

IT-BASED SOLUTIONS FOR USERS AND LIBRARY STAFF: CASE STUDY OF THE TALLINN UNIVERSITY OF TECHNOLOGY LIBRARY

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Abstract

The new building of the Tallinn University of Technology (TUT) Library was opened in 2009. It has open stacks of about 210 000 volumes, which are located on 4 floors. The library has 32 study rooms and about 1 500 visits per day. In this paper some unique solutions are introduced, which have been worked out in cooperation between TUT librarians and library IT staff.

Information kiosk. One single access point for searching in e-catalogue ESTER and ISE database, topographic Open Stack Guide (OSG), study rooms reservation system. OSG is integrated with ESTER item records. There are two ways to find the item location in open stacks: starting from ESTER or starting from OSG. For the response the shelf of location will be shown on the floor map.

GateKeeper system. Registration of visits at the entrance gate. Patrons can use the library card with bar code or Estonian ID-card. Integrated with patron database, which allows real-time verification of patron status. Statistical reports about the visits and visitors in any combination of patron data and chronological limits could be produced.

Inventory of open stacks. The necessary set of records (based on call numbers) is generated from ESTER and loaded to mobile terminal. Using mobile terminal with bar code reader it is easy to scan the set of items. If the item is not on the right place the terminal gives an alert. Eventually the report of absent items will be generated.

Keywords: web-based applications; topographic access to open stacks; reservation of study rooms; visits registration and statistical analysis; inventory of open stacks.

The primary goal of TUT Library (founded in 1919) is to provide information for academic, research and development activities of the university. As a public research library, public services to readers outside of TUT are also offered in the field of technology, exact, natural, health, and social sciences. Beside of traditional library, information, consultancy, training, binding and publishing services, the development of unique IT-based solutions has also been of a great importance for the Library since the technology became obtainable.

Some milestones in using and developing IT-based solutions

First steps were made in 1977 when Library started data processing in TUT computing centre on Soviet mainframes using self-developed PARES software application. There was no online connection between the Library and computing centre. The data about the users, their loans and refusals were entered manually via special input device with magnetic tape and then transported to the computing centre. The goal was to study the book collection as a whole and to specify the user needs. As a result we got statistical analysis of the usability of books by UDC, language, type, user education, faculty and occupation. There was much manual work for generating the input, but not so much real benefit of the results.

The new promising era was opened when personal computers and local area networks became available. In 1987 training courses for librarians were organized and TUT Library periodicals database was created using dBASE III Plus software. The requirements for integrated information system were specified and the strategic development plan was compiled at the same year. Unfortunately there was no financial possibilities to buy any commercial software product and it was decided to use Micro-

CDS/ISIS software of UNESCO for working out local solutions. In 1991 the database „Estonian Technology and Economics“ (articles with abstracts) was created, in 1993 the database of TUT publications was created and in 1995 the database of TUT lecturers and researchers (short biographical data) was created using Micro-CDS/ISIS. The circulation module of CDS/ISIS did not perform correctly in local area network with many concurrent transactions and we reached a conclusion that we need more stable software solution. In 1996 the first Library web site and web-based application for local e-catalogue were worked out using MySQL open source database. It had the UNICODE (UTF-8 encoding) support, which was especially important for using Estonian, English and Russian character sets simultaneously.

Thanks to the support of Andrew W. Mellon Foundation INNOPAC (Innovative Interfaces Inc., USA) integrated library system was implemented by Estonian research libraries in 1999. It was our first commercial software product and allowed us to create contemporary shared e-catalogue ESTER and ISE (Index Scriptorum Estoniae) articles database. At present ESTER is based on Millennium software and it is planned to change it to the next generation Sierra platform this year.

In 1998-1999 TUT Library participated in EU DEDICATE (Distance Education Information Courses based on Access Through Networks) project, which gave us knowledge, inspiration and tools for working out web-based user training environments. The web-based information retrieval courses have been on use since year 2000 and their software has been modified and upgraded year by year. For facilitating the use of open access resources „Subject Gates“ application was worked out in 2000, which included more than thousand classified and arranged links in 10 subject areas.

