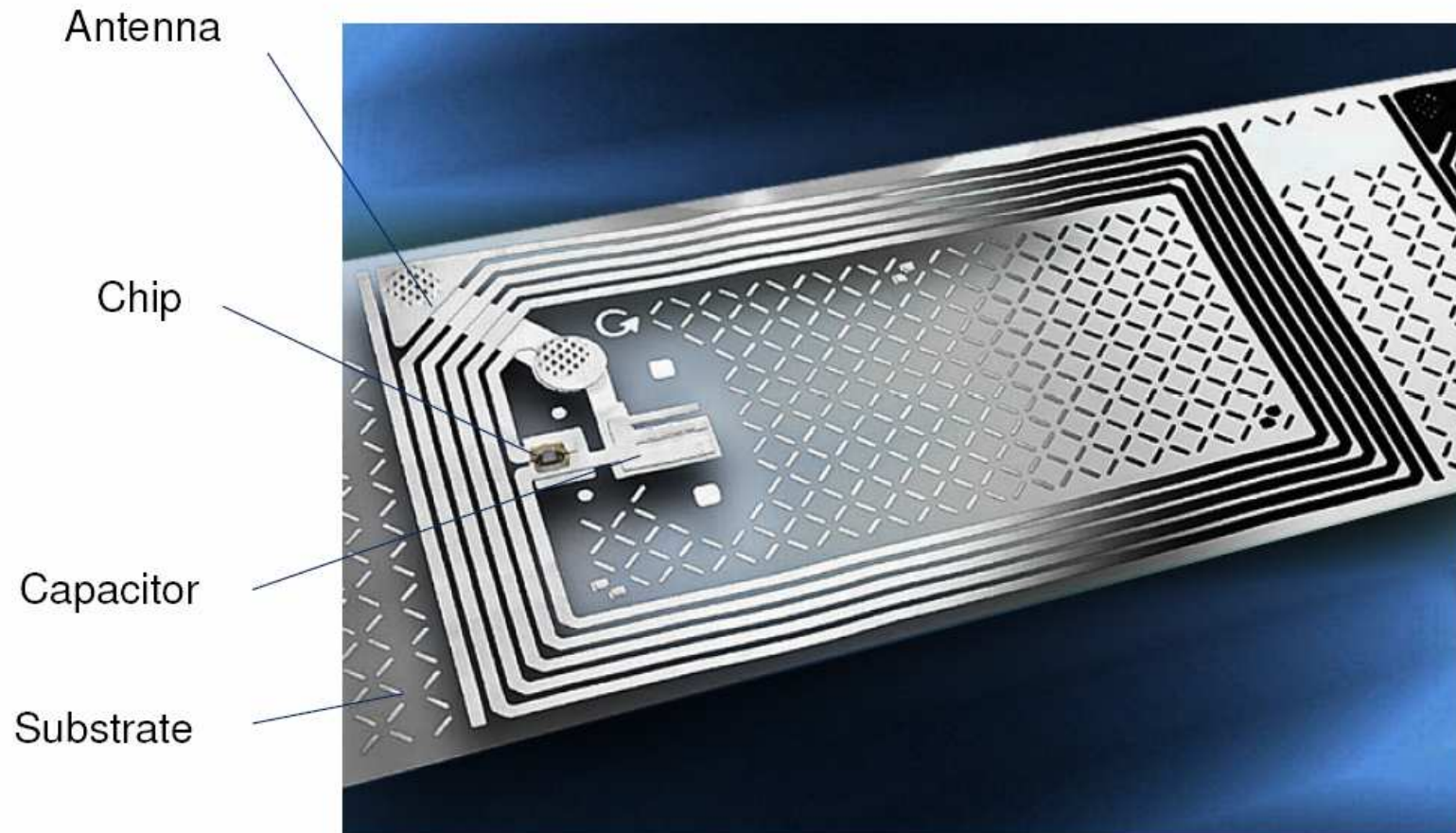


RFID principle



RFID tag

