

Article

Developing a multilingual, personalised medical library portal: use of MyLibrary in Slovenia

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Abstract

The Central Medical Library (CMK) at the Faculty of Medicine of the University of Ljubljana, Slovenia, created its Web site in 1997 and has since then been actively involved in its maintenance and improvement. The analysis of Web site usage, which was performed using different data-mining methods, revealed an increasing interest among the Slovene biomedical community. Patrons have often complained to librarians about information overload and difficulty in following all the Web site's enhancements. This situation called for a dynamic restructuring of the CMK Web site. Such problems are often solved with customisable and personalised library portals. Having limited financial and human resources, it was decided to customise and extend an existing library portal software solution (MyLibrary from North Carolina State University). The MyLibrary portal for the CMK was not only customised, but some important new functionality, most notably multilingual support, was added. This experience of developing a personalised library portal could be of interest to most libraries that offer information in at least two languages.

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Introduction

Academic medical libraries provide information resources and services to students, faculty, health professionals and researchers in an environment that supports learning, teaching, health care and research. The rapid development of information technology is transforming library services at a spectacular rate. By connecting to the Internet and World Wide Web, the academic library expands its access to information resources, some of which appear as a digital library. According to Lesk (1997):

Digital libraries are organised collections of digital information. They combine the structuring and gathering of information, which libraries and archives have always done, with the digital representation that computers have made possible.

Due to technology advances and the wide dissemination of information, users suffer from information overload and expect their library to select the most valuable information and organise it effectively for their personal consumption. Top LITA (Library and Information Technology Association, a division of the American Library Association) experts identified a number of important future trends for technologies in libraries (LITA Top Tech Trends, 1999). They identified Trend 1 as "library users who are Web users, a growing group, expect customisation, interactivity, and customer support". They stated that approaches that were library-focused instead of user-focused would be increasingly irrelevant and mentioned The University of Washington's MyGateway (www.lib.washington.edu/resource/help/MyGateway.html) and North Carolina State University's MyLibrary@NCState (<http://my.lib.ncsu.edu/>) are examples of customised library portals.

A Web portal, also commonly called a gateway, is now the standard interface to aggregate library resources and services through a single access and management point for users. The concepts of personalisation and customisation have gained interest among librarians, especially those at universities and institutions with

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large collections, growing numbers of online resources, and user populations with varying levels of computer and research expertise. Customisable and personalised library portals tend to be customer focused, responding to customer needs, and empowering users to create personal information systems that are responsive to their individual needs (Lakos and Gray, 2000).

Because there are no clear and unambiguous definitions of the concepts “personalisation” and “customisation” in the context of Web portals, we use both terms interchangeably or together to describe the ability of a Web portal:

- to deliver content based on the profile a user creates;
- to allow the user to change her/his profile; and
- to analyse the user’s behaviour and provide different content to each user.

Library portals have been defined as “systems which gather a variety of useful information resources into a single, one-stop Web page, helping the user to avoid being overwhelmed by ‘infoglut’ or feeling lost on the Web” (Looney and Lyman, 2000). Portals are user-centric, while home pages are owner-centric. Portals allow the users to customise their Web information based on personal preferences and the librarians to develop customised gateways to specialised resources of value. Customised Web portals can bring to light the range of resources being offered by a library and will allow the user to create a personalised service.

The MyLibrary option appearing on many library portals is part of a larger trend towards customisation and personalisation. Consumers are being trained to expect that the world will be focused on their needs, wants, and desires. This expectation translates into MyThis and MyThat on the Web. Implementers of MyLibrary projects seek to provide a customised view of the library that reduces information overload and administrative overheads. Some early adopters of MyLibrary concept are:

- University of Washington
(www.lib.washington.edu/resource/help/MyGateway.html);
- NCSU – North Carolina State University
(<http://my.lib.ncsu.edu/>);
- Cornell University
(<http://mylibrary.cornell.edu>);

- University of Utah
(<http://medstat.med.utah.edu/library/personalize.html>); and
- New York University
(<http://library.med.nyu.edu/library/mlsetup.html>).

Many developed a system in direct response to cries of information excess by users encountering a megalibrary with thousands of resources. MyLibrary appeals to individual users to create a personally relevant library (Ketchell, 2000).

Customisation is only one part of the MyLibrary trend. A library portal must be more than a method to select from a set of links; it must also include database and application windows.

