# Developing new RFID devices and features

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**Brno**

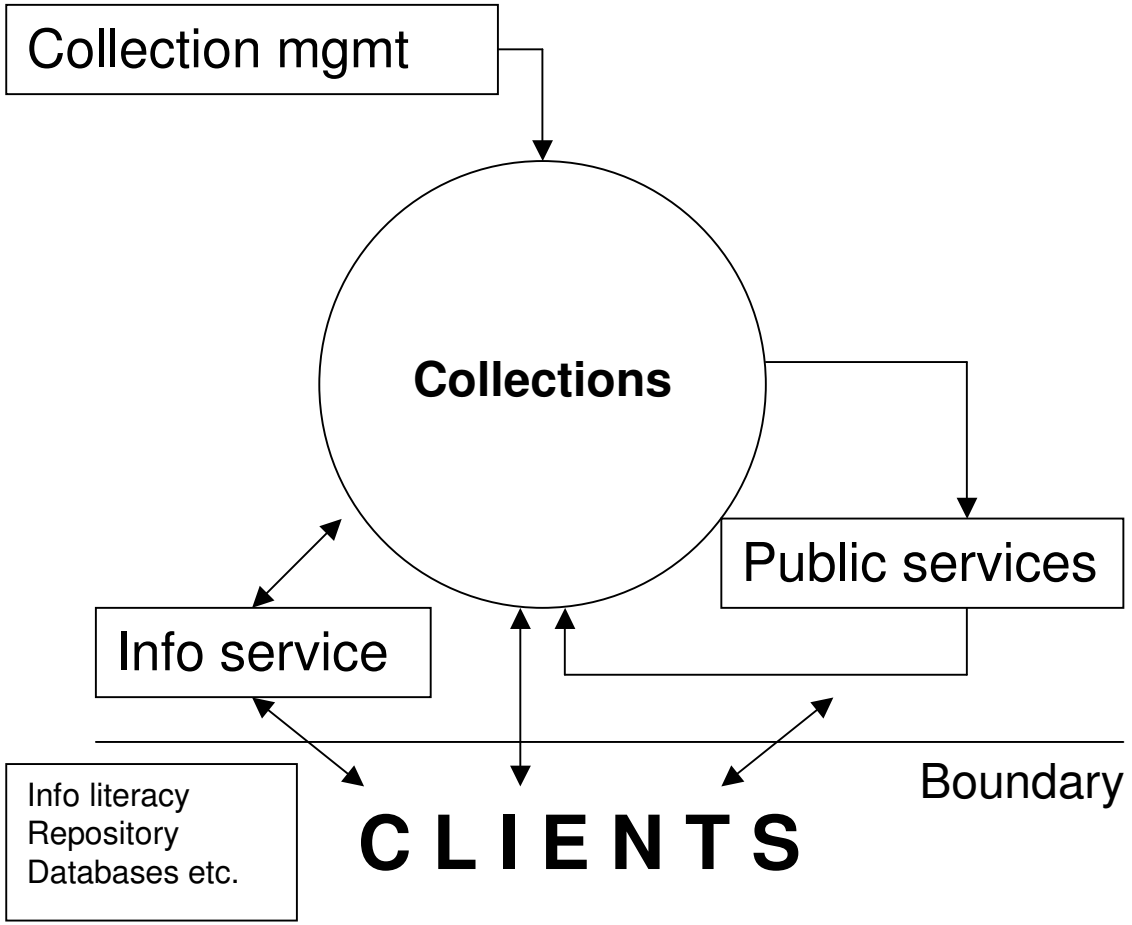
# Helsinki University of Technology

- Students 15 200 (MSc 12 400, PhD 2 800)
- Staff 3 200
- Organisation
  - 12 departments -> 110 laboratories
  - 9 special units
- Locations
  - Otaniemi campus
  - Kirkkonummi
  - Lahti

# Libraries of TKK

- Main library
- Department libraries 10
- Special unit libraries ~5
- Laboratory libraries 20-30
- Numerous laboratory/professor ”collections”