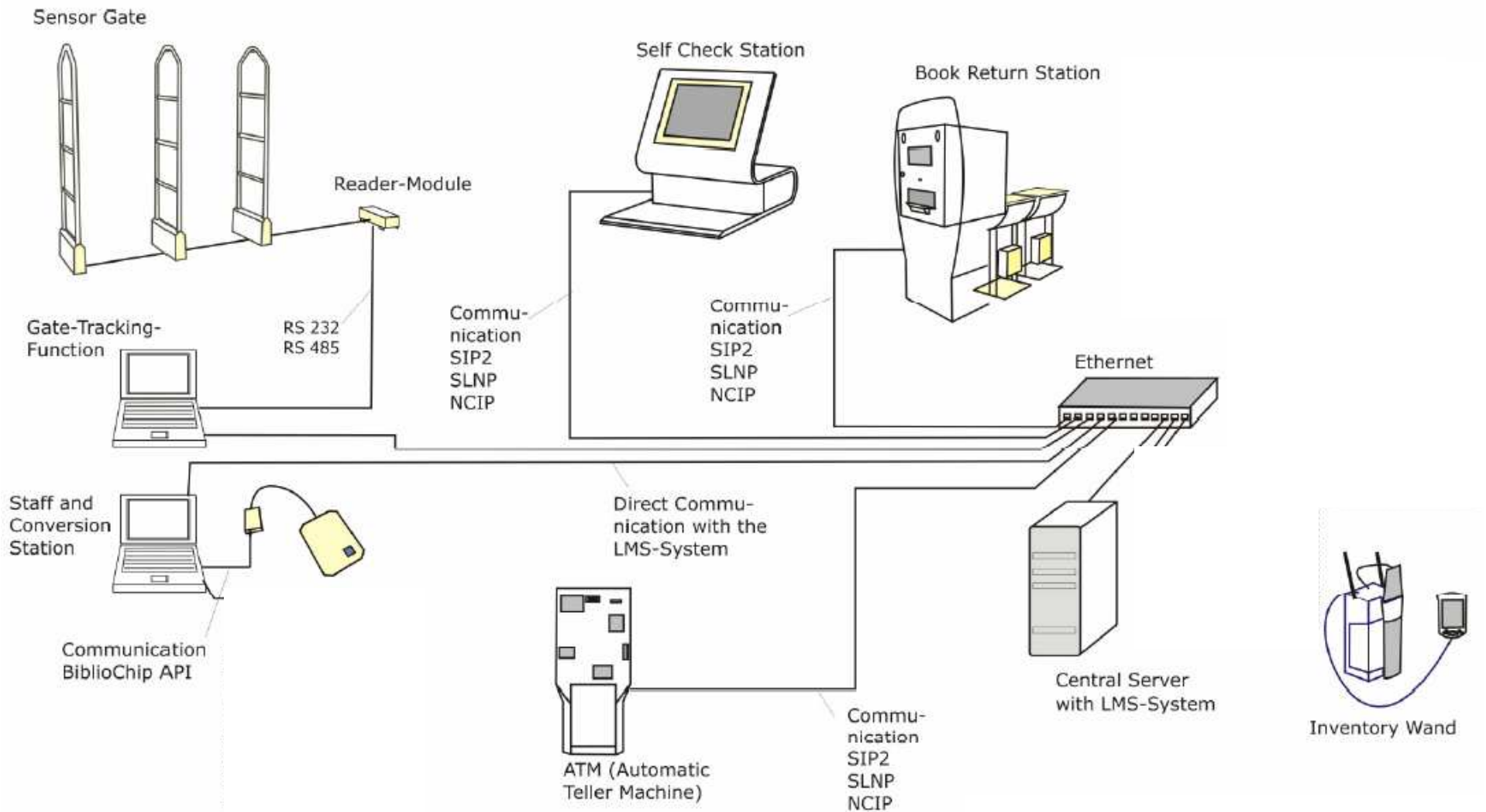
RFID-Label Construction – Inlay with Antenna and Chip