Scope

The Central Medical Library (CMK) is a department of the Faculty of Medicine of the University of Ljubljana, Slovenia. It is the main biomedical library in the country and serves students, faculty, health professionals, researchers and laymen. CMK started to build a library Web site (www.mf.uni-lj.si/cmk/) which included a guide to library services and resources in 1997 (Rozic-Hristovski *et al.*, 1999). Since then, the contents of the Web site have doubled, users have become more aware of its importance, and users’ computer literacy, computer equipment and Internet connections have improved significantly.

The planned content of the Web site had crucially influenced the decisions made regarding its structure. The CMK Web site is built as an information entity embedded in uniform graphic design that encompasses three levels of menus, two levels of headers, the footer and background. It is possible to choose between eight sub-menus that provide some key information needed for effective use of CMK and access to information resources. Desired functionality is obtained by a menu/hypertext link structure with two frames displaying the current menu and active text, whereby information screens and hypertext links allow cross-menu navigation. It is possible to scroll each frame independently of the other. That enables the user to change quickly between different options inside a menu.

In 1998 and 1999 staff at CMK performed an analysis of Web site usage behaviour to obtain concrete knowledge about the way visitors navigate the Web site (Rozic-Hristovski *et al.*, 2002). The Web site access evaluation was conducted by analysing the CMK Web-server log-files. The results revealed that the visitors most frequently started and ended their visits on the CMK home page. Reference pages with lists of printed and electronic information resources were also frequent starting and ending points in exploring the Web site. It seemed necessary to ensure greater visibility of these pages and a more convenient navigation path to them. A more intuitive design for some pages was also needed so that visitors would be able to access information more quickly and easily with fewer clicks. Log-file analysis adequately revealed overall usage patterns, but could only provide rough estimates of individual user characteristics. Because of the problems with log-file analysis we were not able to discover the identity of many frequent users.

In 2000 we decided to explore user navigation patterns in the CMK Web site using a Web usage mining tool Web utilisation miner (WUM) (Spiliopoulou, 2000). We found several interesting patterns, some of which came as a surprise to the Web site designer (Rozic-Hristovski *et al.*, 2001). The discovered navigation patterns gave us a better understanding of our users and their needs, as well as an opportunity to redesign and optimise our site according to the users' preferences. Unfortunately, very frequent requests for links to external Web sites such as electronic journals, databases and search engines were not recorded in the Web log file. Thus, we were unable to analyse the paths to these links.

The results of our studies revealed that users have very diverse interests. The most visited Web pages were dispersed among different sub-menus and subject categories. Hence, the users probably found the whole Web site to be of potential interest. Today the users have to cope with the rapidly expanding digital library and continuous improvement of library services. Such a situation demanded a dynamic restructuring of the CMK Web site because of limitations of a static Web design. Often such problems are solved with customisable and personalised library portals because they address the modern library role directly by being customer focused, by

responding to customer needs and by empowering users to create personal information systems that are responsive to their individual needs. That is why we started to think about a personalised medical library portal. As we have limited financial and human resources, we decided to customise and extend an existing library portal software solution.

We started a pilot project with the aim of selecting the most appropriate portal software from the higher education community. We were looking for a solution distributed under the GNU (GNU's not Unix – see www.gnu.org) public licence as open source code and wanted to customise it to the needs of MyLibrary CMK.

CMK portal design

The number of the CMK Web site visitors is steadily growing and it is approaching 10,000 per year. The majority of them are from Slovenia, while some are from abroad. The patrons from the Faculty of Medicine usually use our Web site most heavily. At the moment the Web site comprises a large number of pages on general information and services, more than 1,500 electronic journals and about 500 links to Internet resources by topic. Web site maintenance and development is supported by a part-time electrical engineer and two librarians, in occasional collaboration with other staff who simultaneously take various other responsibilities.

In such a library environment, considering the results of our analyses, we decided to offer our users a personalised medical library portal. Because of limited human and financial resources we wanted to adopt an existing library portal solution that best suited our needs and the given situation. We wanted the portal to enable MyLibrary features and a powerful search engine. The portal should support the main functions of an academic medical library and its users' needs. Patrons should have the possibility to select their favourite journals, Internet resources and frequently used library links. The number of clicks and time needed to locate a variety of library services and resources should be minimised. Identifying frequent users and reviewing their needs and preferences using registration forms and cookies was perceived as an important portal function. We expected

to establish a connection with the Slovenian national online public library catalogue, COBISS, and establish lists of journals and new books which would facilitate a current awareness service and save staff time (Seljak and Seljak, 2002).