# Duties of a library



# Aims of the RFID project

1. **Getting to know RFID technology and its usefulness in libraries**
   - RFID technology, frequencies, standards etc.
   - RFID applications
   - Functionality of the RFID tags
   - Alarming system
2. **Widening of the self services in the library**
   - Can RFID be trusted?
   - User-friendly check in and check out
   - Simultaneous handling of more than one book

# Aims of the RFID project (2)

3. **Piloting an unmanned library collection**
   - Many potential collections within TKK
   - Many part time librarians
   - Common to have no librarians-on-duty in lab libraries
   - Many outdated collections -> inventory, coll management
4. **Testing the usefulness of the RFID tag in storing information**
   - Capacity of an RFID tag is between 256 and 2048 bytes
   - Compulsory information takes 256 bytes
   - Rest of the capacity free to use
     - tens or hundreds of characters
     - item details, course numbers …

# TKK course book collection

- 1200 items were tagged
- Collection was moved to a separate room
- Check out machine
- Check in shelf
- Alarming gates with the possibility of adding video surveillance

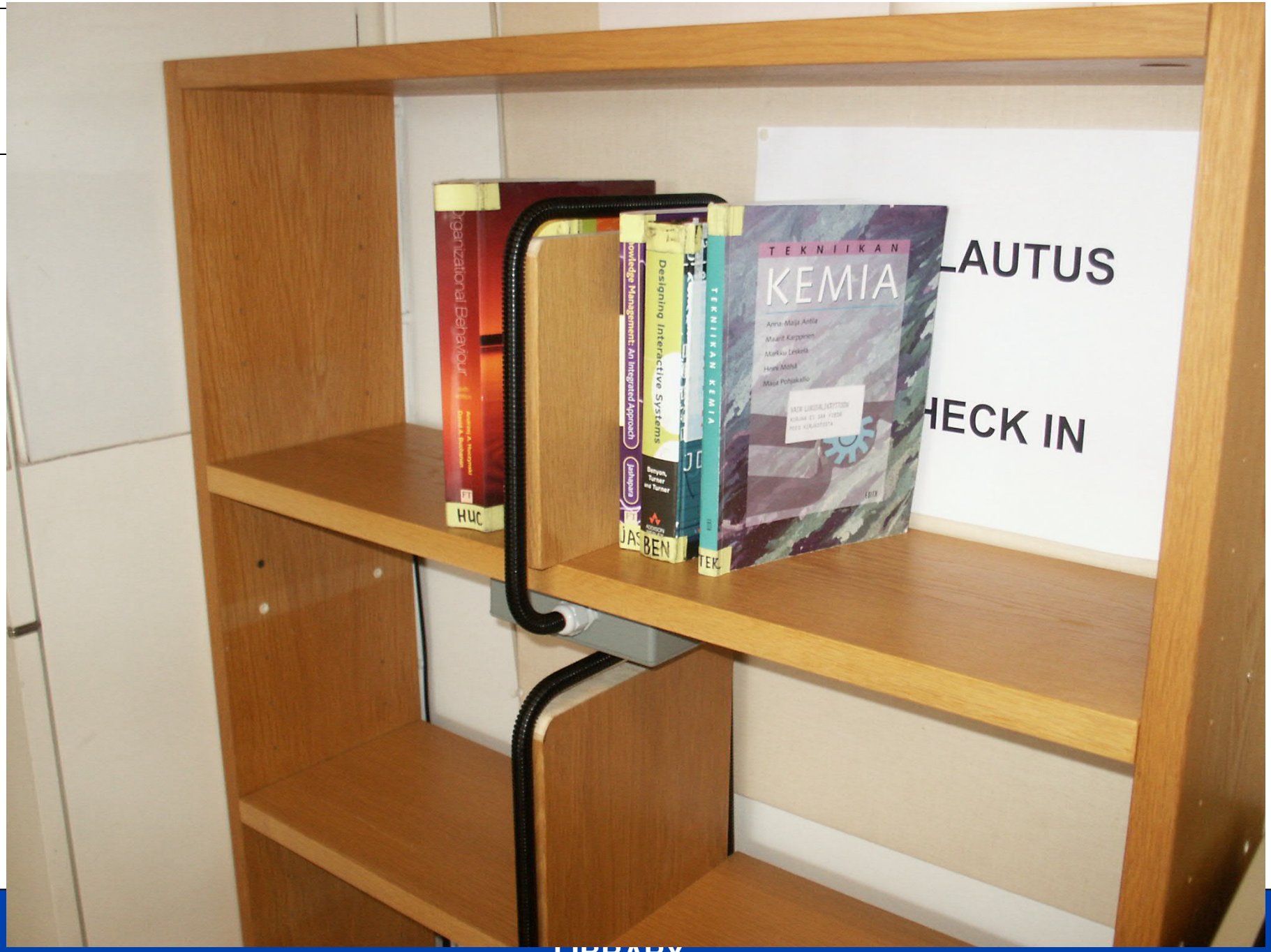
# Check out machine

- New construction
- Library cards still barcoded
- Possibility to read tag information
- Possibility to check status of the item


LAINAUS
CHECK OUT
Aloita valitsemalla lainaus tai palautus

# Check in shelf

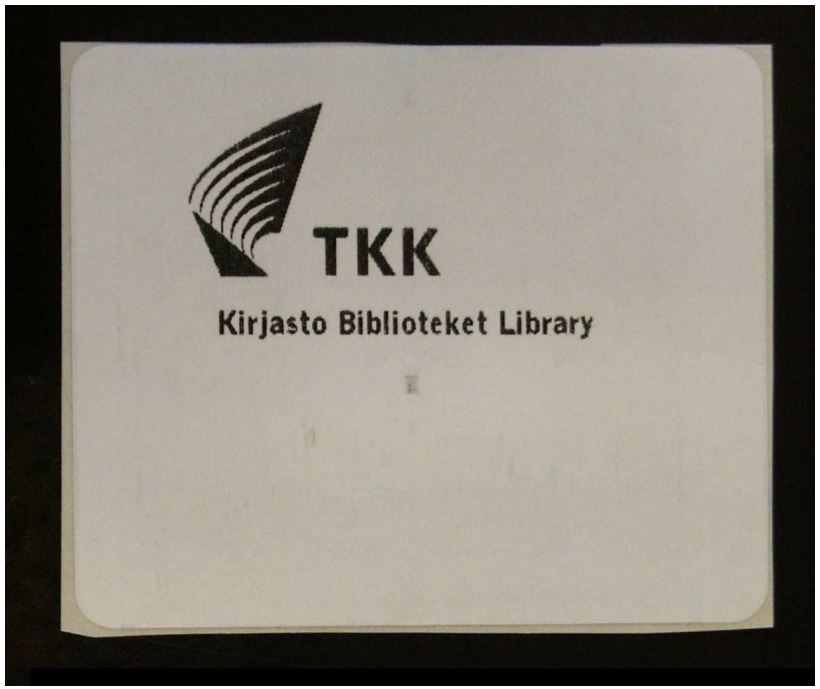
- Normal (wooden) library shelf with an antenna
- Easy check in operation
  - books on the shelf activate checking in
  - check in receipt optional

