Serap Kurbanoğlu Umut Al
Phyllis Lepon Erdoğan Yaşar Tonta
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Communications in Computer and Information Science 317

E-Science and Information Management

Third International Symposium
on Information Management in a Changing World, IMCW 2012
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Preface

"E-science" is defined as collaborative, networked, and data-driven science. Researchers have to get access to large, distributed data sets on, say, global warming or gene sequences, and use a set of tools and technologies for data processing and information visualization. Vast amounts of data need to be collected, curated, stored, managed, and preserved to ensure perpetual access to them over the Internet.

E-science has implications for both researchers and information professionals such as librarians and data archivists. Both groups need information management and computational skills to deal with massive data sets along with some understanding of intellectual property rights, open access, and data literacy issues, among others. A few schools in the United States and elsewhere are already offering graduate degrees in "e-science librarianship" and one is likely to come across advertisements of job descriptions for "cloud librarians."

The Third International Symposium on Information Management in a Changing World, organized by the Department of Information Management of Hacettepe University, took place in Ankara, Turkey, during September 19–21, 2012. The theme of the symposium was "E-Science and Information Management." With this theme, the symposium aimed to bring together both researchers and information professionals to discuss the implications of e-science for information management. More than 30 papers were submitted. All papers were subjected to a double-blind reviewing process and 16 were selected for inclusion in this proceedings book. Accepted papers came from 14 different countries (Bulgaria, Croatia, Denmark, Hungary, Iran, The Netherlands, Norway, Romania, Serbia, Slovenia, Switzerland, Turkey, UK, and USA) and address a number of issues dealing with, among others, academic libraries, digitization, information behavior, information literacy, scholarly communication, life-long learning, and social networks, all in the context of information management.

We would like to take this opportunity to thank the symposium keynote speakers, Tony Hey (Microsoft Research), Serkan Orçan (the Turkish Academic Network and Information Center), and Buğra Karabey (Microsoft Turkey) and members of the international Organizing and Program Committees and the Local Committee who invested their time generously to make this event happen. We are most grateful to Phyllis Lepon Erdoğan for editing the final manuscript. We also thank our colleagues Orçun Madran and Necip Erol Olcay, who designed the symposium website as well as the art work; Zehra Taşkın, Güleda Doğan, Yurdagül Ünal, İrem Soydal, Tolga Çakmak, and İpek Şencan for carefully copy-editing the papers. Last but not least, it is a pleasure to thank our sponsors and supporters whose names and logos are acknowledged in the preliminary pages of the proceedings book.

Yaşar Tonta
Serap Kurbanoğlu

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The Third International Symposium on Information Management in a Changing World was organized by the Department of Information Management of Hacettepe University.

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The Fourth Paradigm – Data-Intensive Scientific Discovery

Tony Hey

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Abstract. This presentation will set out the eScience agenda by explaining the current scientific data deluge and the case for a "Fourth Paradigm" for scientific exploration. Examples of data intensive science will be used to illustrate the explosion of data and the associated new challenges for data capture, curation, analysis, and sharing. The role of cloud computing, collaboration services, and research repositories will be discussed.

Bio. Before joining Microsoft, Dr. Hey served as director of the U.K.'s e-Science Initiative, managing the government's efforts to provide scientists and researchers with access to key computing technologies. Before leading this initiative, Dr. Hey was head of the school of electronics and computer science, and dean of engineering and applied science at the University of Southampton.

As corporate vice president of Microsoft Research, Dr. Tony Hey is responsible for Microsoft's collaborative research with universities and research community to speed research, improve education and foster innovation.

Dr. Hey is a fellow of the U.K.'s Royal Academy of Engineering and the American Association for the Advancement of Science (AAAS) in the U.S. He is also a fellow of the British Computer Society, the Royal Academy of Engineering, the Institute of Engineering and Technology, and the Institute of Physics. He was awarded a Commander of the Order of the British Empire (CBE) for services to science in 2005.

S. Kurbanoğlu et al. (Eds.): IMCW 2012, CCIS 317, p. 1, 2012.

E-Science and E-Infrastructures in Turkey

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Abstract. E-infrastructure comprises all services, applications, organizations and technologies that enable researchers to use high-speed computer networks, computational systems, data warehouses, software tools, and to access resources and share tools to carry out research projects regardless of where they are located. Computationally intensive science uses e-infrastructures to carry out speedy, effective and fruitful scientific research using methods supported by next generation information and communication technologies and distributed networks while e-science analyzes huge amount of scientific data that requires distributed computing. In this keynote paper, we will review the state of the art of scientific research projects carried out by means of e-infrastructures and evaluate them from technical and administrative viewpoints along with international developments and national policies.

Bio. Serkan Orçan has been the Deputy Director (technical) of the Turkish Academic Network and Information Center (ULAKBIM) since 2005. Mr. Orçan served as the chief network engineer in setting up of the Turkish Academic Network (ULAKNET) of ULAKBIM during 1994 and 1999. He also worked in the private sector as an engineer and administrator (2000-2005). Mr. Orçan holds a BS degree in Computer Engineering (1994) and an MS degree in Science and Technology Policies (2006), both from the Middle East Technical University in Ankara, Turkey.

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Big Data and Privacy Issues

Buğra Karabey

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Abstract. With the advent of social networks, mobile technologies, smart phones, tablet devices, Web 2.0, prospective semantic Web, geolocation technologies and machine to machine communications (M2M) we are faced with a never before seen amount of Data -thus Big Data. We are also witnessing leap improvements in the data mining, machine learning techniques that will enable the analysis of this Big Data to come up with results that may be utilized for a plethora of purposes by the individuals, enterprises and even governments. As a result of these major changes we are sailing in uncharted territories from the perspective of Privacy and Data Protection of the individuals. Proper mitigation of the aforementioned issues necessitates a coherent effort within the domains of technology and policy to come up with legislations and regulations that will support the tech developments but at the same time fulfill the Privacy and Data Protection requirements of individuals.

Bio. Dr. Buğra Karabey is the National Technology Officer for Microsoft Turkey. In this role he engages closely with Turkish technology policy makers, standards organizations and the key technology influencers and is devoted on the improvement of the Turkish local software economy, innovation and entrepreneurship in Turkey utilizing Microsoft solutions and technologies as a lever. He also focuses on Information Security from an enterprise and National Security viewpoint.

Buğra Karabey holds a BS in Electronics Engineering from Bilkent University, an MBA, an MS in Information Systems from METU and a PhD in Information Security from METU. He also holds CISM (Certified Information Security Manager) and CIPP (Certified Information Privacy Professional) certifications. He has published technology and art articles on several journals and also has a pending US Patent on Information Security.

He has been active within the ICT sector for 18 years in Turkey and acted as the General Manager and Vice President for several technology companies.

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RODIN – An E-Science Tool for Managing Information in the Web of Documents and the Web of Knowledge

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Abstract. RODIN is a tool for user-defined federated search and the simultaneous exploration of the web of documents and the Semantic Web. The system combines a widget aggregation approach for general web resources with an ontology matching approach for Linked Open Data. The project is part of the E-lib.ch-project (www.e-lib.ch), the Swiss initiative for building a single-point-of-access digital library for Switzerland. Within this context, RODIN was basically designed as an innovative and alternative information portal approach for digital libraries that neither depends on indexing as do common search engines nor relies on harvesting approaches as many library information systems do.

Keywords: Digital libraries, information architecture and web design for e-science, semantic information management, data driven e-science.

1 Introduction

RODIN (ROue D'INformation, i.e. information wheel in French) is a system for the user-defined search in preferred web resources and the simultaneous exploration of large-scale ontologies from the Linked Open Data project to allow and facilitate query refinement. RODIN may be of use in any other search intensive environment that goes beyond the simple search paradigm of web engines and that has to make use of heterogeneous data sources and needs ontologies to explore them further.

The implemented system consists of an aggregator facilitating keyword based search and an ontology driven exploration tool, with two ontologies from the Linked Open Data Project connected to the system so far: a) STW [1], the standard thesaurus for economics and b) DBPedia [2], the semantic web offspring of Wikipedia. STW was chosen to prove the feasibility of the system in an economic project; DBPedia was chosen to add encyclopedic and rather open-domain world knowledge to the closed domain of economics. STW contains links to DBPedia, but that interconnectivity is not yet used by the system; it might nevertheless be useful to resolve questions in automatic disambiguation in a later version of RODIN.

S. Kurbanoğlu et al. (Eds.): IMCW 2012, CCIS 317, pp. 4–12, 2012.

2 Background

RODIN is driven by two main ideas: that of personal knowledge management systems and that of search refinement using simultaneously the web of documents and the web of knowledge and combining these paradigms in a single user interface by using open source software modules and open data sources and developing the appropriate software to bring them together.

The general idea behind RODIN is based on the hypothesis that – in scientific or any search done by experts – the user generally makes use of a limited number of resources that are visited regularly: web engines, digital libraries, catalogues etc. and that can be aggregated or mashed [3]. Every extended search process, being a mixture of browsing and searching [4] usually takes several steps and along the way, new keywords arise out of the documents found and are used to refine the search and make it more precise, a method described thus: "browsing as berrypicking" [5] or "subject pearl growing" [6]. Nowadays, the user has two continuously growing information pools that support search intensive processes: the web of documents, generally explored through the help of search engines and the web of knowledge or semantic web [7], unfortunately still being less user-friendly in terms of exploration. Nevertheless, the latter is growing steadily and is more and more augmented by already developed thesauri and taxonomies, although the linking between Linked Open Data and the web [8] and the matching between search queries and ontologies remains a challenging issue [9].

In some cases, these taxonomies were developed not only over decades but rather over centuries as a result of a subtle intellectual reflection of information specialists. Unsurprisingly, libraries do nowadays realize that they cannot merely benefit from the semantic web, but that they also have a considerable contribution to make; thus more and more of these knowledge representations are made intelligible for the Semantic Web, often using the SKOS-data model [10].

SKOS (Simple Knowledge Organization System) was published by the World Wide Web Consortium (W3C) in 2009 as a new standard for web-based controlled vocabularies. It serves as a data model to publish thesauri and taxonomies within the semantic web and – as a consequence – to make them semantically interoperable. This will lead, on the one hand, to a unification process of the heterogeneous library resources and, on the other, make (if not already making) large volumes of intellectual classifications useful for the Linked Open Data Project. In RODIN, they are used as support for the user while browsing and searching the web.

3 Using RODIN

The core of the user interface consists of a widget aggregator that allows the user to select an appropriate number of information resources under the form of widgets from a box on the left, by simply adding them to the main part of the user interface. By doing this, the user creates his own meta search engine using the organization form as an aggregator.

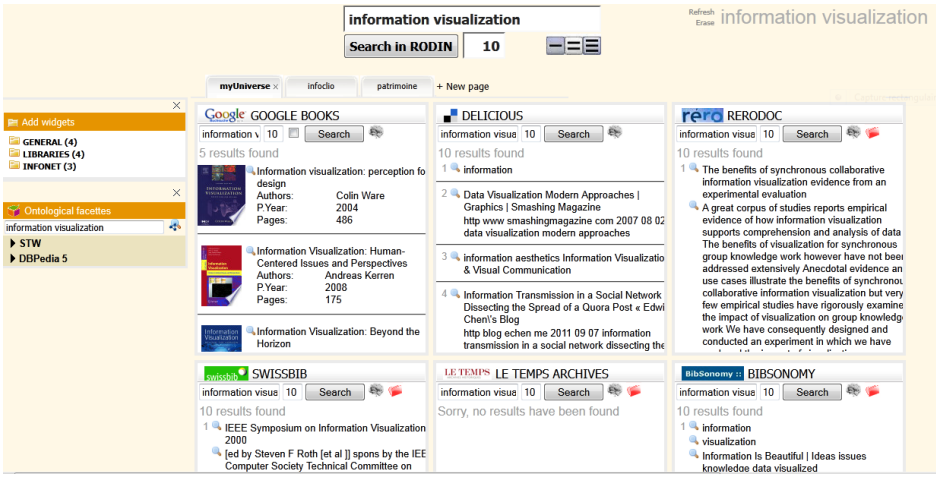

Fig. 1. RODIN general interface

Compared to these systems, RODIN's widget box contains only resources that allow searching via an adequate search field. Most of these resources are in connection with the realm of digital libraries, due to the main project E-lib.ch. The widgets can be organized under different tabs, allowing the user to define several distinct search environments, according to the number of projects or extensive searches s/he is currently dealing with. So far, the results are given in the relevant widgets. In a future version, the user may decide between a mashed and a widget-based representation of the results given.

Besides the widget aggregation box, the user interface is dominated by a prominent search field above the aggregator. Any simple keyword based search may be initiated from this search field (see Fig. 1). The results of this search are represented in the corresponding widgets as received by the corresponding servers.

3.1 Ontology Exploration for Query Expansion

Simultaneously with this simple search, the keywords are transferred to the ontology module and appositely translated into SPARQL-Queries to check for full or partial match against available concepts in the connected ontologies. Due to the large amount of data, disambiguation issues and the need to control and optimize the ontological search process (tokenization, compound analysis, disambiguation, sequencing, search, token collection), this request may take quite a long time and in some cases is pruned by RODIN after a suitable configurable and user-friendly interval of 15 seconds; it is interrupted or restarted whenever a new search is initiated in the main search field or in the ontological search field.

Following the SKOS Data organization, RODIN displays each ontology concept using first its preferred label(s) followed by the alternative label(s). If the matching between the search terms and any ontological entries is successful, the semantic context, i.e. the narrower, larger, and related terms are displayed in the ontology box on the right hand side of the window to be browsed by the user (see Fig. 2).

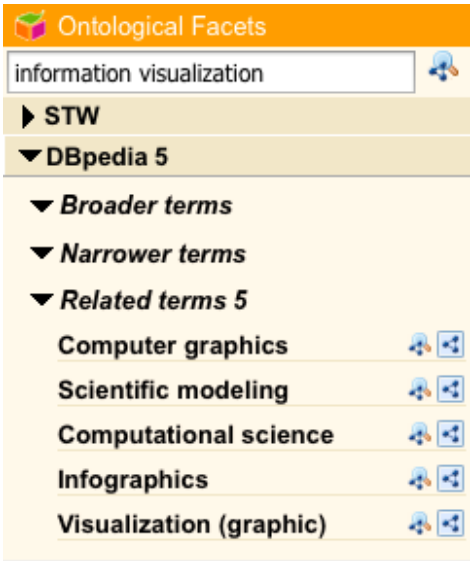

Fig. 2. Ontological facets

For this context, we coined the term ontological facets, since the three different semantic extensions of a term can be seen as facets of a semantic concept.

As can be seen in Fig. 2, every term appears with two icons on the right, the first one (with an RDF-icon like symbol and a loupe) is used to further explore the ontology; the other one (with the RDF-icon like symbol surrounded by a rectangle) is used for the visualization of the term in its ontological context. A left click on the term itself will add it to the refinement bar, as described below. This functionality allows a direct query expansion of the initial search.

These two icons allow the user to explore the ontology in two manners, the folder-like structure of the ontological facets or a graphic visualization, as described in the following section. Both may guide the user along his/her search to find alternative search terms depending on the path (narrower, larger, and related) taken and give him/her an overview of the complex scope of the semiological relationships.

3.2 Visualizing the Ontology

The visualization of the semantic scope (see Fig. 3) is especially helpful to the user whenever the number of ontological relations is high, as is often the case in bibliographical catalogues, with their large numbers of synonyms, hyper- and hyponyms, being a result of the long tradition of thesauri and taxonomies they represent.

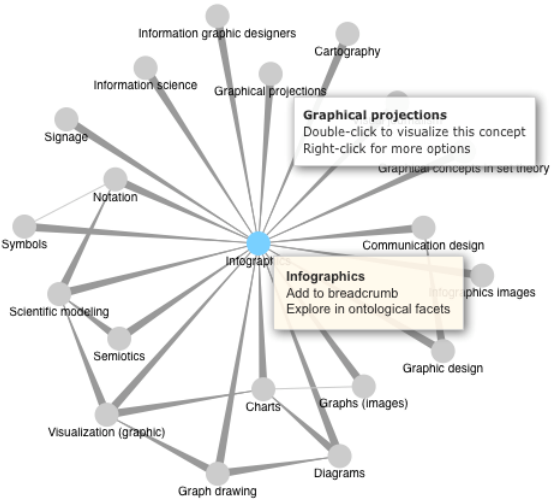

Fig. 3. Semantic scope visualization

The ontological visualization itself is positioned above the widgets, offering the user a simultaneous view of the selected part of the web of documents (i.e. the search result in the widgets) and the corresponding knowledge of the semantic web.

The graphical visualization allows several user interactions:

- by giving a new representational view by rearranging the elements on the screen;
- by adding one of the graphical represented terms to the refinement bar;
- by allowing the start of a new search in the ontological facets;
- by enlarging the view of the concepts by displaying the scope of concepts around a selected peripheral term;
- by navigating the SKOS part of the ontology.

3.3 Search Refinement

Besides exploration and browsing of the ontological knowledge, the search results of the widgets as well as the terms of the ontologies themselves can be used for search refinement, i.e. query expansion. The user may collect these terms and initiate a new search with the collected terms. The terms are collected in a breadcrumbs-like list and represented horizontally in a bar between the main search field and the area containing the other elements of the user interface, i.e. the widget box and the ontological facets, the widget results and, if activated, the ontological visualization.

The breadcrumb list is enlarged with any new term added as a result of one of the actions described in the following subsections.

3.4 Keyword Extraction via DBPedia Spotlight

By clicking on a small loupe or magnifier positioned on the left of every single result, a sub module calculating the key terms of the result is activated. The sub module represents an integration of DBPedia-Spotlight[1] [11], a tool that provides DBPedia concept recognition in text documents.

If the DBPedia-Spotlight service fails to recognize concepts in the chosen text, we perform a search for concepts with similar labels directly in the DBPedia ontology. Should our search for similar labels fail, our last resort is to simply select the most common words in the text. Because the user is only interested in the key terms, the strategy used to extract them from the text can be hidden from him/her. Once the keywords are found, a small window showing them opens above the single result's text (see Fig. 4).

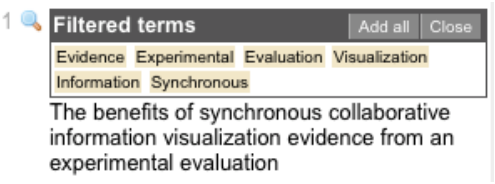

Fig. 4. Keyword extraction from DBPedia Spotlight

By the activation of this module the user is once again guided in the use and the view of a connected ontology, by getting related keywords which link the document to DBPedia. The terms may therefore be used to browse the ontology whenever no match between the terms of the initial search and the ontologies themselves was found. On the other hand, one, several or all terms filtered by DBPedia Spotlight may be used to refine the search, either by clicking on them or by adding all of them to the refinement bar (see Fig. 7).

3.5 Query Expansion

In the meantime, every click on the ontological terms found and represented in the ontological facets will add these terms to the refinement bar (see Fig. 5).

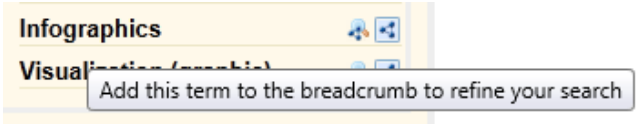

Fig. 5. Ontological term addition

[1] http://dbpedia.org/spotlight

Finally, the user may click on any word in the documents found, i.e. their representation in the result list and add it by clicking on it to the breadcrumb list (see Fig. 6).

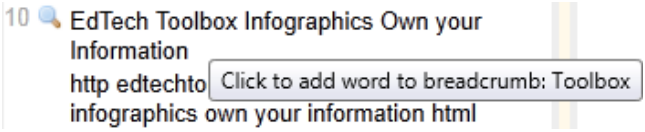

Fig. 6. Simple word pickup

The search refinement process itself is started with the "Refine Search" button at the end of the breadcrumb list of refining terms (see Fig. 7). The activation of this button initializes a new search in the widgets selected with the initial search term (still visible in the major search field) and the terms selected from the documents and the ontologies.

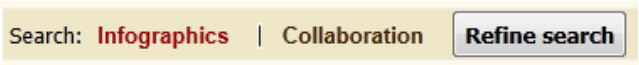

Fig. 7. Search refinement

4 Technical Details

RODIN combines several functionalities for browsing and search refinement and linking the visually perceptible web of documents and the web of knowledge under the form of selected ontologies.

In this context it has always been one of the major goals of RODIN to build a twofold infrastructure that would combine as many technical issues as possible: a project-specific platform serving as a portal for the main project E-lib.ch and its subprojects with a dedicated approach for the world of (digital) libraries and the corresponding ontologies and a rather generic approach being able to integrate if possible any information resource of the web of documents on the one hand and any ontology from the web of knowledge on the other.

The system is based on the open source version of POSH. The software runs under an APACHE2/PHP on a window server. It makes extensive use of AJAX for ontology processing and stores the data results in a relational database for quick recall of relevant portions of data. The main architecture is based on POSH (Portaneo Open Source Homepage, www.portaneo.net), an open source aggregator that allows the administration of widgets and their combination under a common interface. The framework built around POSH permits a structured integration of a wide variety of widgets under a unified Look & Feel for all widgets.

Every application related to a widget is integrated using the systems API and – if possible –a RESTful interface. Unfortunately so far rather few programming interfaces make use of this technology and the integration of APIs is far from being

standardized. This led in several cases to a rather unexpected amount of handcrafting which we reduced to a minimum by adding a suitable generalization to the implemented widget. The generalization consisted of the implementation of a framework with a programming interface fulfilling the needs of each particular data source while allowing the same behavior for any widget.

As regards ontologies and the semantic web, we integrated – as mentioned above – two ontologies using the SKOS-Data Model: STW and DBPedia. Furthermore, RODIN gives a use case for DBPedia Spotlight with a further interest in exploring ontologies and using the results of this process in combination with the result of general web searching for a refined continuation of both processes.

Ontological data sources are integrated using an object oriented interface. The latter allows the easy integration of further sources by using a common programming interface and reusing available sub components.

Since RODIN was mainly designed and implemented as a so-called "web 3.0", i.e. a semantic web tool, it does not contain any collaborative functionalities like recommending a search environment or sharing widgets or the mutual manipulation of a working environment. Since these "web 2.0" functionalities are already contained in the POSH framework, we deliberately decided to omit them from the current system since we believe they add no value to a "web 3.0" tool. Nevertheless, if the user community considered them useful, they could easily be added. For the first release of RODIN, it was decided to put a focus on the single user experience.

5 Usability Issues

Due to the complexity of the user interface and in order to assure user friendliness and a maximum of user acceptance, several usability tests have been conducted so far: a first one after the implementation of the widget aggregator with a test group of seven practicing information specialists, a second one after the integration of the Linked Open Data resources, i.e. after the implementation of all major functionalities.

The first test's results led to some changes in the general look and feel of the system's interface as well as some adjustments concerning the design, arrangement and proportion of the distinct components. Since the system did not contain all functionalities yet, only two severe and six other usability issues were detected. Several users had problems finding the most important elements, such as the search field and the widget box, while others had problems understanding the meaning of the icons for displaying and refining the search results. All of these problems were solved and changed before the integration of the ontological search began.

The second usability test was done as a combination of a heuristic evaluation by two external usability experts and three user acceptance tests including eye-tracking with information specialists, conducted by the same experts. Generally speaking, the interface was now considered "clearly laid out" but nevertheless "challenging in its complexity". Test participants mainly criticized the lack of a structured "Help" explaining the proper use of the major functionalities, but considered the system itself as helpful for search refinements. The test members found it difficult to understand the term "ontology" as well as the terms "broader", "narrower" and "related" and others such as "breadcrumbs".

In the end, the usability experts suggested several modifications in the design, such as location of the refinement terms next to the search field, further simplifications in

the overall design and a reduction of the system features to some core functionalities which will be realized before the release of the system.

6 Conclusions

In this paper we describe RODIN, a tool for simultaneous browsing and searching in the web of documents and the semantic web. The system offers a number of functionalities for search refinement and is designed for the use of information specialists and users in the context of digital libraries, but may be helpful in any similar context.

In the near future, RODIN will be installed in several Swiss scientific libraries to be tested by information specialists as a support for their work (cataloguing, searching) and by their patrons, as a searching device in scientific work. Besides that, the development of a mobile version has started and will be realized within the next development cycle.

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Environmental Researchers' Data Practices: An Exploratory Study in Turkey*

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Abstract. This qualitative exploratory study probes the knowledge and attitudes of information science and environmental researchers in Turkey towards scientific data and information particularly in regards to sharing and preservation. Ten environmental scientists and two information scientists were interviewed. Results reveal that research data is stored mostly on personal computers. This raises two issues: organizational and technological sustainability. Environmental scientists in Turkey do not engage in data-intensive research. Data sharing is limited because of socio-cultural reasons. Although data collaboration is limited, there is an interest in international collaboration. According to the information scientists in Turkey, conversation on data management and data sharing has started but only in academic circles. Data practices are not mandated by funding agencies. The skill sets of information scientists are not fully utilized. For both environmental and information scientists, there is a long way to go.

Keywords: Environmental scientists in Turkey, data sharing, data preservation.

1 Introduction

Climate change is a grand challenge for science since the environmental impact touches societies across the globe [2] especially as society's consumption rates increase, populations grow, and nations modernize [3]. Climate change and its results have been identified by scientists [4], [5], [6] and shared with the public through the popular media [7], [8], [9], [10]. Climate change is implicated in rising sea levels [11] and erratic weather patterns [12] which can precipitate starvation and disease [13] , [14] , [15].

Challenges such as climate change and studies focusing on these challenges such as biodiversity require new approaches to science [16]. Scientific research is increasingly becoming more complex [17], including data-intensive science, which gains new insights through data-driven approaches [18]. Data-driven science includes

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using data gathered from global locations and often uses computational modeling techniques to create new ways to understand the problems. The phrases "the fourth paradigm" or "data-intensive scientific discovery era" [19] have been quickly accepted among researchers as the science literature and data become more accessible online and are increasingly able to interoperate with each other [20]. Data has become more important as the advances in digital computing, remote sensing technologies, and storage technologies allow scientists to engage with the data in new ways to create new knowledge. The new technologies have increased the amount of data collected, used, re-used, and stored [21].

The benefits of data sharing and data reuse, and the importance of data preservation are well documented, The benefits of data sharing include: (i) verifying results, since the re-analysis of data is necessary to replicate studies which can be used in training of new researchers; (ii) reducing re-collection costs; (iii) increasing data integrity through preservation; (iv) reducing data availability reduces the risk of data falsification and fabrication; (v) facilitating new insights and understandings through integrating different datasets [22], [23], [24], [25], [26].

Problems can best be addressed if barriers – disciplinary and geographic – can be overcome [27], [28], [29]. Overcoming these barriers is especially important when studying grand challenges such as global climate change since these are complex systems [30] that require collaborative and interdisciplinary scientific approaches [31]. One approach is the emergence of virtual organizations, i.e. DataONE, that allow scientists to more easily communicate and share their data [32], [33], [34]. This means that we must understand more than the technical issues; we must also understand the socio-cultural, economic, ethical, and political issues that influence scientists' data practices on the global stage. To do this, it is helpful to understand how environmental scientists in different communities conduct their work– whether community is defined by scientific domain or geographic area.

This study focuses on environmental scientists in Turkey because Turkey is an important environmental region and because there is no literature reporting on these scientists' knowledge and attitudes towards data practices. Due to its geographic location and diverse climate, Turkey is rich with endemic species. Moreover, it is an important hub for migrating birds. Therefore, environmental data from Turkey is of importance not only to Turkish audiences but also European, Asian, Middle-Eastern, and African audiences. It is important to know data practices of Turkish researchers since they are collecting data that could inform environmental researchers in each of these other regions. In order to have a better understanding of the practices, we conducted qualitative research in Turkey which explores the knowledge and attitudes of information science and environmental researchers in Turkey towards scientific data and information, particularly in regards to sharing and preservation.

2 Methods

We took a grounded theory approach and used long interviews to allow the themes to emerge from the discussions of our participants [35]. We interviewed two groups of

participants in Turkish universities and research institutions: (1) environmental scientists; and (2) scholars of library and information sciences who are interested in database management, dissemination of information, information architecture, and knowledge management. The importance of environmental research is summarized above; thus, we chose to study this community. The library and information science community was selected because they could play the support role to create the necessary cyberinfrastructure for environmental scientists to take care of their research data. Two interviews were completed with library and information scientists and ten interviews were completed with environmental scientists. We were not able to find more interviewees from library and information science, hence the difference in numbers of interviews.

In the summer of 2010, we conducted in-depth interviews with participants in order to understand what library and information science (LIS) scholars and environmental scientists think about scientists and their data practices in Turkey. Personal contacts were used to initiate contact and snowball sampling was also used to recruit participants. One investigator had worked with NGOs in Turkey from 1999 to 2007 and established a personal network of environmental scientists. Potential participants were contacted by phone and asked if they were interested in participating in such a study. If they were, a meeting was scheduled, and an informed consent form was presented at the meeting prior to conducting the interview.

The interviews were conducted as informal conversations, which were guided by two discussion guides (one for each community) with several open-ended questions. Environmental scientists were asked whether and how they take care of their research data, and their perceptions towards data sharing and preservation. In addition to their research data habits, library and information scientists were asked what they think of scientists' research data practices and what the library and information science community can do to support scientists.

Of the twelve interviews we conducted, two of them were in English and ten were in Turkish. They were translated to English by the researcher. We used the English transcriptions in the analysis. There were separate discussion guides for the information science scholars and the environmental scientists. Some questions emerged from the initial interviews and were used in subsequent interviews.

The first few questions were designed to make the respondents feel more at ease with the interviewer and more comfortable in discussion. The subsequent questions asked the respondents to express their thoughts and feelings toward scientific data and information sharing and preservation. Interviews lasted between 30 to and 75 minutes. Each interview was audio-recorded and verbatim transcribed by the Co-Principal Investigator (Co-PI) for analyzing the data and quotes. The interviews were conducted at the researchers' offices (except one that was in a coffee shop) to ensure high quality audio recording and confidentiality. The audio recordings were destroyed after each interview was transcribed.

Analytic induction was used to find common patterns in the interviews by reviewing the transcripts line by line for themes or categories emerging from the initial cases, then modifying and refining them on the basis of subsequent cases. A peer audit technique, a technique in which researchers check and compare each other's analyses, was used to help clarify the analysis.

3 Results: Emerging Themes

3.1 Environmental Scientists

The ten interviews with environmental scientists exhibited redundancy and therefore provided rich results. There were six emerging themes:

3.2 About Data

Data is most important for publication. Most scientists mentioned that they were "done" with the data after their publication. This meant that at the time of data collection the scientist did not plan how to maintain the data after the analysis was completed and the results published. Although scientists we interviewed had some interest in data as a "research product", none was actively engaged in a formal process to preserve this product. Instead the process for maintaining the data was informal and was usually focused on storage activities conducted after publication rather than being part of a process begun at the inception of data collection. One example illustrating this is noted below,

> "Q. What happens to your data and findings after your research?
> R. We write papers, publish.
> Q. What else? What happens to your raw data?
> R. We store it. Now we are making a database.
> Q. Who are 'we'?
> R. Me and my students I'm talking about it with." – Respondent 2.2

3.3 Storage

Data storage activities exist but do not address sustainability. Most researchers keep their data on personal computers and related media such as CDs and external hard disks. As reflected in the comments below some researchers have an active backup strategy. However, these strategies are usually limited to keeping copies within the research group and often in one physical location. Additionally, these stored copies are only for the PI and the research group. Therefore when the PI retires, the data could be lost forever.

> "In office computers, hard disks, and CDs. The photos and others. We copy everything into CDs and hardcopy" – Respondent 2.3
> "They are in external hard disks and also in CDs. I have 2-3 copies in case something happens. I store such information in multiple copies." - Respondent 2.1
> "I don't use a server but keep flash disks. Not specifically for that data but, with panic, in case something happens. Sometimes I store it in a big external hard disk, sometimes I store it in pieces in small storage media. I try to backup data and my personal files." – Respondent 2.4

There are also substantial issues regarding technological sustainability. These issues often result from software becoming obsolete and researchers having no plan for data migration to new formats. Researchers note that often the data collected in previous years is not accessible anymore.