Open Access Institutional Archive „Digikogu“ was created in 2005 using Linux, Apache, MySQL and Php. It consists doctoral theses defended in TUT, textbooks, reports of research activities, library publications, historical technical journals and documents, etc. In 2012 the new platform for TUT publications was created using MS SQL database and the records from CDS/ISIS were converted and loaded into new environment.

Current background

The new building of TUT Library was opened in 2009. It has total floor area 7 200 m² and open stacks of about 210 000 volumes on more than 1 600 shelves. There are no walls and separated reading rooms, the patrons area is like one open space, which extends through four floors. The shelving system is based on Universal Decimal Classification and has about 1 300 subdivisions. There are about 500 seats (including 100 with computers) in the building. The use of computers is supported everywhere with WiFi, power and network sockets. The patrons with their own laptops can borrow additional equipment (big display, number keyboard, mouse, ID-card reader, scanner, headphones). Many self-services (check-out and check-in equipment, printers, scanners, copy-machines) are available for the users. It is also possible to order services from bindery, publishing office and Print-On-Demand digital production line. Library regulations, services and news are introduced via information TV system. All visual information is available in Estonian and in English. There are 6 group study rooms and 26 individual study rooms in the library, which are very popular among the patrons. All the building is accessible for the people in wheelchair, special equipment (reading TV, scanner with audio output, Braille printer) for persons with visual deficiency is available.

The Library has more than 33 000 patrons (including 17 000 outside TUT) and about 1 500 visits per day. The user population is very international – we have patrons from 70 countries all over the world. In our printed collections there are about 700 000 stock units. We have campus-wide access to 120 000 e-books, 80 000 e-journals and about 40 factographic, reference, citation etc databases. About 70% of the acquisition budget is spent on the subscription of electronic resources. Our Open Access Institutional Archive consists of about 1 000 documents. The Library staff is 68 full time equivalents.

Starting from the needs of patrons, the features of the new building and the requirements of the library it was necessary to put into practice some new special IT applications. In this paper three unique solutions are introduced, which have been worked out in cooperation between TUT librarians and library IT staff.

Information kiosk

Information kiosk could be observed as only software product or as complex product, which consists of software, hardware and furniture. In both cases the target group is library patron. It could be accessed through library web site or as a physical standing-room-workstation with limited capabilities. In library building we have 16 information kiosk workstations based on Thin Client Windows terminals. The user interface is available in Estonian and in English. Essentially, the information kiosk is one single access point for:

- searching in e-catalogue ESTER and Estonian articles database ISE
- topographic Open Stack Guide
- reservation system for group and individual study rooms

Open Stack Guide is integrated with e-catalogue ESTER item records. There are two ways to find the item location in open stacks:

- starting from ESTER, which allows to use different search criteria and to combine them, to limit search results etc
- starting from Open Stack Guide, which allows to search by topic (about 900 divisions) or call number

After the initial search it is possible to limit the search results by selecting textbooks, special literature, reference books, dictionaries, periodicals, standards or booklets. For the response the shelf of location in red with shelf number will be shown on the floor map.

Patron assessments for Open Stack Guide have been rather high. By the feedback (user survey 2012) 48% of respondents were very satisfied, 47% satisfied, 5% partly satisfied and there was 0 answers for the choice not satisfied.

The reservation system for group and individual study rooms is necessary because the rooms are very much occupied, especially before and during examination sessions. For the reservation one must log in with ESTER account identifiers. The system allows to select the date from the calendar and the room number from the room table. It shows graphically which room at which time is free or reserved. Each reservation may be up from 1 to 4 hours per day. Not more than 2 reservations per week are permitted. It is allowed to make reservations up to 14 days in advance. Reservations could also be made through smart mobile phone scanning QR-code at the front side of the room.