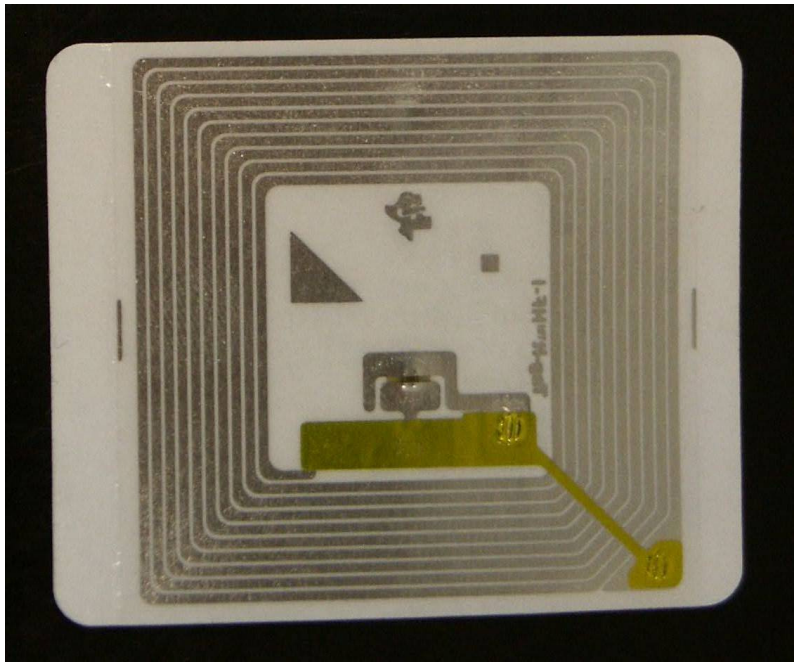

Organizational Behaviour
Knowledge Management: An Integrated Approach
Designing Interactive Systems
TEKNIIKAN
KEMIA
TEKNIIKAN KEMIA
LAUTUS
HECK IN

# RFID tag

- Tag type 3M D7
- Storing capacity 2048 bytes
- Library logo and name printed on the tag
- Possibility to print barcode on the tag as well