> "I even had a database about my field notebook made but now I can't use that software because the operating system has changed. … [T]he digital environment changes in 3 years. You have to stop all your work and try to keep up with the new stuff [format] because everyday something new is introduced. You have to change accordingly; thus, you have to deal with that only. Thus, my data that I put into my computer with the operation system I had in 91-92 is now unavailable/unusable." – Respondent 2.6
> "Yes, we have format problems with very old data. Even, for some time – I'm not a very young person so let me explain to you like this. There were some operating systems different from IBM PC. We have some simulation work done in these systems. There is nothing to make them work anymore. The floppy disks are here but we can't use them." – Respondent 2.9

3.4 Data-Intensive Research

Data-intensive science is not yet a regular part of the research environment. Turkish environmental scientists are not yet regularly engaging in data-intensive science for a variety of reasons.

> "What I'm trying to do is not interpreting something that is already known. Discovering a phenomenon, that's what I like. But, of course, the big datasets you mention might point out a phenomenon. I'm not denying that, I'm aware of that." –Respondent 2.7

But some are encouraging students to use data in new ways. In some cases, individual graduate students contact the PIs and ask for datasets. However, there is not an established mechanism to attract the interested researchers. It generally works as mouth of word.

> "What happens is a student comes in who is very keen on modeling and data mining, you know. Data can be used from different angles, different perspectives." –Respondent 2.2

3.5 Data Sharing

Data sharing is only engaged in on a limited basis. Data sharing happens primarily when multiple researchers are involved in a specific project. However, there is little sharing outside the research group which is involved in the initial data collection. The interviews suggest the reason extends beyond technological limitations to several socio-cultural reasons. Trust is one of the most prominent reasons among them.

> "In fact I am a sharing person, however, the trustworthiness of the person that I'm going to share with is critical. For instance, I might share with the people I work with or I trust. But in our country, besides plagiarism, there are cases that someone else's data is used and published. Thus, I am not sharing often." –Respondent 2.5

Additionally data sharing is limited by concerns for intellectual attribution.

> "I'd very much like to publish; however, if person A calls me and says 'you did such a study but you didn't publish. I'm going to do something like this, I'll benefit from them (the data)', I might not give it." – Respondent 2.4

The scientists we spoke with also feel that they do not receive enough support from their organizations. Limitations on resources, technology, staff, and the training needed to exercise stewardship of data means that the lack of institutional support becomes an important barrier.

> "You don't have continuation. Instead of this I'd rather work in an institute where you work with technicians and so on, supporting groups. You'd have a computer guy, database, graphic institute-office everything, whereas in a department like this [academic department], you do research with your own capacity, own students. You get nothing else as support." Respondent 2.2
> "Q. Does the university you work for provide you space on a server?"
> "No, no, no. No such thing." Respondent 2.5

In addition to limited resources, academic institutions are not promoting a culture of data sharing among the scientists. The scientists do not get any credit for the data they provide to others. In fact, many feel that their efforts and hard work are undermined.

> "At the universities, there isn't any institutional culture that encourages sharing. There, it depends on the skills of the individual only." – Respondent 2.6
> "The institution is of course not aware of such a thing. We do it ourselves, by our own methods. I mean, I don't know how the institution could provide support." – Respondent 2.8

In fact there was a general feeling that in a big dataset, their scientific contribution seems 'minor'; however, it does not feel 'minor' to them because of the time and effort they had to put into the data collection. This kind of inequity makes the scientists reluctant to share.

3.6 Data Collaboration

Collaboration with the broader scientific community is limited. Scientists felt that there is limited science data collaboration with researchers outside Turkey. However, the scientists expressed an interest in being involved in international collaborations.

> "I haven't had such an experience but I believe it should be happening. I think very positively about it. I believe the real sound studies could emerge in that way. Quite the opposite, I consider myself an introvert and unproductive because of this (not having international experience)." – Respondent 2.1
> "Many things in environment are transboundary. Thus, collaboration is a must; regional and international collaboration is a must." –Respondent 2.3

3.7 Academic vs. Government

Attitudes towards the use and storage of data vary with the research environment. Scientists in both the academic and government research environments mentioned incentives. The incentives seem to be one of the factors that influence scientists' attitudes towards data and data sharing.

> "In government, it's much easier to share information. You don't have many problems because ultimately you are an environment specialists, even if you write five articles you will continue to be an environment specialist, … Neither your salary will change, nor your title." – Respondent 2.4

3.8 Scholars of Information Science

Some of the barriers hindering the sustainable data practices and data sharing of Turkish environmental scientists might be overcome through collaborating with information specialists. Therefore, we interviewed information science scholars about their relationship with environmental scientists in Turkey and their impressions of the scientists' data practices. Most important is the information science scholars' attitude toward collaborating with the environmental scientists.

Although we contacted seven information science scholars, very few felt they could discuss data practices, particularly in reference to science information, so only two interviews could be conducted. The fact that so few felt qualified to discuss this topic suggests that there is potential for expanding the understanding of science data through increased training opportunities of information scholars. For the purposes of this study, the small number of interviews meant that redundancy could not be reached and themes could not be identified. However, the results are still valuable in providing a very preliminary look at the information science perspective and in providing details about the science data environment.

The information science scholars we interviewed believed that most scientists kept their data on personal computers. They also believed that data is seen as a means to reach an end—a publication; rather than as a research product that has value in and of itself. These beliefs aligned well with our findings from interviewing the environmental scientists.

> "I think information scientists should have dual roles in data preservation. First of all they … themselves [need] to practice you know data preservation. But in general information scientists are not that different from other scientists when it comes to data storage, data preservation, etc. because as a researcher they just want to complete this study and walk out just like any other scientist." – Respondent 1.1

According to the information science scholars, a conversation regarding data management and sharing has been simmering within some academic circles, but it is still only on a limited basis. While there is some interest in sharing there are concerns about who will implement and maintain the process for sharing because most scientists are not willing to do so. Additionally there are concerns about how data will be used.

Data practices that are mandated by a granting agency, for example a European Union collaborative research project, are likely to be adopted for that project but this does not mean these practices will be adopted for other work conducted by that scientist or research group. The information science scholars feel that information sciences can play an important role in supporting interdisciplinary science efforts. However, they feel there are hurdles to overcome in order for information science to play a vital role. They note this would require more people to be aware of information science and what it can do to support research.

> "I'm speaking for Turkey, I don't think our field is known by many." – Respondent 1.2

These scholars feel that as the scientific world moves towards more interdisciplinary and data intensive research, Turkey must become involved. This would be a new direction in Turkish library and information science education.

> "These are new topics for us, new collaboration topics. I think this is going to change the curriculum of the information sciences." –Respondent 1.1

4 Conclusion

This is the first study that deals with the data practices of environmental researchers in Turkey. Clearly, more studies are needed to make generalizations and implement policies accordingly. However, the findings resemble those found in previous studies done in different parts of world [36], [26]. Data practices are poor among many scientists and Turkish environmental scientists are not very different. Strong data practices include activities in all eight steps of the data lifecycle (Fig. 1). These steps promote the sustainability and accessibility of data into the future. Scientists engage in some of these steps and other steps are supported by information specialists.

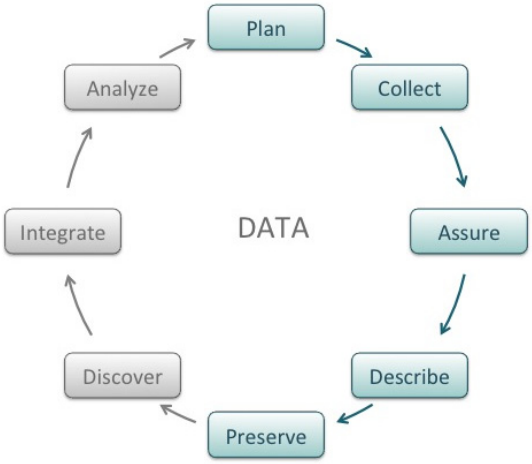

Fig. 1. Data life cycle [37]

The DataONE data lifecycle has eight unique stages (Fig. 1). It begins with creating the research plan, then progresses through data collection, quality assurance and quality control. Metadata is created to describe the data. The data is then deposited in a trusted repository where preservation activities may occur. Data discovery, integration, and analysis including visualization can then be supported by tools and services [37].

The results of this study suggest that, while Turkish environmental researchers and information science scholars participate in some steps of the data lifecycle, the existing research environment does not provide the organizational or technological infrastructure to support the full life cycle. For example, while several scientists have an active back-up strategy, they are conservative in promoting and sharing their data. Trust and intellectual attribution are the most mentioned socio-cultural barriers to data sharing. Moreover, lack of institutional support is an issue. Thus, they do not engage in data-intensive research. Metadata/interoperability issues and interdisciplinary barriers, which came up in previous studies, did not come up as data intensive science has not developed enough in Turkey.

In our opinion, research institutions and funding agencies could address some of the socio-cultural issues by providing incentives (such as having citation of a dataset increase points towards promotion) and resources (such as technology and training) for researchers and the information specialists who could help provide support for their intellectual pursuits. International collaboration opportunities should be utilized more since researchers are open to collaboration and there are some readily available EU funds for such opportunities. Promoting collaboration with information science scholars is a must to reach this goal; however, the information science community must do more to increase awareness among scientists of what information science offers and how that can positively impact the quality of the environmental scientists' research.

While this study provides insights into the data practices of environmental scientists in Turkey there is still much work that needs to be done to better understand the full picture. Our future research plans include preparing a survey based on the findings from these interviews which would measure the attitudes of environmental scientists in Turkey towards data sharing by accessing a much larger sample. These results could help the science policy makers in Turkey to develop relevant policies/incentives and could also help identify potential collaborators outside Turkey, which would help facilitate the collaboration process.

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Speculations on Combating Information Overload in Amateur and Professional Environments

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Abstract. In this paper, based on desk research, we point out some of the relationships that exist between information overload, Web 2.0 (often called new media) and information literacy. The proliferation of new media augments information overload in both amateur and professional environments. The adoption of information literacy, tailored to the needs of the given environment, alleviates the symptoms of overload by fostering a critical approach to information.

Keywords: Information overload, new media, information literacy.

1 Introduction

Information overload (IO) is a major problem that affects all spheres of our life, and represents one of the most important disturbances to the business world, academia and the professions [1].

Our hypothesis was that the extensive use of Web 2.0, often called new media, is one of the main present-day causes of IO [2]. Our main argument was that IO is one of the phenomena which can be combated by efficient and goal-oriented information literacy (IL) education. In order to test our hypothesis, we have done desk research that identified the concepts underlying our assumptions. We examined the nature, potential and appropriateness of IL when offered to professionals (writers and scholars), contrasted to the importance of their roles in the amateur setting of new media environments. In doing this, we focused on some features of scientific research (scholarship) and on some of the activities of professional writers.

The concepts used in this paper are the following:

Information overload is an impediment to efficiently using information due to the amount of relevant and potentially useful information available [1].

Information literacy refers to the process of recognizing information need, finding, evaluating, and using information [3].

Web 2.0 is generally taken to encompass a variety of sites and tools for shared information creation and updating, social networking and communication [1].

The main feature of *new media* is the presence of Web 2.0 software, bringing with it the capacity to input data and exercise manipulative control over it. This software enables mass participation in social activities and results in a visible growth of user-generated content [4].

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A substantial number of Web 2.0 users can be qualified as *amateurs* of our era, who can be defined as persons who love to be engaged in a particular activity. They may be knowledgeable or not, but usually they lack credentials [5]. Amateur settings are different from professional environments that foster both scientific inquiry and information use by members of a given profession. The latter includes activities of professional writers.

2 Combating Information Overload

The phenomenon of overabundance of information is not only a continuation of the often experienced and lamented growth of information of earlier times, due to the ease of publishing and storing information that motivates people to produce, but not to remove their production [6]. In spite of this, information overload is mainly a social condition, propagated by people [7].

IO has to be seen in the context of new media. The underlying context of new media, Web 2.0 is characterized by its simple and easy–to-use tools. This results in a mode of operation where users do most of the organizing and structuring for themselves [8]. These users are encouraged to produce anything, without paying attention to its value, and they are discouraged from being critical. The majority of users are not aware of this. They do not perceive it [9].

As the tools enable and encourage rapid updating and posting of new material, constant novelty is expected and easily achieved. Such expectations can be satisfied by producing ephemeral artefacts and by re-using existing material [1]. All this contributes to a landscape based on shallow novelty, that characterizes a substantial part of amateur production and is usually not suitable for fulfilling professional goals. Having said this, we have to acknowledge that not all amateur content is shallow. Perhaps the most notable exception is Wikipedia, first of all by virtue of its reliance on references [10] and the fact that it is not based on any commercial enterprise. The intellectual rewards of writing Wikipedia articles are also different from "collecting friends" on social networking sites, although it is similar to placing posts and leaving comments on blogs. In comparison to the majority of new media applications Wikipedia is not a herd-like project, especially because participants write full-fledged articles with the intent to enhance this encyclopaedia, which they have found useful [11].

For amateurs it is not always indispensable to compete for attention, and the consciousness of competition is considerably lower than that in the corporate sector and especially for the providers of the Web 2.0 applications themselves. This is one of the reasons why the world of the new media is not an ideal one, where every participant would be an expert in producing information, as Huvila [11] suggests.

On a more general level we can say that new media participants are relatively equal within the Internet, but not within society [12]. Equality in the possibility to participate in public discourse and to express ourselves does not mean that we are equally prepared to do something professionally or adapt a professional attitude. This is one of the reasons why widely popularized wisdom cannot be regarded as a feasible means of producing reliable information, at least not for professional goals. Groups of uninformed individuals can be dumb, even if equipped with the newest technology

[13], and people gathered together somewhere are not necessarily wiser than the individuals who constitute this crowd [14]. The wisdom of the crowd does not alleviate IO either, especially not on the qualitative side, because it does not require or stimulate conscious selection. This increases IO, especially in professional environments where information is directed to relatively well defined audiences. Obviously, professional communication is far from being exempt from IO. On the contrary, professional purposes require conscious critical selection of information, which seems to be very much the crux of combating IO.

Both scholars and professional writers are united into communities by their traditions, customs and practices. They share meanings and knowledge and they use regulated forms of communication, which often take the form of norms [15]. Among professionals, scholars need to be considered as a special group. We can say that the existence of information overload may make the originality of some scientific discoveries somewhat questionable. Nonetheless, scholarship generates information, based on organized scepticismalso in regard to the results of research. It favours cautiously reaching conclusions rather than building on conviction [16].

Amateur production usually lacks this scepticism. This is also one of the reasons why amateur content cannot substitute for content created by professionals and used for professional purposes [17]. Popularity, a cornerstone of new media in many regards, seems to be a crucial factor here. On the one hand, ranking content according to its popularity is not appropriate for the proper production of professional content. Neither is such ranking efficient in combating IO. On the contrary, it is one of the causes of overload.

The question is not if IO hampers the discovery, identification and proper use of information. We have to find out instead which measures (skills and tools) are the most efficient in combating IO.

IO can be counteracted by taking control of one's own information environment, taking measures towards organizing information more efficiently, cultivating a rational personal information management style. All this goes hand in hand with critical thinking [1].

The intellectual standards of becoming a critic of someone's own thinking [18] have to be weighted as well. Focusing on relevance seems to be equally important for both categories. Focusing on fairness is of general importance, although it seems more important for amateurs. Professionals should pay special attention to focusing on accuracy, on depth and on significance. The lack of such critical thinking, the lack of adequate filters to information or failure to apply them appropriately results in IO [7]. However, there are a number of literacies, most notably information literacy, that bring in the element of critical reading and writing.

3 Helpful Literacies

Because of the growing complexity of our environment, we face diverse and abundant information choices in almost all fields [13]. Besides the multitude of choices there is abundance of information itself and easy access to information and communication technologies (ICTs). All this does not create more informed citizens without appropriate literacies [19].

We can count a number of different literacies, because they depend on the varying social contexts and the varying social conditions of reading and writing. Consequently, they change in time, according to purposes and circumstances and to the people and tools involved [20]. Among the influencing factors we obviously find the existence of Web 2.0. On the other hand, we have to agree with Livingstone, van Couvering and Thumim [21], who direct our attention to a convergence among literacies that appeared as a consequence of convergence between different forms of media and ICTs.

One of the best known forms of literacies is information literacy. IL education emphasizes critical thinking and the necessity to recognize message quality. It has strong positions among literacies despite some (well founded) scepticism, highlighting the fact that this concept and especially the *lack of information literacy* has always seemed to be of more importance to academic librarians than to any other players in the information and education arena [1]. Information literacy was dominated by questions of access, because it has been dealing with media that have been far from accessible [21]. However, this situation has radically changed with, among others, the appearance of Web 2.0, because it offers (or rather propagates with a strong push) a tremendous variety and diversity of newer forms of information and communication resources. This requires not only choices but substantially contributes to IO, even though these forms are not entirely and genuinely new, being extensions of issues, techniques and solutions already seen on Web 1.0 [1]. This situation is reflected by the appearance of the concept of digital literacy (DLi). Digital literacy links together a number of relevant literacies, including information literacy and the use of information and communication technologies, and includes an active ingredient in the form of communicating (publishing) information [22]. Digital literacy's core lies in the awareness, attitudes and abilities of individuals who need to use digital tools and facilities appropriately to identify, access, manage, integrate, evaluate, analyse and synthesize digital resources and communicate through media expressions with others [23]. In DLi information seeking is coupled with critical thinking, similarly to IL, and traditional tools continue to play an important role, while it acknowledges that ordinary people became not only receivers, but senders of messages [24]. In some settings, especially in Central and Eastern Europe, digital literacy is often associated with and restricted to computer literacy, i.e. the skills of using ICTs efficiently [25]. Paradoxically, this understanding brings endorsement to DLi from the corporate sector and DLi may have a chance of being accepted more widely than IL. Nonetheless, this represents a chance, which is somewhat similar to the idea expressed by Luke [26]. He suggested that media literacy (another important form of literacy) can be brought into schools through the "back door" into computer literacy education and enrich it at the same time. Why should not information literacy acquire more recognition in this way?

When treating differences and similarities between IL and DLi we may adopt the point of view expressed by Špiranec and Banek Zorica [27]. According to them IL can overlap or even merge with DLi due to its focus on emerging digital environments. Let us add that it seems to be of lesser importance whether literacies of the information age are called information literacy or digital literacy [24]. Taking all this into consideration, we will stick to the widely accepted concept of information literacy.

Information literacy's interface with IO is relatively clear cut. With the apparent loss of gatekeepers, like reviewers, editors, librarians and others, readers themselves are required to fulfil this function [28]. We believe that this loss may prove to be partial and temporal. One of the reasons of this is in the very nature of scholarship. It seems to resist the loss of gatekeepers by preserving peer review.

Nonetheless, the partial loss of gatekeepers causes IO and requires the application of IL skills, because there is a multitude of options, which make decisions more difficult because they require more cognitive effort [6].

With the heavy presence of digital media, contestation over the power and authority related to access, interpretation and production of printed texts has been magnified [29]. Despite the decisive impact of ICTs on literacies it would be at the very least one-sided if we limited them to the effective use of ICTs [20]. Even more, it would be a failure to concentrate exclusively on the understanding of the technological infrastructure. Beyond that, our view of information should not be limited to issues of representation, storage and processing; we have to consider how information is used in work and social contexts to construct and share meanings and to coordinate action [30].

On the whole, technology is just a tool; it does not determine how we must act (ACRL, 2000). It is literacies that help to understand the digital world better and to take meaningful courses of action. We have to understand that what is digital is subject to human agency and to human understanding. In spite of close ties to technology, IL is intimately related to literacy in its original sense, which is *reading literacy* that involves the integration of listening, speaking, reading, writing and numeracy. Thus reading literacy can be defined as an individual's ability to understand printed text and to communicate through print. Similarly, ties exist to functional literacy, which most commonly denotes the ability to read and use information essential for everyday life [24]. In accordance with this, we can state that in our culture and society it is almost impossible to function without mastering the skills of written communication [13].

There are plausible arguments that IL should go beyond caring for the abilities of finding information and concentrating on reading. Literacies have to include the creation of information, i.e. writing [32],[11], because literacy is a cultural knowledge that enables us to recognize and use language appropriate to different social situations [33]. As a result of the dynamic relationship between analysis and synthesis, information seeking is embedded in writing in a complex way [34].

The possible emphases of contemporary education on information creation and organization (in other words IL, which takes writing into consideration) can be the following ones:

- Making information creators think about their audience(s) and emphasizing that they create information for a community of users as a part of that community;
- Focusing on simple tools in order to achieve as much as is feasible but no more;
- Emphasizing the ways information creators themselves can benefit from better-created information;

- Emphasizing that citing, reusing and linking to the existing information is a virtuous habit, while the creation of new information is desirable only when a particular kind of information does not seem to exist [11].

The latter, i.e. finding or commissioning good texts by selecting, arranging, filtering and recombining pre-existing information instead of creating original texts [35] or "reproduction literacy" as it is called by Eshet-Alkalai [36], is prevailing in our era. This kind of "remixing" characterizes mainly amateur production. Scholarly and professional writing seems to show a certain amount of it simply due to the importance of citing existing literature. Nonetheless, professionals go beyond that, because their activities are directed towards establishing and occupying niches of research [37]. Filling in niches means that we produce new information. This has to be done according to beliefs about performing research properly [38].

As to the use of simple tools, we have to add that professional writers do not focus only on them. They are aware of the fact that ways of producing information should not be limited to amounts of "feasible" information, among others, due to the attention towards their audiences. The question of reaching targeted audiences always has been at the centre of professional writing. These audiences are professional communities that read, interpret texts and reach consensus about interpretation [38].

There is a need to offer different literacies. One type of literacy should serve the "general public", while another has to be geared towards the needs of professionals. The example of media literacy as outlined by Potter [39] can be serviceable to illustrate this difference. Not forgetting that media literacy is not a category but a continuum, we can still differentiate between basic and advanced stages.

The "Development Stage" is a basic one. Still, it is fully functional as people in this stage feel they are exposed to the messages and getting the meaning out of them according to their needs. This stage seems to suffice, even be desirable for amateurs. The "Critical Appreciation Stage", which is characterized by a deep understanding of the historical, economic and political contexts of messages, or the "Social Responsibility Stage" that adds amoral aspect, are required for professionals.

4 Conclusion

In this study we have examined some issues, related to information overload and underlined the necessity to differentiate between amateur and professional production with the aim of arguing that this dichotomy defines the nature of literacies. We added to this that amateurs and professionals have differing motivations and mental models for handling information. The world of the new media is far from ideal, where every participant would be an expert in producing information.

Information literacy, if it does not limit its scope to the abilities of finding information and reading, can be the most efficient means in combating information overload among scholars and professional writers.

Besides accounting for the complexity and varied nature of literature, we have to acknowledge that there is no single literacy that is appropriate for everyone, every time. Instead, literacies require constant updating of concepts and competencies in accordance with the changing circumstances of the information environment [40], [41].

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Are We Experiencing the End of the Library as We Know It? Speculating on the Future of Libraries as "Space of Flows"

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Abstract. Social networking facilities alongside the massive digitization of information resources and popularity of search engines clearly impact on the nature and conditions of public library services. This has also affected the public library's societal role and institutional identity. The new digital information environment and social software tools such as blogs, wikis and social networking sites have contributed new perspectives to discussion of the future of public libraries as information providers. Within the profession, in LIS academic environments and in the wider media, varying views of the public library's future have been presented. Whereas some professionals, library directors and LIS academics see a bright future for the public libraries, believing in their flexibility and pointing to their potential for survival, there are analysts and commentators who are much more pessimistic about the need for public libraries in the next 20-30 years. But however uncertain their future, there does seem to be a need for public libraries to critically review their aims and objectives and consider redefining their service identity. In discussing the survival of public libraries in the digital age, a range of visions have been proselytised while ways of widening and enhancing the role of libraries have been indicated. Some emphasis has been given to exploring the public library as "space of flows", a term proposed by Manuel Castells. By analysing key papers reflecting on the public library as a space for communication and networking, this paper intends to examine the nature of the communications dimension of the public library in a phase of reorientation and struggle for survival. Included in this analysis is the library's role as a democratic agora and as a hybrid learning space. The library can thus host conventional face-to-face meetings and seminars and actively initiate e-discussions that aim to involve citizens in discussions of cultural, political and community-related issues. In contributing to the development of a conceptual basis for the study of communication and networking activities in public library settings, the paper presents an analytical approach that is structured around Manuel Castells' spatial division of "space of flows" and "space of place".

Keywords: Communication hubs, democratic agoras, Manuel Castells, meeting places, public libraries, space of flows, network society.

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1 Introduction

The first decade of the century is behind us and the challenges facing the world have not become less acute: famine, climate change and the risk of future climate collapse, pressure on energy resources, the repercussions of the global financial crisis, the discontinuity between recession and economic upturn, the gloomy prospects for Europe including threats to the eurozone's financial stability, corrupt media conglomerates (e.g. the phonehacking scandal), increasing disparity between rich and poor, revolts and riots, migration pressures, erosion of democracy in many parts of the world, etc. These major geopolitical factors constitute the public library's external environment. Although global phenomena like demographic trends, meteorological hazards, media monopolisation, the volatility of financial markets and energy scarcity do not directly affect the existence and service provision role of public libraries, it seems obvious for libraries to review and reflect upon the current status of their global conditions. In other words, libraries need to re-examine their role in society and reconsider their responsibilities and priorities. In determining their future function and in identifying future user needs and services, libraries can apply scenario analysis. Overall (and this applies to most countries) the public library's service environment exhibits an increasing degree of complexity and unpredictability: shifts in library users' preferences, expectations and behavioral patterns alongside the emergence of new media, platforms, formats and gadgets which offer you not only thousands of songs but also your documents, your books and your life paraphernalia, rematerialised and stored in the “clouds”. The e-book has arrived - as usual, its growth trends in the USA are spreading to other parts of the world including Scandinavia - and mobile devices: smartphones, iPhones, iPads and different playware products create new media opportunities. Broadly, public libraries seem to be aware of developments in the digitization of information and the increasing growth of electronic networks. And they are, to a greater or lesser degree, seizing the potential of social media to provide information resources and services for their clients and for enhancing their web visibility. However, a more fundamental problem for libraries is the fact that, in many countries, public libraries are experiencing severe cuts in expenditure with staff being dismissed and branches closed. Further, some opinion leaders, politicians and members of the general public have started questioning or debating the actual rationale of libraries. In these times, libraries cannot afford to be complacent about their role as convenient information centres and cultural experience providers in a consumerist society. Libraries have to remediate and reorient their community role. Similarly, library theorists and researchers have a role to play in this process by re-examining the theoretical basis of public librarianship. In this respect, in reviewing existing conceptual frameworks in the public library world, it is worth appropriating ideas and perspectives drawn from other academic disciplines.

2 Methodology

The study described here intends to discuss the modern manifestation of the public library and the future role of the library. The emphasis is on survival strategies for public libraries in an environment where the justification for the public library's

existence is increasingly being challenged. In most countries, public libraries are operating in a climate of aggravated competition, recession-affected economies and budget reductions. In considering survival strategies for the public library and revisiting the mission of the library, a review is being conducted of selected published sources addressing the reorientation and rethinking of public libraries along with the future roles and major tasks of public libraries. The literature analysed covers public library environments in Scandinavia, primarily Denmark, United Kingdom and the USA. This language-related, cultural and academic "bias" - the illustrative emphasis put on these countries - can be justified by referring to the state of fairly advanced public library reform projects in these countries. In Scandinavia and in the Anglo-American library world, a range of books and reports have been published that take an innovative and exploratory approach to determining the identity, purpose and priorities of the public library.

The other analytic approach adopted for delineating the options and alternatives relevant to the public library in a transition phase considers a few selected projects, completed as well as ongoing, that are concerned with public discourse in public library settings. Some of the issues and perspectives not covered by the monographs and journal papers selected for analysis have been illustrated by a handful of projects funded by Danish bodies and agencies including the Danish Agency for Culture and its Centre for Libraries and Media and for Digitalization and IT.

In attempting to envisage the future challenges for public libraries, various scenarios can be imagined. Some of these developments and emerging roles are identified within the framework of the present study and outlined in this paper. There are several routes to exploring both the challenges and opportunities facing public libraries in the first half of the 21st century. Some hints and suggestions can be found in the published literature. But as mentioned, other perspectives are offered by projects and analyses in progress or already completed.

A third educative approach incorporated in this study is the inclusion of bodies of theory from outside the field of information science. Admittedly, external theorists do not necessarily offer answers that can be regarded as definitive. But in our view, valuable elements of theory and perspectives can be drawn from Manuel Castells' seminal theoretical construct on the space of flows and the space of places in his book *The Rise of the Network Society* [1]. We seek to relate specific observations and ideas derived from Castells' theoretical works to current challenges and transformation processes affecting the public library. Our central aim is to illuminate how these external theoretical approaches and perspectives can be relied upon to identify possible options, priorities, future roles and identities etc. In this respect, the present paper emphasises a critical and conceptual approach more than a pragmatic and evidence-based one.

3 Extended Literature Review

There are quite a few proposals which address the profile and priorities of future public libraries in addition to the challenges facing the library in the years to come. In

his imposing and magnificent work on Danish library buildings via a historical and architectural perspective, Dahlkild [2] observes that a library should be viewed and experienced as an extension of urban space. In this sense, the library is an institution that does not confine its sphere of activities to specific functional and service spaces but also forms part of urban life. Last year the National Library of Sweden issued a small compact anthology entitled "Will the library exist in 20 years' time?" Included in the booklet are twelve brief estimates and predictions about public library futures and a summary of a panel discussion. In discussing the future profile of the public library, Rydell [3] feels convinced that there will be a consolidated and thriving public library even in 2030 and she adheres to the view that the library will act as a "knowledge broker" whereas, somewhat surprisingly, the function of the library as a physical meeting place will be less important. Another contributor, Svensson [4], a cultural journalist and critic, is much more pessimistic about the public library's survival opportunities. He predicts that most libraries will have disappeared and those still existing will have been relegated into monasteries for fringe bookworms.

In a published study of the public library in urban development, three Danish public library researchers Casper Hvenegaard Rasmussen, Henrik Jochumsen and Dorte Skot-Hansen [5] offer their view of future challenges to the library. Their view is based on results of studies of visible and innovative libraries in Nordic countries as well as the rest of Europe and North America. In their studies the three researchers highlight the role the library can play in urban development today and how the library can strengthen its contribution to users' experience, creativity and innovation. In quite a few library systems, citizens are most satisfied with libraries that are similar to those they have always known, and libraries generally boast very high scores in satisfaction measurement surveys. But even though everything may seem to be going well within the library's four walls at the moment, there is a risk that the library in its classic form will be overtaken by the multiplicity of new virtual and tangible cultural offerings. Competition is fierce in a cultural and media environment that is constantly changing, and in an urban policy context in which global competition requires visibility and success. The library is not an island, and it must make a much more determined effort to adapt itself to a rapidly changing cultural and urban existence. Here the authors see three main challenges. Firstly, the library should not perceive itself as an independent culture/knowledge-oriented institution, but consider itself as being part of a broader strategy for the urban development occurring in the library's local area and interact with this process in formulating its own future expansion plans. Secondly, the library should not think in terms of "borders" but closely cooperate with cultural and urban planners in order to enhance the municipal environment as public domain and experience space. Thirdly, it is advisable to think less in terms of "library", i.e. materials, functions, services and offerings but rather place more emphasis on processes, interaction and synergy in relation to its broader network. Hence the space of flows. In this respect, the library can be modernised by entering into new relationships and partnerships and may contribute to the synergy that can arise in the boundaries between different institutions, cultural forms and user clienteles. This means that the library has to be conscious of its own values and competences while respecting those represented by other players, partners, communities, user groups, etc.

According to our analysis, the library should not be amorphous, nor should it abandon its unique capabilities for organizing and disseminating information, knowledge and culture. But these assets and competences must be manifested through new channels and in new contexts if the library is to retain its support from a new generation of digital natives.

It appears that libraries are being beleaguered by both budgetary constraints and technological advancements. Dorte Skot-Hansen has become a member of a steering committee for a development project concerned with the public library of the future and funded by the Danish Agency for Culture. The title of the project is "Model Programme for Public Libraries". This Danish public library researcher has also entered into collaboration with a local public library system (Gentofte, Greater Copenhagen) under the heading of "From Model to Project" focusing on the development of a new conceptual framework for the public library. Underlying this grant-assisted collaborative development activity is the recognition that, as an institution, the public library is facing several challenges and there is no single solution to these. Various options for artistic, cultural and social experiences, often customized, are widely available to urban residents and the library is finding it increasingly difficult to justify its role and services. At the very least, young people should feel at home and be offered the possibility of seeking a place where their knowledge is being challenged and where they can be inspired to express their creativity.