The difference between a static Web site, used only for delivering information via the World Wide Web, and a portal is that the latter presents a standard interface to aggregate the library's resources and services through a single access and management point for the users. Using dynamic page generation, personalisation and customisation, a portal can help users to avoid being overwhelmed with information. Technically speaking, a library portal is a database application, accessible from a Web interface, and governed by the principles and practices of librarianship. The distinctive element of such a system is not the technology driving it but the interactive assistance and services it provides via librarians.

In the first phase of the portal design process, we had to find out how to customise the existing portal sections to the scope of CMK resources and services, and determine which information needed to be personalised to meet the needs of library patrons. We can divide the information that the library provides into two types. Static information, such as opening hours, service charges, location, staff information and circulation policy, does not change often and can be a part of a static Web page. The second type is the library information resources that grow permanently and therefore change very often. This type of information has to be updated simply by a librarian, without interaction of a system administrator, whereby all the portal sections containing information not of interest to all users require the personalisation approach.

If a library decides to provide personalised access to its resources and services, nowadays the system no longer needs to be developed from scratch. Several software projects of this kind have been developed and some of them are willing to share their code. Technical infrastructure requirements – hardware, software and needs for local configuration and customisation – may vary considerably, although when deploying an already developed system, the majority of the hard work has already been done. Some of these projects are quite sophisticated, but

unfortunately some of them are quite dependent on, and linked to, the library's online catalogue system, which means different standards in different countries. Customisation of such systems may require more than just an installation and deployment of readily developed portal software, while the development of the library-dependent intersystem interfaces could take considerable time and demand significant programming experience.

During our platform-choosing process we reviewed the documentation of the systems listed below.

- MyLibrary service at Virginia Commonwealth University (Gharphery and Ream, 2000);
- My Gateway system at the University of Washington (Jordan, 2000);
- MyLibrary personalised electronic services in the Cornell University Library (Cohen *et al.*, 2000);
- MyLibrary project at Los Alamos National Laboratory (Di Giacomo *et al.*, 2001); and
- MyLibrary system at North Carolina State University (Morgan, 1999).

We decided to select MyLibrary@NCState using the short review of these systems, provided below, which we made during our decision-making process.

MyLibrary service at Virginia Commonwealth University (MyLibrary@VCU) is fairly simple both in presentation and infrastructure. Users select items for display from an initial set-up screen listing possible resources, and can later adjust them by clicking the edit button on the personalised page. On the server side, a Perl program is used to store all the user passwords, logins and e-mail addresses in a single text file. Text files are also used to store information about each user's profile. The system can be ported to various platforms. The source code is free but still requires localisation and customisation for use within the library.

My Gateway system at the University of Washington offers an extensive array of resources. Users can add and delete categories of resources using the "category manager". The URLs can be drawn from the library's URL database that resides in the "digital registry" or can be the users' own URLs. The records of the resources are

loaded from the library's INNOPAC system into My Gateway's local database, which enables resources to have far more detailed records than resources at competing systems. The server side is implemented using Microsoft technology. Server side scripting is done by Active Server Pages (ASP), used for dynamic generation of HTML pages using the data stored in the Microsoft SQL server database. The operating system must be a member of the Microsoft server family.

MyLibrary personalised electronic services from Cornell University Library consists of several tools for collecting and organising resources (MyLinks) and informing users of new resources provided by the library (MyUpdates). Users can sort the library's and their own links into folders, accessible from everywhere with only a Web browser. The system is built in a way that encourages users to communicate with the library and thus reduces common pitfalls in library-patron communication. The system enables offline integration with the NOTIS, the online mainframe-based catalogue software used at Cornell. The technology behind the system uses an Oracle database for storing information, Kerberos for authentication of user identification and password combination, and Java servlets for implementing access to the database over JDBC (Java database connectivity) and providing dynamic Web content.