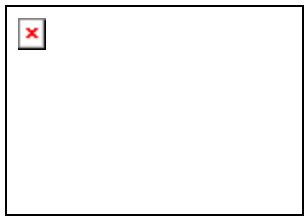
# RFID tag



# Data conversion

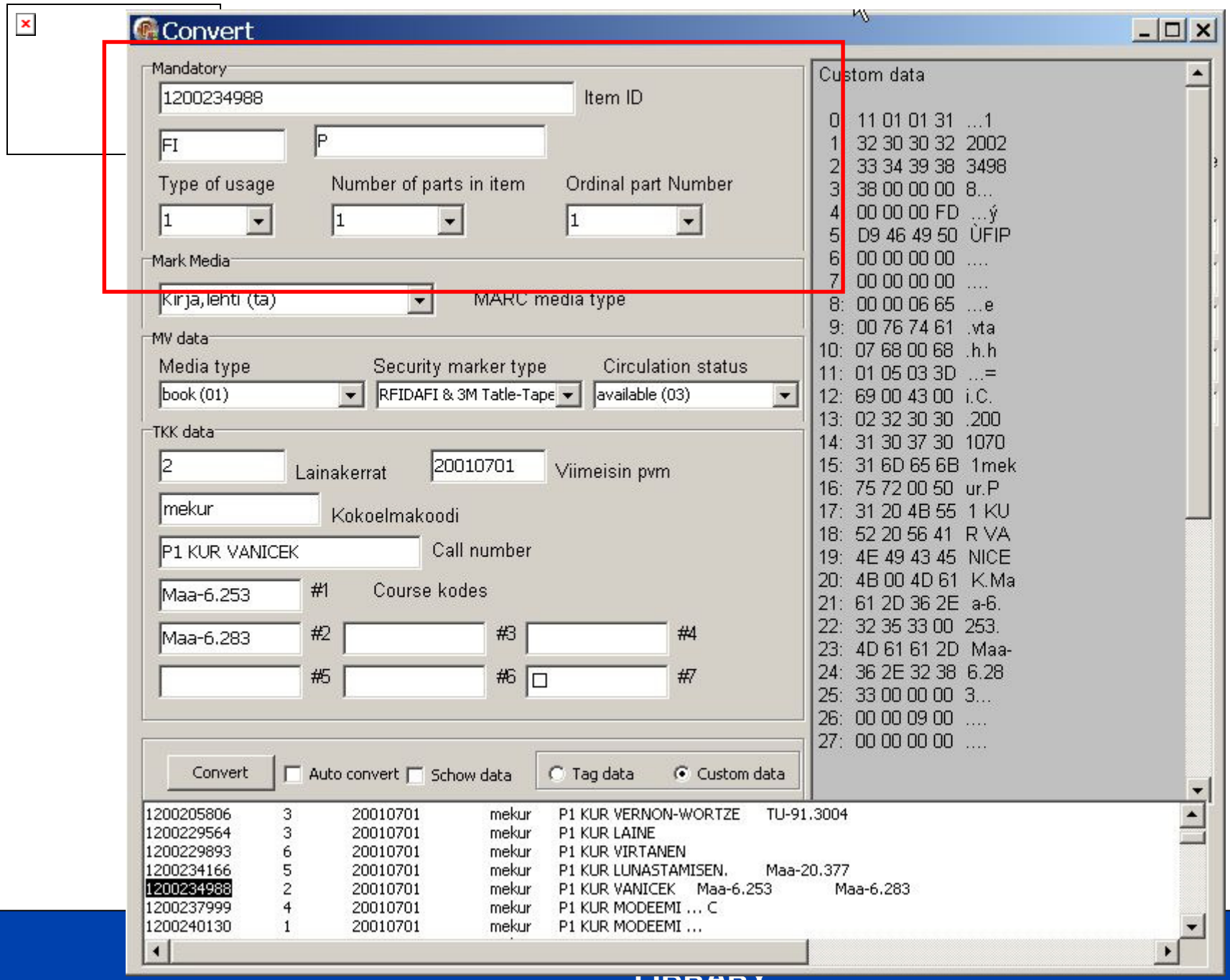
- Information picked up from Teemu database
- Ad hoc conversion program by Mikroväylä Oy
- Conversion rate about 1 min/item
- Few corrupted tags found
- Easy and fast process