Some library analysts see a future for public libraries as centres for specialized services or advise libraries to define and highlight a major speciality. O'Beirne [6] strongly argues that libraries should upgrade the educational part of their mission, revive the forgotten ideal of learning and concentrate their energy on learning activities in the library environment. O'Beirne [6] asserts that the ability of libraries to support informal learning is their greatest asset. It is time to consider the reorientation and redefinition of the library's prime purpose: "With its recent emphasis on entertainment, the learning aspect of public library activity has become less well served and less well understood" [6].

Other contributors to the debate about the public library's future role, including some politicians, have openly called for entrepreneurship, commercialization, customization, more demand-orientation, public-private sector synergies and fee-based services. Recently, for instance, John Huber [7]- author of *Lean Library Management* - has received some attention within the library community (e.g. in Denmark and UK) for his introduction and promotion of eleven strategies to make public library services efficient and competitive. According to Huber's [7] recommendations, libraries should learn from their commercial competitors; they should compare and measure their performance against rivals like Google and Amazon. Similarly, McMenemy [8] discusses whether public libraries could learn lessons from the retail sector. He also calls for more debate and discussion within the library profession to clarify to what extent the private sector can actually influence public libraries in a constructive and helpful manner. Rightly, however, McMenemy [8] states "public library users must be seen by the profession as citizens and not consumers".

The human rights perspective is brought in by Kathleen de la Peña McCook and Katharine J. Phenix [9] in their chapter entitled "The Future of Public Libraries in the Twenty-First Century: Human Rights and Human Capabilities". McCook and Phenix [9] predict that library professionals in the USA in the 21st Century will start developing conceptual frameworks and service models relying on a vocabulary reflecting universal human rights values.

Aabø, Audunson and Vårheim [10] reported a milestone-type empirical study exploring how public libraries are used as meeting places and by whom. Based on the analysis of survey data, six categories of place were identified:

- the library viewed as a “square”
- as a place for meeting and interacting with people with varying backgrounds
- as a public sphere/space
- as a place for joint activities with friends and colleagues
- as a metameeting place
- as a place for virtual meetings.

The survey concentrated on representative samples of the population in three townships in Oslo, Norway, each with a markedly different demographic profile (labeled the gentrified community, the multicultural community, and the middle-class community). Analysis was conducted to examine why some people use the library for various kinds of meetings whereas others do not. Also investigated were variations in the use of the library for different types of meetings. Findings revealed that public library spaces are used for a variety of meetings, formal, unstructured, virtual, etc. The Aabø, Audunson and Vårheim [10] study forms part of a research programme undertaken within the project framework Public Libraries—Arenas for Citizenship (PLACE), which received funding from the Norwegian Research Council for the period 2007–2011. As pointed out in the paper reporting the study, two dominating trends fundamentally modify and mould today's society: digitization and multiculturalism. The three Norwegian researchers consider that both major societal developments can be seen as potentially positive. It is mentioned, as an example, that digitization developments increase the number of individuals that constitute a community. Moreover digitization opens up new modes of communication between citizens and politicians as well as between citizens and citizens. The new digitized landscape enables and encourages increased participation in democracy. Similarly, multiculturalism can pave the way for a fruitful and dynamic interaction between people from different cultural backgrounds. The researchers note that public libraries serve as meeting places, but there is a dearth of published empirical research on the actual use of public libraries as meeting places. Thus, the reported piece of research offers a valuable contribution to filling this vacuum. The results of the study critically illuminate the role of the public library in a multicultural context.

Kranich [11] explains how libraries help reduce the digital divide, increase access to government information and are fighting against both censorship and private interests to ensure that access to information is as free as possible. The library as civic space creates opportunities for community and dialogue, which she thinks, provides a very important democratic function to supplement information-related and

education-centred tasks. In their joint article Canadian library researchers Alstad and Curry [12] describe how squares and other public spaces are increasingly being replaced by company-owned areas such as shopping malls, where people can no longer act as citizens, but are primarily consumers. In order for libraries to support democracy and serve as public spaces they should, among other things, change their objectives and move towards a more proactive stance by making room for lectures and discussion groups.

Issues and requirements regarding theory building in civic librarianship are addressed by John Budd [13] who takes a fresh look at (public) library purpose and sets the scene for a fundamental re-examination of the social foundations of librarianship. What Budd [13] offers is an intriguing in-depth analysis of the interrelatedness and interplay between the vital concepts of social responsibility and intellectual freedom. Through extensive reading of academic texts in disciplines such as philosophy, political science, public sphere theory and democracy research new light is shed on basic ideals and tenets in library service provision including, for instance, the continuing controversy of value-neutrality. Concepts are critically examined and philosophically reconfigured to identify new unorthodox features and perspectives. In exploring the place and role of (public) libraries in a democratic society, Budd [13] returns to first principles, embarking on a conceptual analysis of democracy as an entity. In conjunction with this mapping exercise, Budd [13] focuses special attention on the notion of deliberative democracy, which has a Danish precedent as Danish theologian and educator Hal Koch can be said to be the founding father of a political theory termed *samtaledemokrati* ("conversational democracy"). According to Koch, the essence of democracy is dialogue and not just a form of governance. Budd [13] thoroughly explores how deliberative democracy relates to libraries and librarianship and the extent to which it is actually relied on in specific library-related contexts. Fairly detailed coverage is given to the phenomenon of neoliberalism and the way this ideology leaves its stamp on current library policy-making and rhetoric. Budd's [13] approach and his painstaking analysis of the democracy-sustaining and supporting role of librarianship is very refreshing and stimulating and is matched by very few contributions in our study.

John Buschman [14], cited by Budd [13], strongly disputes one-sided economic logic, customer-centredness, marketplace thinking and value-for-money regimes in (public) librarianship. Reservations about the dangers involved in these reforms are voiced as follows: "The democratic public sphere roles of libraries as disseminators of rational, reasoned, and organized discourse, as a source of verifying or disputing claims, and as a space for the inclusion of alternative views of society and reality have no place in the vision of the library as the instant-satisfaction, fast-food equivalent of information".

4 Manuel Castells and the Space of Flows

This section highlights the concept of the library as a 'public space' and posits how we can refashion and remediate the library in the direction of "space of flows". In respect

of this discussion, it seems obvious to draw upon Castells' spatial approach concerned with the space of flows and the space of places. Convincing arguments can be presented in support of transforming the public library to represent the space of flows in which the technological infrastructure as well as the services provided are advanced and where the library does not only exist in a physical realm, but has moved more into a digital realm through global networks. However, this process (i.e. the library conceived as bricks and walls being transformed into a space of flows and thus being hybrid, interactive and open), we would argue, inevitably implies changes in the service modes whose principles are still upheld by the public library. This transformation process necessarily supports the introduction of a business model which may require libraries to be restructured or perhaps deconstructed.

Castells in his extensive work The Rise of the Network Society mentions "the space of flows that is becoming the dominant spatial manifestation of power and function in our societies" and "space organizes time" unlike traditional environments where time organises space. So what do we mean by flows? Castells [1] explains:

> [O]ur society is constructed around flows: flows of capital, flows of information, flows of technology, flows of organizational interaction, flows of images, sounds and symbols...[T]hus I propose the idea that there is a new spatial form of characteristic of social practices that dominate and shape the network society: the space of flows.

As argued above, if a library can be seen as extension of an urban space, indeed in Castells' terms "postmodernism could be considered the architecture of the space of flows" [1]. The "information-based value production complexes" feed into global nodes from anywhere in the world through "key locations"; thus the world has become more "interconnected" and global cities become a "process" not merely a "place". While these key locations stay connected to a global network, the "territories surrounding these networks" stay disconnected at a local level. Consequently, these key locations or indeed spaces of flows become "irrelevant or even dysfunctional" to their surroundings and hinterlands [1]. This raises the question of whether public libraries can help to link up these "switched off" places to the nodes in the network. Being disconnected is arguably a form of punishment in a network society as it may lead to continuous "decline in economic, social and physical deterioration" [1]. Although it may seem that in today's world "spatial dimension" is not included in the concept of place of innovation or in Castells' concept: "milieux of innovation", we two authors agree with Castells that "place" is still a vital "condition" in order for "such milieux" to exist: "the space of flows is not placeless". So much so that Castells sees the technological infrastructure as a key characteristic of the digital age just as the railway network was for the "economic regions" in the industrial age. In other words, for Castells, the space of place, which is the "historically spatial organization of our common experience", still matters in order to create "synergy" [1]. Hence, communication hubs, information centres or libraries can act as a hybrid space, a connection where global and local interact in a meaningful way, as opposed to clashing head-on. Castells [1] shares the same hypothesis:

> People do still live in places. But because function and power in our societies is organized in the space of flows, the structural domination of its logic essentially alters the meaning and dynamic of places. Experience, by being related to places, becomes abstracted from power, and meaning is increasingly separated from knowledge. There flows a structural schizophrenia between two spatial logics that threatens to break down communication channels in society.

We think that Castells analyses important issues about today's power structures and their distribution through the nodes in the network society. These factors are not only relevant from a technological point of view but are also salient sociologically, economically and, of course, philosophically. We would argue that libraries can act as a bridge, a hybrid space, in making surroundings more relevant to the global network and vice versa in a world where services and products are designed globally and distributed locally. Such processes cause conflicts as local communities may feel excluded from decision-making, by their being disconnected from the nodes while the cosmopolitan elites dominate them. Hence, the space of flows becomes a space of power, where the "technocratic-financial-managerial elite" hold a prime position [1]. However, there are alternatives to this. Libraries or information centers may serve as a starting point for interaction, resistance, and indeed alternative politics and policies.

Finally, libraries can restore reconciliation and revitalise spiritualization both locally and globally. In this context, it seems advisable to use the word "deconstruction" as a philosophical trope to illustrate how to reform and re-think libraries in the digital age: a deconstructed library where online, offline, digital and physical planes symbiotically interact, transforming the traditional library as we know it into a whole new model.

5 The Public Library as a Virtual Meeting Place and a Space for Democratic Empowerment

In this section, a few case studies are considered to illustrate how public libraries can organize web-facilitated discussions and act as a virtual meeting place. The examples have been selected from the Danish public library community. In the Municipality of Odder (Denmark) it has for several years been natural for citizens and politicians to engage in discussions on a variety of issues using web-based discussion forums. According to Buur Rasmussen [15], the 2009 municipal elections in Denmark provided an example of electronic communication between citizens and local politicians in that more than 400 comments were posted as part of a lively debate between citizens and those standing as candidates for the Odder Town Council.

This demonstrates how public libraries could take a role in stimulating active democratic communication in matters and issues that are of concern to citizens. In the context of the 2009 Municipal Election, video-based profiles and portrayals of the candidates for municipal election were made available. At the same time a group was set up on Facebook in the hope that this network could offer more effective channels

for attracting and engaging younger target audiences. Digital debate is not better than analogue debate, and you cannot say that it is better to argue on the web rather than relying on conventional discussion forums like letters to newspapers or asking questions at public meetings. But e-debates facilitated by outlets such as the Odder Net before and up to the municipal election could be instrumental in enabling citizens to make an informed decision when casting their votes. At the same time it should be noted that many citizens express themselves only on the Web. Obviously, a certain amount of resources are required for setting up an adequate framework for a debate. Therefore, the role of the library/librarian is primarily that of a mediator.

Similarly in the light of the 2009 Municipal Election, the Vejle Libraries conducted a project entitled ”Debate that has effect: the library as a democratic greenhouse” [16]. The Libraries decided to highlight democratic values and brought up the major themes of art and politics for discussion by arranging a series of workshops leading up to the Municipal Election. Each of the six political youth parties was invited to participate and to select a specific democratic principle, and at the same time six artists created works of art that interpreted the ideals chosen by the young politicians. Within the urban space, six selected places provided the location for public debates based on the democratic values selected and the works of art that came into existence within the conceptual framework represented. In this way the artists' contributions challenged the politicians and a high level of discussion was recorded. The project experiences inspired the Vejle Libraries to respond to the variety of intermediary roles performed and to initiate public discussion sessions enhancing participants' perception of the issues being addressed.

Considerably broader in scope is a draft development project presented by the Aarhus Municipal Libraries and entitled *Demokrateket* [17]. The concept of demokrateket seeks to animate societal and community-related citizens’ movements and create physical and virtual forums that allow citizens to be involved in shaping the political agenda. Although currently embryonic, demokrateket is intended to develop innovative approaches to the library's communication and mediation of community information as a proactive and interactive process, which should include users and political players in the physical library environment along with web pages and social and mobile forums. The final project will be unique in that it envisages a paradigm shift of the library's activities via a democratic (physical and virtual) application from a reactive and communication-centred model towards a proactive, front-edge and staging role. In taking on its new role, the library should establish and facilitate interactive, independent and direct channels of communication between citizens and their political representatives. In doing so, the library should support free opinion building and active citizenship. The library staff's competencies in terms of serving as trendspotters identifying social and political issues and moderating discursive and dialogic processes become central to implementing the demokrateket. The project was initiated by the Aarhus Municipal Libraries and a local adult education association. Potential partners for the project include media houses in the Aarhus area, a local high school (Thestrup), political parties and social science departments (e.g. political science) at the Aarhus University. The intention is to create a forum for Aarhus as a whole. Modelled on the concept of reading clubs that

have already been tried out for quite a few years are a range of debate clubs which will be set up to operate digitally as well as physically. Opinion formers, experts and politicians will be invited as contributors and presenters. An essential principle is that the library should act as facilitator whereas content will be provided by others, but the library system could support and supervise debates on various topics, local as well as national, regularly brought up for discussion. An interesting new informational role is envisaged for Aarhus librarians in that library professionals could compose "information packages" covering specific themes tailored to the needs of debate clubs and those actively participating in debates. These theme-specific information packages could be downloaded for use either in the library or in private homes. Social media like Facebook might, in spite of their transient, elusive and somewhat superficial nature, have a curiosity-raising effect and could serve as a vehicle for highlighting and spreading information via demokrateket and ongoing public debates.

Related to the Aarhus project is a previous project undertaken by the public library in Frederikshavn and supported by a grant from the Danish Agency for Libraries and Media (now part of the Danish Agency for Culture). The project, which has now been completed, is entitled "The Library as a Democratic Agora" and one of its objectives is to explore the role of the public library as a "third place (space)" and as one of the cornerstones of Danish democracy. In examining and developing this role, which includes facilitating democratic discourse, a challenging and slightly provocative approach should be adopted. Critical analysis of the findings of the Aarhus and Frederikshavn projects and output from similar democratic discourse projects conducted in library contexts is essential to defining a new role for the public library.

Although social media are typically seen as opportunities and methods for supplementing, enhancing and enriching the existing mix of library-related services and facilities, a few innovative approaches can be found as well. Thus, as a library-driven social media campaign a project was launched to set up a social network targeted towards senior citizens (those over 50) in Denmark [18]. This age-specific social forum on the web shares some of the features of Facebook, but in some respects it differs from Facebook; for instance, no disturbing commercials and banners are included. The name of the site is Ageforce.dk and the development of the project was grant-funded. Ageforce.dk is based at Roskilde Library and three libraries are involved in the pilot run, but the intention is to increase the number of libraries involved. Hence, a toolbox with materials on user instruction, public relations and promotion as well as the conduct of meetings and joint activities for site users, etc. is available to libraries deciding to embark on this social site project intended for mature users. Those setting up profiles on Ageforce.dk can exchange information, post items on an electronic notice board, conduct internal communication, register for discussion groups covering a wide spectrum of interests and topics, become involved in blogging and participate in discussions with other registered users on various issues and matters raised. Although the site cannot fully qualify as an initiative on the part of libraries for deliberately activating public and community-wide e-discussion on specific topics and issues identified, it provides an example of a library initiative combining user education, web 2.0 and web-based discussion facilities.

6 Concluding Observations

Today public libraries are faced with major concerns and challenges such as dealing with new technological innovations, tackling increasing levels of communication literacy, coping with a decreasing professional work-force and maintaining public awareness by raising the level of services provided. Other major challenges to be confronted by public libraries and the public library community include cutbacks and reduced library budgets, which force public libraries to review their current business models. Equally pertinent is the fact that the value of public libraries has gradually lost esteem - a perception which is becoming more popular. Attention has also been focused on the fact that user services in libraries can be made more digital and that library space can be used for alternative services (in harmony with the principles of place-based economy).

It appears from the review of relevant public library sources that the library can be viewed as an extension of urban space. We are - in a metaphorical sense - seeing trends towards removing or eliminating the walls between the library as a physical entity and the community in which the library functions. In other words, the library should be an integral part of urban life. In addition, in the age of social networking, the library could serve as a space for communication, leisure and cultural activities as well as learning and act as a meeting place (civic spaces). In enhancing the communication and meeting place functions, libraries can encourage and facilitate public discourse and exchange of views on current social, political and cultural issues (democratic agoras). Numerous ideas about the roles and major tasks of the future public library have been circulated within the library world, the LIS academic community and within the political sphere. At the same time, there seems to be a need for the library to redefine or reinvent itself by opening up to the surrounding world in new ways and by establishing new alliances and partnerships. Some information science professionals and scholars see a role for the public library as a catalyst and mediator of alternative information sources and as a facilitator of public discourse. But it is hard to see the viability of a "platform" for the library emphasizing this sort of "activist" or political orientation. Some authors argue in favour of a contrasting library model of a very customized and demand-oriented nature emphasising fees and revenue generation. This is a library where the connotations of "business models" and other concepts from the neoliberal vocabulary are uncontroversial. Digitization seems unavoidable as a key feature of the ongoing and upcoming transformation process facing public libraries everywhere. Another significant consideration, according to some researchers and practitioners, is the multicultural dimension of public librarianship. The public library also needs to modernise the way in which it fosters information literacy and supports lifelong learning.

The perennial question arises: can the public library of the future successfully redefine its mission? The analytic review of selected readings and reported projects on the public library of the future, coupled with an outlook on the space of flows and the space of places conceptualizing approach as defined by Castells, has generated intriguing issues. “Places are increasingly becoming unrelated to each other, less and less able to share cultural codes” states Castells. “Unless cultural, political and physical bridges are deliberately built” he argues, “we may be heading toward life in a

parallel universe whose times cannot meet because they are wrapped into dimensions of a social hyperspace" [1]. These might be relevant reference points to develop the continuing discussion on the changing role of the public library. To elucidate this issue, more exploratory efforts are needed.

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Slovenian Researchers: What Influences Their Information Behaviour?

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Abstract. The paper presents a segment of a survey of information behaviour of Slovenian scientists. Results show that, in most areas, Slovenian researchers exhibit usual characteristics of scientists elsewhere, with the exception of a rather weak use of Web 2.0 tools for research purposes, and weak use of open-access materials. This survey confirms that information and communication technologies (ICT) strongly impact professional activities of scientists, in relation to the choice of resource formats, access to information, means of information exchange, organization of one's own resources, reading, writing, and the use of library services. Most of the characteristics in behaviour are research-field-specific. Other factors of influence are age, area of employment, and available time; gender difference was important only in one case.

Keywords: Information behaviour, scientists, researchers, Slovenia, surveys.

1 Introduction

Exploration of user behaviour has become an important element of studies dedicated to the use of new information technologies. Among different groups of users, researchers show some special characteristics. They use particular information resources, many of which have become increasingly available online during the last decade. But such availability has also produced special developments in information behaviour in this user group. There exist variations in which resources are used, how they are used, and when they are used. Recently, some significant changes have occurred in the ways of communication among researchers [1], in the ways of publishing [1], [2], collaboration [3], [4], and searching and using information [5], [6], [7]. It is quite certain that such transformations have to an important extent been brought about by the developments in the field of information and communication technologies (ICT).

To evaluate some characteristics of information behaviour in the scholarly circles, at the end of 2011 we carried out a broad survey in Slovenia. A part of the preliminary results of our investigation is presented in this study. The aim was to identify the patterns of information behaviour of this group of users, in order to offer

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some possible directives for libraries and information centres, which provide access to information resources, and also for publicly funded research agencies which provide financial means for acquisition and subscription to such resources. The results may serve to understand better some phases in the research activities, as well as help plan more efficient future library policies. For example, more balanced acquisition may provide better distribution of resources and thus facilitate activities of research organizations.

The preliminary results presented in this paper thus focus on information behaviour of researchers. They tackle the types of resources and media utilized in support of research activities. Some special emphasis is placed on types of use and user preferences regarding the types and formats of information resources. In general, we have investigated the impact of information and communication technologies on various aspects of the information process. The study was conducted as a part of the project V5—1016, funded by the Slovenian Research Agency.

2 Review of the Literature

2.1 Information Behaviour of Researchers

The aforementioned studies note, as was also observed by Vilar and Zumer, 2011 [8], that while scholars still carry out activities addressed in earlier studies, e.g. browsing or berrypicking [9], [10], some new patterns of researchers' information behaviour have occurred. Rowlands and Fieldhouse [5] note the following activities: skimming (looking at one to two pages at a time); navigating (looking around at what is available, i.e. ‘the electronic sweet shop’); power browsing (reading abstracts and titles, even indexing terms, rather than full text); squirreling (downloading material to `read’ later); cross-checking (collecting information from different sites). Similarly, Palmer, Teffeau and Pirmann [7] provide a two-layer model of scholarly information activities, each of the activities consisting of two or more 'primitives'. In this case, primitives are defined as basic or initial functions common to scholarly activities across disciplines, whereas activities are broader in scope, and have an explicit role of information in researching and producing new knowledge. Palmer, Teffeau and Pirmann [7] identify five core information activities: searching, collecting, reading, writing and collaborating. Based on these studies we decided to focus on:

- skimming (looking at one to two pages at a time);
- power browsing (reading abstracts and titles, even indexing terms, rather than full text);
- squirrelling (downloading materials to 'read' later);
- cross-checking (collecting information from different sites);
- chaining (linking citations in references in order to find new information);
- berrypicking (evolving queries as a result of finding new information during searching); and
- bouncing (leaving a resource very quickly upon realization of its non-relevance).

Besides explaining some other information-related activities, these studies present findings with respect to the use of various information sources and in various formats. It is becoming increasingly clear that the extraordinary impact of new digital information and communication technologies has brought about new patterns in the ways the researchers look for, acquire, and subsequently organize thus obtained information. Some scientific communities, for example High Energy Physics, need immediate access to information; sometimes even open access is not speedy enough.

One of the most important consequences of changes is the influence of information behaviour on library services. Libraries and research libraries in particular, are dedicated to the needs of users, or the perceptions of such needs. Information behaviour studies tend to identify a characteristic set of information needs and reveal the way that those users locate and access the information that is needed for their work. Finding and choosing an appropriate source of information is an important activity of researchers. If basic information activities bypass the traditional library services, the functions of the research libraries can no longer advance. It is therefore indispensable for the libraries to be attentive to the changing world of the needs and methods of research work (especially with the younger researchers); otherwise they will no longer contribute to the competitiveness of research [11].

3 Research

3.1 Methodology and Sample

We employed data from the central database of Slovenian researchers, which is maintained by the Slovenian Research Agency (ARRS, henceforward referred to as Agency). The Agency, which was established by the Government of the Republic of Slovenia in 2003, is a public funding organization which performs tasks relating to the national research and development program. The Agency is in charge of the information system SICRIS (Slovenian Current Research Information System; website: http://sicris.izum.si). The system monitors and assesses selected research activities of every publicly funded researcher in the country. Within this system, every researcher is registered with a unique research ID number. In the year 2011, some 4.800 active[1] researchers were registered in the system. In Slovenia, research fields are organized in the following research groups: Natural Sciences, Technical Sciences (Engineering), Medical Sciences, Agricultural Sciences, Social Sciences, and Humanities (and also Interdisciplinary Research). In the period 1998-2008, significant growth occurred in the numbers of research groups as well as researchers. In 2001 and 2008, there were 753 and 1128 (an increase of almost 50%) research groups, respectively, in Slovenia, with the following breakdown by discipline or area: Natural Sciences (121/181), Engineering (346/558), Medical Sciences (75/95), Agricultural Sciences (60/80), Social Sciences (98/142), and Humanities (53/72). The

[1] The 'Active' status means that in the year 2011 a researcher was allocated at least 100 publicly funded research hours.

age structure of researchers in 2008 was as follows: younger than 35 years of age (39%), 35-44 years (31%), 45-54 years (19%), 55 years of age and older (11%). Women accounted for 38,9 % of researchers [12]. In the year 2011, some 4,800 active researchers were registered in the system. The Agency provided us with the contact data of the researchers.

We used a random sample of all currently active researchers who had been officially registered in Slovenia by the Agency. The research ID numbers of researchers were used for sampling. Sampling included every eighth researcher. Thus among almost 5000 researchers, 592 received, on the basis of this sampling, a personal email invitation to participate in the online survey (open from September 14th to November 14th, 2011). Response rate, as of October 24th, when we finished collecting the results (although the poll remained open), was 33.1% (196 researchers). 119 researchers (or 20.1% of the total sample) provided answers. Although not all questions were answered by all participants, the 119 completed surveys nevertheless allow for a comprehensive analysis of results.

3.2 Methods of Data Collection

The online questionnaire involved 25 questions: 18 content questions (Likert scale type) and 7 demographic questions. Demographic questions related to gender, age, type of current occupation (research, teaching), years of experience (referring to either research or teaching), employment status (independent researcher, employed at a research organization, university, commercial organization), and research area (provided in the preceding section and in Table 1).

Content of the survey (the 18 content questions, mostly Likert scale type) addressed various aspects of information behaviour. In this paper we present the following:

- types of information seeking: cross-checking, power browsing, bouncing, berrypicking, skimming, squirreling, chaining,
- amount of time dedicated to various aspects of information process (searching, organizing information, quick reviewing of sources, thorough reading, writing, collaborating),
- preferred format of information sources (printed, electronic, either),
- opinion on the impact of information and communication technologies on various aspects of research work (searching and gathering of information sources, relevance judgment, organization of acquired sources, citation checking, reading, communicating, independent writing, collaborative writing),
- number of printed and electronic sources in the personal archive,
- frequency of the use of information sources in a personal archive,
- instances when the researcher in question uses electronic tools to search for sources, but then prints out these sources for the purpose of reading,
- how much they use (i.e. cite in their publications) the following types of sources: publications in scientific books and journals, publications in open-access, publications in electronic format,

- ways of acquiring scientific publications (personal subscription to printed or electronic journals, subscriptions to printed or electronic journals by an institution, from e-archives or repositories, interlibrary loan or document delivery services, directly from colleagues) and the frequency of each,
- types of sources used in research work (e.g. formal (conventional) sources, such as books, journals, reference material, or informal (non-conventional) sources, such as project reports, dissertations, social networks, blogs, forums, websites) and the frequency of each,
- tools used to begin a search for information for research purposes (e-journal providers, specialized bibliographic databases, specialized information portals, web search engines, library catalogues).

As explained above, the respondents, who were selected on a random basis, received an email invitation to participate in the survey. The data were assessed as collected by October 24th, 2011. SPSS software was used for statistical analysis. In addition to descriptive analysis, we also conducted bivariate statistics in order to identify some possible relationships between demographic and content variables.

4 Results

The share of women among the researchers was 46.5%. The age of respondents was as follows: 20-30 years (27.6%), 31-40 years (36.7%), 41-50 years (17.3%), 51-60 years (12.2%), more than 60 years of age (6.1%). The distribution of respondents by research area is shown in Table 1. Among the 119 respondents (all are active researchers according to the Agency database), 91 are involved in research, 60 in teaching and 16 in other activities (more than one current activity is possible for an individual; for example, besides being active researchers, many are also university teachers, medical doctors, etc).

Table 1. Distribution according to research area

	n	**%**
Natural Sciences	30	25.2
Technical Sciences	20	16.8
Medical Sciences	12	10.1
Agricultural Sciences	8	6.7
Social Sciences	21	17.6
Humanities	15	12.5
Interdisciplinary Research	13	10.9
Total	119	99.8

Note: Total does not add up to 100% due to rounding errors.

In general, most have experience in both research and teaching. These data are presented in Table 2. In terms of their current employment, only 3.4% work as independent researchers. Most are employed either at an institution of higher education (52.9%) or some other type of public institution (32.7% are currently employed in research organizations which are part of some larger institution, and 5.9% in other, smaller research organizations); 2.5% work in the business sector; and 4.2% in other organizations, such as hospitals (again, one individual can be employed in one or more institutions). When asked about their current work tasks (multiple answers were possible), 91.9% responded that they conduct research, and 60.6% that they also teach. We can thus infer that two thirds are actually involved in both activities.

Table 2. Experience in research and teaching

	Research experience		**Teaching experience**	
	n	**%**	**n**	**%**
Less than 1 year	1	1.0	16	19.3
1-5 years	29	29.6	27	32.5
6-10 years	24	24.5	13	15.7
11-15 years	15	15.3	9	10.8
Over 15 years	29	29.6	18	21.7

4.1 Information Behaviour

In the first section we present some general characteristics of information behaviour. All "new" types of (scientific) information behaviour which were addressed in our research, show strong presence (Table 3). The most prevalent are cross-checking, bouncing and squirreling. The first two are typical of scientists. It is not surprising for scientists to refuse to check a source if they estimate that it is not worth their time. Bouncing is one of the two types of behaviour for which none responded that they did not perform. Squirreling is the third most common type of behaviour. We assume that the researchers collect a large quantity of information and then extract later what they really need. But this can be linked to information overload. The other three types of behaviour, skimming, berrypicking and power browsing, are performed often or occasionally. Skimming – simultaneous looking at more than one source – seems to be in line with cross-checking. Berrypicking has been known to occur only in certain search situations (when it suits the searcher). If we judge from the frequency of power browsing (performed by all researchers), the researchers are obviously satisfied with such services that provide only a summarized description of content (e.g. abstracts, keywords). This may indicate lack of time on the part of the researchers.

Table 3. Types of information behaviour

	Never %	Almost never %	Occasionally %	Often %	Always %
Cross-checking	1.9	2.8	15.7	49.1	30.6
Skimming	0.8	10.1	19.3	47.1	13.4
Bouncing	0	1.9	10.2	39.8	48.1
Power browsing	0	8.4	43.0	42.1	6.5
Berrypicking	0.9	3.7	51.9	36.1	7.4
Chaining	0.9	7.4	29.6	47.2	14.8
Squirreling	0.9	4.6	26.9	47.2	20.4

Researchers were also asked how often they really looked at what they had saved when squirreling: 44.4% often look at stored sources and 8.3% very often which probably means that, for many researchers, squirreling produces relatively good results. However, it seems that often researchers collect many more sources than they really need or eventually use. Thus, 38.9% of the respondents only occasionally look at what they save, 7.4% almost never and 0.9% never.

Researchers are time-stressed. This is evident from their answers to questions on time available for various aspects of the information process (Table 4). Not surprisingly (and in accordance with what was shown above) they seem most often to have enough time for quick reviewing but they do not have enough time for thorough reading, writing, and organizing information in their personal archives.

Table 4. Frequency of occasions when researchers have enough time for various aspects of information process

Enough time for…	Never enough %	Almost never enough %	Occasionally enough %	Often enough %	Always enough %
Searching	9.2	24.5	34.7	27.6	4.1
Organization of information	13.3	37.8	32.7	14.3	2.0
Quick overview	2.1	14.6	47.9	29.2	6.3
Thorough reading	8.4	41.1	37.9	10.5	2.1
Writing	8.2	33.7	40.8	13.3	4.1
Communicating	2.1	17.5	51.5	25.8	3.1

If we look at the use of types of information sources (Table 5), we can observe that researchers intensely use formal sources (understandable). The use of informal sources is also quite strong, however. Over one third of researchers use informal sources always or often, and another fourth occasionally. Research reports and dissertations are used often by one fourth and occasionally by half. Over one fourth

often/always acquire information from e-archives. If we add those researchers who use such resources occasionally (38.5%), this accounts for more than two thirds.

Personal contacts are also a strong source of information. Communication provides important information within an organization, other institutions in the country, and abroad (Table 5). International contacts are also important, which is indicative of the international character of sciences. Table 6 shows that colleagues are frequently used as a source of information.