The MyLibrary project at Los Alamos National Laboratory (MyLibrary@LANL) provides digital library users (as individuals or groups) with a personalised Web environment while offering tools that extend the functionality of a Web browser (bookmarklet). The personalised fields consist of the list of databases, electronic journals, general reference, Web resources as well as personal Web links recommender system integration and Web link checking mechanism. The technical solution adopted for MyLibrary@LANL is object-oriented Perl and Javascript, and the database used is Open Source SQL Database MySQL. The operating system is Linux, but software should be portable to other Unix-originated systems. The system is complex and consists of several modules: such as library manager, folder manager, link manager, database manager, style sheet manager and bookmarklet manager.

We found the MyLibrary system at North Carolina State University (MyLibrary@NCState) to be the most suitable application for the previously mentioned needs of our library. It is very well documented, open source (easily upgradeable) and freely available on the Web. A more detailed description follows below.

MyLibrary@NCState: system description

The MyLibrary system at North Carolina State University (NCSU) is probably the best-documented implementation of a user-centred, customisable interface to the library's collection of information resources. It is well developed and offers an intuitive interface for both users and administrators. MyLibrary@NCState as an entry point offers its users several information and resource collections divided into the following sections:

- Global message;
- Message from librarian;
- Your librarians;
- Library and university links;
- Bibliographic databases;
- Electronic journals; and
- Reference shelf.

Users have an opportunity to select or deselect items they want to have displayed in these sections on the starting screen using the "customise" option. The last three sections are discipline dependent. This allows users quicker access to the resources from the field they are particularly interested in. Once configured, MyLibrary@NCState can store information about the user on the local computer using Web cookies. This way, the user does not have to login repeatedly unless he or she wants to use previously defined settings on a different computer.

The administrative part of the system, which is also very important from the library's point of view, is divided into four categories covering functions for:

- (1) content providers – librarians;
- (2) Webmasters;
- (3) system administrators; and
- (4) report generation.

Content management functions allow authorised librarians to review, add, delete or change the current content, such as list of disciplines, names, links and descriptions of databases, journals, libraries and universities, the names and contact information of librarians and texts provided by the system.

The administration system provides creation of reports on broken links and is used for reviewing items of all resources linked with a specific discipline. Webmasters are provided with a powerful system, which uses a proprietary scripting language for describing the data that reside in the MyLibrary's database. Web page design, such as changing background and text colours or selections arrangements, can also be done through the Webmaster part of the administration system. The appearance of the system can be controlled via cascading style sheet commands directly entered into forms provided in the Webmaster sub-menu. The system administrators have overall system control by means of setting the global preferences, defining new disciplines, assigning librarians to disciplines and controlling the texts used for user-system communication.

It is evident that this system is much more than just a bookmark manager. It allows users to regularly receive and search lists of new books added to the library's collections. The user selects the preferred discipline and, according to that choice, he/she is referred to an appropriate librarian and a collection manager who is specialised in the given subject area. Since library users do not always have time to hunt constantly for new and better resources, librarians can use the "Message from the librarian" service to keep patrons informed and make announcements and suggestions in order to help users stay in touch with interesting information in their selected discipline.

At the North Carolina State University, the MyLibrary@NCState system resides on a Unix computer, but for the same purpose an open source and free operating system from the Unix family could also be used, such as Linux or FreeBSD. The database server is MySQL, and is also freely available, with the ability to run on multiple computers and an application programmer's interface support for both the Perl and C programming languages. MyLibrary@NCState works with any (free) HTTP server which co-operates with a Unix family operating system, as long as it has common gateway interface (CGI) scripts support. The application part uses Perl to extract data from the database and dynamically format the HTML output according to the user's profile. Perl was chosen since it is an interpreted language,

easy to debug, free, works on almost every platform and comes with API (application program interface) support for MySQL.

The customisation and functionality extension of MyLibrary@NCState

The installation process of MyLibrary@NCState is straightforward and, due to very good installation instructions, it is a simple task for a skilled Unix/Linux administrator. The CMK administrator chose Intel-Pentium based hardware to serve the application. He opted for the Linux operating system and chose MyLibrary as it was the only application hosted on the selected system.

The following applications, usually shipped with Linux distribution, were chosen during the operating system installation:

- Apache as an open source and free Web server with CGI support;
- Perl as the scripting language (freely distributed at CPAN (comprehensive Perl archive network)); and
- MySQL as the required database.

The operating system set-up was followed by installation of several modules and packages that were deliberately left out during operating system setup because of not being included in the adopted distribution of Linux. After that step, the system was ready for MyLibrary@NCState installation, which consists of configuring and testing the MyLibrary SQL database and publishing the HTML content and Perl scripts on the Web.