# Stored information

- Item number
- Single/multivolume monograph
- Possible supplements (CD-ROM etc.)
- Name of the collection
- Number of check outs
- Latest check out or handling date
- Call number
- Course number

**The information is not currently locked**


Convert
Mandatory
1200234988
Item ID
FI
P
Type of usage
Number of parts in item
Ordinal part Number
1
1
1
Mark Media
Kirja,lehti (ta)
MARC media type
MV data
Media type
Security marker type
Circulation status
book (01)
RFIDAFI & 3M Tatle-Tape
available (03)
TKK data
2
Lainakerrat
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P1 KUR VANICEK
Call number
Maa-6.253
#1
Course kodes
Maa-6.283
#2
#3
#4
#5
#6
#7
Convert
Auto convert
Schow data
Tag data
Custom data
Custom data
0 11 01 01 31 ...1
1 32 30 30 32 2002
2 33 34 39 38 3498
3 38 00 00 00 8...
4 00 00 00 FD ...ý
5 D9 46 49 50 ÙFIP
6 00 00 00 00 ....
7 00 00 00 00 ....
8: 00 00 06 65 ...e
9: 00 76 74 61 .vta
10: 07 68 00 68 .h.h
11: 01 05 03 3D ...=
12: 69 00 43 00 i.C.
13: 02 32 30 30 .200
14: 31 30 37 30 1070
15: 31 6D 65 6B 1mek
16: 75 72 00 50 ur.P