Table 5. Types of information resources used

Resource type	Never %	Almost never %	Occasionally %	Often %	Always %
Print books	2.0	11.1	36.4	30.3	20.2
E-books	3.0	12.1	48.5	24.2	12.1
Print journals	0	21.2	34.3	28.3	16.2
E-journals	0	3.1	12.2	43.9	40.8
Reference sources	5.1	20.4	46.9	19.4	8.2
Patents, standards, reports	22.2	41.4	24.2	11.1	1.0
COBISS/OPAC (Slovenian union cat.)	0	13.1	33.3	34.3	19.2
Bibliographic databases	10.1	14.1	28.3	33.3	14.1
Raw data sources	39.8	26.5	15.3	15.3	3.1
Proceedings	4.0	23.2	40.4	27.3	5.1
Preprints	9.1	41.4	29.3	20.2	0
Reviews	14.1	44.4	30.3	11.1	0
Research reports, dissertations	2.0	21.2	51.5	25.3	0
Communication with colleagues in own org.	2.0	12.1	37.4	40.4	8.1
Communication with colleagues in Slovenia	4.0	22.2	48.5	19.2	6.1
Communication with colleagues abroad	4.1	20.4	46.9	20.4	8.2
Social networks	65.7	19.2	12.1	3.0	0
Forums, discussion groups	28.3	36.4	23.2	11.1	1.0
Library	16.5	18.6	41.2	17.5	6.2
Email alerts	19.2	18.2	34.3	21.2	7.1
Blogs	51.5	31.3	10.1	6.1	1.0
Invisible college (conferences, meetings, etc.)	3.0	19.2	44.4	27.3	6.1
Web portals	30.6	29.6	24.5	12.2	3.1
Websites	5.1	14.1	41.4	32.3	7.1
E-archives	17.3	30.6	33.7	14.3	4.1

Table 6. Ways of acquiring resources

How resources are acquired	Never %	Almost never %	Occasionally %	Often %	Always %
Personal subscription to print journal	63.3	17.4	11.9	6.4	0.9
Personal subscription to e-journal	68.8	18.3	10.1	2.8	0
Organizational subscription to printed journal	7.3	21.8	33.6	24.5	12.7
Organizational subscription to e-journal	5.5	1.8	16.5	45.0	31.2
E-archive, repository	13.8	20.2	38.5	23.9	3.7
Interlibrary loan	13.6	36.4	39.1	10.0	0.9
Colleagues	5.5	23.6	47.3	20.9	2.7

As for library services, researchers use them less frequently (Table 5). Libraries are used occasionally (41.2%) or never/almost never (35.1%). The use of ILL (interlibrary loan) for acquisition of resources is also weak. Table 6 shows that 13.6% never use it, and 36.4% almost never. However, we can see that some library services are employed more frequently: 53.5% use OPAC (Online Public Access Catalogue) often/always; 44.8% often/always start search with OPAC (Tables 5 and 7).

Table 7. Information resources used to start research-related searches

Resource	Never %	Almost never %	Occasionally %	Often %	Always %
E-journal sites (e.g. Science Direct, Sage,…)	3.2	8.4	27.4	33.7	27.4
Specialized bibliographic databases (e.g. Medline, Inspec,…)	9.4	12.5	25.0	33.3	19.8
Information portals, cross-search engines (e.g. DiKUL – search portal of UL)	28.1	31.3	24.0	11.5	5.2
Web search engines (e.g. Google)	2.1	9.3	11.3	45.4	32.0
COBISS/OPAC (Slovenian union catalogue)	4.2	20.8	30.2	31.3	13.5

4.2 Impact of Information and Communication Technologies

The new technologies have had a profound impact on Slovenian researchers and their information seeking. This, however, is not much different from researchers elsewhere

as researchers are known to use electronic materials extensively. They are strong users of web search engines (77.4% use them often or always), and websites (39.4% are frequent or regular users). This, on the one hand, shows that researchers in some areas behave much like the general public. On the other hand, the use of e-journals clearly characterizes them as scholars (61.1% use e-journals often or always). E-preferences are also evident from other data:

- 49.6% prefer to have resources in electronic format (compared to 5% who prefer print resources),
- 51.3% have over 200 electronic papers in their personal archive,
- 38.1% of researchers cite 81-100% e-resources in their publications.

We also asked researchers how often they print out electronic materials. Half do it often and 14% always. Regarding the estimations of which areas were made easier or harder by ICT, the results (presented in Table 8) are as follows: the great majority search and acquire resources more easily (99%), organize them (83.5%), chain citations (91.3%) and communicate (93.9%). Writing in collaboration (84.8%) seems to be easier than writing alone (71.9%). Areas which are more difficult for many are relevance judgment (23.7%) and reading (25%). Very few think that ICT does not have any influence.

Table 8. ICT makes easier/harder

Activity	Much easier	Easier	No change	Harder	Much harder
Search & acquisition	80	19.1	0	0.9	0
Relevance judgment	22.8	40.4	13.2	19.3	4.4
Organization	48.7	34.8	13.0	3.5	0
Citation chaining	54.8	36.5	6.1	2.6	0
Reading	6.9	28.4	39.7	22.4	2.6
Communicating	61.4	32.5	5.3	0.9	0
Independent writing	26.3	45.6	22.8	2.6	2.6
Collaborative writing	45.5	39.3	12.5	1.8	0.9

4.3 Some Other Findings

The use of Web 2.0 tools for research purposes is almost non-existing: social networks are never or almost never used (84.8%), nor are weblogs (82.8%). Web forums are never or almost never used by 64.6% of respondents (Table 5). Also, it seems that quite a significant share of researchers (20%) use (and cite) a relatively small share of resources in electronic format (Table 9). As explained in the methodology section, researchers were asked to estimate how much they use (i.e., cite in their publications) the following types of sources: publications in scientific books and journals, publications in open-access, publications in electronic format.

When we look at other types of information resources (Table 4), we see that a half never or almost never use preprints and, similarly, a good third never or almost never use email alerts. Cross-search services and specialized portals (Table 5) are perceived as equally unimportant (60.2% never or almost never start their search using those). Interestingly, open-access materials do not seem to get used much either. Data show that open-access materials comprise less than 20% of citations for 58.3% of researchers (Table 9). All these findings differ from usual findings for contemporary scientists and would need some exploration.

Table 9. Shares in citations

Shares in citations	Below 20%	21-40%	41-60%	61-80%	81-100%
Share of scientific publications	3.7	2.8	10.1	20.2	53.8
Share of open-access publications	58.3	15.6	13.5	6.3	6.3
Share of electronic sources	20.0	14.3	7.6	20.0	38.1

Note: By 'citations' we mean resources which are cited by researchers in their own publications.

5 A Closer Look: Information Behaviour in Relation to Demographic Variables

We performed bivariate statistics (Chi-Square test) to investigate some links between demographic and content variables. Links can be identified between the age of respondents and certain types of information seeking, as well as with the perception of various aspects of digital tools, formats, ways of communicating and acquiring information. Generally, younger researchers tend to express higher digital preferences. Also, younger researchers prefer skimming, which corresponds to findings in some other studies (e.g. [5]). Time was again confirmed as an important factor. In terms of employment, researchers from the business sector more often express the lack of time. This is also the case with the researchers who are employed at independent research organizations. This group also lacks time for communicating and thorough reading. Those who are currently involved in two main activities (both research and teaching) most often lack time to search for and organize information. Gender of respondents has no influence on behaviour, excepting squirreling which is preferred by women. This is interesting, as, generally, gender is rarely identified as influential in information seeking.

We highlight some selected characteristics which are more strongly expressed in the respective research disciplines:

- Natural Sciences:
  - mostly collaborate with colleagues abroad,
  - don't acquire their information from print journals or by interlibrary loan,
  - use raw data.

- Social Sciences:
  - mostly collaborate within own institution.
- Technical Sciences:
  - don't use raw data,
  - use standards, patents.
- Humanities:
  - show preference for individual work,
  - if they do collaborate, they mostly do so within their own institution,
  - prefer printed sources, for example print journals,
  - cite lower share of e-sources and lower share of open-source materials,
  - use ICT less extensively in organization of resources.
- Interdisciplinary Research:
  - show tendency to more frequent berrypicking,
  - use e-archives to acquire their resources.
- Medical sciences:
  - show tendency to chaining,
  - collaborate mostly within their own institution,
  - use websites,
  - use colleagues to acquire resources and information (invisible college),
  - use raw data, but are skeptical in terms of ethical dilemmas of its use,
  - believe that ICT assist in independent writing.
- Agriculture:
  - show tendency to squirreling,
  - show tendency to later using the sources saved during squirreling,
  - prefer e-sources,
  - support availability of raw data,
  - use ICT to communicate and organize resources.

Other demographic variables that exhibit some influence: employment status, experience in teaching and research, and current job tasks.

6 Discussion and Conclusions

The results in this study confirm that the Slovenian researchers in most scientific fields do not differ significantly from researchers elsewhere. Since this is the first such study in Slovenia, it may serve to provide some insight into the behaviour of end users of scientific and similar information, in order to provide some guidelines for the policies of libraries and information services. The most important factors in user preferences seem to be age, research discipline and sector of employment. There are some areas which show additional differences – primarily the use of Web 2.0 tools for research purposes. While it can be inferred that researchers rely strongly on personal contacts, this has for some reason not transferred to digital environment. Digital scholarship has in recent years been gaining importance, both in research and teaching (see for example [4], [13], [14]). Non-use of weblogs and digital social networking

tools by Slovenian researchers can to a large extent be attributed to work overload (majority of researchers also teach, and some of them (medicine) work as professionals), lack of motivation and maybe also to some possible negative general connotations of social networking. The researchers are expected and required to publish scientific results through regular scientific channels such as journals, so this form of communication has an absolute priority.

Another issue which obviously has not as yet received much attention from Slovenian researchers is open access. We plan to extend our future research also in this area to gain some insight. The lack of concern with open access may perhaps be attributed to the traditionally well-organized access to academic journals in Slovenia [15], through different consortia, supported by THE Slovenian Research Agency.

There is no doubt that information and communication technologies have had a strong impact on the life and work of researchers, involving many issues: resource formats, access, means for information exchange, organization of resources, writing, reading, etc. We also noticed that, quality of infrastructure notwithstanding, researchers are, as always, independent, innovative and creative in finding ways to acquire the necessary information and use it appropriately.

In some respects, Slovenian researchers show behaviour that is similar to that of the general public. However, there are some areas which clearly distinguish scientists, such as reference judgment, which characterizes some specific types of information seeking, such as cross-checking or skimming. As shown by our results, scientists are (for obvious reasons), much more than average users, concerned with judging the content and quality of their information sources.

The increasingly expanding utilities of e-resources represent a challenge for research libraries. The libraries must adopt new technologies which they need to provide for users. Library space is being redefined. User education and information competencies (information literacy) must also be promoted by academic libraries. But are all libraries successfully adapting to these developments? Based on statistics which focused on circulation and reference among different academic and research libraries, simple advice was offered, “Follow the user” [16]. Users might be absent (from the library perspective) but they are far from being inactive.

It is becoming increasingly frequent for researchers, as the users of academic libraries, to have increasingly little contact with the library, and little knowledge about what value a librarian’s competence can add to their work [11]. In our research, no differences could be traced to age or gender; the most common differences were discipline-specific, such as between researchers in the humanities and those in the sciences. Other studies find that researchers make little use of traditional library services and perform, instead, many traditional library functions by themselves [17], which is also supported by our findings. Namely, over half of the surveyed researchers keep more than 200 electronic papers in their personal archive, which is basically a small private library. This supports the tendency whereby the researchers acquire relevant information by themselves, and thus less frequently (as we have found) employ the direct service of the libraries. We cannot support a rather generalized opinion that the Web search engines are the utility of choice in information seeking. It is very common, however. Most scientists start their searching

(often or always) with Google. But this does not mean that Google has an absolute monopoly over searching and that researchers have stopped using other information venues. E-journal portals do not lag much behind; followed by bibliographic databases and, most surprisingly, library OPAC (online public access catalogues). Almost half of the researchers in our survey often or always start their search with OPAC – what is a unique result. Slovenia has a centralized and unified system of researchers' bibliographies that make up part of the Cooperative Online Bibliographic System and Services (COBISS). COBISS is also a centralized system that includes almost all libraries in Slovenia (not only academic and research libraries but also general public libraries). It has nevertheless become obvious that researchers have begun to carry out many of the previously traditional library services.

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Rapid Changes of Serbian Scientific Journals: Their Quality, Visibility and Role in Science Locally and Globally

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Abstract. More than 400 scientific journals are published in Serbia, and 357 are referred to in the Serbian Citation Index - national citation index. The visibility of Serbian scientific journals in the citation database Web of Science has risen significantly in the last decade. Results of this analysis show the presence of Serbian journals in Web of Science, JCR, Scopus and Serbian Citation Index (SCIndeks) during four years (2007 to 2010). The paper discusses different bibliometric parameters in Web of Science, JCR and the Scopus portal SCImago (citations, average citations/year, impact factor, Hirsch index) for Serbian journals. Bibliometric indicators that appear in the National Citation Index are also analyzed. The number of Serbian journals with impact factor has increased during the observed period. The impact of Serbian publishers rose remarkably in 2010, and Serbia has two highly ranked journals.

Keywords: Scientific journals, citation analysis, Web of Science, Scopus, national citation index, Serbia.

1 Introduction

Journals are the main medium in scientific communication. Parameters that characterize those journals can be used for analyzing the scientific disciplines, both in separate regions and globally. It is also possible to follow the development of the scientific community itself, since the appearance of journals show that the scientific community in a particular country has reached the level at which communication through journals is needed. Journals serve as a medium for dissemination of information and as a social institution showing the scientific contribution of particular institutions and authors. The number of journals is constantly rising, but it is known that for each discipline a small number of journals publish the most relevant results with high impact on its development. Bibliometric indicators are widely used for evaluation of journals and their impact on a local and global scale. In this paper, the most influential Serbian journals, according to citations to papers they have published, are analyzed.

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2 Literature Review

The state of science for a particular country can be evaluated through the presence of national journals in various citation index databases. The highly ranked and very precise citation index database Web of Science produced by Thomson Reutersis recognized worldwide. The majority of the bibliometric parameters in Web of Science are very indicative and well defined. Web of Science consists of the following cited reference indexes: Science Citation Index Expanded (SCI-EXPANDED), Social Sciences Citation Index (SSCI), Arts & Humanities Citation Index (A&HCI), Conference Proceedings Citation Index- Science (CPCI-S) and Conference Proceedings Citation Index- Social Science & Humanities (CPCI-SSH) [1]. There are many different citation indexes, international and national. Still, it is not usual that a developing country, such as Serbia, has its own national citation index, but thanks to the efforts of the Centre for Evaluation in Education and Science (CEON/CEES), the Serbian Citation Index has existed in this form for more than six years [2], [3], [4], [5]. The Centre for Evaluation in Education and Science (CEON/CEES) is an independent, non-governmental organization which collaborates with many researchers and academic staff in Serbia and abroad. The Centre has many activities and goals but the most important one is precise analysis of facts concerning science and higher education in Serbia [6]. One of its products, the Serbian national citation index (SCIndeks), covers scientific journals from Serbia which are continuously monitored and bibliometrically evaluated by the Centre [7].

Numerous international and Serbian papers describe scientific tendencies in Serbia during the recent decades, mostly concerning the problems of scientific journal publishing, their visibility in the scholarly community, and ranking according to strictly defined rules and parameters. Many authors from Serbia have analyzed results of citations in national and international journals. In addition, authors from the Department for Scientific Information of the University Library in Belgrade have also explored, using different methods, citations and bibliometric indicators, and the presence of Serbian journals in WoS and SCIndeks [8], [9], [10].

Many scientists from Serbia and abroad have researched the status of science in Serbia during different periods (mostly the last decade or two) [11], [12]. Particularly interesting are data which describe historical aspects of science development in Serbia from the 1980s until the beginning of the 21st century, and the position of Serbian science and other countries in the region [13]. Those data clearly reflect the turbulent historical conditions in Serbia – economic and social crisis, UN sanctions, civil war in Yugoslavia, and the highest hyperinflation in world history.

Bibliometric practice includes analysis of periodical production on the national level based on different aspects and methods [14], [15], [16], [17]. Results and conclusions are very heterogeneous being based on varying parameters and periods of time.

It is common practice to compare citation analysis of leading national journals in different international and national bibliographic data sources (Thomson Reuters, Scopus and National Citation Index, etc.) or for specific scientific disciplines [18], [19], [20], [21]. Those results might be very valuable for promoting procedures of modern evaluation methods in science, further advancement of academic publishing, planning and future goals.

3 Methodology

The paper presents the results from the Web of Science, Scopus and the Serbian Citation Index during the period 2007- 2010. We have analyzed 18 journals referred to in WoS with and without impact factor and we have compared them with the same corpus of journals in SCIndeks. The only exception is *International Journal of Electrochemical Science*: being an international journal, it is not referred to in SCIndeks. In WoS we used the following search criteria: publication name, publication years and the option "create citation report". Results for Scopus are from its portal SCImago, covering 39 journals from Serbia. On the portal SCImago Journal & Country Rank for bibliometric analysis, we specified the indicator "country search", choosing "Serbia". Finally, in SCIndeks we searched citation results from the Journal Bibliometric Report.

For the period 2007-2010 we have examined the ten most cited papers in WoS (author's country affiliation – Serbia) and h-index for each journal.

The repository doiSerbia [22] was used for general information about the journals.

4 Results and Discussion

The impact of Serbian journals on a local and global scale can be estimated from the results obtained from all available citation databases: Web of Science, Scopus and Serbian Citation Index. Since the bibliometric report for Serbian journals in the Serbian Citation Index is available until 2010, and since the number of journals from Serbia included in WoS and Scopus rose significantly in 2007, we compared the number of articles and citations in those databases from 2007 to 2010. Articles included in Scopus and Web of Science can be considered more visible on a global scale. The number of citations that they receive from other articles included in those databases shows is the visibility of Serbian scientific output. It is important to mention that Scopus has much broader coverage of regionally important journals than does Web of Science, since Web of Science is much more selective.

4.1 Journals in JCR

In Journal Citation Reports there are data about 18 Serbian journals with calculated Impact Factor (IF). Those journals are analyzed in more detail, since they represent the main visible results communicating Serbian science to the world. One of those journals is the oldest medical journal from Serbia, published continuously since 1872. The distribution of the starting years and their inclusion in JCR is shown in Table 1.

Table 1. Journals: Date first published and inclusion in JCR

Journals	Year	in JCR
Acta Veterinaria – Beograd	1951	1978
MATCH Communications in Mathematical and in Computer Chemistry	1975	1998
Journal of the Serbian Chemical Society	1946	2000
Science of Sintering	1974	2005
Archives of Biological Sciences	1993	2009
Hemijska industrija	1947	2009
International Journal of Electrochemical Science	2006	2009
Journal of Mining and Metallurgy, Section B: Metallurgy	1997	2009
Psihologija	1968	2009
Thermal Science	1997	2009
Applicable Analysis and Discrete Mathematics	1956	2010
Chemical Industry and Chemical Engineering Quarterly	2005	2010
Computer Science and Information Systems	2004	2010
Filomat	1994	2010
Nuclear Technology Radiation Protection	2002	2010
Panoeconomicus	2006	2010
Srpski arhiv za celokupno lekarstvo	1872	2010
Vojnosanitetski pregled	1930	2010

Fourteen journals were included in Web of Science in 2007 and 2008, and got their IF in 2009 and 2010. Six journals are published by faculties, 3 by scientific institutes, 8 by professional associations and one by a commercial publisher. Seventeen journals are open access. Five journals appeared in the last decade, with the intention of being included in the Web of Science. All five are published in English as the most widely used language of scientific communication. The journal *Applicable Analysis and Discrete Mathematics* has changed its title (the former title was *Publications of the Electrical Engineering, Series Mathematics*) and set higher standards for accepting articles. *Srpski arhiv za celokupno lekarstvo* is still published in Serbian but has extended abstracts in English, and explanations of tables and figures are bilingual (Serbian and English).

4.2 Journals by Subject

The journals under investigation are classified in five different disciplines. The majority are listed as Technology, Metallurgy and Chemical Engineering (8); four are Life Sciences and Medicine, three are Mathematics, two are Social Sciences and one deals with Computer Science.

Table 2. Journals by subject and by authors' country addresses (Ten most cited papers in each journal)

Subject	No	A (%)	B (%)	C (%)
Life Sciences and Medicine	4	15	8	77
Mathematics	3	73	10	17
Computer Science	1	36	10	55
Technology, Metallurgy and Chemical Engineering	8	49	4	47
Social Sciences	2	45	5	50
Total	18	44	7	49

A= Foreign authors

B= Foreign + Serbian authors

C= Serbian authors

The ten papers most cited in WoS (from 2007 to 2010) for each journal in a particular area were identified. The percentage columns show the participation of papers by foreign authors, papers with foreign and Serbian co-authors and papers by Serbian authors. The largest per cent of foreign authors can be noted in the field of mathematics. The largest per cent of Serbian authors publish in the area of Life Sciences and Medicine. The total per cent of foreign and Serbian authors in those journals shows almost equal distribution of highly cited items between them.

4.3 Journal Citations

The results for citations distribution in WoS, SCIndeks and Scopus are given in Table 3.

Table 3. Citation distribution of Serbian journals listed in WoS, SCIndeks and Scopus

Year	Articles in WoS journals	Cit. WoS	Average cit / article	Articles in SCIndeks journals	Cit. SCIndeks	Average cit/item	Articles in Scopus journals	Cit. Scopus	Average cit / article
2007	728	92	**0.126**	1010	1013	**1.003**	1594	4744	**2.976**
2008	1169	609	**0.521**	986	1231	**1.248**	3479	11320	**3.254**
2009	1334	1731	**1.298**	1090	1094	**1.004**	4236	8655	**2.043**
2010	1463	3090	**2.112**	1238	1381	**1.115**	4843	3582	**0.740**
Total	4694	5522	**1.176**	4324	4719	**1.091**	14152	28301	**2**

It can be seen from Table 3 that the number of citations for the journals chosen by Thomson Reuters to be included in Web of Science database is growing fast. The situation with the same corpus of journals in the national citation index is different – the number of citations does not change much during the four years (no data for *International Journal of Electrochemical Society*). The Scopus database with the whole sample of 39 journals from Serbia gives very inconsistent results (it appears that the results for 2010 are not yet fully available).

Table 4. Journals by subject and their citation count in WoS and SCIndeks 2007-2010

Subject	Journal	Cit. WoS	Ave. cit/year	Cit. SCIndeks	Ave. cit/year
Life Sciences and Biomedicine	Acta Veterinaria	59	**14.75**	246	**61.5**
	Archives of Biological Sciences	168	**42**	373	**93.25**
	Srpski arhiv za celokupno lekarstvo	70	**17.5**	464	**116**
	Vojnosanitetski pregled	94	**23.5**	324	**81**
Mathematics	MATCH Communications in Mathematical and in Computer Chemistry	2161	**540.25**	1548	**387**
	Filomat	14	**3.5**	52	**13**
	Applicable Analysis and Discrete Mathematics	116	**29**	85	**21.25**
Computer Science	Computer Science and Information Systems	13	**3.25**	27	**6.75**
Technology, Metallurgy and Chemical Engineering	Journal of the Serbian Chemical Society	672	**168**	719	**179.75**
	Thermal Science	189	**47.25**	130	**32.5**
	Chemical Industry and Chemical Engineering Quarterly	70	**17.5**	39	**9.75**
	Science of Sintering	84	**21**	109	**27.25**
	Hemijska industrija	44	**11**	135	**33.75**
	Journal of Mining and Metallurgy Section B Metallurgy	76	**19**	82	**20.5**
	Nuclear Technology Radiation Protection	42	**10.5**	83	**20.75**
	International Journal of Electrochemical Science	1624	**406**	/	/
Social Sciences	Psihologija	17	**4.25**	257	**64.25**
	Panoeconomicus	9	**2.25**	46	**11.5**

In Life Sciences and Biomedicine the average number of citations received per article in the national citation index is much greater than in Web of Science. In Mathematics the situation is completely opposite, showing that the results published in those journals are used more abroad than in Serbia. In the subject field Technology, Metallurgy and Chemical Engineering the average number of citations received in the local citation database and in Web of Science are nearly equal. In Social Sciences many more citations are received in the national citation index than in WoS.

4.4 Hirsch Index and Journal Ranking in JCR

Table 5 shows the Hirsch index for all 18 journals with impact factor from 2007 to 2010. The lowest h-index value is 3, and the highest h-index value is 25. The journal with the highest h-index, *MATCH Communications in Mathematical and in Computer*

Table 5. Hirsch index 2007 - 2010

Journal	h-index
MATCH Communications in Mathematical and in Computer Chemistry	25
International Journal of Electrochemical Science	22
Journal of the Serbian Chemical Society	11
Thermal Science	8
Applicable Analysis and Discrete Mathematics	7
Journal of Mining and Metallurgy, Section B: Metallurgy	6
Chemical Industry and Chemical Engineering Quarterly	6
Nuclear Technology Radiation Protection	6
Acta Veterinaria – Beograd	5
Archives of Biological Sciences	5
Science of Sintering	4
Computer Science and Information Systems	4
Srpski arhiv za celokupno lekarstvo	4
Vojnosanitetski pregled	4
Hemijska industrija	3
Filomat	3
Psihologija	3
Panoeconomicus	3

Chemistry, is first in the JCR category of Mathematics, Interdisciplinary Applications. The journal with h-index value 22 (*International Journal of Electrochemical Science*) is ranked in the 2nd quarter in the category of Electrochemistry, after only two years in JCR. The largest number of journals (9) belong to the 4 th quarter (Fig. 1).

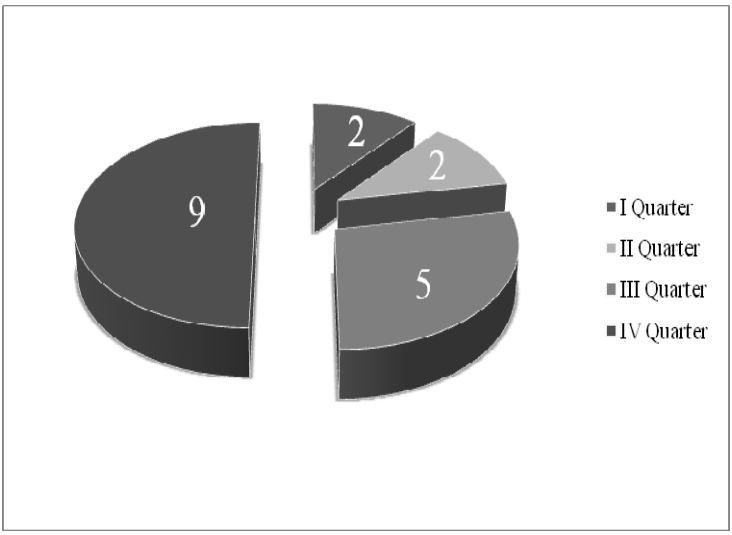

Fig. 1. Journals by JCR subject ranking

Since Serbian journals have had IF for a relatively short time, a rise of h-index and rank in the JCR categories can be expected in the years to come**.**

4.5 Journals by Regional Countries

Table 6 shows the number of journals in JCR for the period 2007-2010 for the countries in the region that are geographically and demographically similar to Serbia. Serbia has more journals than Bulgaria and Greece, but considerably fewer than Croatia and Hungary. All five countries had significant growth in the number of journals included in 2009 and 2010. The number of regional journals in the JCR in 2010, compared to 2007, rose by approximately 70% (Bulgaria 70%, Greece 75%, Serbia 78%, and Croatia 73%). The number of Hungarian journals increased slightly less, 57%. The fact is that the editors of Web of Science decided to increase the number of journals in the database from those in the region fulfilling WoS criteria (accuracy of publication, original articles, age of cited references, citations, etc.).

Table 6. Journal numbers in JCR

Country	2007	2008	2009	2010
Bulgaria	3	3	8	10
Greece	4	7	10	16
Serbia	4	4	10	18
Hungary	16	15	24	37
Croatia	13	14	36	48

5 Conclusion

During the last decade Serbian scientific journals have shown continuous improvement according to bibliometric indicators. First, the total number of journals with Impact Factor jumped from four in 2007 to 10 in 2009 and 18 in 2010. Presently, four of them are ranked very high (two in the 1 st quarter of the JCR category ranking, two in the 2 nd quarter, and five in the 3 rd quarter), and we expect that this ranking will soon be even higher. At the same time, the number of citations also shows an increase, but the difference between various subject disciplines is noticeable: in the subject of Mathematics the number of citations is greater on the international level than on the national. The possible conclusion can be that the this group of journals in the area of Mathematics is more globally oriented and interconnected with the world scientific community. The opposite result is visible in the subject of Life Sciences and Biomedicine: higher numbers of citations in national journals. One of the main reasons is the journal language (*Srpski arhiv za celokupno lekarstvo* and *Vojnosanitetski pregled* are published in Serbian). Generally, journals in the native language are more noticeable in the national citation index SCIndeks (e.g. *Hemijska industrija* and *Psihologija*).

Some of these journals have a long tradition of publishing, but there are also several new journals. All of them have had to adjust to international criteria. At the same time, the new policy of Web of Science is to include important regional journals (published in English or some native language). Finally, these results are consequences of the stricter legislation in the process of evaluation of national scientific output by the Ministry of Education and Science of the Republic of Serbia in the new millennium and the use of bibliometric criteria in evaluation. Even though bibliometric criteria are not ideal for evaluation of individual scientists [23], this pressure on scientists contributes to the visibility and impact of Serbian journals and Serbian science in general.

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A Dutch Repository for Open Educational Resources in Software Engineering: Does Downes' Description Fit?

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Abstract. In 2007, Stephen Downes described three models for Open Educational Resources in his article entitled "Models for Sustainable Open Educational Resources". The models describe the issues that are relevant to institutions which want to develop a repository with Open Educational Resources (OER). Two years later, the new Dutch organisation "Network for Open Education in Software Engineering" (NOH-I) decided to start a programme to develop a repository in which all the newly developed learning materials could be made freely available. In this article I will describe this programme and compare it to Downes' models. The questions I have tried to answer are:

- Is Downes' article a valid description of the relevant issues compared to a practical casus?
- What decisions did the NOH-I make on the relevant issues?

It can be concluded that Downes' models are really important to the development and existence of the repository. An important issue for the NOH-I repository that was not described by Downes is that of the metadata model. NOH-I put a lot of effort into creating a model that complies with international standards and fits the characteristics of their learning objects.

Keywords: Open educational resources, repository, metadata, OER.

1 Introduction

In 2007, Stephen Downes [1] described three models for Open Educational Resources in his article entitled "Models for Sustainable Open Educational Resources". The models describe the issues that are relevant to institutions who want to develop a repository with Open Educational Resources (OER). Two years later, the new Dutch organisation "Network for Open Education in Software Engineering" (NOH-I) decided to start a programme to develop a repository in which all the newly developed learning materials could be made freely available for all Dutch institutions with higher education in software engineering . In this article I will describe this programme and compare it to Downes' models. The questions I will try to answer are:

- Is Downes' article a valid description of the relevant issues compared to a practical casus?
- What decisions did the NOH-I make on the relevant issues?

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I will start with a description of what OER really is. The William and Flora Hewlett Foundation describes them as: "teaching, learning, and research resources that reside in the public domain or have been released under an intellectual property license that permits their free use or re-purposing by others" [2]. Johnstone [3] states that the resources include:

- Learning resources – courseware, content modules, learning objects, learner support and assessment tools, online learning communities.
- Resources to support teachers – tools for teachers and support materials to enable them to create, adapt and use OER, as well as training materials for teachers and other teaching tools.

One of the first and best known repositories with OER is the OpenCourseWare repository of the Massachusetts Institute of Technology (MIT) in Boston. It was announced in 2001 and launched in 2006. Caswell et al. [4] state that OpenCourseWare supports advanced teaching models such as distance learning and blended learning. OpenCourseWare is an expression of OER, but not quite the same. According to the OpenCourseWare Consortium [5], OCW only includes high quality college and university-level educational materials. The standards for OCW are high, those for OER are not. Materials for lower education or with moderate quality can be presented as OER. An example of a repository with OER that is not OCW is Youtube.com/edu. However, the MIT repository is often mentioned as the standard for repositories with OER.

The distinction between OCW and OER is illustrated by the first question Downes raises in his article: What resources? In correspondence with the statement by Johnstone [3], NOH-I decided that learning resources as well as the resources to support teachers should be placed in the repository. These include textbooks, presentations, tasks, images, software tools, etc. Every learning object that is developed for NOH-I courses will be uploaded to the repository. This guarantees a certain quality: only that which is good enough for use in NOH-I will be uploaded. Because these materials are used on a regular basis in NOH-I courses, they will be constantly updated and improved according to the experiences of the teachers.

In addition to objects that are developed by the teachers, high quality student products can also be labeled as OER, when they are a good illustration of how a certain assignment should be done. This is to be decided by the teachers.

A second group of contributors is the wide community of Dutch teachers in software engineering. They are invited to contribute to the repository by sharing their own material. For the materials that are uploaded by these users, an alternative way of quality control has to be organised which I will discuss later in this paper.

In his article, Downes' second question is: 'What is 'Open'? On this issue, Downes cites Daniel [6], who states: "the four A's: accessible, appropriate, accredited and affordable". The NOH-I repository is freely available by means of a website and it is free of charge to use material and to contribute by uploading material.