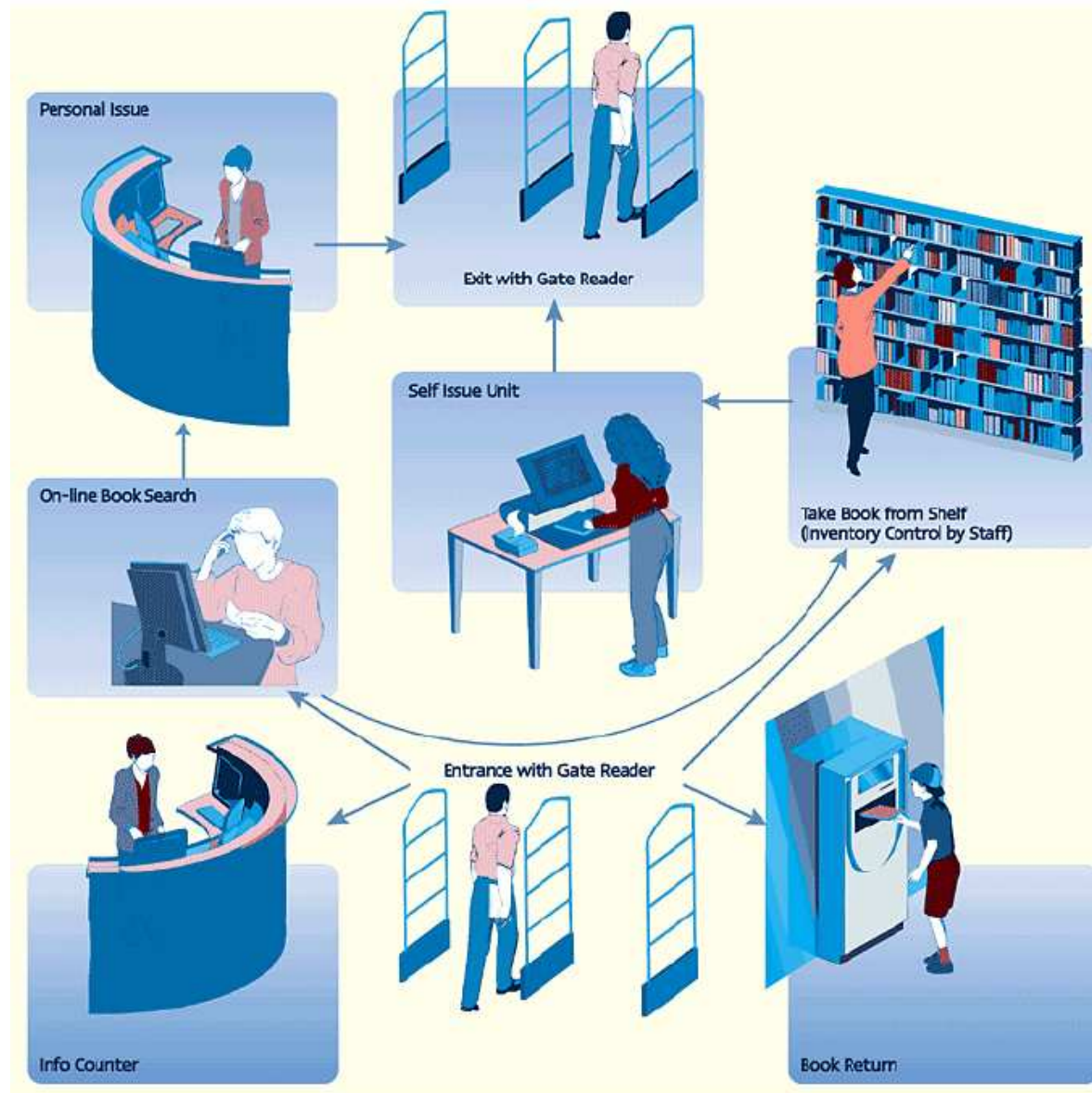
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