Since the database shipped with the distribution of the system is filled with examples, the system can be tested immediately after installation.

We customised the portal by:

- extending the database structure to enable the multilingual functionality needs;
- redeveloping Perl scripts to support multilingual functionality for the user part;
- loading the database with the contents that CMK wants to provide to its users; and
- providing the portal with appropriate design to suit the existing CMK Web site.

The majority of the content we wanted to make available through the CMK portal is already accessible as part of the static CMK Web site. It is published in a static HTML format and contains the resources needed to

be loaded into the database. In order not to have to manually rewrite all the resources, we developed Perl tools that reformatted all the gathered information and automatically inserted it into the database. We are also planning to develop Perl scripts to help our librarians provide a current awareness service using the national online library catalogue system COBISS.

A disadvantage of the readily developed portal systems is that they support only English as the language of user-library communication. None of the abovementioned systems provides either the possibility for translation or for multilingual support.

Since most of our Web site users originate from Slovenia, and there is also a non-negligible percentage of users from other countries (such as Croatia), our primary goal was to upgrade and change the functionality of the MyLibrary@NCState system to support language dependence and later on multilingual support. The languages supported in the first version of the CMK portal are Slovenian (for local users) and English (for the international users). The libraries in countries with several official languages could use systems with multilingual support to provide the users with access in their native language (e.g. a Swiss library could be offering the contents in German, French and Italian).

The multilingual support is offered primarily at the user-oriented part of the MyLibrary@NCState system. There is no reason to add this kind of functionality to the administrative part since the content providers and the administrators usually know the system in detail and have no problems using a computer system in the English language.

Choosing the language is an important part of the personalisation process. At the time of account creation, the user provides the information about the language that he/she wants to use (i.e. selects the language from the list of languages the system supports). The information about the user is stored in the system as a user profile and is read and reconfigured during the log-on process. For example, if a user who uses the system in the Slovene language, logs on to MyLibrary, the information provided to him/her should be in Slovene. When the user logs off and another user logs on from the same computer, and if

the second user's selected language is English, the system should respond in English.

The process of adding the described functionality was not trivial – it required redesign of the entire system. First, the entire system had to be inspected for language-dependent data. The system has most of the data continuously used for generating HTML communication stored in one table in the database. The other language-dependent features are the description texts of links, electronic journals, universities and databases. This information is stored in the database's tables linked with the sections they support. There is some general and frequently used data which are also language dependent (e.g. name of sections, such as “quick searches”, headers and footers); this information is also stored in the database. Unfortunately, there are some pieces of information (used most frequently for the communication forms, such as the words: “username” and “password”) that are hard-coded into the Perl module and the executable Perl script.

Every part of the system that comprises language-dependent data required a different approach to enable the multilingual functionality. At the database level, all the tables that contain language-dependent data had to be expanded with an additional field, which indicates the language of record's information. The primary key was changed from the ID column to the conjunction of the ID and the language column. The user's data also had to be extended to include the information on the language the user has selected during the account creation phase. The translation of hard-coded language-dependent information in the Perl module could not be done directly. Fortunately, these texts present a minor portion of all of the text displayed by MyLibrary@NCState. They are mainly presented in forms and have not yet been completely translated in the pilot version of the system with integrated multilingual functionality. We suggested to the system developers to move these texts to the database, where the multilingual functionality can be added in the same way as for general data. In the next version of the MyLibrary@NCState system a different approach would be helpful for the data-presentation layer, using language-dependent XML files and XSL transformation. This solution would not only make multilingual

design easier – it is also recommended as a state-of-the-art portal building solution and would also make the system portable to handheld or wireless devices.

To accomplish multilingual functionality at the application layer, Perl scripts and modules had to be changed to be able to use the new extensions of the database layer. This was the most demanding task. After completing it, some extensions to the forms and dialogues had to be made to enable users to change their language of choice.

At the end of the multilingual features implementation, the database had to be filled with the data in the languages the system was going to support. In the case of CMK, previously chosen records, needed for communication with users, had to be translated into Slovene and stored in the correct fields in the database. We did not develop our own administrative user interface for this purpose; instead, we installed MyODBC (my open database connectivity) drivers to the translators' computers and gave the translators direct access to a copy of the MyLibrary database. This way, the librarians in charge of translation could use the program they are already familiar with – Microsoft[®] Access – to enter the translated texts directly into the database. The system administrator had to review all the inputs and copy them into the original MyLibrary database.