A crucial, and often difficult, issue in this matter is that of the copyrights. 'Open' is not the same as 'Without limitations'. Most institutions want to prevent publishers from using OER for commercial purposes. The Creative Commons license model

provides several possibilities to prevent abuse of materials that are freely available. The NOH-I studied the model and its possibilities and decided to apply the CC-BY-SA model, in which BY stands for the obligation to the user to mention the creator of the learning object. SA stands for 'Share alike', which means that others are free to use the objects to create derivative works, even by a commercial party, as long as they share the materials under the same conditions [7].

This model is in line with the terms formulated by Foote [8]:

- Freedom to copy
- Freedom to modify
- Freedom to redistribute
- Freedom to redistribute modified versions

2 Sustainability and Funding Models

The development of an OER-repository is often organised as a project and financed on a temporary basis. Downes states that when the repository has been developed, there should be a funding model that guarantees a long existence of the repository. Our activities to develop the NOH-I repository are also being temporarily financed by a special fund. The Dutch investment programme "Nation Action Plan E-learning" (NAP) is financing all the activities until the summer of 2012.

In the long term, all the costs for the hosting, management and quality control of the repository will be paid for by the NOH-I itself. As the NOH-I is a new initiative of which success is not guaranteed, the developers are searching for solutions in case NOH-I should end its activities due to an insufficient number of students.

3 Technical Models

Downes states that technical matters are important aspects in sustainability. This is of course true; however, when the development team of the NOH-I repository started its activities; it had to take more matters into consideration than just sustainability.

The most important matters were:

- Selection of the database software. Criteria for the selection were: usability, sustainability, search functions, version control and the opportunity to add comments to the learning objects in the repository as part of the quality management. Besides this, the software had to be able to implement the chosen model for metadata.
- Model for metadata.

Selection of the database software: After formulating the requirements, the development team did not start the selection procedure immediately.. First a pilot was started to test if the requirements were valid. For this pilot a database was created in a semantic Wiki, using the Mediawiki Software. Some members of the development team uploaded learning objects to experience important facets such as the usability and the chosen model for metadata.

In the meantime, there were some interesting developments in relation to OER-repositories in the Netherlands. The Minister of Education launched a national portal to OER-repositories in December 2008. This portal, called Wikiwijs.nl (Wikiwise), was primarily developed to provide access to existing repositories with OER for primary and secondary education, but in the long term it can also provide access to OER repositories in Higher Education.

For this reason, the NOH-I development team came into contact with the founders of Wikiwijs. It soon appeared that Wikiwijs.nl was not only a portal to external repositories but also a repository itself, prepared to host any initiative with OER.

The development team of the NOH-I repository tested the software of the Wikiwijs-repository and decided that it met all their requirements. Besides this, Wikiwijs offered to provide hosting and services free of charge until the end of 2013, thanks to the funding by the Dutch Ministry of Education. For this reason, the NOH-I development team decided not to create their own repository but to use the software and hosting that are offered by Wikiwijs. However, the business model of Wikiwijs after 2013 is uncertain. It might be possible that NOH-I will have to pay for the services by Wikiwijs in the future.

Of course this only applies to the Dutch situation but it also illustrates that it might be interesting to investigate opportunities to join an existing repository instead of spending energy and money on creating a new one.

The decision to create an environment with learning objects for higher education in Wikiwijs made technical matters a lot easier, but it did not help with the decision about the model for metadata that should be used:

Model for metadata: There are several reasons why OER need to be enriched by adding metadata. First of all, metadata is needed for appropriate management of the learning objects. Material type, creator and copyright issues are only some of the relevant metadata fields in this matter. Secondly, harvesters of OER portals need to recognise the learning objects when indexing. For this reason, it is important to apply standards for the metadata that meet the OAI-PMH, a protocol harvesters use to index open access resources [9].

But the most important reason for using metadata is to make the collection searchable in a way that fits the needs of the users. When searching for OER, users of a repository have the need for searching using facets; subject, level, target group, type of the object, etc. are criteria to select the objects that fit the need of the user.

Wikiwijs offers an interface with these metadata fields as selection criteria. For this it applies the national standard for metadata: NL-LOM. NL-LOM is a description of relevant metadata-fields, based on the international standard IEEE 1484, which is managed by the global learning consortium IMS [10].

NL-LOM [11] contains descriptions of nine main elements, each with several sub-elements. Some of these elements are compulsory, others are optional. For some elements, such as date and language, the notation format is given. For others, the developers of a repository can choose their own format or vocabulary.

This applies in particular to the element ‘Classification’ (field no. 9 in NL-LOM). Where other elements mainly describe the formal aspects of the learning object, this

element is meant to describe the topic of the object (what it is about) and the educational level.

Developers of a repository should find out if there is a standard vocabulary or classification that can be applied to this field in order to create authority lists from which users select the correct values. The development team of NOH-I encountered the fact that there was no accepted vocabulary that met their needs, so they had to develop a new vocabulary for their repository. For this, they researched the description of competences for the Bachelor of ICT in the Netherlands. This domain description has been developed by HBO-I, a cooperation of ICT programmes within Higher Professional Education in the Netherlands [12]. In 2009 the description was published to help institutions to develop their curricula. Although adoption of the description is not compulsory, most institutions use this description. This stimulates uniformity of the curricula throughout the country and makes it easier to compare the educational programmes among institutions [12]. The education for Library and Information Sciences is also based on this description.

The NOH-I development team decided that the description could be used as a basis to create a vocabulary for the learning objects. The description consists of three layers:

Life Cycle Phases. In the past, many courses on ICT were based on the life cycle phases. Different models such as the European e-Competence Framework or the framework from the ISO/IEC standard 12207 are also based on the life cycle. The phases are: Analyse, Advise, Design, Implement and Manage.

ICT Architectural Layers. Based on several frameworks and standards, the model describes the layers: User interaction, Business processes, Software, Infrastructure and Hardware interfacing.

Skill Level and Professional Duties. According to the HBO-I Description: The European Competence Framework states five levels of competence at the workplace and always integrates three facets in these competence levels:

- Autonomy: has a range from “carrying out instructions” to “making personal choices”.
- Behaviour: represents what is seen as the consequences of an attitude and has a range from “the capacity to apply” to “the capacity to penetrate”.
- Context: has a range from “structured - predictable” situations to “unpredictable – unstructured” situations [12].

The Dutch bachelor degree at universities of applied sciences educates students to skill level 3 to 4.

The three layers of the HBO-I competence model can be visualised in a cube:

Every learning object that is uploaded to the repository can have a positioning in this cube by attributing values from the three dimensions. The interface of the NOH-I repository provides three compulsory fields for the three dimensions.

The skill level (1-3) can be subject to personal view and subjectivity. In order to facilitate users’ making a good estimation of the skill level of the object, the NOH-I adopted the matrix which has been developed by the ICT department of the Hague University of Applied Sciences:

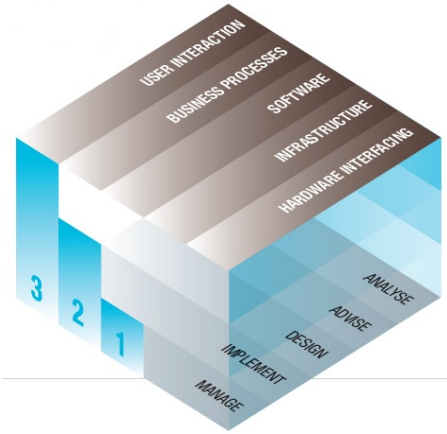

Fig. 1. HBO-I competence model

Table 1. Matrix of levels

		Role		
		guided	independent	guiding
Context	easy	1	2	3
	difficult	2	3	4
	complex	3	4	5

This matrix helps teachers and students to estimate the skill level of a certain task and can also be used to attribute the level to learning objects.

In cooperation with the developers of HBO-I, the description will be accepted as a formal standard for learning objects in Dutch repositories.

4 Content Models

The NOH-I repository is primarily filled with learning objects created for the NOH-I courses which take place at several universities throughout the year. However, developers and teachers from other institutions in the Netherlands are invited to contribute to the repository. Downes states that all the materials should be sustainable, in the context of tantamount to reusable, which means that the materials can be adapted to local needs and conditions (or 'glocal') [13]. The development team of the NOH-I repository took no action to guarantee this kind of sustainability. However, as the learning objects of NOH-I are based on the description of the HBO-I (as explained above), which is used by many institutions for their curricula, it is expected that the objects in the repository will fit into their programme of software engineering.

Another matter, not mentioned by Downes, is that of quality control. Any object that is uploaded to the NOH-I repository that has not been developed by NOH-I itself

is subject to a quality check by a board of the NOH-I before it is made public. The board considers several criteria, of which the most important are:

- Reusability of the object
- The object contains correct information
- The object has no copyright restrictions
- The object can be used independently

Downes describes the different issues that matter in copyright restrictions. NOH-I maintains the rule that those who contribute to the repository must declare that all parts of the objects are free of restrictions and the objects will be presented according to the license model CC-BY-SA as described above.

5 Staffing Models

Sustainability is one of the main issues in Downes' models. He justly states that good organisation of the staff managing the repository is vital to guarantee a long existence. The technical management of the NOH-I repository is in the hands of its host Wikiwijs. The content, however, including the quality check, is managed by staff members of NOH-I. These staff members are paid by NOH-I, which makes the organisation stable. Downes describes organisational and voluntary models for the growth of the content. The NOH-I repository is a combination of both. All teachers and developers of NOH-I are obliged to upload their learning objects to the repository. Users from other institutions may contribute on a voluntary basis. To stimulate these contributions, a community has been created on LinkedIn. In this community all kinds of issues concerning OER are discussed and members are stimulated to contribute to the repository.

6 The Way Forward

Under this heading, Downes repeats the main issues in his paper with an eye to the future. Here, sustainability plays an important role as well. In this context, he cites Wiley [14] who asks: "What is the future of open education, where is it going?" Downes' answer is: localization. The NOH-I repository is intended as a national repository with learning objects in Dutch. This seems to be in line with Downes' vision. Whether this guarantees a successful repository is not certain, but the initial prospects are hopeful.

7 Conclusions

In this article Downes' models are related to a practical case: the repository that has been developed by NOH-I. It can be concluded that Downes' models are really important to the development and existence of the repository. An important issue for the NOH-I repository that has not been described by Downes is that of the metadata

model. The findability and exchange options of learning objects are important factors for the success of a repository. The development team of NOH-I spent a lot of time creating an appropriate vocabulary to enable this. Most of Downes' models are important for the sustainability of a repository. The NOH-I development team formulated answers to these topics. The future will tell us if those answers will help to make the repository a success.

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Self Archiving in Atılım University

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Abstract. Self archiving is defined as storing the scientific research outputs in researchers' own web pages/sites, organizational web sites or institutional repositories. In this study the self archiving activities of academicians of Atılım University are investigated. For the purpose of the study the web pages of the university, personal web pages of the academicians and open repository of the university are explored. We found the details of 2176 academic activities of the instructors in web pages. More than half of these activities (1147 - 53%) consist of refereed journal papers. Almost a quarter of the instructors saved their research outputs in the university's open repository. Yet, those instructors have not published their works in their personal web pages or institutional web pages. Only 4% of the works are published in personal/organizational web pages. According to the results obtained, the usage of institutional repository is the common self archiving method in the Atılım University. On the other hand, the personal/organizational web pages should be as a point of attraction in self archiving. While discussing the efficient usage of the institutional repository, we suggest that the social networks as a meeting point should include links to personal/institutional web pages containing academicians' papers.

Keywords: Scholarly communication, open access, institutional repositories, citation indexes, open science.

1 Introduction

According to the Budapest Open Access Initiative declared in 2001, self archiving is defined as storing the scientific research outputs (especially published in refereed journals) of the researchers in self web sites/pages, organizational web sites of the researchers or institutional repositories (IRs). Besides, the definition also requires the open access and free download. This definition is also known as *green road.* The main aim of self archiving is to provide the visibility of the papers (original or different forms) published in refereed journals on the personal web pages/sites or IRs. There are 26 IRs in Turkey, containing about 55,000 documents (mostly dissertations). Only 22% of the documents in these repositories are research papers [1].

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2 Earlier Studies

Self archiving is a mechanism for academicians to make their research papers readily available so that other researchers could get access to, read and cite them [2], [3], [4], [5], [6], thereby increasing the visibility of the research performed in the organizations and, at the same time, protecting the intellectual output of the organization [7], [8], [9], [10], [11], [12], [13], [14], [15].

Swan and Brown [5] found that most of the researchers prefer to store their papers (68%) and their conference proceedings (51%) in IRs. In a different study carried out in University of California in 2006, Greenhouse [16] found that more than half of the researchers want to store their papers (82%), books (81%), and conference proceedings (55%) in IRs. McDowell [17] found that there are 300 IRs in USA. While there are a few thousands of documents in some of these IRs, figures reach 45,000 in some of them. However, only 13% of documents in IRs are refereed journal papers. Vernooy, et al. [18] found out that more than half of the universities in Europe have IRs. The detailed information about the number of repositories and their content can be obtained from international open access guides.

In another study, the storing preferences of 684 researchers from 17 different universities are investigated [19]. It was found out that 480 of the participants (70%) stored their research outputs in open access environments. In this study, five different methods for self archiving which are used by academic staff are determined: personal web pages/sites, research group or laboratory web sites, departmental web sites, related disciplinary repository of the work, and finally the IRs. It is observed that the most preferred method for self archiving is the personal web sites with 67%. The frequencies of the other methods are 52% for research group web sites, 42% for departmental web sites, 28% for disciplinary repositories, and 23% for IRs. Some of the IRs lost their functionality as time passed [19], [20].

In a study carried out at Hacettepe University, Ertürk and Küçük [21] found out that more than half of the researchers are aware of open access, and 86% plan to store their research outputs in IRs in their original form. In a different study by Ertürk [22], new management methods and a few strategies about construction of IRs were suggested. Karasözen, Zan and Atılgan [23] investigated open access studies in Turkey and found that there are only a limited number of IRs in Turkey and they were all set up by librarians. Ertürk and Şengül [1] indicated that the year 2011 is a milestone for IRs in Turkey in that the number of documents stored in IRs have doubled in 2011.

3 Materials and Methods

In this study, self archiving studies of Atılım University is investigated and evaluated. Following research questions are addressed: Do the instructors effectively use the self archiving methods? Do the instructors practise self archiving as an academical behavior? What is the capability of the instructors about self archiving their research studies? Are the research papers, especially published in journals listed in citation indexes, also stored in self archiving platforms?

In order to collect data, the institutional web site of Atılım University, personal web pages of instructors and the Institutional Repository of Atılım University were searched between 13th July and 6th August of 2011. All the data obtained was stored in a database. Data groups were organized and the relationship between these groups was analyzed, and finally the results were interpreted.

4 Findings and Discussion

Atılım University was founded by the Atılım Foundation on 15 July 1997. The university is composed of 5 faculties with 31 departments, 2 institutes, and 15 research and application centers. As of July 2011, there are 5121 undergraduate and graduate students and 377 (almost half 185 have their PhD degrees) academic staff. The distribution of academic titles by faculties are given in Table 1.

Table 1. Distribution of instructors by their faculties and titles (N=185)

Faculties / Title	Prof.		Assoc. Prof.		Asst. Prof.		Lecturer Dr.		Total	
	N	%	N	%	N	%	N	%	N	%
Faculty of Arts & Sciences	7	13.5	4	19.0	13	16.3	14	43.8	38	20.5
Faculty of Management	7	13.5	3	14.3	16	20.0	10	31.3	36	19.5
Faculty of Engineering	24	46.2	12	57.1	35	43.8	5	15.6	76	41.1
Faculty of Law	9	17.3	1	4.8	5	6.3	1	3.1	16	8.6
Faculty of Art, Design & Architecture	5	9.6	1	4.8	11	13.8	2	6.3	19	10.3
Total	52	100.0	21	100.0	80	100.0	32	100.0	185	100.0

Forty-one percent of instructors are in the Faculty of Engineering while 9% are members of the Faculty of Law. Nearly one fourth of the academic staff (24%) are in three departments, namely, Faculty of Law (which has only one department), Civil Engineering Department and the Department of Mathematics.

Atılım University has 550 papers published in journals listed in Web of Science (WoS) since 2000 [23]. We found a total of 2176 records of publications in web pages/sites belonging to the 185 faculty members given in Table 2. More than half of these publications (1147 - 53%) are refereed journal papers (744 indexed and 403 other). Besides, there are 787 conference proceedings (352 indexed and 435 other), 150 books and 92 book chapters. The distribution of publications with respect to academic titles is given in Table 2. When the total number of publications is considered, 55% of all publications, 44% of internationally indexed journal articles and 36% of papers that appeared in journals indexed by WoS were authored by professors. In this context, when the papers indexed in WoS are considered, 33.8% of the authors are professors, 10.8% of the authors are associate professors, 52% of the authors are assistant professors and 3.4% of the authors are lecturers with PhD degrees. Meanwhile, 52% of the authors in the internationally indexed conference papers are assistant professors.

Table 2. Distribution of publications by academic titles

	Prof.		Assoc. Prof.		Asst. Prof.		Lecturer Dr.		Total	
Publication / Title	N	%	N	%	N	%	N	%	N	%
Indexed Papers	328	27.4	159	61.6	219	34.7	38	42.2	744	34.2
Indexed Papers (WoS)	*119*	*33.8*	*38*	*10.8*	*183*	*52.0*	*12*	*3.4*	*352*	*100.0*
Other Papers	305	25.5	26	10.1	56	8.9	16	17.8	403	18.5
Book	111	9.3	7	2.7	31	4.9	1	1.1	150	6.9
Book Chapter	57	4.8	4	1.6	22	3.5	9	10.0	92	4.2
Indexed Proceedings	119	9.9	38	14.7	183	29.0	12	13.3	352	16.2
Other Proceedings	276	23.1	24	9.3	121	19.1	14	15.6	435	20.0
Total	1196	100.0	258	100.0	632	100.0	90	100.0	2176	100.0

The distribution of publications with respect to faculties is given in Table 3. More than half (51%) of the total publications, 54% of published papers, and 70% of papers that appeared in journals covered by international indexes were written by the academic staff in the Faculty of Engineering. The Departments of Mechanical Engineering, Mathematics and Chemical Engineering are the most productive ones. Although the Faculty of Law has the lowest number of faculty members, they publish almost one fourth of the total publications. Academicians of Faculty of Fine Arts, Design and Architecture publish only 1% of the total papers.

Table 3. Distribution of publications by faculties

Publication / Faculty	Arts & Sciences		Management		Engineering		Law		Art, Design & Architec.		Total	
	N	%	N	%	N	%	N	%	N	%	N	%
Papers	150	86.2	121	35.2	617	56.0	253	47.8	6	22.2	1147	52.7
Indexed Papers	*121*	*33,8*	*52*	*15,1*	*520*	*47.2*	*49*	*9.3*	*2*	*7.4*	*744*	*34.2*
Book	6	9.3	39	11.3	15	1.4	88	16.6	2	7.4	150	6.9
Book Chapter	3	4.8	33	9.6	16	1.5	31	5.9	9	33.3	92	4.2
Proceedings	15	9.9	151	43.9	454	41.2	157	29.7	10	37.0	787	36.2
Total	174	100	344	100	1102	100	529	100	27	100	2176	100

There are three different methods that can be used for self archiving by academic staff in Atılım University. These methods can be given as follows: Web sites of the departments, personal web sites/pages of the faculty members and IR of the university.

Academic staff can access their pages with a secure method (password protected), and update their information with the help of a form interface/page. These pages allow users to enter publication information or to give hyperlink to the publication. However, there is no facility to upload a full publication. Academic staff have an

indirect method for self archiving in their web sites by providing a hyperlink address for the publication stored in another place. Some 74% of the academic staff have publication information (full name of the publication, publication address, DOI number if available, authors, volume, page numbers, etc) on their web pages. Yet, only 30% provide hyperlinks to their publications. The majority of the hyperlinks refer to the original publishers' web sites. This cannot be considered as self archiving.

Table 4. Self archiving status in departmental web sites and personal web pages/sites

Staff / Faculty	Arts & Sciences		Management		Engineering		Law		Art, Design & Architec.		Total	
	N	%	N	%	N	%	N	%	N	%	N	%
Publication Info	27	71.1	26	72.2	59	77.6	14	87.5	11	57.9	137	74.1
Publication Hyperlink	13	34.2	12	33.2	23	30.3	6	37.5	2	10.5	56	30.3
Self Archiving	2	5.3	1	2.8	4	5.3	-	-	-	-	7	16.8
Self Web Page	8	21.1	4	11.1	19	25.0	-	-	-	-	31	3.8
Total	38	100.0	36	100.0	76	100.0	16	100.0	19	100.0	185	100.0

We found that 31 academicians (17% of the academic staff) developed specialized personal (self) web pages, and 7 of them (4% of academic staff) stored their publications in their web pages as a self archiving. Self archiving status with respect to faculties is given in Table 41. The numbers given in this study show that self archiving is not generally accepted as a common behaviour in Atılım University.

IR activities began in 2009 in Atılım University. The preferred software for it is MITOS, developed by a native company and conformant to international open access standards. The IR of Atılım University is indexed in Directory of Open Access Repositories - OpenDOAR and Registry of Open Access Repositories – ROAR. We found 477 documents available in Atılım University's IR. Some 35% of these documents are research papers. The detailed information about the content of the repository is given in Table 4. Documents were also stored in the repository of the university library. Uploading documents to a repository can be directly performed by the academic staff, or can be done with a central authority (library). Besides, we also found that the university does not have any enforcement about the self archiving. It must be also noted that there are only three different document types available in the repository, and the number of conference proceedings is very low.

Figure 1 gives the relationship between the academic staff and the repository. A quarter (24%) of the instructors stored their papers in the repository. The academic staff in the Faculty of Engineering provided 36% of the papers available in the IR. Moreover, 42% of the academic staff in the Faculty of Management stored their papers in the repository. Meanwhile, the distribution of academic staff whose documents are available in the IRs are: 27% professors, 25% assistant professors, 24% lecturers with PhD degrees, and 19% associate professors.

Table 5. Atılım University IR content types

Faculty / Publication	Papers		Proceedings		Thesis		Total	
	N	%	N	%	N	%	N	%
Faculty of Arts & Sciences	16	9.5	3	37.5	-	-	19	4.0
Faculty of Management	49	29.0	-	-	-	-	49	10.3
Faculty of Engineering	19	11.2	5	62.5	-	-	24	5.0
Faculty of Law	12	7.1	-	-	-	-	12	2.5
Faculty of Art, Design & Architecture	2	1.2	-	-	-	-	2	0.4
Unknown	71	42.0	-	-	300	100.0	371	77.8
Total	169	100.0	8	100.0	300	100.0	477	100.0

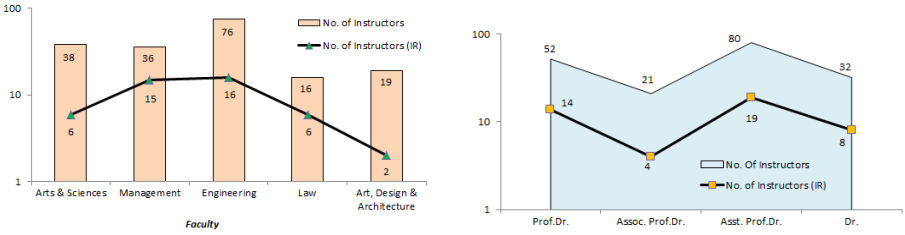

Fig. 1. Instructors in Atılım University IR

There are only 169 refereed papers stored in the IR of Atılım University. The academic staff in the university have 1147 refereed journal papers (as listed in the web pages of the departments) and only 15% of papers were uploaded to the repository. But this is not realistic. Total number of articles belonging to the academic staff having articles on the IR mentioned above is 388 (33%). When only those academicians are considered, we see that 25% of the papers were uploaded to the repository. Besides, 6% of the papers are indexed in international indexes. Figure 2 also gives the relationship between the academic staff and the repository. It is also found that about half of the documents (%40) were uploaded to the repository by Faculty of Management.

We also found that 73% of the documents uploaded to the IR are in Turkish. All the remaining documents are in English (majority of these documents are theses). Meanwhile, these documents are stored in their original form as PDF files. Since January 2011, half the documents in the repository were displayed more than 300 times, and 80% of the documents were downloaded between 50 and 300 times. Documents of the Faculty of Management were displayed and downloaded most.

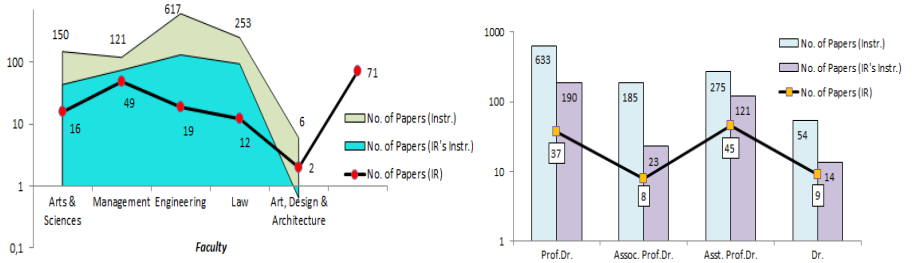

Fig. 2. Papers in Atılım University IR

5 Conclusions and Suggestions

This study shows that self archiving is not generally accepted as a common academic staff behaviour in Atılım University. Although IR of the university provides a better alternative for self archiving than the personal and/or departmental web sites, it still needs improvements and new construction mechanisms. Documents were stored in the repository of the university library. University does not have any mandatory policy for self archiving. The following suggestions by Ertürk [22] may help to increase the usage of the repository:

- The legislations and regulations related to IRs should be established and carried out by the authorized bodies of the university with the help of The Council of Higher Education. It is also necessary to establish obligatory archiving policies for the papers, project documents, conference proceedings and other research outputs developed by the academic staff.
- In order to provide technical personnel and infrastructure for the IRs; a *Center of IR* should be established. The technological infrastructure must be set up and kept up-to-date to maintain the documents archived in the IR.
- It is also necessary to provide measures that take the documents archived in the IRs into account in academic evaluations and project evaluations. These measures can be established in cooperation with The Council of Higher Education.
- The electronic journals published by the universities should be archived in the IR. It is also necessary for these journals to be indexed in library catalogues.

Besides, it is necessary to develop scenarios for uploading the content, and this may increase the self archiving activities. However, we suggest linking the personal web pages and social networks, so that it can help the self archiving activities in the university. Social networks should enable users to share their scientific research outputs.

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Information Literacy Meets "Research 2.0": Exploring Developments in Croatian Academic Libraries

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Abstract. Information literacy training for researchers should be determined by information needs of scholars and by reconfiguration of information environments. New research environments, which are a result of technological innovations initiated by Web 2.0, have the potential to change the very principles of science and research. In the paper the authors analyze the main features of research practices that rely on Web 2.0 tools and comment on re-conceptualizations of IL training for researchers that are a consequence of such "Research 2.0" transitions. The main idea behind IL re-conceptualizations is that libraries have to concentrate less on the traditional IL paradigm which focused heavily on resource discovery and especially on traditional library tools, while dealing more with evaluation, information management, authority issues and a range of new concerns brought about by Web 2.0. The paper presents a survey of the deployment of conceptual adaptations in IL in the context of Croatian academic libraries. The study showed that libraries concentrate on a relatively narrow subset of IL in the form of traditional library topics such as searching and finding sources in libraries and academic databases. The authors suggest that new approaches are needed to make IL sessions for researchers more relevant and truly meaningful.

Keywords: Information literacy, Web 2.0, academic libraries, Croatia, survey.

1 Introduction

Information literacy (IL) can be perceived as central to research and integral to the professional lives and careers of researchers. Information is the basic building block of research and can therefore influence the research process significantly. Information literate researchers will demonstrate awareness of how they gather, use, manage, synthesize and create information and data in an ethical manner and will have the information skills to do so effectively [1].

The information literacy concept has begun to spread as the result of a growing heterogeneity and complexity of information, information resources and information structures and has always been influenced and determined by features of information environments. With the appearance of Web 2.0, information environments became even more complex and unstructured, which poses new challenges for information

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literacy instruction aimed at researchers who have to cope with these complexities. In order to make IL sessions for researchers more relevant and compliant with "Science 2.0" or "Research 2.0", shifts in IL from traditional library-focused themes towards the inclusion of new issues and concepts are needed. In the remainder of this paper, the rationale and elements of such transformation will be considered and the results of a study of these issues in a national context presented.

2 Transformation of Research Landscapes: Research 2.0 and Science 2.0

There is no doubt that science has changed and metamorphosed through the use of information and communication technologies (ICT) and numerous authors have commented on this phenomenon [2], [3], [4], [5], [6], [7]. However, deeper and more radical transformations that potentially may cause changing configurations of the principles of science and scholarly activities are a result of technological innovations initiated by the Web 2.0 [6], [8], [7], [9], [10]. Web 2.0 brings the promise of enabling researchers to create, annotate, review, re-use and represent information in new ways and of promoting innovations in scholarly communication practices – e.g. publishing work in progress and openly sharing research resources [9]. In order to express these substantial changes the terms *Science 2.0* and *Research 2.0* were coined. The analysis of several definitions shows that both terms refer to new approaches in research that promote collaborative knowledge construction, rely on providing online access to raw results, theories and ideas and focus on opening up the research process [8], [11]. An important element of the Science 2.0 concept is the publication of drafts and non-finalized output, which brings insights that are not possible to replicate in a protected environment. Such draft products enable shorter and more frequent feedback mechanisms and continuous improvement [12]. *Research 2.0* or *Science 2.0* practices rely heavily on Web 2.0 tools like wikis, weblogs, social networking, RSS, etc. Such new forms of disseminating and communicating scholarly information permit scientists to create enriched conversations, digital modes of expression and participate in forms of information communication that represent an alternative to the traditional system of scholarly communication. While Science 1.0 is characterized by text and the document-centric paradigm, research in the Web 2.0 environment is very much about people and communities that have become the new central focus of scientific processes [13].

However, despite interesting possibilities of applying Web 2.0 technologies in science, a review of published literature shows that use of Web 2.0 in academic research has not been overwhelming to date. Research evidence suggests that the Web 2.0 will not prompt the kinds of radical changes in scholarly communications in the short or medium term. For example, the research findings by Procter, et al. [9] demonstrate that only some Web 2.0 services, mainly the generic, intuitive and easy to use services that are built upon existing practices, are experiencing rapid uptake. At the same time, many researchers are discouraged from making use of new forms of scholarly communication because they are unable to put their trust in resources that

have not been subject to traditional peer review [9]. Similar research results are documented in other studies [14], [15]. At the same time, longitudinal data shows indications that use (active or passive) of some social media and networking tools in research is slightly on the increase among Generation Y doctoral students [15]. This is consistent with Arms & Larsen [4] who predict a more intensive uptake and identify younger scholars as early adopters of innovations such as Web search engines, Google Scholar, Wikipedia, and blog science. Other authors also refer to evidence that many postgraduate and postdoctoral researchers are changing the ways in which they acquire and share research information including taking advantage of Web 2.0 technologies to "pre-publish" research papers [16]. Although at this point of analysis it looks like Web 2.0 services will not replace established media and information channels in science, the power of Web 2.0 services and technologies should not be underestimated. Web 2.0 services already bring new qualities into research processes and therefore probably will at least supplement the traditional ones.

3 Relevance of Information Literacy Training in Web 2.0 Research Environment

3.1 Information Literacy in Web 2.0 Environments

There is no doubt that social media have caused deep impact in the Library and Information Science (LIS) field and IL as well. Some authors interpret the interdependence of IL and Web 2.0 through a *tool* perspective [17], [18], [19]. Within this perspective, Web 2.0 is perceived as a rich source of diverse tools that enable IL teaching enhancement and more engaging and active methods of teaching users.

However, a rising number of authors recognize a much deeper and more complex relationship between IL and developments of participative Web 2.0 environments [20], [21], [22], [23], and some even go so far as to label this relationship *Information literacy 2.0* [24], [25], [26], [27].

However, many of the arguments and concerns that are raised by authors who analyze the relationship between information literacy and social media have been put forward in earlier writings, either as a plea for more holistic views in information literacy or in forms of critical perceptions of highly skills-oriented IL practices. One of the first holistic views on IL was articulated long before the advent of social media and Web 2.0 technologies by Shapiro & Hughes who defined IL as a "new liberal art that extends from knowing how to use computers and access information to critical reflection on the nature of information itself" [28]. The concentration on information tools and technology rather than on information per se – as content and semantic – [29] is a problematical feature of many IL endeavours. Another set of similar critical observations refers to the skills-orientation that is in particular expressed in IL standards. According to Webber and Johnston [30], the use of a set of standards as a framework significantly reduces a complex structure of competencies and knowledge to limited and isolated units.