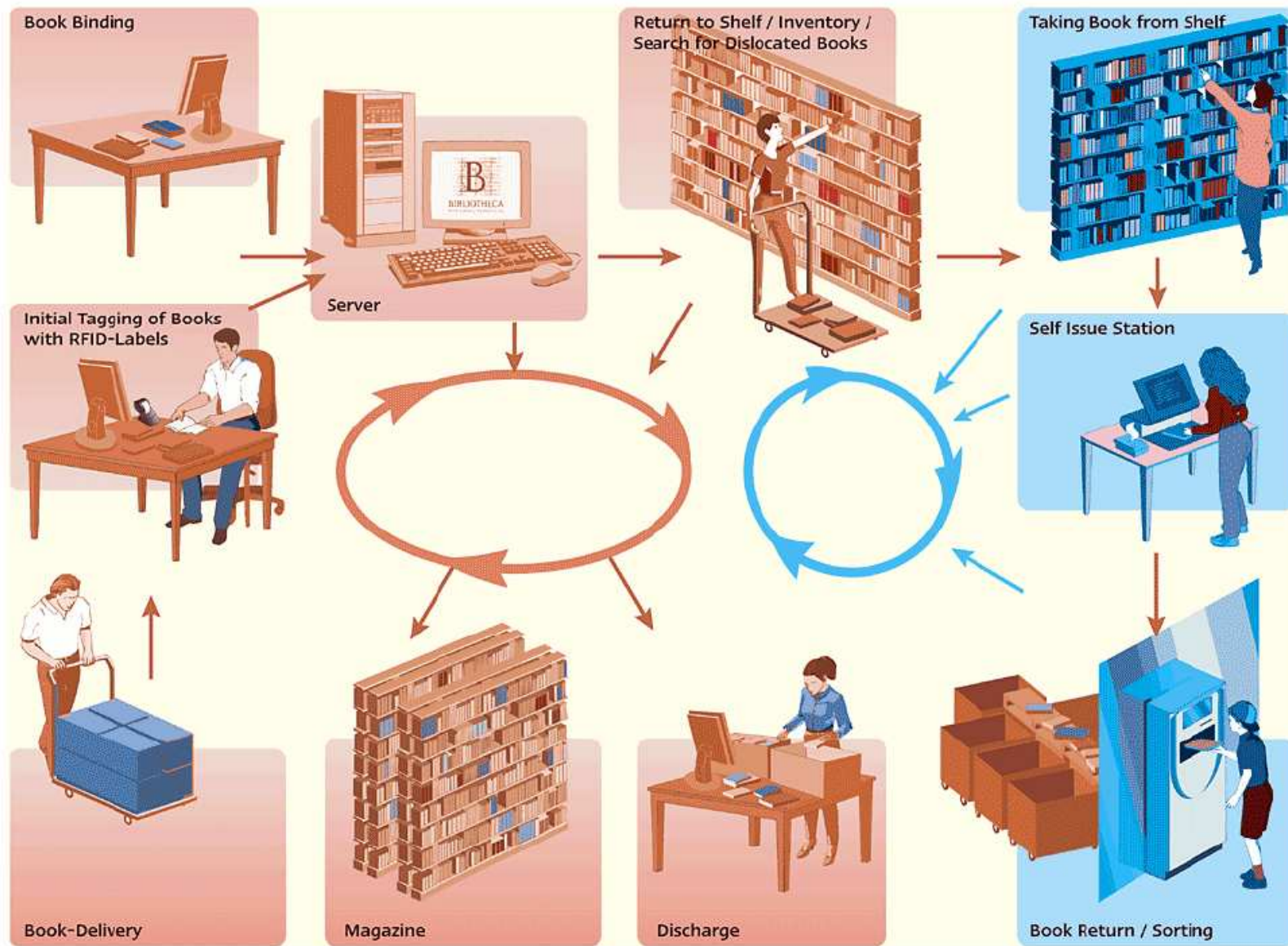
Potential Applications