MyLibrary CMK functionality

CMK is an academic medical library that provides biomedical information resources to its clientele. The organisation, role and function of CMK is somewhat different from that of the NCSU libraries. Therefore the help text for users, the contents of MyLibrary and the list of disciplines needed appropriate customisation and changes. CMK cataloguers classify library information into 60 medical disciplines, which are included in discipline-specific sections: reference shelf; databases; and electronic journals.

All the text in the records that help the user to create and use MyLibrary CMK was translated into the Slovene language. Records considering databases, reference shelf, new book list, librarians, technical details and some other topics needed customisation to the CMK environment.

Resources on the user's MyLibrary CMK page include information about the system, messages from librarians, links to librarians,

university resources, personal list of Internet resources, reference resources, databases, electronic journals, as well as access to the search engine and display of news. The authorised librarian can create, modify or delete the names and contact information of librarians, links and description of information resources, help texts and messages from librarians.

The usage of MyLibrary CMK usually starts with the creation of a new account. The user has to fill in the displayed form and choose the appropriate language from it. Afterwards, the MyLibrary page is displayed in Slovene or English and all subsequent communication with MyLibrary is done in the selected language (Figures 1 and 2).

The users have a possibility to customise their profiles, including changing the language (Figure 3).

The message from the librarian is intended to be displayed only to people who have chosen a particular discipline. Every user of MyLibrary is associated with a medical discipline and each of these disciplines is associated with a text message. The user cannot customise message functions.

- *Your librarians* section lists names, telephone numbers and e-mail addresses of the librarians associated with the user's chosen discipline. In CMK, all reference librarians serve all medical disciplines therefore all of them should be associated with all disciplines. This section is not directly customisable by the user.
- *Library links* section enables the selection of some of the most important items about library services, policy and directions. Users can select only those items needed for the regular use of the library.
- *University links* section provides access to some important items on the Faculty of Medicine home page and the University of Ljubljana home page. It is useful to have all these links in the same list and the possibility to choose the preferred ones.
- *Personal links* section allows the users to save links to Internet resources that they often use and are not included in other sections.
- *Reference shelf* section includes a digest of about 500 quality Internet resources

Figure 1 Login and MyLibrary CMK page are displayed in the language that was selected in the user's profile, e.g. in Slovene

Prijava v MojoKnjižnico

Na tej strani se lahko prijavite v MojoKnjižnico.

| Predmet | Izbor | Opis |
|---------|---|--------------------------|
| Up. ime | <input type="text" value="matej_turk"/> | Vnesite uporabniško ime. |
| Geslo | <input type="password" value="....."/> | Vnesite geslo. |

(Na začetek)

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MojaKnjižnica

Centralna medicinska knjižnica

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Hitro iskanje (o | po men)

CMK homepage

Vaši knjižničarji (o)

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listed by medical discipline. Users can choose items from an alphabetically ordered list or from a discipline-specific list.

- *Databases* section includes various medical databases: bibliographic; factual; and electronic textbooks. The list of databases is limited; therefore the discipline-specific selection is not necessary even though it can be enabled. The selection from alphabetic list seems to be the useful choice.
- *E-journals* is the most rapidly expanding section in CMK. At the moment, it provides access to more than 1,500 titles.

Hence, personalisation according to the preferred discipline could be a very useful tool for busy faculty or clinicians.

Selection from an alphabetic list is also enabled (Figure 4).

- *News* section is intended to offer a list of new books. For the creation of this list, we plan to establish a connection with the national online library catalogue COBISS.
- *The quick searches* section provides direct access to the Google search engine and the CMK catalogue within COBISS. A searching tool for the whole CMK Web site is under development.

Figure 2 Login and MyLibrary CMK page are displayed in the language which was selected in the user's profile, e.g. in English language

The image shows two screenshots of the MyLibrary CMK website. The top screenshot is the login page, titled "Login to MyLibrary". It features a navigation menu on the left with links for Home, About, CMK HP, New Account, Login, Profile, Layout, and Logout. The main content area has a heading "Login to MyLibrary" and a sub-heading "Use this page to login into MyLibrary." Below this is a login form with three fields: "Item Selection" (containing "Username"), "Description" (containing "john_white"), and "Description" (containing "Password"). Each field has a "(More help)" link. A "Login" button is positioned below the form. At the bottom of the page, there is a "Go to top" link, copyright information "CMK © 2001", and a contact email "moja.knjiznica@mf.uni-lj.si". A white arrow points from the bottom of the login page to the top of the second screenshot.