Such critical reflections on IL are echoed within Web 2.0 environments. More holistic and less tools- or technology-oriented approaches to IL are essential because of profound shifts in how information is flowing online. For instance, some of the concerns raised by S. Webber in the early 2000s are of even greater relevance with "the possibility to publish things quickly via Web 2.0, and the ways in which people are able to (and often encouraged to) share information". Therefore, contemporary agendas for IL education draw on new perceptions [23]:

- IL is context specific and sensitive,
- IL is not just searching, but also encountering, browsing, monitoring managing and creating,
- people move between the virtual and physical worlds, using different sources and spaces,
- IL with people sources,
- people being information literate individually and collaboratively [23].

Main themes that emerged out of the interdependency between IL and Web 2.0 environments are information overload, authority and credibility, erosion of information contexts, multi-perspectiveness and negotiation, communities, new information genres, subjective and personal information organization, etc. Bawden and Robinson [22] identify the changing information Web 2.0 environments as the cause of current information pathologies: "The variety and diversity of novel forms of information and communication resources within Web 2.0, and their sheer number, clearly contribute to the overload and other issues…".

According to Hapke [25], the emphasis on existing information literacy concepts lies in searching information and learning with information, which has to be questioned: "More than efficient retrieval and navigation strategies, information literacy today includes the creativity to organize and shape one's own information and learning process in a conscious and demand-oriented way, therefore IL 2.0 is more about learning about information than learning with information".

An interesting recent critique of existing IL research and practices that was inspired by the emergence of Web 2.0 and its potentials in creating information was expressed by I. Huvila: "Even though the term information literacy may be considered to refer to a idea of using information in a broad non-specific sense, the conceptions of information literacy discussed in the literature have tended to focus on the seeking, locating, receiving and evaluating information" [31]. With Web 2.0 tools IL research and practices can and have to shift towards some of their neglected dimensions like the creation, organization and management of information.

Many facets of current IL practices still reflect a strong dependence on a print-based culture which is incongruent with the transient and hybrid nature of Web 2.0 environments [26]. Print based environments are much more stable, structured and linear. In digitized and Web 2.0 environments information is decoupled from its material carrier, but equally from authority and sometimes trust. In recognition of this, issues like credibility and authority, intellectual property, coping with

information overload or problems in privacy, understanding publishing mechanisms and gaining true understanding of contemporary information environments should become part of IL activities.

3.2 The Significance of Information Literacy in New Research Landscapes

Researchers, scientists or future researchers like PhD students are expected to conduct original scholarly research. For this reason, they have to acquire competencies related to the efficient application of various procedures involved in conducting scientific inquiry, such as the ability to ask valid questions and gather and analyze information, to evaluate ideas, proofs and arguments, to defend and communicate them. These more complex scholarly activities are based on basic competencies of finding, evaluating and using information. To put it differently, the basic building block of research is information and information literacy as the ability of finding, evaluating and using information can significantly enhance the research process. However, researchers do not deal with any kind of information but scholarly information. Therefore, IL for researchers has a strong focus on the universe of scholarly information, which itself has gone through a tremendous change in the last decade, particularly as a result of the appearance of Web 2.0. IL for researchers, while focusing on scholarly information, should certainly be informed by the transformations that scholarly information and research processes have gone through.

The last decade has brought changes in how researchers discover and gain access to information resources relevant to their research and how they create and manage information resources of new kinds. Reconfigurations within domains of scientific activity, research cultures and scholarly communication have a direct impact of how IL training for researchers is focused, structured and offered. In particular, this assertion refers to thematic focus of IL sessions and issues and problems such sessions should deal with. More exactly, IL for researchers should be informed by issues raised within the "Information literacy 2.0" discourse described in the previous section, but in the research environments those issues are even more complex and urgent. It is necessary to focus IL programs for researchers on the specific aspects presented below [13]:

Issues of Trust and Authority: Scientific data and research are traditionally captured and locked within traditional valued sites of research, like journals or academic databases, which make activities like locating or evaluating scientific information convenient, transparent and reliable. As opposed to centrally managed and structured information environments, the research process today includes sites of information not stewarded by traditional information gatekeepers and publications or other non-traditional scholarly objects that lack the imprimatur of publishers, but still may be of scientific value. Borgman [5] also commented on this issue: "[Quality] indicators included publication channels, selection by libraries and citation rates. With fewer external quality clues available, individuals must make more sophisticated judgments about whether to trust a document or a source". For every scholar today it is crucial to

be aware of issues surrounding the trustworthiness of data and to learn to express doubt over the provenance or accuracy of posted information. IL programs should therefore draw the attention of the researcher to these new issues and enable him/her to determine authority, significance and scholarly validity of new sources and sites of scholarly information.

Understanding Novel/Alternative Forms of Disseminating Information: Scholarly communication before the Internet required the intermediation of publishers, libraries, etc. Intermediation is not a prerequisite for finding or accessing scholarly information any more. Although traditional journals are still vital components of scholarly communication, next to and in parallel with them new and alternative forms of scholarly output and sources have emerged that do not fit into existing traditional publication models. Even when consulting authoritative sources, the researcher is not confined to traditional scholarly domains (e.g. peer-reviewed publications, academic databases, etc.) but potentially may include blogs, self-published items, datasets, simulation or presentations in this quest for high-quality information. A deeper understanding of these forms within IL sessions could help researchers make informed decisions on whether to use particular alternative forms of scholarly information in any given case.

Managing and Communicating Research Information and Data: As changes in the scholarly domain are possible and according to the opinion of some authors will quite likely happen [6], [7]; [32], postgraduate researchers should be introduced to new information spaces and instructed in how to express themselves in this new context, how to organize resources for themselves and contribute to these new environments not just as users of information, but as creators and co-creators as well. This not only includes the creation of scientific content, but also the ability to take part in user-oriented organizational practices (tagging and creation of research-focused digital collection of links, collaborative managing of web links and bibliographic data). Particularly with the infusion of technology into research endeavors scientists rely more and more on networks of personal contact for accessing and acquiring information. Many scientists today share their ideas over informal networks of communication or participate in social media networks which offer access to unverified data and preliminary ideas and theories. Various communication channels like interpersonal communication and networks at different levels, including membership groups or invisible colleges are becoming an ever more important source of information [10].

Alternative Forms of Evaluating and Pre-Reviewing Scientific Works: Social navigation or collaborative filtering systems that have spread in the Web 2.0 environment offer opportunities not just for accessing and sharing scientific content, but also to evaluate it and supplement traditional forms of peer-review of it. User judgments, reviews, tags or comments are inherent to Web 2.0 services and allow users to identify the most popular or best rated articles on a general level or articles that users with similar profiles have bookmarked and tagged. The more scientists tag

a document, the more relevance this article seems to have for these people. According to Stock [33], click rates (and additionally download rates), the number of tagging users, and the number of comments linked to articles become criteria for relevance ranking. These systems offer new indicators for evaluating scientific work, although it would be more precise to define them as popularity instead of quality markers. Insights into these emerging types of discovery and evaluating scholarly information are relevant for researchers and should be considered in IL training.

Building Reputation and Research Prestige Online: As stated before, there is no doubt that scientific research is increasingly undertaken, shared and communicated online in a highly collaborative fashion. Discussions on authority and credibility have shown that new forms of scholarly practices raise serious questions concerning identity of individuals who contribute to an expanding range of different forms of digital expressions as part of their scientific activities. This is not only an issue for users, but also for creators of scientific information. How to maintain a good reputation and research prestige online will be a crucial question for researchers. Other, albeit commercial domains (e.g. Amazon ratings) have already shown how important it is to build a good internet reputation which generates attention and influence. This is a significant aspect of Science 2.0 that is based on measures of implicit and explicit data (such as incoming links, page views or ratings). Information literacy activities should raise researchers' awareness of both positive and negative aspects of creating scholar identity in the digital environment

The contemporary researcher acts and works in information landscapes characterized by increased complexity and new and alternative forms of scientific output like wikis, blogs, social bookmarking sites, etc. Therefore, IL frameworks for researchers should focus less on resource discovery, especially on traditional library tools, while dealing more with evaluation, information management and authority issues. Such a conceptual adaptation of IL gains in importance in the context of Web 2.0 and reflects new IL research paradigms captured in the notion of "information literacy 2.0" described in previous sections. However, conceptual transformations are always slow processes and the same may be assumed for approaches to IL. Existing research evidence [34], [21], [35] suggests that a classical approach to IL still prevails in many libraries, despite shifting needs of researchers and transformed landscapes of scholarly communication. The results of a national study addressing these questions will be presented in the next section.

4 The Case of Croatian Libraries

4.1 Research Questions and Problem Statement

When analyzing the state of IL in Croatia, assertions similar to those regarding the whole South-East European region can be made. South-East Europe is certainly one of the regions which lags behind in positive global IL development with few

exceptions [36]. Despite low expectations regarding IL offerings at Croatian academic libraries, in 2011 a survey was conducted in order to a) determine the percentage of academic libraries active in IL training for researchers, and b) define the extent and scope of such offerings, specifically whether these offerings conform to the need of modern/future researchers who have to deal with highly complex 2.0 landscapes.

4.2 Data Collection

Data collection was based on a combined methodology (e-mail questionnaire, telephone interview, information presented on library web sites). First, questionnaires were administered to 62 academic libraries in six Croatian universities via direct e-mail. In cases where no response from libraries was received per e-mail, direct telephone interviews were set up. Where responses could not be acquired by e-mail or telephone, information about IL offerings was gathered by analyzing library web sites.

4.3 Survey Instrument

The questionnaire comprised the following two sets of questions: 1) questions concerning formal features of information literacy education (number of hours, elective or mandatory, number of credit points); and 2) content coverage and methodological features. The second part of the questionnaire was essential for answering the stated research question. Responses pertained to thematic focus of IL sessions (e.g. database search, types of information resources, search strategies, etc.) and their underpinning pedagogy (e.g. presentations, lectures, hands-on activities, etc.).

4.4 Selected Results

The surveyed sample included 62 academic libraries (5 university libraries, 57 faculty/department libraries). The survey questionnaire elicited 45 responses either by e-mail or telephone (e-mail n=18; telephone n=27), which was an overall response rate of 73%. Where response could not be obtained by e-mail or telephone, web sites were analyzed in order to determine educational services the library offered. The assumption was that libraries without presentation and promotion of IL on their web sites did not provide such service at all. At none of the 17 analyzed web sites was information on IL courses presented, meaning that those libraries do not offer specialized IL sessions for researchers systematically as part of their service. However, eight libraries offer e-guidance pertaining to IL elements (how to cite, how to retrieve academic databases) on a very generic level and not tailored to special researchers' needs.

Out of 45 responses gathered by questionnaire or telephone interview, 10 respondents (16%) claimed their library offers IL for researchers regularly as a part of

the normal library service. Some 57% of libraries (n=35) indicated their library does not offer information literacy courses regularly but individually, ad hoc and on demand. For the rest of the sample (27%, n=17) web sites were analyzed and no indication of IL offerings for researchers determined (Fig. 1).

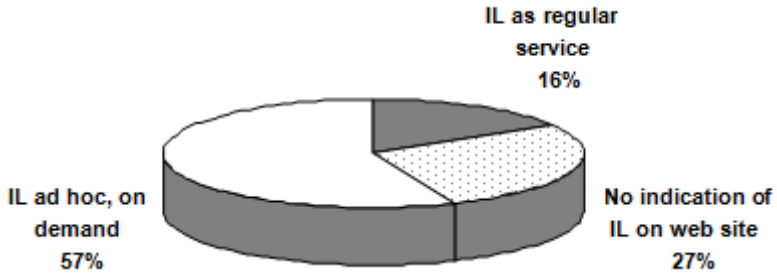

Fig. 1. IL as a regular library activity

Despite the small number of responses confirming IL as a regular library activity (16%; n=10), interesting conclusions regarding formal, thematic and pedagogical features of IL education for researchers could be drawn from detailed descriptions provided by respondents.

Questions regarding formal features of IL sessions elicited some interesting insights:

- Seven out of 10 libraries that offer formal IL training for researchers carry out only the simplest and most fundamental forms of introduction to the library and information resources ranging from 1 to 4 hours, usually at the beginning of semesters;
- Only two libraries reported that their IL training course offered credit (Faculties of Medicine, University of Zagreb and University of Split);
- Three libraries indicated deeper and more extensive approaches to IL ranging from 18 hours (Faculty of Law, University of Zagreb) to 30 hours (Faculties of Medicine, Universities of Zagreb and Split);
- Two libraries restrict their researcher-oriented IL sessions to their faculty's academics;
- In just one library (Medical Faculty, University of Zagreb) information literacy sessions are obligatory.

Responses collected in telephone interviews revealed a very indicative, yet unexpected aspect of professional perception of IL. Thirteen percent (n=6) of librarians commented either in the questionnaire or in the telephone interview that PhD students receive IL training because they have a course on Informatics/ICT which is mandatory, meaning that no additional training provided by the library is

needed. Such comments demonstrate that confusion between IL and computer/ICT literacy exists and librarians treat those literacies as one and the same concept.

Responses pertaining to the content of IL sessions for researchers were crucial for clarifying questions that represent the rationale of the study; those questions refer to new approaches to IL that address challenges posed by the Research 2.0 environment. The distribution of IL themes for researchers offered in Croatian academic libraries is shown in Fig. 2.

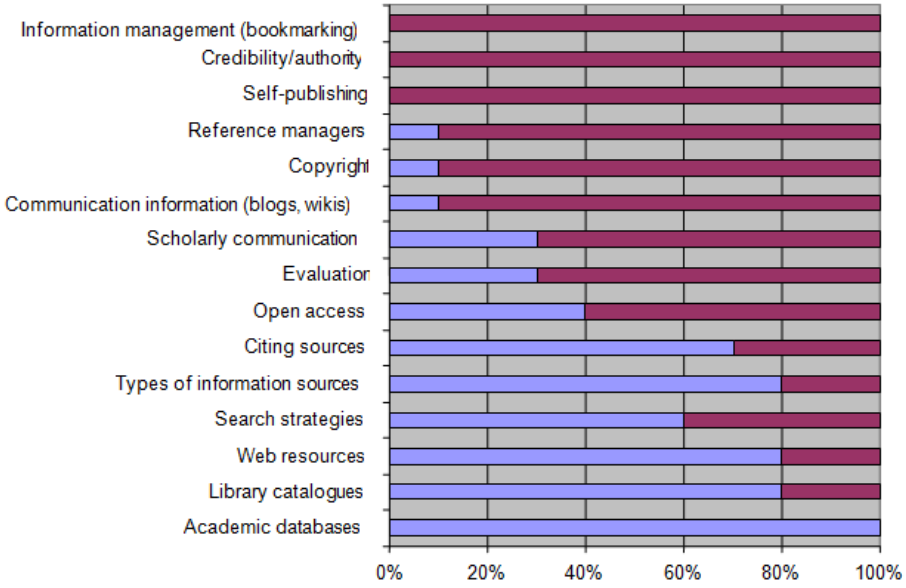

Fig. 2. Thematic focus of IL sessions for researchers

The thematic focus of IL sessions shows a prevalence of training concerning the use of very specific electronic tools like academic databases, library catalogues or web resources. All libraries that provided a positive response on offering IL services in a systematic way train their users in searching academic databases. Clearly, the chart demonstrates a strong orientation towards content relating to access and retrieval and information seeking while other elements of IL like evaluating or communicating information receive much less attention or are not at all represented (Fig. 2).

An analysis of libraries offering IL instruction by research field and discipline shows a significant prevalence of libraries in the field of applied sciences (medicine, engineering) and science (mathematics), while from the wide array of social sciences just two libraries offer IL on a regular basis (law, economics). The examination by scientific branches also shows that academic libraries from the humanities are not represented at all, i.e. do not offer IL systematically (Fig. 3).

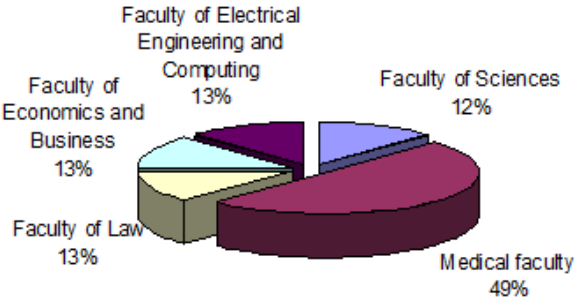

Fig. 3. IL services in academic libraries by research field and discipline

The last section of the questionnaire referred to methodological approaches in IL training sessions. The set of responses revealed that libraries apply more traditional forms centered mainly on lectures and demonstrations, combined with structured exercises. As stated before, eight libraries developed some kind of e-guidance or tutorials with IL themes, but only one library offers a more advanced form of tutorial with an integrated quiz. However, after analyzing these sources it was concluded that these tutorials are generic and not tailored to the specific needs of researchers but to the wider academic community. Two libraries employ group work during IL sessions. Other alternative pedagogical approaches like case studies, group discussions, reflecting learning/research experiences, engaging with alternative forms of scholarly information, portfolios etc. are not indicated as common IL training frameworks (Fig. 4).

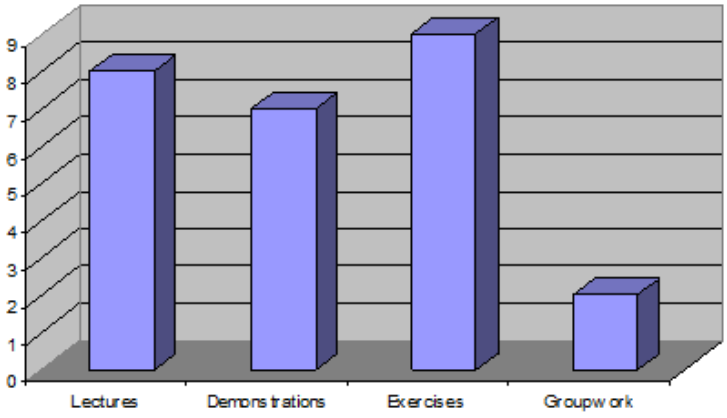

Fig. 4. Pedagogical approaches applied in researcher IL training

5 Discussion

Responses drawn from the first questionnaire section clearly demonstrate that activities in IL represent a marginal sideline of the library service which is in most cases offered ad hoc, individually and on demand. Systematic approaches to IL are rather rare and in the case of Croatian academic libraries employed in 16% (n=10) of libraries included in the sample. Even when librarians acknowledge IL as a regular library service, such researcher training with the exception of two medical faculty libraries carries no academic credits. Credit offerings command the attention of students, faculty and administrators and serve as the key indicator of what an institution considers essential in the education of its students [37]. Therefore, present practices in Croatian academic libraries cannot be described as effective. The teaching role of academic librarians continues to be predominantly restricted to very limited classroom engagements in the form of one or two hour sessions at the beginning of PhD programs or academic semesters.

An examination of academic libraries by scientific field shows that libraries at faculties of medicine were the most successful in integrating IL into PhD curricula and offering IL sessions for researchers. According to [38], the reasons for such advancements are probably the changes and innovations in the structure and process of medical education, with a strong orientation towards preparing physicians to cope with the explosion of medical scientific knowledge and technology and a desire to inculcate in physicians a habit of lifelong learning. Furthermore, the mandate of the medical school is to teach the principles of scientific method and evidence-based medicine, including analytical and critical thinking, throughout the curriculum. IL instruction may play a key role in these activities.

The central focus of the study pertained to Web 2.0 issues that define contemporary research environments. Within such environments researchers have to deal with new and alternative forms of scholarly communication and have to learn how to manage personally held information. They also need to learn how they might articulate and communicate their findings in novel genres and how they can build and maintain their scholarly reputation or create networks in new environments. However, the research findings have elicited a highly “library-centric” view of IL in Croatian academic libraries where access and retrieval and the use of specific tools receive much attention while issues of information authority and credibility, critical appraisal of research evidence, copyright, community/networks, open access and personal information management are rarely or not at all elaborated.

The identified library-centric and tool-based approach to IL is also visible in pedagogical approaches to IL training. Most of the training focuses on specific information sources and tools through demonstration, lectures or defined linear hands-on activities that are often employed when training users in searching databases. A wide variety of other, pedagogically more sound, forms of IL instruction that could convey deeper and more critical insights into information environments are neglected.

6 Conclusion

Current developments in the information universe can be perceived principally as the drive for shifts in the way scholarly information is accessed, evaluated, disseminated,

communicated or shared. Scholarly information has undergone revolutionary transformations in the last decade, particularly as a result of the appearance of Web 2.0.

The Web 2.0 has caused the outbreak of different information phenomena, and called attention to issues like information overload, authority and trust, novel forms of disseminating and communicating information, open access, ethics, scholarly reputation, etc. These issues should become the focus of IL training for researchers. In other words, IL activities should concentrate less on finding or searching for information and instead deal more with evaluating and communicating information and promoting a deeper understanding of ever more complex information environments.

A survey among Croatian academic libraries was conducted in order to determine whether such transformation of IL training for researchers is visible. Beside expected low percentages of libraries offering any kind of IL session for researchers on a regular base, the study also showed that libraries concentrate on a relatively narrow subset of IL in the form of traditional library topics such as searching and finding sources in libraries. Academic libraries must realize that the Web 2.0 has changed how researchers find and use information and has brought about issues that seriously influence scientific processes. In order to make IL more relevant for researchers (or relevant at all), it is necessary to include such issues in IL programs because some of those issues will very soon influence careers of many researchers who will need to make informed decisions about them.

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Information Literacy in Legal Education: The Case of Istanbul Bilgi University

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Abstract. The main purpose of the law is to seek justice by solving both individual and social conflicts in society and thereby achieve peace, equality and freedom. In order to achieve this goal, the rules of law should be understood in order to be implemented and interpreted correctly. Due to the rapid changes and increase in technology and information, the concept of information literacy is becoming more crucial in every field including legal education. The aim of this paper is to examine briefly the legal information skills and legal information literacy implementations worldwide and in Turkey, and to give information about the appropriate information literacy standards for undergraduate legal education. Information literacy practices at Istanbul Bilgi University Law Faculty are specifically mentioned.

Keywords: Legal information literacy, law librarianship, legal research, Istanbul Bilgi University.

1 Introduction

The Internet, and developments in information technologies, is one of the greatest changes in the information arena since the invention of the printing press. Change in information media has taken place in parallel to these developments with the amount and types of information resources increasing like an avalanche. In our time, when globalization is unavoidable, knowing where and how to locate and access needed information is more important than trying to obtain all the information related to our subject.

Efforts to share all kinds of information, often from unknown sources and of doubtful integrity, have resulted in difficulty in locating accurate information on the Internet in our digital world. Students use search engines to access information on the Internet and get masses of results that need to be selected, filtered and evaluated. To cope with these challenges, "digital native" law students, those born and grown up surrounded by modern computing and technologies – need to be equipped with the knowledge and skills to be information literate in order to understand, follow and manage the changes in the digital world.

Like students of other disciplines such as medicine and engineering, students majoring in law need to learn these new skills. Changes in the legal profession require

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meeting fast developing social needs. Current legal information is needed to make correct legal decisions. As with all professions, access to print and electronic legal information, and the skills to use and evaluate these sources, requires legal information literacy skills. Providing these skills to law students is important to assure social justice, the mission of jurisprudence.

The university library's main responsibility is to provide its patrons with information sources in all formats, classified systematically. Providing access to many information resources in electronic form along with applications of increasing information resource usage, reference and user education services is now more important than the previously time-consuming cataloging, classification and book recovery activities. University libraries have always given seminars, presentations and workshops to their students on how to access information sources. These activities are useful; however, they are insufficient for law students who need to gain skills in information literacy in law through planned and scheduled courses.

The present study considers the importance of information literacy and standards for information literacy in law at the undergraduate level in Turkey. Attention has been given to the scope, contents and evaluation of Istanbul Bilgi University's first year law course on "Research Methods and Access to Legal Information Resources". In addition, the results of a pre- and post-test to determine the knowledge levels of the students before and after the class during the 2010-2011 academic year are presented.

2 Information Literacy

Information literacy has been debated in the literature as a concept since its first usage by Paul G. Zurkowski in 1974 [1] and defined by many disciplines, organizations and authors. The American Library Association (ALA) defines the term as recognizing when information is needed and having the ability to locate, evaluate, and use required information effectively [2]. The term is also defined by the Council of Australian University Librarians (CAUL) as knowing when and why you need information, where to find it, and how to evaluate, use and communicate it in an ethical manner [3]. Besides the definitions, there are several models and standards of information literacy. The Association of College and Research Libraries' (ACRL) Information Literacy Competency Standards for Higher Education [4] is commonly used as a framework by scholars, librarians, associations, etc. A review of the literature shows that information literacy is not only related to information skills, but also to an integration of higher-order thinking skills, personal and interpersonal skills, and a mixture of literacy skills. Additionally, there are close links to social and economic issues as well as to ethical and legal issues [5].

The definitions of *legal information literacy* have generally been derived from the concept of information literacy and reshaped to be relevant to legal information and research [6]. One of the earliest studies defines the term as searching skills, analytical and evaluative skills and Information and Communication Technologies (ICT) skills [7]. It is also defined as the ability to locate legal materials (primary and secondary) – implicit in this is the knowledge of retrieval tools and techniques; evaluate the relevance, applicability and value of the materials to the task at hand; manage the

information by sorting, categorizing, ranking the information; use the information for the task at hand [8].

3 Standards and Principles of Legal Information Literacy

In any field, in order to evaluate a study as inadequate, adequate or superior, one requires standards and principles. In this context, it is necessary to have standards and/or principles to evaluate the legal information literacy studies efficiently and effectively.

There have been efforts to determine legal information literacy standards and principles. In 2009, a study was started by a group of US law librarians in order to determine a set of practical "Law Student Information Literacy (LSIL) Standards," and the group submitted their draft standards to the Executive Board of the American Association of Law Libraries (AALL). That group evolved into the Law Students Research Competency Task Force for developing the standards [9]. The task force presented in its report a set of "Law Student Research Competencies and Information Literacy Principles" accepted by the AALL Board in March 2011 [10]. These principles are as follows:

- ***Principle I: A successful researcher should possess fundamental research skills***
  - Law students should have an understanding of the complexities of the legal system.
  - Law students should know how to effectively use secondary sources.
  - Law students should have an awareness of the cost of research.
- ***Principle II: A successful researcher should implement effective, efficient research strategies***
  - Law students should select appropriate sources for obtaining required information.
  - Law students should construct and implement efficient, cost-effective search strategies.
  - Law students should confirm and validate research results, incorporating existing work product and expertise.
  - Law students should document research strategies.
- ***Principle III: A successful researcher should critically evaluate legal and non-legal information and information sources***
  - Law students should critically evaluate the validity and credibility of information sources.
  - Law students should critically evaluate retrieved information.
  - Law students should synthesize the results of their research to construct new concepts applicable to resolving the problem at hand.
- ***Principle IV: A successful researcher should apply information effectively to resolve a specific issue or need***
  - Law students should understand the context for the legal issue under analysis.
  - Law students should modify the initial research strategy as suggested by preliminary results.

  - Law students should determine when research has provided sufficient background to explain or support a conclusion.
  - Law students should use the results of their research to formulate their legal analysis and to prepare their work product.
- ***Principle V: A successful researcher should be able to distinguish between ethical and unethical uses of information and understand the legal issues arising from discovery, use, and application of information***
  - Law students should have a mastery of information ethics and should be able to articulate the factors that determine whether an information use is ethical.
  - Law students should apply laws, rules, and other legal authority that govern a lawyer's use of information in the course of practice.

The above standards and the principles can be used as a framework and applied to local needs for constructing an information literacy program for law students. Primary sources can be added to the skills in Principle I. Also, attention may be given to legal writing and communication skills, and time management skills.

The Law Student Information Literacy Standards [9] reflect the ACRL standards shown below:

- **Identify**: The information-literate law student should be able to identify the type and sources of information appropriate to the problem or issue at hand.
- **Access**: The student knows how to access the appropriate information effectively and efficiently.
- **Evaluate**: The student also evaluates the information and its sources critically, in order to properly incorporate the appropriate information into a reliable work product.
- **Apply**: The student applies the information effectively to resolve a specific issue or need.
- **Ethical & Legal Issues of Use**: The information literate student understands many of the economic, legal, and social issues surrounding the use of information, and accesses and uses information ethically and legally. This standard recognizes that students must be taught the social, economic and political issues surrounding information, specifically the ethical and legal uses of information and its technology.

These standards cover most of the concerns of stakeholders such as law librarians, instructors, lawyers and students. Bird [6] applied these standards to information literacy skills in law and gave the following three examples:

- Knowing about the need for authentication of sources on the Internet
- Some awareness of the great differences between search engines and the importance of asking the right question in the right way
- Understanding what is being searched, which in law could mean distinguishing between digests, encyclopedias, cases, opinions.

The number of these examples may be increased much more with the standards and principles; however, one of the most important things is to adapt them to local and professional needs. Moreover, the way they are introduced to the target students is important.

Beljaars [11] suggests emphasis on acquisition of the following skills by the first year undergraduate law students:

- The ability to classify subjects into different branches of law
- Identifying and classifying legal sources
- Using statute bundles; the ability to make a formal analysis of rulings
- Analyzing and problematizing legal questions
- Learning to deal with legal academic information
- The ability to generate simple and complex case solutions
- Learning to analyze facts, and consequently to distinguish legal questions
- Mastering the plagiarism rule.

Providing these skills to the law students will enable them to cope with local legal challenges as well as global challenges and will make them better in their education as well as in their work and daily life. It may also help to bring about better rulings based on knowledgeable research.

4 Overview of Legal Information Literacy Implementations

In the light of the definitions given above, and the content, aim, standards and principles of information literacy, there are several applications of information literacy in a legal setting for students. In his article Kauffman [12] mentioned four means of encouraging information literacy in law students:

- Offering mandatory law school courses in legal research
- Adding elective (non-required) courses in legal research
- Offering non-credit legal research support to law students at their point of need
- Testing prospective lawyers on their legal research competencies as a requirement for being licensed to practice law.

There are many universities offering courses, e.g. “Advanced Legal Research” at Yale Law School [13], “Advanced Legal Research Techniques” at Columbia Law School [14], “Legal Research Skills” at the University of Cambridge Faculty of Law [15] and “Legal Research” at the University of Sydney Faculty of Law [16]. These lectures are mandatory or elective and are sometimes embedded in other law lectures.

According to research done in the US in 2007 by the Association of Legal Writing Directors [17], 79 of the 149 universities responding had courses related to legal research. There are even more specialized legal research courses such as “Advanced Environmental Legal Research,” and “Health and Medical Research for Lawyers” [18].

5 Legal Information Literacy Implementations in Turkey

Before mentioning legal information literacy implementation in Turkey, one should look at the situation of information literacy in Turkey. According to Polat [19], the information literacy programs are inadequate at Turkish universities and information

literacy implementation is to be found only at Dokuz Eylul University and Sakarya University. However, nowadays there are many universities such as Koc, Bilkent, Ozyegin that provide information literacy activities such as library orientations, seminars, workshops, virtual reference, online tutorials, research guides, etc. Moreover, one of the activities in this regard is a web-based Information Literacy Program (HUBO) developed by Hacettepe University [20].

It is usual to give students in law faculties around the world courses that aim to provide information literacy skills. Before giving information on such courses in Turkey, the numbers of Turkish universities, law faculties, law students and academic staff are presented in Table 1. The number of universities in Turkey increased by 13% from 2010 to 2011 whereas the number of law faculties in Turkey increased by 55%. Moreover, the total number of undergraduate law students in Turkey increased by 17% whereas the total number of academic staff in law faculties in Turkey increased by 52%. It can be surmised that the increase in the total number of undergraduate students and the number of law faculties will result in increased demand for information literacy courses related to law.

Table 1. Legal education in Turkey by numbers [21], [22], [23], [24]

Number of	2010	2011
Universities	145	164
Law Faculties	44	68
Undergraduate Law Students	27.943	32.680
Academic Staff	1.302	1.975

The Turkish law schools have a four-year curriculum leading to a Bachelor's degree. It should be noted that the undergraduate nature of Turkish legal education makes it different from those countries in which legal education begins at the graduate level, such as the program leading to the Juris Doctor (JD), or Doctor of Jurisprudence, in the United States.