Scenarios – External Part



Scenarios –Internal and External Part



RFID advantages

- ***Chip is user-friendly and multi-purpose***
 - Media is re-writable
 - More ergonomic for staff
 - Theft control more efficient
 - Stack check out (more than one book at a time)
- ***Efficient self-check***
 - Use fewer resources for that repetitive work
 - No waiting lines
 - 24 hours return (automatic book return)
 - Privacy
- ***Inventory control***
 - Faster
 - Done more frequently
 - Shelf order function

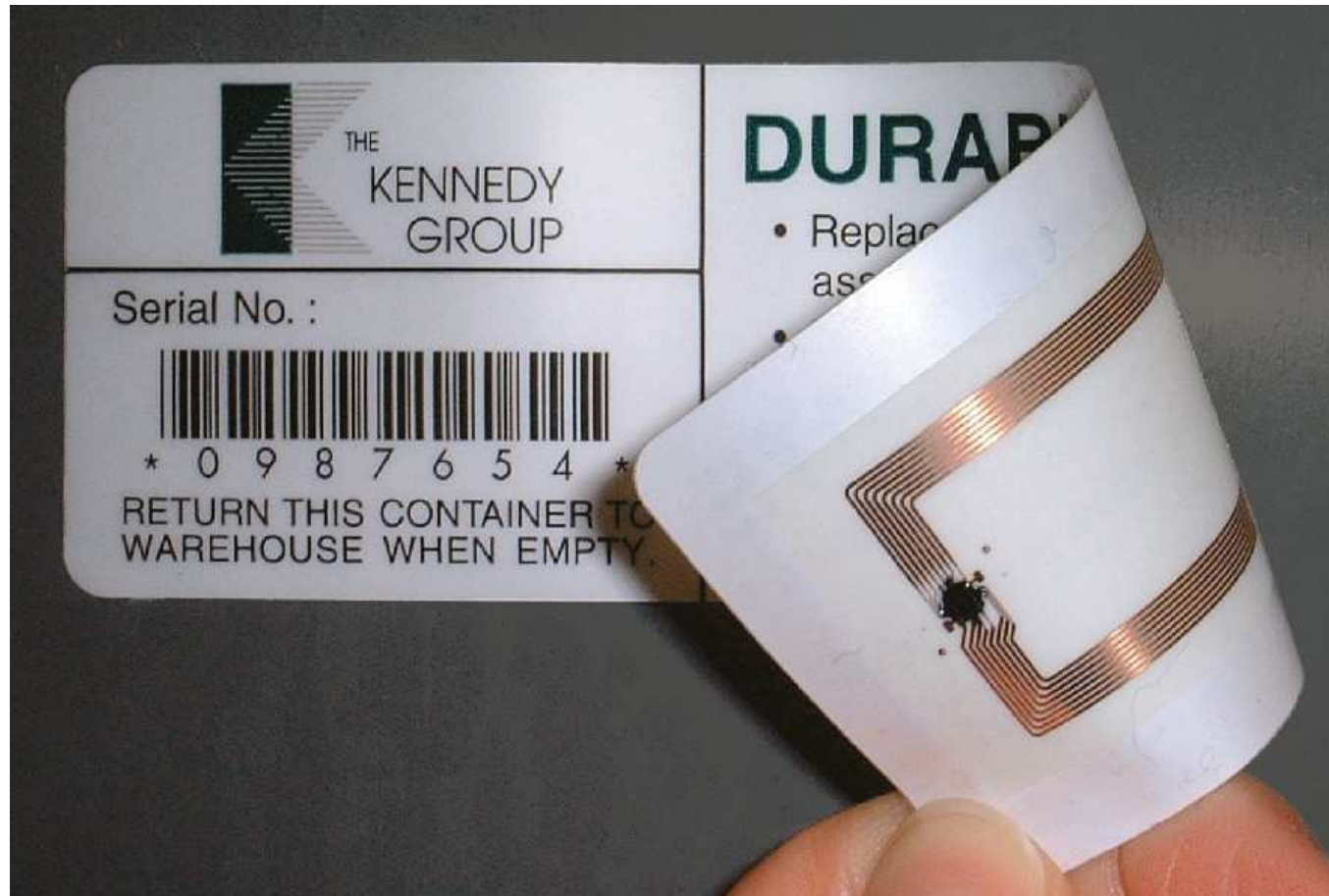
Automated return processing



Bar-codes vs. RFID

	Reader Management	Book Management
Bar-code	Reader number (bar-code) printed on reader's card	Bar-code stucked to outside of book
Pros / Cons	<ul style="list-style-type: none"> + Reading reliable - Easy to duplicate 	<ul style="list-style-type: none"> + Reading reliable - Theft control inefficient - Inventory difficult and cumbersome - Non-modifiable - Single item check-out - Line-of-Sight Technology
RFID chip	Reader number written inside reader's RFID card	RFID tag stucked inside book