GateKeeper

GateKeeper software application was worked out for the use by library staff (only authorized users). The goal was to get up-to-date information about user status at the entrance gate and to receive detailed statistics about the visits and visitors afterwards. GateKeeper is integrated with ESTER (Millennium) patron database via Patron Application Program Interface (PAPI), which allows real-time verification of patron data.

Each patron must register the library visit at the entrance gate. For identification TUT Library patrons can use the special library card with bar code or Estonian ID-card (chip card). At the entrance gate it is mandatory to scan the patron card. After scanning the query is sent automatically to ESTER patron record and PAPI will send the query results back to the gate. On the public patron display only short information about patron status will be shown, the detailed data (fines, fees, validity of the card etc) will be shown on the librarians display. If there are any problems the librarian can act as necessary. At the

same time the query results with date and time are stored in our local SQL database, which allows to produce different statistical reports later on. Statistics about the visits and visitors in any combination of patron data and chronological limits could be produced. Patron data available:

- Study level/occupation/social status
- Education
- Faculty/college/field of activity
- User type
- Gender
- Country of origin
- Age at the end of the period
- Age by decades

Chronological limits are available as follows:

- By the day
- By the week
- By the month
- By the days of the week
- By the dates
- By the selected period

It is possible to differentiate the number of total visits and unique visits (personal visitors). Simple graphical view of the results is also available.

Inventory of open stacks

In the new library building it was possible to make much literature available in open stacks, which is very user-friendly service for the patrons. But from the librarian side it is necessary to guarantee that each volume is always located on the right place at the shelf. The inventory solution consists of special software, hardware and some procedures for using ESTER database as the source of bibliographic and item records. The programming of the first version was made by the specialists from ID-Balti AS, but the library shelving system is changing and today the software is upgraded by the library IT staff. The specification of the portable data collection device is as follows:

Mobile terminal Honeywell Dolphin 9900

Processor: Intel XScale PXA 270, 624 MHz

Memory: 256 MB RAM, 1 GB Flash

Mass Storage: 2 GB memory card

Display: 3,5" VGA color TFT LCD with touch panel

Keyboard: alphanumeric, 56 keys

Scanner: laser, 1D and 2D symbologies, images, OCR

Adaptus Imaging Technology 5.0

Power: extended-life battery, 10 hours cordless work

Weight: 600 g

Wireless Full Area Networking (802.11 b/g)

Windows Mobile 6.1

Dolphin 9900 HomeBase station for data exchange and battery charging

First the necessary set of records (based on call numbers) is generated from ESTER and loaded to mobile (handheld) terminal. The items, which are checked out, are marked with special identifier. Each inventory record consists of the following data elements:

- Bar code
- Call number
- Item location

- Item status
- Language
- Note (if available)

Using mobile terminal with bar code reader it is easy to scan the set of volumes by the librarian. If the item is not on the right place the terminal gives an alert. If the item status is „checked out“ but it is however on the shelf, the system shows detailed status information. It is possible to interrupt the inventory and to continue it later. Eventually the report of absent items will be generated.

Conclusion

Why we are working out self-made IT solutions and not buying the service from IT companies? The reasons are partly caused by our history. Until 1991 it was not allowed to buy software outside Soviet Union. The borders were opened after 1991, but our budget did not afford to buy any software. Today we are able to buy something, but there is no product on the market, which corresponds to our requirements. Our requirements are very library-specific and the solutions must be continuously supported and upgraded. In addition, we do not have any binding contract with definite company, which demands juridical supervision and special fees will be asked for any small modification, which was not specified in primary agreement.

In cooperation between librarians (description of the goal and initial task, testing, feedback) and library IT division (application design and programming, prototyping, corrections, modifications, support) it is possible step by step to work out exactly those solutions, which we need. In summary the synergy and economy is achieved in cooperation and teamwork between librarians and library IT staff.

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