The bottom screenshot is the "MyLibrary" page, titled "Central Medical Library". It features the same navigation menu on the left. The main content area has a heading "MyLibrary" and a sub-heading "Central Medical Library". Below this is a notice: "Submit the papers to the Nuclear medicine Conference due the 28.7.2002!". The page is divided into several sections, each with a heading and a list of links: "Quick Searches" (with a search box and "Search" button), "Your Librarian(s)", "Library Links", "University Links", "John - Links", "Reference Shelf", "Databases", "E-journals", and "News". Each section has a heading and a list of links. At the bottom of the page, there is a "Go to top" link, copyright information "CMK © 2001", and a contact email "moja.knjiznica@mf.uni-lj.si".

Plans for further work

We plan to finish our pilot version of the CMK portal during 2003. To ensure full functionality, some further elaboration is still needed in certain sections. Afterwards, the existing pilot portal will be evaluated from the users' perspective through a usability study. The study will focus on what the users think about the portal, how they figure out how to interact with the portal and how they acquire the information essential to the portal's operation. We plan to include both faculty and students in the study.

The detailed usability study will be performed by different approaches: we will carry out a survey among users and at the

same time we will analyse the Web server log files and database records about users. Since the users who decide to use personalisation features of the library's portal have registered the data on their status, education and fields of interest, we are able to correlate the way they use the portal with the appearance of their portal. We were not able to perform such analysis using only Web log files since these files offer no possibility to recognise distinct users.

Later, we plan to automatically personalise the user's portal based on her/his behaviour and on the behaviour of other users with similar interests. To achieve this we will use data mining methods to discover user navigation patterns.