Pros / Cons	<ul style="list-style-type: none"> + Very difficult to duplicate - May involve reading problems, difficult to understand for non-specialists 	<ul style="list-style-type: none"> + Theft control (offline gates) + Easier inventory process (Handheld device) + Fewer resources for check-in/out (Self-Check Station) + Contains more information (name of library, type of book) - Book tagging process cumbersome - Bar-codes are kept for compatibility with non-RFID libraries

RFID tag and bar-code



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RFID applications at EPFL

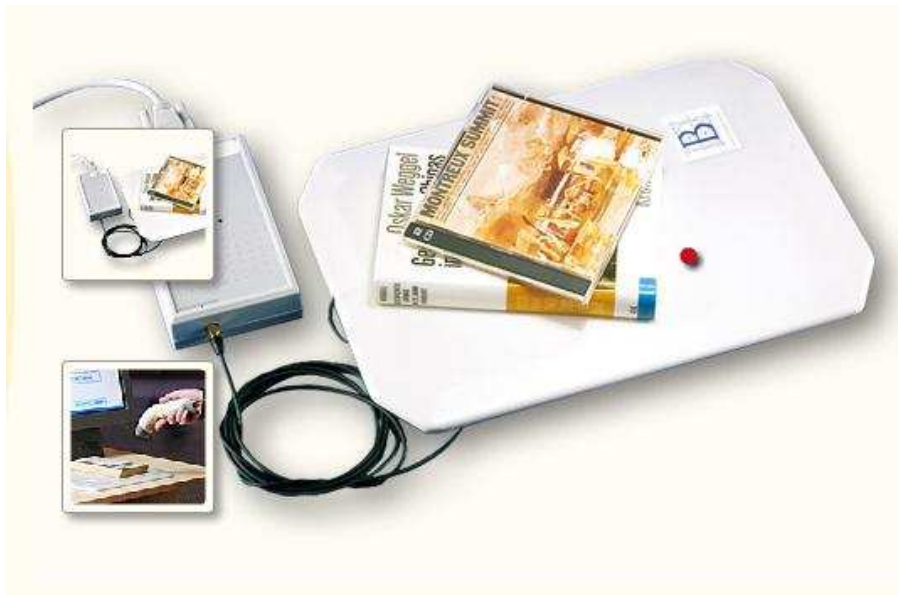
- Badge Management → 4 InfoTerminals
- Access Control → 700 doors equipped
- E-card payment
 - 21 Points of Sale
 - 5 money chargers
 - 9 vending machines (Selecta)
- Copy Management → 14 CopyManagers
- RFID library at architecture department
- To come:
 - Parking
 - Free-access bikes
 - Lockers

EPFL architecture library status

- Provider is *Bibliotheca*, in collaboration with *polyright*
- LMS : Aleph
- Self-check station, staff-station, gates, BiblioWand, conversion station, people counter
- 20'000 books tagged
- Next steps
 - Finalize installation and tests (BiblioWand, staff-station)
 - Acquire experience for the future Learning Center Library

EPFL Library Installation (1/2)