In general, all the university libraries have traditional user education activities [25] such as library orientation, seminars, workshops, one-to-one research assistance, virtual reference, online tutorials and research guides, but there have not been many semester-long, elective/selective or mandatory regular courses which integrate information literacy skills [26]. Similar user education / instruction activities also take place at law firms, courts and other related libraries. There are not many subject-specific research courses in Turkey. The first course designed specifically for law students with theoretical and practical instruction according to a syllabus for one full semester, related to information literacy in a legal setting, was offered to the 1st year undergraduate law students at Istanbul Bilgi University Faculty of Law in the 2009-2010 spring term as "LAW 105: Research Methods and Accessing Legal Information Resources." Maltepe University and Yeditepe University included such courses in their curricula from the beginning of the following academic year.

The Legal Research Methods course at Maltepe University Faculty of Law [27] concentrates primarily on definitions, research methods in law, print and electronic

information resources, how to access them, the use of theoretical knowledge in examinations, how to solve abstract and concrete legal problems and evaluation of court decisions. The course is given by law professors. Its expected learning outcomes for the students are as follows:

- To build knowledge on how to access information resources, both printed and electronic, using retrieval tools and techniques
- To read and evaluate legal texts and judicial decisions
- To acquire the skills necessary for solving abstract and concrete legal problems and presenting the results.

The Legal Research Methods course at Yeditepe University [28] aims to develop students' skills to conduct legal research and writing. The course is taught by law professors in the spring semester of the second year as a 2-credit course.

Hacettepe University Department of Information Management changed its undergraduate curriculum in 2011 and added a course titled "BBY 369: Legal Information Management" as part of a resource-centric approach to information management [29]. This is the first such course offered to students in Turkish LIS schools.

As mentioned above in the "Overview of Legal Information Literacy Implementations," legal research courses covering information literacy skills are common in many parts of the world. In light of the recent developments in Turkey, it is expected that the number of legal research courses covering information literacy skills will increase in Turkey in the coming years.

What follows is a detailed description of the course "LAW 105: Research Methods and Accessing Legal Information Resources" offered at Istanbul Bilgi University Faculty of Law and taught by library and information professionals.

6 Istanbul Bilgi University Faculty of Law Library

Istanbul Bilgi University was founded as a private, non-profit institution in 1996 and has three campuses. Having realized many firsts in its initial 10 years, and with the aim of enhancing the quality of its education and research and becoming a university that can compete globally, in 2006 Istanbul Bilgi University began a long-term partnership with Laureate Education, one of the largest international education networks in the world, and continues to be a part of this network. Istanbul Bilgi University is also an associate member of the European University Association (EUA) and has academic links with several European universities including the London School of Economics and Political Science of the University of London and the University of Liverpool. Istanbul Bilgi University currently has around 11,000 students, 600 academic staff members, 6 faculties, 4 institutes, 4 schools, and 7 programs associated with its Vocational Schools. Some 100 programs provide education to its associate, undergraduate and graduate students [30].

The Istanbul Bilgi University Law Library offers extensive support to the university's degree programs, research and teaching. An impressive collection of

books, periodicals, e-books, e-journals, academic Internet resources and other printed materials are available in the library.

The Bilgi e-Library as a whole contains 94,000 electronic books, 32,500 electronic journals, 86 electronic databases and encyclopedias. Access to these resources is via the Internet, on-campus or off-campus, and free wi-fi access is provided in all Bilgi Library locations. Some of the Law Library's e-Library databases of particular interest are: Beck Online, EUR-LEX, HukukTürk: Mevzuat ve İçtihat Bilgi Bankası (Turkish law database), Lebib Yalkın Yayınları (Turkish law database), LexisNexis Academic, LexisNexis JurisClasseur, Resmi Gazete (Turkish Official Gazette), Swisslex, United Nations Treaty Collection, Westlaw International and Yargıtay Hukuk Bilgi Bankası (Republic of Turkey Supreme Court Decisions) [31].

6.1 User Education Activities

Since the founding of the Faculty of Law at Istanbul Bilgi University, user education activities for law students have been given by librarians as classes and workshops at all levels. These focus on general orientation, research tools, electronic resources, library collections and academic Internet resources. They are offered several times each semester by faculty, subject and reference librarians to undergraduate and graduate students and academic staff, as well as to external users and special visitors. Faculty and subject specialist librarians help students and teach them how to access and use legal information resources in the libraries.

The Istanbul Bilgi University Faculty of Law, for the first time in Turkey, added a compulsory course known as "LAW 105: Research Methods and Accessing Legal Information Resources" to the first-year curriculum [32]. The course provides students with a working knowledge of academic research processes and research methods, covering printed and electronic legal information resources with recent academic research on the subject. The goals of the course are to develop students' academic writing skills, increase their exposure to the various applications used in academic research, and help them become proficient in using traditional and online library systems.

7 Research Methods and Accessing Legal Information Resources (LAW 105)

With the establishment of the Turkish Platform of Law Librarians in 2007 [33] under the Association of University and Research Librarians (ÜNAK), law librarianship is being considered as a special field within the Turkish library community. In the establishment process, a literature search was done in the field of international law librarianship to obtain an overview about the situation of law librarianship in the world. As a result of this research the web sites of the American Association of Law Libraries (AALL), the International Association of Law Libraries (IALL), the British and Irish Association of Law Librarians (BIALL), the Australian Law Librarians' Association (ALLA) and Yale, Columbia and Cambridge Universities (mentioned earlier in the "Overview of Legal Information Literacy Implementations") were examined. The Law Student Information Literacy (LSIL) Standards and the Research Instruction and Patron Services Special Interest Section of AALL were also reviewed.

It was thus determined that law librarians teach legal research as credit-based and compulsory courses in law schools/faculties around the world.

A literature search was also performed in Turkey by examining websites of the Council of Higher Education (http://www.yok.gov.tr/en/), the Turkish Librarians' Association (http://www.kutuphaneci.org.tr) and The University and Research Librarians' Association (http://www.unak.org.tr/). According to the Council of Higher Education website, 68 universities have law faculties. All of the 68 faculties' websites were examined to see whether they have a compulsory information literacy course related with legal information. It was found that there were no compulsory courses for law faculty undergraduate students in Turkey although there was quite a demand for such courses from both the faculty and students. Faculty members were struggling due to inadequate information literacy skills of the students. The students were lacking such skills and thought they could find any kind of information they might need through searching on the Internet or Google.

Professionals in the legal field, especially lawyers/attorneys, spend great amounts of time on research after their graduation from law school. Research by Thomson West in 2007 shows that, on average, 45% of the new attorney's first year of practice and 30% of years two and three will be spent conducting legal research [34]. These statistics show that the law school graduates who have information literacy skills are more in demand by the legal market, and this shows the importance of legal research and information literacy courses in legal education.

These results, in line with the demands – in terms of knowing, accessing, making use of legal information resources, and writing academically and ethically – from the Istanbul Bilgi University Law Faculty academics and students, indicated that a compulsory course given by librarians on these subjects would be of great benefit.

Taking into consideration the research mentioned above a 14-week mandatory course consisting of lectures, in-class practice, home practice, assignments, term project, quizzes, and final exam was prepared and the syllabus presented to the Dean of the Faculty of Law in 2009. This mandatory course proposal was very well received and it was decided to offer "LAW 105: Research Methods and Accessing Legal Information" in the 2009-2010 academic year. It is taught in the second semester of the 1st year, when the law students have had a semester to become familiar with the university and also with the legal profession. This 1-credit 2 hours a week course is taught by librarians.

Until this course was added to the curriculum, there were many user education activities at the Istanbul Bilgi University Law Library such as orientations, seminars, legal research instructions on invitation by a faculty member and legal database training sessions by librarians and by legal database vendors. It should be noted that the library still offers such instruction. The main difference between the course offered for credit and the other user education activities is that the course is mandatory and designed specifically for law students, giving theory and practical work in an orderly manner for one full semester.

7.1 Contents of the Course

- Introduction to what is happening in the information world
- The importance of information literacy

- Traditional and new research methods, tools, techniques
- Legal information resources
- Turkish print and electronic legal information resources
- In-class practice related to Turkish legal information resources
- Legal information resources in international law
- In-class practice related to legal information resources in international law
- Plagiarism, copying, and ethics
- Writing and citation
- In-class practice sessions related to writing and citation
- Hypertext, search engines and social networks
- The Internet, information pollution
- General evaluation

7.2 Aim of the Course

This course focuses on identifying, researching and accessing print and electronic legal information resources. In addition, the process of academic research, basic legal research methods and skills of academic writing are examined.

7.3 Objectives

- Provide information on the academic research process and methods
- Identify, access and use printed and electronic legal information resources effectively and efficiently
- Gain competency with practical applications in the field of law related to the consumption of resources
- Review some of the programs used in academic writing such as EndNote, RefWorks, and develop students' academic and legal writing skills
- Improve skills of students in using traditional and online library systems

7.4 Desired Learning Outcomes

Upon successful completion of this course a student is supposed to be able to identify, access, use, and evaluate printed and electronic legal information resources, develop academic writing skills and become proficient in using online library systems.

7.5 Evaluation

2 quizzes, 1 term project, 1 final exam.

7.6 Teaching Methods

Theoretical lectures, in-class practice sessions and guest speakers.

In order to measure the information literacy levels of the students before the course, a pre-test was administered in the beginning of the spring term of the

2010-2011 academic year in the first week of February, targeting 1st year Law Faculty students who were to take the LAW 105 course. Students were asked to answer 14 multiple-choice questions about information literacy in a legal context. Students were not given any explanations about the aim of the test. At the end of the spring term, the post-test was administered to the students. Some 206 students took the course and 54 of them who took the pre- and post-tests were included in the study. The aim of the test was to determine the impact of the course. The results of the tests (see the test in Appendix 1) are shown below:

Table 2. Pre- and post-test results

	Pre-Test Correct Answers		Post-Test Correct Answers	
Questions*	n	%	n	%
1. Which database shown below is more suitable for beginning international legal research?	24	44	53	98
2. Which Google database provides access to academic journals?	45	83	46	85
3. Which of the following is not a reference resource?	30	56	39	72
4. Which of the following is the main purpose of using online databases?	17	31	38	70
5. What does "Call number" mean in the library?	51	94	50	93
6. Where do you look for academic articles for your research?	48	89	42	78
7. Which search string gets more relevant articles about social networks in a database?	36	67	48	89
8. What transactions can you do with your library account?	42	78	48	89
9. What kind of information do databases provide?	36	67	46	85
10. Which of the following is one of the advantages of searching multiple databases by using the discovery service (Bilgi Academic Search Engine)?	35	65	47	87
11. Which of the following is not an option, if you couldn't find a full-text article in a database that we subscribe to?	26	48	34	63
12. What criteria must not be taken into account when evaluating Web resources?	29	54	47	87
13. Which of the following is an exercise of fair use for copyrighted works?	47	87	48	89
14. Which of the following fall under the scope of plagiarism?	44	81	51	94
Total	**510**		**637**	

* Some of the questions were taken from the Hacettepe University Information Literacy Program: http://hubo.hacettepe.edu.tr/.

As seen in Table 2, the pre- and post-test results show that the total number of correct answers increased by 25%. The highest increase in the percentage of correct answers is 54% in the first question. There were five choices in the first question:

ScienceDirect, ERIC, LISA, LexisNexis and SciFinder. In the pre-test three students responded ScienceDirect, six students ERIC, 16 students LISA, 24 students LexisNexis and 5 students SciFinder. In the post-test 53 students responded LexisNexis and only one student SciFinder. It can be concluded from the results of the first question that students responded randomly without having knowledge and choosing all the choices in the pre-test, whereas only one student responded wrongly and the rest responded correctly in the post-test.

One of the most interesting findings of the test is in the Question 6. In this question "Where do you look for academic articles for your research?" there are five choices: Magazine, Database, Newspaper, Web page and Catalog. In the pre-test 48 students responded database, five students web page and one student catalog. In the post-test 42 students responded database, one student newspaper, 11 students catalog. Interestingly, as is shown in Table 2, the percentage of correct answers in the post-test decreased by 11% according to the pre-test results. This could have resulted from the place of the catalog link which is next to the discovery service (BASE) link on the library web page or from a confusion of the concepts. Both possibilities show that more concentration is required on the two concepts.

On the other hand, the total number of incorrect answers decreased by 48%. The biggest change is in the number of unanswered questions which decreased by 79%. It is observed from Table 2 that there is an increase in the number of correct answers to the questions about knowing and using legal databases and using web-based resources. It is also seen that the students' knowledge on library systems and applications increased. It can be concluded that this course had a positive impact on students' information literacy skills.

Moreover, in the last lecture of every semester, there is a one-hour general evaluation of the topics when students are asked by the course instructors to evaluate the course and give their feedback verbally in order to improve the course. It should be noted that although most of the students who took this course gave positive feedback, they also shared the following recommendations, that there should be:

- an elective in Advanced Legal Research class in the 4th year before graduation
- an increase in computer-based in-class practice sessions
- an increase in the course credit from 1 to 2 or 3 credits
- an inclusion of writing in the first weeks as well as more writing practice during the course
- attention to improving IT skills such as MS Word, EndNote and RefWorks.

8 Conclusions and Suggestions

Applications both in Turkey and worldwide have shown that courses given by librarians on legal research with information literacy skills will benefit law students. Due to the rapid transformation of information resources from print to electronic, and the disappearance of the boundaries between countries, law students should have the ability to locate and access, evaluate and use national legal information resources as

well as international legal information resources. Particularly with the exponential increase in the amount of legal information, they should acquire correct techniques of learning.

It is found from the case of Istanbul Bilgi University that such subject-specific courses can be successful and give students the skills they need during their legal education, professional and daily life to cope with the challenges of the digital world. Particularly, it is seen from the pre- and post-tests and evaluations that the teaching style and catching the students' interest is very important.

The legal research topic that covers information literacy skills may be put into the Bar Examinations so as to encourage law students to develop these skills during their legal education.

The recommendations below can be taken into account for a successful course related with legal research covering information literacy skills in Turkey:

- A task force or working group should be formed under the Turkish Platform of Law Librarians
- Best practices should be shared between university libraries regarding information literacy
- The AALL standards and principles should be adapted to local needs
- There should be a compulsory course in the 1st year and an elective class like Advanced Legal Research in the 4th year before graduation
- In-class practice should be intensive
- The course should be at least 2 credits to encourage students' interest
- Writing should be put into the first weeks and should be practiced on more than one occasion
- There should be lectures to improve IT skills such as MS Word, EndNote and RefWorks.
- Some relevant outside speakers should be invited to the class, e.g. database vendors and practicing lawyers
- Librarians should be given pedagogic education.

It can also be concluded that the progress mentioned above, namely the establishment of the Turkish Platform of Law Librarians, opening of the Legal Information Management course at Hacettepe University and the three courses on legal research and information literacy in the law faculties, have been instrumental in developing the law students' information literacy skills.

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Appendix 1

Pre- and Post-test Questions

1. Which database shown below is more suitable for beginning international legal research?
   a. ScienceDirect
   b. ERIC
   c. LISA
   d. LexisNexis
   e. SciFinder

2. Which Google database provides access to academic journals?
   a. Google directory
   b. Google books
   c. Google blogs
   d. Google images
   e. Google scholar

3. Which of the following is not a reference resource?
   a. Encyclopedia
   b. Dictionary
   c. Law bibliography
   d. Newspaper
   e. Almanac

4. Which of the following is the main purpose of using online databases?
   a. To find books in the library
   b. To search information on the web
   c. To find and access to articles published in the scholarly journals and reports
   d. To follow current news
   e. To find information on a topic

5. What does "Call number" mean in the library?
   a. Shows the place of the material in the library
   b. Shows the journal which the requested article is in
   c. Shows the place of the article in the journal
   d. Shows the place of the web page in the web
   e. Shows the place of the information in the database

6. Where do you look for academic articles for your research?
   a. Magazine
   b. Database
   c. Newspaper
   d. Web page
   e. Catalog

7. Which search string gets more relevant articles about social networks in a database?
   a. social network
   b. "social network"
   c. social AND network
   d. social OR network
   e. social AND net*

8. Which transactions can you do with your library account?
   a. Renew materials
   b. Create alerts
   c. See the materials that have been checked out
   d. See previous research
   e. All

9. What kind of information do databases provide?
   a. Bibliographic
   b. Summary
   c. Full-text
   d. Information about database
   e. All

10. Which of the following is one of the advantages of searching multiple databases by using the discovery service (Bilgi Academic Search Engine)?
    a. To save time
    b. No need to learn the features of different interfaces
    c. No need to compare the search results
    d. No need to know which database to use
    e. No need to know which database covers related sources
    f. All

11. Which of the following is not an option if you couldn't find a full-text article in a database that we subscribed to?
    a. Other library online databases
    b. Other print journals in the library
    c. Databases of other libraries
    d. E-journals in the library
    e. Online catalog

12. What criteria must not be taken into account when evaluating Web resources?
    a. Reliability
    b. Objectivity
    c. Design of the text
    d. Currency
    e. Domain names

13. Which of the following is an exercise of fair use for copyrighted works?
    a. Wholly duplicate the work
    b. Sell the work
    c. Copy a part of a work for personal use
    d. Adapt the work to a film
    e. Perform the work in musical

14. Which of the following fall under the scope of plagiarism?
    a. Copy information without giving reference
    b. Copy and paste information from the web without giving reference
    c. Paraphrasing an information without giving reference
    d. Summarize a work without giving reference
    e. All

Managing and Managers of Academic Libraries

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Abstract. This paper looks at attitudes about leadership and decision making among leaders in academic libraries in Norway and Romania. Two different surveys were conducted, containing similar questions, and the results were compared. The surveys uncovered demographics – "who are the leaders?" as well. One of the findings that concerns the status of the library leaders is that in Romania they are considered academics, and this is also mirrored in their backgrounds. For Norway, the recruitment to a leader position in the academic library comes through the ranks, so to speak – most academic library leaders have already worked in the library before they become leaders. This background is different from the Romanian situation. To what extent it also has implications for attitudes about leadership remains to be seen, or whether the differences that can be observed in the attitudes between the academic library leaders in the two countries can be explained otherwise.

Keywords: Leadership, academic libraries, Norway, Romania.

1 Introduction

Libraries can be seen as warehouses for information, and when the information world changes, so must the libraries. In this paper we look at how leaders of academic libraries think and act in coping with changes that affect their libraries.

The warehouse metaphor is maybe too passive, and academic librarians globally have been forced–by personal inclination, by decisions made by the university or college they serve, by the changing times in academia and technology – to become more pro-active in order to survive.

An important feature in the discussions about librarianship of the future, and especially about academic librarianship, where many of the issues within e-science and information management are likely to be experienced most acutely, is the extent to which academic librarians are able to make strategic decisions about the way forward by themselves and, as they see fit in cooperation with staff, or whether the academic institutions to which they belong will be making those decisions on their behalf.

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The paper reports findings from two surveys among academic librarians. One was carried out in Norway in the fall of 2011.[1] The survey was sent out to 35 university and college libraries and 78 librarians responded to the questionnaire. Since the total number of university and college librarians in Norway is 145 [1], the response rate is approximately 50%. In the survey, in addition to demographic information – age, gender, type and size of library, educational background, how long they have been a leader or worked in the library – the survey also investigated how decisions are made, by whom and with what kind of influence. The requirements (formal and others) for the job and the way leadership is conducted were also explored. The questions were posed in Norwegian, and the text of the questionnaire and answers were later translated.

The second survey was carried out among Romanian academic librarians from universities with government funding that are taking part in a new acquisitions consortium formed in early spring 2012. In this survey, the respondents were asked to reply to background questions, and to questions similar to those in the Norwegian survey about attitudes and ideas about different aspects of leadership. The questionnaire was translated into Romanian from Norwegian through English. During the translation questions were altered and fewer alternatives were offered for replies. The survey was sent to 25 library directors. Eleven directors replied, giving a response rate of 44%. Since the actual number of replies was relatively small and the questions were altered (with fewer choices of response than in the Norwegian survey), the Romanian data is presented either in narrative form or in more concentrated tables.

2 Leadership in Libraries

The survey is modeled closely on similar surveys of various groups of Danish and British library leaders [2], [3], [4], [5]. The Danish surveys were done in close cooperation with the Danish Association of Librarians, and aimed at uncovering and supporting issues within library leadership. Seen together, they give a fascinating picture of library leaders' changing focus, from being mainly concerned with the internal workings of the libraries to focusing a much higher degree of attention on the circumstances surrounding them [3]. In their research Landøy and Repanovici [6] found that this shift is even more pronounced for the Norwegian library leaders.

The changing surroundings are concerns for leaders of all kinds of libraries, and to a certain degree all libraries are under the same set of pressures from user expectations and rapidly changing technology, with the internet and electronic information sources being recognized as the most prominent. In the academic world, however, there are additional pressures from scholars' needs for access to the best possible and most up-to-date sources of information, and academic libraries that

[1] The Norwegian survey is part of Ane Landoy's ongoing PhD research to be submitted to the Royal School of Library and Information Science in Copenhagen, Denmark. Original research includes 243 library leaders from both public and academic libraries. Here, only some of the results from her research regarding academic library leaders are presented.

cannot deliver what their students, researchers and academic staff require will rapidly face threats of economic cuts or even of closing. Many academic libraries around the world are also facing severe economic problems due to the global economic crises and are looking at more efficient ways of fulfilling their visions and missions. This will include among other things the use of the new technological possibilities to create other sets of services, and to promote them to the users as improvements [7].

In the Scandinavian context, most research about libraries is done on issues concerning public libraries and their role in society, while academic libraries are seldom the subject of studies. "Leadership" as a library topic is also not very well investigated. Still, recently there has been some research done on academic library leadership. Also globally, the interest in management and leadership issues has increased, in the LIS field as well as in the public sector and in business and organizational research generally [4].

Professor Peter Hernon at Simmons College in Boston, USA, is one of the leading LIS academics who have written extensively about leadership in the LIS-profession, although mainly from a US perspective, and within the traditional US educational framework. In his recent book *Shaping the Future* [8], he lists some of the ongoing research trends. They are quite similar to the current trends in general (not library-specific) management research.

3 Findings

3.1 Educational Background

Table 1 shows the educational background of the Norwegian academic library leaders. More than two-thirds of the Norwegian academic library leaders were educated as librarians for three or four years in one of the LIS schools in Norway, Denmark or the UK. There is also a substantial group who have a minor in LIS with a major in another discipline. The group with a master's in LIS is small, which is not surprising since the master program at the Oslo University College (where the majority of Norwegian librarians are educated) is relatively new.

The Norwegian law for municipal libraries states that library directors or top level leaders have to be educated as librarians in an institution offering a LIS degree. There is no such formal requirement for leaders of academic libraries, and it is only rarely that advertisements for vacant positions mention a master's degree in LIS. There are, however, a number of leaders with a degree in leadership subjects, or a master's degree in other academic subjects.

Table 1. Educational background of library leaders in Norway (N= 78)

Degree	n	%
Librarian	53	68
LIS part of degree	13	17
Master's in LIS	3	4
Degree in leadership	9	12
Master's in other disciplines	17	22
Other	4	5

In Romania, the picture is somewhat different. 27% (3) of the academic library leaders were educated as librarians, but nobody has a postgraduate degree in LIS. The rest have a master's (27% - 3) or PhD (46% - 5) degree in fields other than LIS. In Romania, according to the law, university library directors are academic staff. That is probably why just a few have had their main education in one of the LIS schools.

3.2 Leadership Responsibilities

As for the Norwegian library leaders, findings indicate that 92% (69) of respondents have operational responsibility while 80% (60) have responsibility for staff, and 88% (66) have responsibility for finances. The mean number of staff for whom the respondents have responsibility was 11. The staff responsibility includes individual follow-up and assessment of subordinates, human resources, personnel policies, recruitment, etc. while the operative responsibility includes practical facilitation, coordination and professional quality management in the libraries.

So for Norway we see a picture of somewhat smallish libraries, divided into several branches and departments, and the leaders having direct responsibility for a limited number of staff. At the same time, we find that the mean length of employment with leadership responsibility in the library is 12.5 years while the mean work experience in the library sector is 22 years. The leaders can therefore be seen as quite experienced, having worked in the library before they become leaders, and also as library directors at the time of answering the survey. There seems to be a tendency among employers to prefer experienced librarians as leaders in academic libraries, as we can see from the difference in the mean number of years in employment in a library and the mean number of years as leader in a library.

The leaders of Romanian academic libraries also have operational, staff, and budgeting responsibilities. Ninety-one percent (10) have responsibility for coordination, 82% (9) for professional quality management and 64% (7) for practical facilitation. Regarding responsibility for personnel, 91% (10) have individual follow-up and assessment for personnel, 82% (9) are responsible for human resources, 64% (7) for personnel policies and 64% (7) for recruitment. 73% (8) have budget responsibilities.

As for Romania, the mean length of employment with leadership responsibility in the library is 15 years. Figures vary from 5 months up to 29 years. Contrary to the Norwegian situation, most library leaders have been employed as library directors from the beginning of their employment in the library. In Romania, one can become a library leader without previous experience in the same library, and can stay there throughout his/her entire career. Most of the respondents have had this position for more than 10 years, and all were over 40 years old at the time of the survey.

3.3 Leadership – Making Decisions

From the background variables an image of Norwegian academic library leaders emerges: they have a solid basis as experienced librarians and leaders, and medium to long education. How this influences their thoughts on decision making is also explored. Respondents were asked about their opinions on certain statements regarding decisions made in the library.

Table 2. Agreement with statements about decision making (Norway)

	DA %	AaL %	A %	QA %	TA %	N/A -DK %	N=
Strategic decisions by library leadership	3	10	5	33	48	2	63
Strategic decisions delegated in organization	22	16	16	25	17	5	64
Staff have large influence on decisions	5	18	21	38	19	-	63
Agreement important	3	16	18	48	15	-	62
Strategic decisions made by owner organization	16	18	13	21	21	11	62
Library influence on owner's strategic decisions	9	22	17	28	16	8	64

DA: Don't agree; AaL: Agree a little; A: Agree; QA: Quite agree; TA: Totally agree; N/A – DK: Not applicable or don't know.

The most striking replies here are the 22% of Norwegian library leaders who reply that they don't agree with the statement "many strategic decisions are delegated in the organization", and the 16% who agree only a little. Even though slightly more than 50% of the respondents to some extent agree, the number of non-agreement and little-agreement can be seen to run counter to most research on leadership in the Nordic countries. One typical example of findings from research in Nordic leadership is Schramm-Nielsen et al [9] who found "a management style characterized by informality, equality and restraint. . .[and] a consensual, participative and inclusive approach to decision making and change implementation" in their study of Nordic managers in different businesses [9]. In the Danish survey from 2007, however, Pors found something similar. His theory is that the academic institutions at top (rectorate) level make decisions that the library has to adhere to. Also, both the Danish and Norwegian academic libraries are smallish with little room for strategic decisions.

In the academic libraries agreement on decision making is very important, both for Denmark in 2007 [3] and Norway in 2011. On the other hand, we see that the overwhelming majority of Norwegian academic library leaders quite agree or totally agree that strategic decisions are made by the library leadership. This supports the same tendency, that the top leadership makes strategic decisions rather than overseeing delegation in the organization.

Table 3. Agreement with statements about decision-making (Romania) (N=11)

	%	n
Strategic decisions by the library leadership	55	6
Strategic decisions are delegated in organization	36	4
Agreement about strategic decisions	73	8
Strategic decisions made by parent organization	27	3
Library has influence on owner's strategic decisions	45	5

In the Romanian survey, the questions were asked as "agree/don't agree". Some 73% of Romanian academic library leaders claimed that agreement about strategic decisions is important in their libraries while 45% said that the library has influence on strategic decisions, and 55% agree that these decisions have to be made by library leaders. About one-third agreed that "many strategic decisions are delegated in the organization", and even fewer (27%) agree that "strategic decision are made by the owner organization". Similarities as well as differences with the Norwegian findings are detected: one of the main differences is the significantly lower agreement with the statement about strategic decisions being made by the library leadership. At the same time, both the Norwegian and Romanian library leaders agreed that it is important to have agreement about strategic decisions.

Strategic leadership is more than just making decisions. In Table 4, influence ascribed to different aspects of leadership in relation to staff was explored. We see that the formal position, competences and personality/relations are understood as most important, and that "punish and reward" are much less significant for leaders in Norway.

This shows an image of a leader with persuasion as a leadership tool instead of dominance and reliance on force. It is also in tune with the picture we have of the Norwegian academic library leaders, in smallish libraries, with relatively long work experience in the library, first as staff and then as leader. The fact that many seem to have been promoted "from the ranks" will also influence their relation as leaders to staff. This phenomenon is well known in areas other than the library sector also.

Table 4. Influence ascribed to different aspects of leadership in relation to staff (Norway) (N=60)

	NS	AbS	MS	SS	LS	N/A - DK
	%	%	%	%	%	%
My formal position	3	12	18	33	33	-
My knowledge and understanding	-	5	13	35	47	-
My possibilities to punish and reward	42	35	7	7	-	10
My possibilities to manage resources	7	10	17	32	32	3S
My personality and relation to other people	-	-	10	25	65	-

NS: No significance; AbS: A bit significant; MS: Medium significance; SS: Some significance; LS: Large significance; N/A –DK: Not applicable or don't know.

As for the Romanian survey, questions were asked as "agree/don't agree". Some 91% of Romanian academic library leaders agreed with the importance of academic knowledge and understanding, while 73% agreed with the importance of the possibility of managing resources. Only 36% found possibilities to punish and reward to be important. The least important influence is ascribed to the formal position.

Romanian leaders in academic libraries rely more on their academic knowledge and understanding, while Norwegian leaders think of their formal position as a more significant influence than the Romanians do. This is probably because the Romanian library directors are recognized as academics in their universities, and therefore consider themselves just as much academic staff as library directors. This is also in accordance with their educational background, where the Romanian leaders to a much higher degree are PhD holders from other academic disciplines, not LIS. For both groups of leaders the possibilities to punish and reward are seen as less significant.

We have also seen an indication that this group of Romanian library directors to a lesser degree than the Norwegian library leaders were recruited from library staff, but they came from outside the library to become directors. It would be interesting to research this further, to see whether it is true for all Romanian library leaders, and what differences in perceptions and attitudes can be explained by this.

Table 5. Influence ascribed to different aspects of leadership in relation to staff (Romania) (N=11)

	%	n
My formal position	27	3
My knowledge and understanding	91	10
My possibilities to punish and reward	36	4
My possibilities to manage resources	73	8
My personality and relation to other people	27	3

The degree of agreement with statements about the job situation and the framework for decisions is explored in Table 6. We see that the Norwegian leaders have quite clearly defined targets, responsibility and authority, and hardly ever doubt where a task belongs. On the other hand, almost half do not have a written job description although they have a clearly defined leader on the next level.

Table 6. Agreement with statements about job situation (Norway) (N=60)

	DA	AaL	A	QA	TA	N/A - DK
	%	%	%	%	%	%
I have clearly defined targets	10	23	18	38	10	-
For staff, it is obvious that I am the leader	2	8	23	40	27	-
I have clearly defined responsibility and authority	2	13	23	30	32	-
I have a written job description	40	5	8	8	35	3.3
I never doubt where a task belongs	17	12	18	33	20	-
I have a clearly defined leader at the next level up	15	17	13	15	40	-

DA: Don't agree; AaL: Agree a little; A: Agree; QA: Quite agree; TA: Totally agree; N/A – DK: Not applicable or don't know.

The situation is a bit different for the Romanian library directors. All have very clearly defined responsibility and authority with 73% having written job descriptions, 64% with a clearly defined leader at the next level up and never doubt where a task belongs, and 46% are sure that for staff it is obvious that they are the leader.

Table 7. Agreement with statements about job situation (Romania) (N=11)

	%	n
I have clearly defined targets	100	11
For staff, it is obvious that I am the leader	45	5
I have clearly defined responsibility and authority	100	11
I have a written job description	73	8
I never doubt where a task belongs	64	7
I have a clearly defined leader at the next level up	64	7

4 Conclusion

We have analyzed two quite different systems of academic libraries, both of which have developed new and modern libraries in recent years. Perhaps the Norwegian system can be said to be more advanced regarding implementation of new information and communication technologies. Our first conclusion is that library leaders in both countries are confronted with the same user needs, with the same information preferences for the tools of the new generation.

From these two surveys we get an image of academic library leaders in smallish libraries, with responsibilities for personnel and budgeting, and to a certain degree also for strategic decisions. The libraries are, however, clearly parts of their universities, and major decisions are made at the top level (Senate or equivalent). The Norwegian academic library directors seem to be recruited through the ranks, and the Romanians mainly from outside the library. The Romanian academic library leaders are also more often considered as academic staff of their university. Some of the differences in perceptions and attitudes may be explained by this, but further research and more respondents would be necessary for a better picture.