Figure 3 Customisation of the user's profile includes the change of language

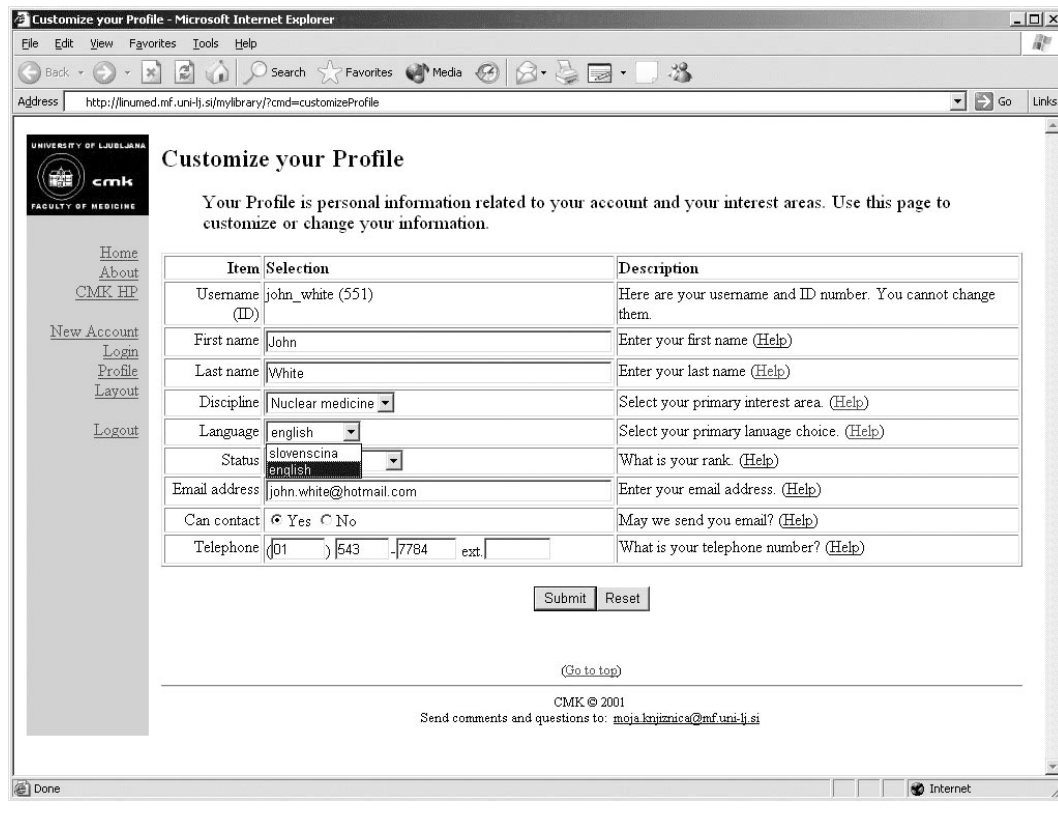
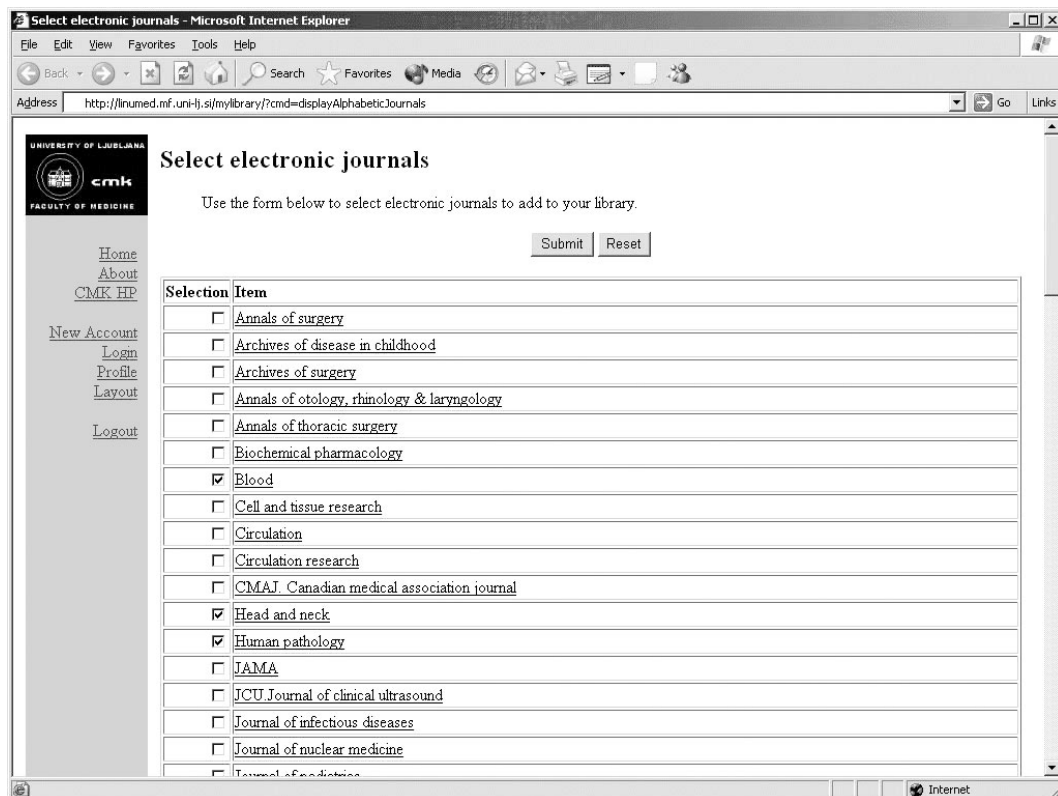


Figure 4 Selection of electronic journals which user wants to have displayed on his/her MyLibrary CMK page



Conclusion

The exponential growth of the amount of information and its availability in electronic form makes users concerned about their ability to assimilate and manage this bounty. Library users have high expectations based on the broader commercial marketplace. The development of library Web portals will inevitably make libraries and their staff more customer-centred. Trends in portal development include customisation and personalisation. The personalisation process is provided by portals using dynamic page generation and server-resided data storage. But there are benefits not only for the users – such systems also facilitate the content-updating procedures through the user interfaces and the tools they provide.

The pilot development of MyLibrary CMK is a logical step in the CMK Web site developments from 1997 onwards. It is based on an existing portal solution with extended functionality, which is adjusted to the functions of the academic medical library and its users' needs. One of the most important needs of visitors from Slovenia and abroad is multilingual support, which means that the users can select a language in which the portal interface is presented to them. This multilingual support is the key extension we have developed for the MyLibrary CMK portal.

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