- Self-check station
- Staff-station

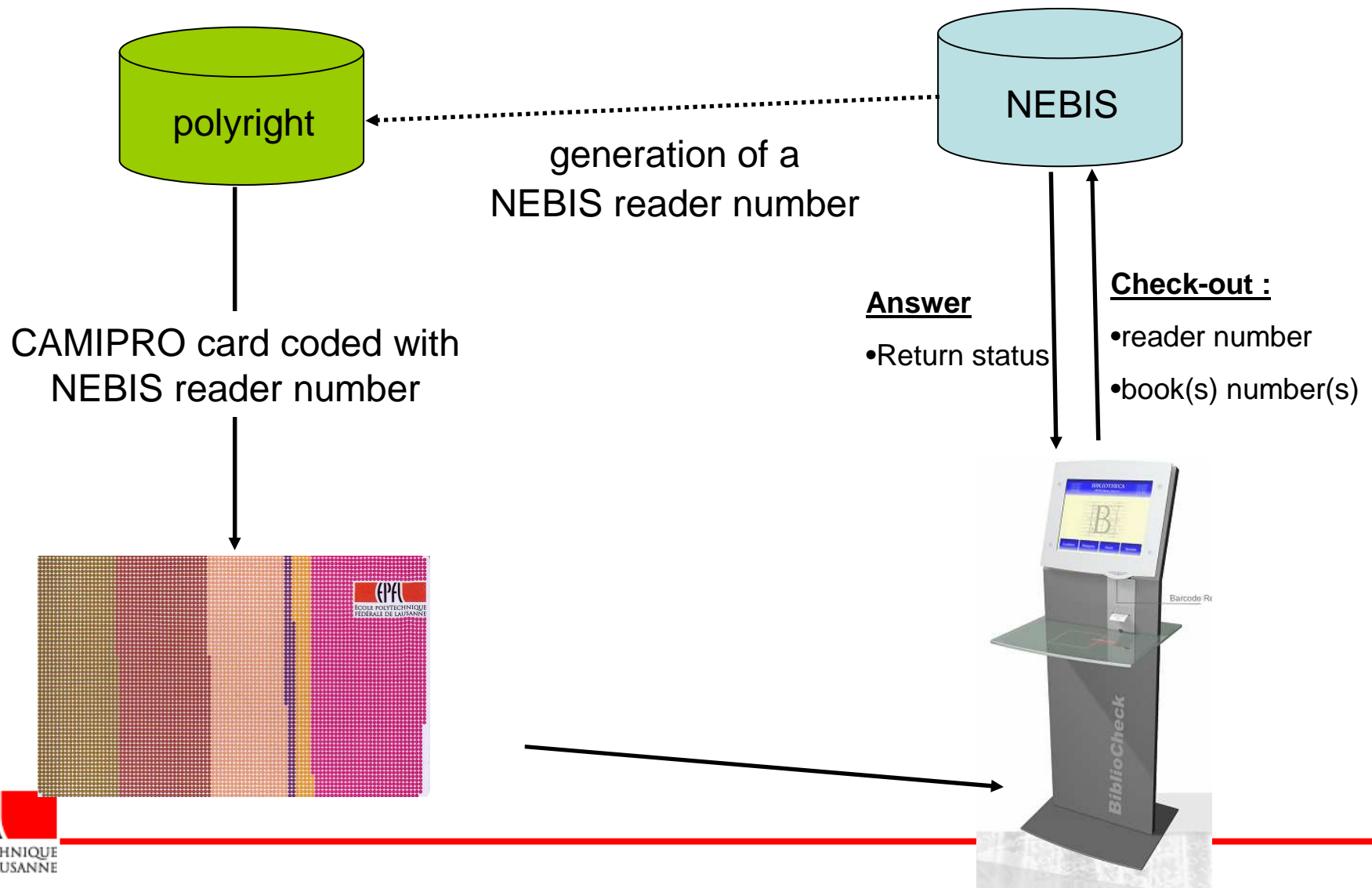


EPFL Library Installation (2/2)