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18: 52 20 56 41 R VA
19: 4E 49 43 45 NICE
20: 4B 00 4D 61 K.Ma
21: 61 2D 36 2E a-6.
22: 32 35 33 00 253.
23: 4D 61 61 2D Maa-
24: 36 2E 32 38 6.28
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26: 00 00 09 00 ....
27: 00 00 00 00 ....
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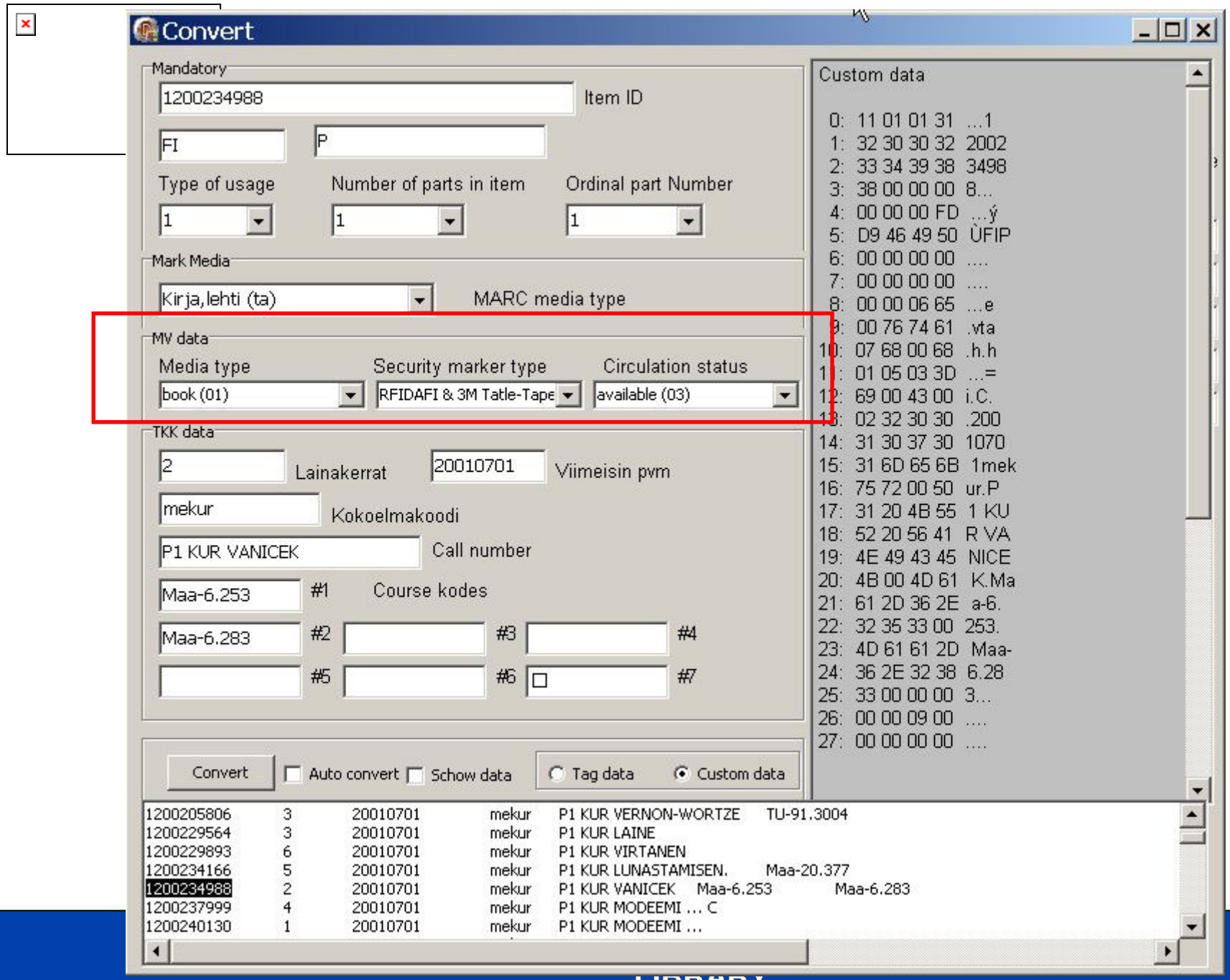
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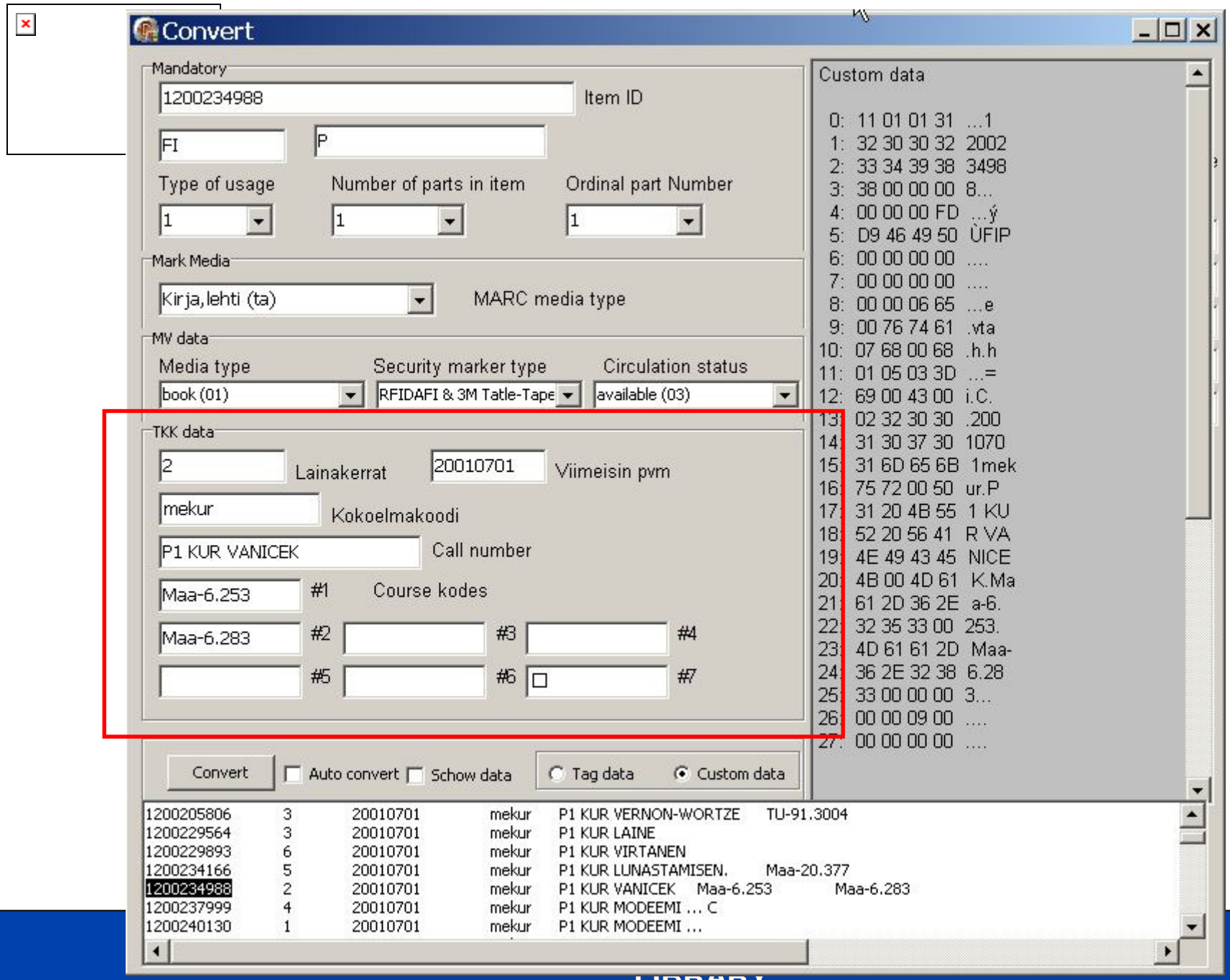
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# Digital Library Assistant

- Separate device for
  - maintaining the collection in order
  - finding items
  - inventory

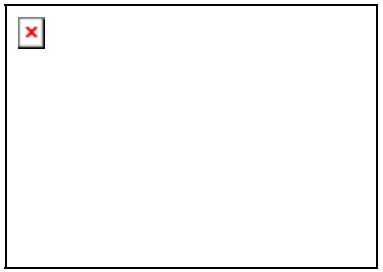
# Experiences

- In production since May, 2007
- Not self evident for users
  - guidance!
- Technology has caused no problems
  - except for library card barcodes

# Future

- First unmanned laboratory library about to start
- Video surveillance added to the alarm gates
- RFID tagged library card

- New ISO standard
- Tag prices down?



# Thank you!

Ari.Muhonen@tkk.fi