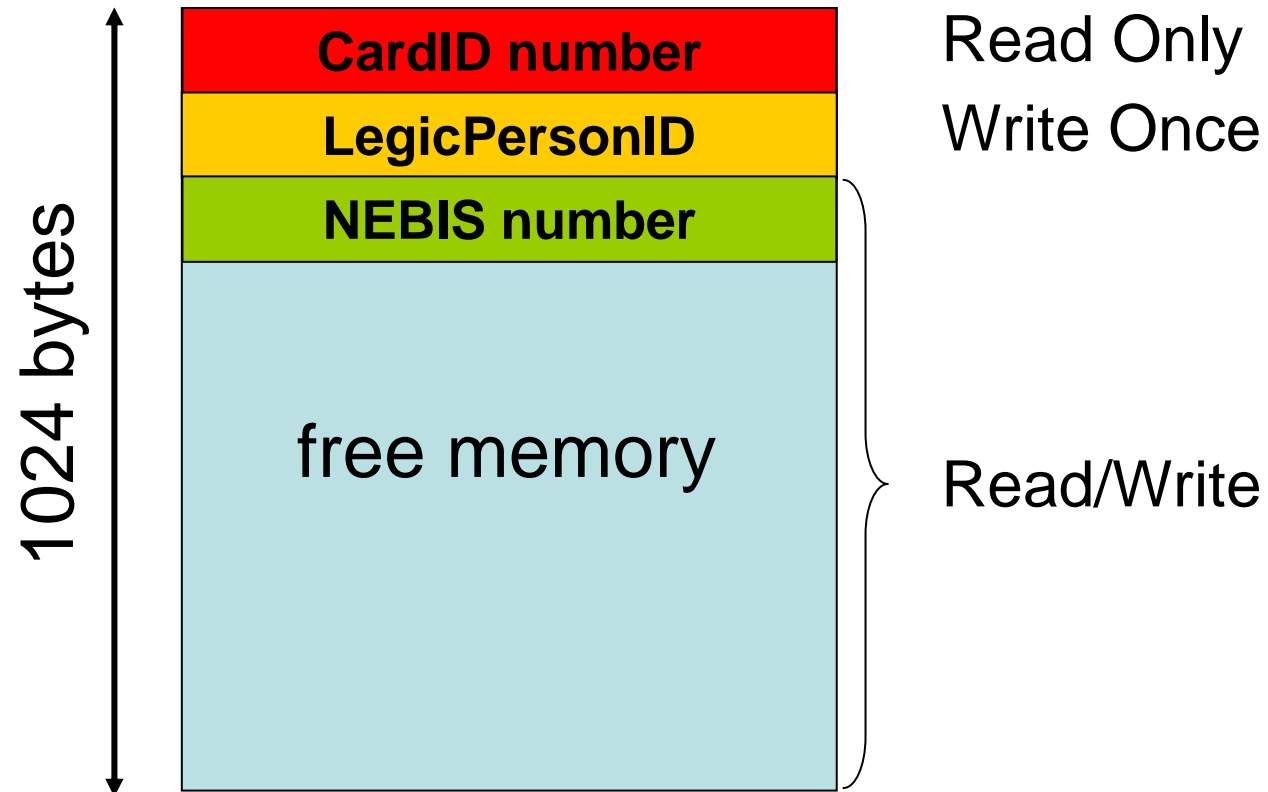
- Double gates
- Conversion Station
- BiblioWand
- [People Counter]



Interfaces between Information Systems



CAMIPRO Card and NEBIS Number



Book tagging

- RFID technology, 13.56 MHz, ISO 15693
- Passive tags, no power source
- Tag is initialized with:
 - bar-code number
 - Library ID and country
 - Type of book
 - Info if book can be borrowed or not
- Possesses a « checked-in » security bit

Value	State of book	Offline gates behaviour
1	Checked-in	Alarm goes off
0	Checked-out	No alarm

- Enables theft detection with gates

Benefits and difficulties

- ***Benefits***

- Before installation of gates, 10% theft rate
- Installation of gates (even when not in service) has drastically improved that figure
- Need more time to assess advantage of self-check station (should be of benefit for human resources used)

- ***Difficulties***

- First installation on Aleph-based library in Switzerland
- Interface of Bibliotheca and Aleph not straight-forward
- Tagging is a large operation, not to be neglected
- Performances of RFID system are decreased by use of metallic shelves (USM)

Sources

- **Presentation material from Bibliotheca RFID**
- **K. Curran, M. Porter, « A primer on radio frequency identification for libraries », *Library Hi Tech*, Vol. 25 No. 4, 2007, pp. 595-611.**
- **Santa Clara City Library, « Implementing RFID today... Lessons Learned », presentation**