In the discussion about the future, with e-science and the roles of (academic) libraries as points of focus, one needs to take into consideration the fact that strategic decisions often are made on the top level. The libraries may be allowed to suggest, and may also be consulted about plans for e-science, but the final decision will be at Senate level.

No matter where they are situated, library leaders have to be familiar with the latest technology developments and the latest devices to provide information. They have to promote a continuing education system that is up to date, also for the librarians. They have to keep up with marketing and other research regarding users' needs for any kind of information.

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The Status of Librarians' Knowledge Sharing by the Usage of Web 2.0 Tools: A Case Study of Central Libraries of Tabriz Governmental Universities

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Abstract. The main aim of this research is to survey the status of the use of web 2.0 tools in knowledge sharing of 37 librarians who work in central libraries of Tabriz Governmental Universities. Findings indicate that they desire to use such tools. The most important reasons for the usage of web 2.0 tools in knowledge sharing are speed and ease of use, managing personal knowledge, easier communication with users and colleagues. More than half of them stated that lack of knowledge in the use of these tools and lack of familiarity with these services are the main obstacles. The relationship between age, gender, education, level of experience, library section they belong to and (a) the rate of usage of web 2.0 tools in knowledge sharing, and (b) the level of familiarity with knowledge sharing concept is not significant. However, there is significant relationship between librarians' education and the usage of web alerting as well as between the level of familiarity with knowledge sharing concept and the level of use of some web 2.0 tools.

Keywords: Knowledge sharing, web 2.0, Tabriz governmental university, librarians.

1 Introduction

Nowadays, with the advent of modern information tools, users collaborate and participate more and share knowledge by means of Web 2.0 tools. Academic librarians due to the professional nature of their job and their interaction with professors, students and researchers ought to empower users' skills in the usage of modern information tools such as Web 2.0 tools. So librarians using these tools will be able to share their knowledge with their colleagues in order to meet their users' needs faster and more efficiently. In the next step, they can teach their users how to use these tools for knowledge sharing in a collaborative way.

Knowledge sharing is the key element in fruitful and effective knowledge management programmes [1]. Targeted knowledge sharing in organizations causes individuals and organizations to learn faster, develop creativity and, finally, improve individual and organizational functionality [2]. People usually do the activities they have a tendency to do. It's expected that people are interested in sharing knowledge

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with positive attitudes towards it [3]. Knowledge sharing requires sustainable commitment, creativity and interactive learning process [4]. Sharing knowledge creates new knowledge and improves the effectiveness of organizational performance [5].

Most of the researchers believe that sharing and transferring knowledge, particularly in this age, is significant and organizations should continuously learn to be creative to survive in a competitive environment [6]. Without sharing knowledge, knowledge management will not be effective and organizations will have to leave the competitive atmosphere gradually [7].

2 Literature Review

The term ''Web 2.0'' was coined by O'Reilly [8]. It refers to a perceived second generation of community-driven web services such as social networking sites, blogs, wikis, etc. which facilitate a more socially connected web where everyone is able to communicate, participate, collaborate and add to and edit the information space [9], [10], [11], [12]. Given the aforementioned characteristics, Web 2.0 has also been commonly referred to as the ''social web''. Participation is a key feature of Web 2.0, which is structured around open programming interface that allows any user to freely create, assemble, organize (tag), locate and share content [13], [14]. Web 2.0 is very close in its principles and attributes to knowledge management. Web 2.0 should have effects on knowledge management in organizations. The adoption of Web 2.0 tools will increase participation of users [15].

Recently Web 2.0 websites such as wikis and blogs have enhanced digital sharing (e.g., videos, images, journals, etc.). Users no longer just passively receive information. Now they can respond by sharing their knowledge with others [16]. In contrast to complicated web programming languages and print publishing, most Web 2.0 sites are free and have made it easy for users to create a personal space where they can share information immediately, hence making collecting, establishing, sharing, and transmitting information more rapid [17], [18].

The aim of effective knowledge management is to enable everyone to gain from the intellect, imagination, potential and enthusiasm of people working in and with organizations [19]. Although there are philosophical arguments around whether knowledge can be managed at all, in practice, most organizations attempt to manage knowledge creation and sharing through a mixture of people, process and technological tools and techniques that are designed to improve performance and add value [20].

For the knowledge-based company, managing organizational knowledge is a way of establishing a competitive advantage. Knowledge sharing is central to this goal [21]. Knowledge sharing is not only the biggest challenge and obstacle in knowledge management, but also the most important factor in measuring the performance of the knowledge management or organizational learning. Within an organization, knowledge sharing can be done through informal, unsystematic and non-daily routines [22].

Web 2.0 has reinvented the concept of knowledge management towards the vision of facilitating interaction, cooperation and knowledge changes between individuals, groups and communities. This vision acknowledges the synergy between both personal and collective dimensions in managing knowledge work [23]. New knowledge management tools enable knowledge-intensive organizations to better capitalize, share and reuse knowledge and thus to be more efficient, more flexible and more innovative. Web 2.0 tools (including social media) generate strategic advantages for companies, multiplying opportunities for collaboration and knowledge sharing [24]. Furthermore, the use of social media (and its techniques) is expected to grow significantly over the next few years [25].

According to Kuhlen [26], the understanding of knowledge management has undergone a paradigm shift from a static, knowledge-warehouse approach towards a more dynamic communication-based or network approach. Similarly, Hazlett, McAdam and Gallagher [27] maintain that the literature in knowledge management has moved away from focusing on the explicit dimensions of knowledge (i.e. the computational paradigm) to the tacit dimension of knowledge (i.e. the organic paradigm). The latter paradigm, unlike the former one, Hazlett, McAdam, Gallagher [27] argue, is a dynamic, people-centric approach that takes into account cultural problems and motivational issues in knowledge sharing [14].

The knowledge management literature has identified a wide range of factors that influence the knowledge sharing behavior. These factors can be categorized as technological, organizational or environmental, and individual or personal factors [28], [29]. The questionnaire we used in this study is designed according to these factors.

The most related research to this study is carried out by Sotirios and Alya [14]. In their study 11 in-depth interviews were conducted and, additionally, secondary data were collected. Grounded approach was used to analyze data. Research findings indicated four key determinants of knowledge sharing by the use of Web 2.0 technologies: history, outcome expectations, perceived organizational or management support and trust. “Trust” is highlighted to be a key determinant of participation in Web 2.0 platforms. It is highly recommended that top management take an active leadership role in introducing Web 2.0 technologies, communicating their benefits and articulating how they fit into the organization’s knowledge management strategy and, ultimately, how they could help achieve organizational objectives.

It is equally important to provide the necessary training and have the appropriate reward systems in place. It is also important for management to avoid mandating or enforcing knowledge sharing using Web 2.0. Tseng and Huang [18] investigated the correlation between knowledge sharing through Wikipedia and job performance. The results indicated that there is a significant correlation between the two, implying that enterprises could employ Wikipedia to increase willingness among workers to share knowledge and enhance job performance. The findings of Kang, Chen, Ko and Fang [30] can be used as reference resources by those who want to employ wiki system as the on-line knowledge-sharing tool in organizations. In their paper, researchers followed the phenomenological research methodology. The results show that the essence of experience of knowledge sharing by applying wiki collaboration system

can be grouped under four themes: mass collaboration with co-workers to construct knowledge, infrastructure of wiki collaboration system, collaborative knowledge sharing design, and scaffolding as the learning facilitator.

Payne [20] indicated that social software has the potential to help organizations develop collaboration capability, but the bottom-up features that make it attractive to users can also make it unattractive to groups of people with a stake in preserving existing organizational structures.

The present study addresses the use of Web 2.0 tools for knowledge sharing.

3 Aim and Scope of the Research

The main aim of this research is to survey the status of the use of Web 2.0 tools for knowledge sharing by librarians who work in central libraries of Tabriz governmental universities. Survey focused on the following: librarians' familiarity with knowledge sharing, their believes about the influence of Web 2.0 on knowledge sharing, their reasons for using these tools, their usage rate and familiarity with Web 2.0 tools, main obstacles in the use of Web 2.0 for knowledge sharing,. What strategies are important to promote librarians' skills to use Web 2.0 tools for knowledge sharing and what educational measures should be taken to educate them to use these tools to share their knowledge were also investigated.

Findings will help to develop strategies to promote critical thinking skills of librarians and their abilities to share knowledge which eventually help them providing better services to users.

3.1 Research Hypotheses

- There is a significant difference between gender, age, level of education, experience, library section they belong to and
  - the level of use of Web 2.0 tools in knowledge sharing by the librarians;
  - the level of familiarity with knowledge sharing concept.
- There is a significant difference between the level of use of Web 2.0 tools and the level of familiarity of knowledge sharing concept.

3.2 Operational Definitions

Knowledge sharing (KS): It is a process that through which people can transmit their knowledge interactively, so that individual knowledge turns to organizational knowledge, as a result there is an opportunity to learn new experiences and exercise their experiences, skills and capabilities [31].

Librarians: 37 people who are working in 4 Tabriz governmental universities included 4 universities named Azarbaijan University of Tarbiat Moallem, Tabriz University, Tabriz Islamic Art University and Sahand University of Technology.
Web 2.0 tools: RSS, Weblog, Podcast, Wiki, Facebook, Instant message, watermark sites (such as Digg), Google alert, Twitter, Flickr and Google Doc, etc.

4 Findings

Findings show that 40.5% of research community included women and 59.5% men. The largest group of subjects were 30-35 years old (37.8%). All librarians hold degrees in Library and Information Science in different levels,: 83.8% bachelor level, 13.5% master level, and 2.7% doctoral level.

Some 5.4% of research community has experience less than 5 years, 29.7% between 5 to 10 years, 21.6% between 15 – 20 years and 16.2% more than 20 years. More than half of librarians work in cataloging/classification and circulation departments of libraries (Fig. 1).

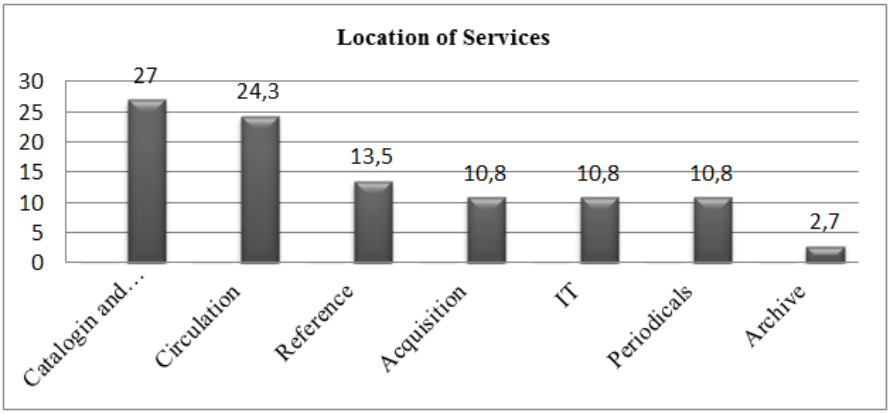

Fig. 1. Section librarians belong to

4.1 Librarians' Concepts for Knowledge Sharing

Almost a quarter of librarians are much (21.6%) and very much (2.7%) familiar with the concept of knowledge sharing while more than 20% have little (18,9%) or very little (2.7%) familiarity with it. More than 60% believed that the use of Web 2.0 tools have an influence on facilitating and sharing knowledge.

All librarians mentioned that by knowledge sharing they can keep themselves up to date. Almost all of them believe that sharing knowledge empowers their self-confidence and make them more successful in meeting users' information needs. On the average, 62.1% of the research community use Web 2.0 tools often and very often to share their knowledge. The status of the use of these tools by librarians is acceptable, although it needs to be promoted further.

4.2 Familiarity with the Usage of Web 2.0 Tools

Almost 60% of librarians are much and very much familiar with instant messaging, 48.6% with wikis and 43.2% with social networks (Fig. 2). Very few librarians are familiar with Flickr (2.7%), Twitter (2.7%) and bookmarking sites such as Dig (5.4%).

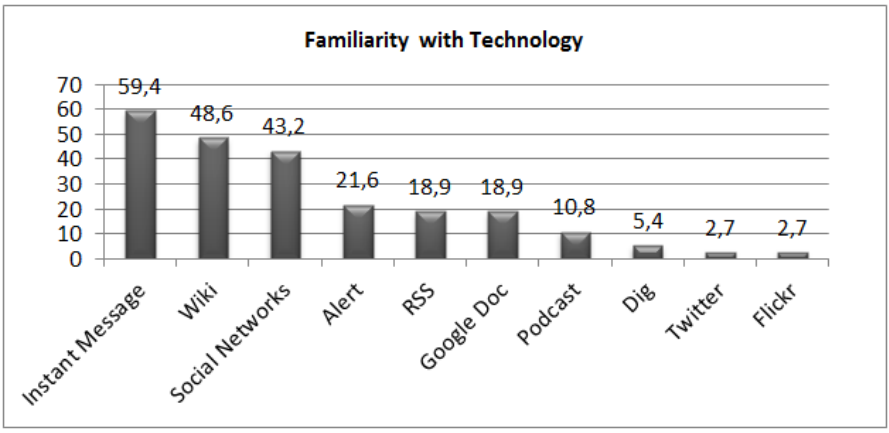

Fig. 2. Familiarity with Web 2.0 tools (much and very much)

4.3 Use of Web 2.0 Tools for Knowledge Sharing

More than half of librarians use instant messaging often and very often to share knowledge while very few librarians use Dig, or Twitter or Flickr to do so (Fig. 3).

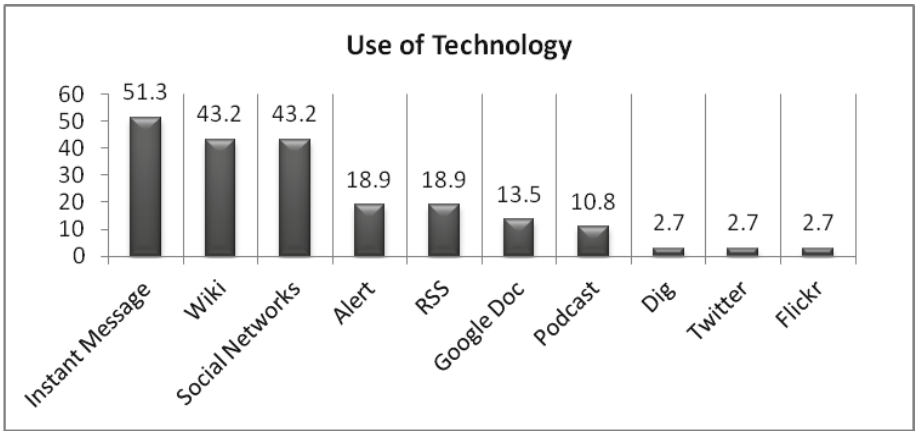

Fig. 3. Use of Web 2.0 tools (much and very much)

4.4 Reasons for the Use of Web 2.0 Tools for Knowledge Sharing

In regard to main reasons for librarians' usage of Web 2.0 tools, the most important reasons are, respectively, speed of usage, ease of use, personal knowledge management (because it is a collection of processes that a person uses to gather, classify, store, search, retrieve, and share knowledge in his or her daily activities, also it is a bottom-up approach to knowledge management), easier communication with far

away users and colleagues, finding answers for topical questions, discussion about new concepts and ideas, avoiding answering similar questions, receiving help and feedback and helping to reduce numbers of emails.

4.5 Main Obstacles for Effective Use of Web 2.0 Tools

Table 1 summarizes the main obstacles of effective usage of Web 2.0 tools. More than half of librarians believe that the lack of knowledge, lack of familiarity with these services, inadequate hardware and software facilities, inadequate awareness of the value of the usage of these tools, lack of support at the university with filtering are the most important obstacles of the effective usage of Web 2.0 tools.

Table 1. Main obstacles for the use of Web 2.0 tool

Main obstacles	Percent
Lack of knowledge in the usage of these tools	64.9
Lack of their familiarity with these services	59.5
Inadequate hardware and software facilities	56.8
Inadequate awareness of the value of the usage of these tools	54.1
Inadequate feeling of professional responsibility	51.4
Lack of the support of these tools in the university with filtering	51.4
Lack of skilled librarians	27.0
Fear of inadvertently shared confidential information	21.6
Not used by other colleagues	18.9
Lack of confidence in the usefulness of knowledge sharing	16.2
Lack of confidence in the quality of shared information through these tools	8.1
Lack of trust in others to shared information through these tools	8.1

4.6 Strategies to Promote Librarians' Usage of Web 2.0 Tools for Knowledge Sharing

Findings indicate that librarians think holding workshops (54.1%), in-service training (51.4%), usage of internet and electronic resources (29.7%) are much and very much needed to promote the use of Web 2.0 tools for knowledge sharing (Table 2).

Table 2. Desired strategies

Strategies	Very much (%)
Holding workshops	54.1
in-service training	51.4
holding familiarity tours about Web 2.0 tools	35.1
Usage of Internet & electronic resources	29.7
short term computer training courses	24.3
Presenting educational pamphlets	24.3
long term computer training courses	21.6
Membership and participating at LIS associations	13.5
Usage of online databases, such as Eric, Emerald, Elsevier	13.5
Usage of LIS journals & quarterlies	8.1

4.7 Training Opportunities Offered to Teach Modern Tools for Knowledge Sharing

One third (32.4%) of librarians mentioned that holding workshops, 8.1% preparing facilities to take part in scientific conferences, 40.54% professional short term education and 5.4% presenting educational pamphlets are the prepared educational measures that are presented by central libraries of Tabriz governmental universities to educate librarians in order to promote their skills to use Web 2.0 tools for knowledge sharing efficiently.

5 Hypothesis Tests

To test the research hypotheses, Mann Whitney and Kruskal-Wallis tests are used. Findings indicate that there is no significant difference ($p > .05$) between gender, age, level of education, experience, library section they belong to and (a) the rate of usage of Web 2.0 tools in knowledge sharing, (b) the level of familiarity with knowledge sharing concept. However, there is a significant difference between the librarians' education and the usage of web alerting. Also, there is a significant difference between the level of familiarity of knowledge sharing concept and the level of usage of Web 2.0 tools (RSS, Weblog, Podcast, Social network, Web alert, Twitter).

6 Conclusion

Findings indicate that librarians are most familiar with instant messaging while they are less familiar with Flickr and Twitter due to filtering. Weblogs are used most often as Web 2.0 tools to share knowledge.

The results of the hypothesis testing indicate that there is a significant difference between the librarians' education and the usage of web alerting. As a result, using professional staff in the realm of library and information science who are familiar and up-to-date with of the use of IT (Web 2.0) in libraries seems to be a good strategy to offer better and more effective services to users. Also, offering an educational course in the field of "modern information tools (such as Web 2.0 tools) in academic libraries" will be helpful.

There is a significant difference between the level of familiarity of knowledge sharing concept and the level of the usage of Web 2.0 tools (RSS, Weblog, Podcast, Social network, Web alert, Twitter). So, holding educational workshops on the topic of "knowledge sharing concept for librarians" will raise the awareness and help them use these collaborative tools effectively. Factors such as education level and the level of familiarity of knowledge sharing will improve the level of the usage of Web 2.0 tools.

Librarians should try to keep themselves up-to-date and do their best to adapt themselves to new technologies. They should make efforts to collaborate and share their knowledge with their colleagues through in-depth training sessions, intensive educational courses, workshops and pamphlets, which could be helpful in terms of

updating their knowledge and promoting their skills to offer better and efficient services to end users.

There is a constant avalanche of information flowing out there; it is vital for librarians or information scientists to promote critical thinking, creative and research skills - and become better (informed) librarians, scholars and lifelong learners of tomorrow. But, more importantly, they should try out promoting their skills to share knowledge by the use of modern tools to improve collections and services. So, managers ought to force their staff to share their knowledge collaboratively via modern interactional tools and try out to reward them for instance for "top and up-to-date weblog", "post on wiki" or "watermarked resources on related sites". Eventually, through this approach they will find that missing piece to the organization's knowledge management puzzle, create new knowledge and manage it effectively.

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A Questionnaire for the Institutional Assessment of Personal Information Management

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Abstract. The purpose of the research was the development of a questionnaire that can measure the behaviour of groups of students (for instance department cohorts) in Personal Information Management (PIM). Variables for the questionnaire were derived from the international literature on PIM. The questionnaire was tested on 79 students (last year before graduation) from four different departments of the Academy of ICT&Media at The Hague University of Applied Sciences. The students' responses were checked on consistency, item non response, desirability bias and information value of the results. All these criteria indicated that the questionnaire is an adequate tool for the assessment of PIM at an institutional level. The results that have been found for the four departments have not yet been discussed with the managers of the Academy or of the individual departments.

Keywords: Information literacy, personal information management, questionnaires.

1 Introduction

Information literacy is often considered as a set of skills to solve specific information problems [1]. The Scoring Rubric for Information Literacy that is described in a previous paper [2] is an example of a tool that can be used to assess students' performances for such information problem-solving tasks. However, academics use many other conceptions of the phenomenon information literacy [3]. One of those conceptions is the "information control conception" [3]. This conception of information literacy is about "storing information (usually documents), in a fashion which ensures easy retrieval. For example, all the information is selected on the basis of its likely value for future use in research or teaching" [3].

1.1 People Still Build Their Personal Information Collections

People appear to prefer the use of information that is easily accessible. McGeachin [4] reports a 1999 research paper from Hurd, et al. that found that scientists were accustomed to using easily accessible information and often cite "those titles that

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were in the library closest to them" and David Owen [5] reported that "many scientists and health professionals turn to their personal collection of documents as their primary source of information". But this was before the common use of digital information and electronic journals and nowadays the most convenient ways to obtain information are the World Wide Web and the electronic (journal) collections of the institutions where people work [6]. However, this does not mean that people rely solely on retrieving information from the Web or their institutional electronic journal collections at the moment that they need it. A lot of information users prefer to use information sources which are personally known to them [7] and they still keep personal information collections for future use [8]. While building such collections, they interpret the information they have encountered and evaluate it before deciding to keep it. This process assists them in remembering the information at the moment that it suits them. In other words, it helps them to avoid the situation that the existence of an item is forgotten entirely, at the moment that it could be useful for them [9]. The previously mentioned Hemminger, et al. [6] found that more than 85% of the scientists they surveyed maintained a personal article collection, in print or electronically.

Coughlan and Johnson [10] discovered a similar practice among creative practitioners (in their case "film makers") who collected interesting materials and ideas which came along more or less accidentally and which were not really related to the projects they were currently working on. The maintenance of collections like these by scientists, scholar authors and more general information workers might also be motivated by the argument that they prefer to have reliable and relevant information at their fingertips at the moment that they compose their creative products rather than having to carry out the labour-intensive work of evaluating a long list of information items after a retrieval session.

The finding that people build personal information collections seems to be true not just for experienced information workers like scientists, scholar authors and creative practitioners. Head and Eisenberg [11] found that also college students do not rely solely on search engines but use personal collections (notes, books and magazines in print), besides turning to their friends, family and classmates when they need information for daily life. These findings seem to confirm that the "control of information" is really a valuable facet of the information literacy competence.

According to Christine Bruce [3] this "information control conception" should be distinguished from the "knowledge construction conception" that is also described by her. Critical analysis and meaning construction are important aspects of knowledge construction which in Bruce's opinion do not have to be a part of the information control conception. However, as has just been argued in this paper, storing information often needs evaluation and that is why it may be a good starting point for the construction of knowledge and may enable a learning process. This is particularly true when a person not only stores formal data or downloaded documents but also interprets the information in it for categorization and when he/she processes it cognitively [12], [13].

1.2 What Kind of Instruments Do People Use to Build Their Personal Information Collections?

Personal index cards are of course nearly out of use nowadays and have been replaced by databases or spreadsheet software with search opportunities. Bibliographic citation managers are particularly designed for building personal information collections and for using the references later to generate correct in-text citations and references but people seem to experience a lot of trouble using them. María Pinto and Dora Sales found that the Spanish "translation students" they surveyed were badly motivated to use bibliographic management tools and that these students also believed that their performance was impaired when using tools like these [14].

Much more popular are bookmarking tools: either the URLs are stored on a person's local computer or in the cloud (online/social bookmarking with, for instance, Delicious). More recent and still not well known by students are academic social networks like Mendeley (see, for instance, [15]). From the viewpoint of e-science the cloud solutions have the advantage that data can be shared with other people. Some bibliographic citation managers (for instance RefWorks) also provide this opportunity but as mentioned before those tools are not very popular [14], [15].

On the other hand, downloading personal copies of electronic files and storing them locally is a fairly common practice, by students as well as by professionals. Titles in file names and a hierarchical folder system are standard tools of the computer operating system that can be used to relocate those files [4]. A more advanced solution for the storage and retrieval of downloaded documents is the use of Personal Information Management (PIM) software that has the advantage of the integration of other types of information (email, contact information) in the reference collection [4].

My own observations of student groups have taught me that a lot of students keep a kind of log file in MS Word with metadata and URLs of documents that they have used, but also that some of them still rely on a paper note block. The more "net savvy" students send documents to their email account and use this as a kind of archive or they use a digital note tool like Evernote that gives them access to their personal notes at any place with any device.

2 Development of the Questionnaire

With the insights from the literature and my own observations as described in the introduction section of this paper, an online questionnaire was developed that can evaluate the practice in Personal Information Management of students in Higher Education. It was not the intention to develop a tool for the measurement of students' individual information performance but more an instrument that provides insights into the students' practices at an institutional level and that can provide suggestions for improvement of curricula.

The online questionnaire (in Dutch) is divided into an introduction and three "sections". A translation of the complete text of the questionnaire is attached as an appendix to this research paper. The first section after the introduction consists of only one question: whether or not they use such a personal information system. If their answer is "No, I don't save data. If I need a document or an information item, I

will search for it again" the respondents are directed to section 3 with four questions to categorize the respondents (the department of study, whether a full-time or part-time student, gender and age).

If their answer to the first question is "Yes, I save data about information sources with the aim to use them at a later time" the respondents are guided to section 2. In this section they are asked for 5 variables of the personal collections they use:

- the kinds of tools they use
- the kinds of data they store
- whether they share their collections with other people
- how often they add an item to the collection
- how often they use their collection(s) to retrieve an information item.

The first three questions of these five are multiple answer check boxes. The suggested choices are all based on the literature that is found on personal information collections as discussed in the introduction section of this paper. Questions number 1 and 2 have an additional free text field for the respondents' own alternative answers.

The final two questions are multiple choice questions for which respondents have to choose one answer. After completing section 2 respondents are guided to the same section 3 as the respondents who answered "No…" in section 1.

All the items in the online survey are "required questions": Respondents cannot leave a section before completing it. There is a "back button" at the end of sections 2 and 3 to allow respondents to change their answers in a previous section.

A draft version of the survey was published on the Internet with Google Docs. In a personal blogpost, a message on the HHS Yammer-site and a posting on the Dutch Library 2.0 Ning site, people were invited to test the draft version and to leave their comments. Fifteen professionals completed the questionnaire. Remarks of two of them (both academic librarians) were used to improve the questionnaire.

3 Results for the Academy of ICT&Media at The Hague University

The questionnaire was administered in regular classes on research methodology in September and November 2011. Seventy nine students (both full-time and part-time) completed it. All students were undergraduate students of the Academy of ICT&Media but from four different departments and each class had participants from the four different departments. The class in which the questionnaire was administered was for most of the students the last one of their major programme before they started work on their bachelor thesis (year 4 of the bachelor programme). To obtain a high response, it was decided to use a non-electronic version of the questionnaire that was completed by the students in the classroom itself. The survey was introduced by their regular teacher who was not engaged in the development of the questionnaire.

3.1 Use of PIM

Table 1 gives the results for the first question (whether they use any kind of PIM system or not) for each department and for the complete Academy of ICT&Media.

Table 1. PIM use of students of the Academy of ICT&Media

	Bus. IT&Mgt	Computer Eng.	Lib. & Inf. Sc.	Software Eng.	ICT&Media
Yes	17	11	15	21	64
No	4	0	0	11	15
Total	21	11	15	32	79

A more detailed analysis of the results can be found in Table 2, in which for each department the kind of data stored in the PIM systems is presented, and in Table 3, which shows how those data are related to the different types of PIM systems that the students indicated they used. The numbers in brackets in Tables 2 and 3 refer to the totals for the category concerned. In the group "Other" in Table 3 the students filled in a variety of systems, for instance Dropbox (4 times), Read It Later, Instapaper and iCloud. All the results in these tables will be discussed in more detail in the next section of this paper, in the evaluation of the questionnaire.

Table 2. Data that students of the different departments store in their PIM systems

	Bus. IT&Mgt (17)	Computer Eng. (11)	Lib. & Inf. Sc. (15)	Software Eng. (21)
URL (60)	16	9	15	20
Subjects (33)	9	6	11	7
Bibl. Data (21)	5	1	11	4
Summary (16)	4	4	4	4
Other (4)	1[a]	1[b]	1[c]	1[d]

a: Images, Audio recordings

b: Self created instruction

c: Copy/paste Introduction or Conclusion

d: Picture with IPhone

Table 3. Data that students store related to the types of PIM systems they use

	Bookmarks (48)	Self created dig. doc. (40)	Dig. Copies (37)	Paper Copies (26)
URL (141)	44	38	35	24
Subjects (88)	27	25	20	16
Bibl. Data (56)	16	18	12	10
Summary (46)	10	14	11	11
	Online Bookmarks (16)	Digital notes (16)	Bibl. Mgt. Software (13)	Other (13)
URL (57)	15	16	13	13
Subjects (43)	10	12	10	11
Bibl. Data (26)	9	5	11	1
Summary (21)	5	7	4	5

3.2 Subject Related Information

From the viewpoint of learning it is useful to remark that only 37 respondents reported that they store topic-related information (subjects and/or summaries). The scores for these two categories were 33 and 16, respectively (Table 2) but there was a lot of overlap between positively responding students. The other 27 students say that they restrict themselves to the more factual information (URL, title, author). Table 4 gives the distribution for storing subject related information over the four departments and for the complete Academy of ICT&Media.

Table 4. Students who store subject related information

	Bus. IT&Mgt	Computer Eng.	Lib. & Inf. Sc.	Software Eng.	ICT&Media
Yes	9	8	11	9	37
No	8	3	4	12	27
Total	17	11	15	21	64

3.3 Information Sharing

In the questionnaire the students were also asked whether they share their references with other students or their friends. Table 5 gives the answers on this question for the four departments. The results for this survey item make clear that LIS students are much more accustomed to sharing their personal collections than students from the other departments and seem to be much more prepared for a collaborative work environment. A chi-square test for the distribution of the answers in Table 5 indicated that those differences for the four departments were extremely significant statistically (p value was 0,001). This finding was also true when obvious 'false answers' (see next section on consistency in answer combinations) were deleted. In that case p value was 0,003.

Table 5. Students who share the data in their PIM system with other people

	Bus. IT&Mgt	Computer Eng.	Lib. & Inf. Sc.	Software Eng.	ICT&Media
Yes	7	7	15	8	37
No	10	4	0	13	27
Total	17	11	15	21	64

4 Evaluation of the Questionnaire

The students' responses reported in the previous section have been analysed to evaluate the questionnaire. Five indications were used to estimate the quality of the responses.

4.1 Consistency in Answer Combinations ("Reliability")

At first, an attempt was made to reveal any unexpected and therefore inconsistent answer combinations. A high occurrence of inconsistent answers from individual respondents may be an indication that the survey is not reliable. Reasons for such inconsistent answers can be that questionnaire items are badly formulated or that respondents did not answer the questions seriously, because of survey fatigue, for instance [16]. This last phenomenon can be affected by the survey's length and the relevance of the survey in the eyes of the respondents [17].

Three combinations of answers were found that could be indications of low-quality responses:

- Question2Option1-Question3Option2 (Bookmarks but not URLs) was found for 4 respondents of the 48 who answered that they used Bookmarks
- Question2Option2-Question3Option2 (Online bookmarks but not URLs) was found for 1 of the 16 respondents who answered that they used Online Bookmarks
- Question2Option6-Question3Option1 (Bibl. Mgt. Software but no bibliographic data) was found for 2 of the13 respondents.

A second inspection of these questions and answer options did not lead to the conclusion of bad formulation although the concepts of Bibliographic Management Systems and Bibliographic Data may indeed lead to misunderstandings for non LIS students. For the two other inconsistencies the occurrence was rather small and they did not influence the main outcomes of the survey (see also the last paragraph of this section on the information value of the results). Hence, the occurrence of some inconsistent answers for these survey items was not a reason to doubt the reliability of the survey.

Inconsistency was also found within the answer options for question 6 and in this case it really was due to bad survey construction: 27 students answered that they do not share their references with other people in any way but four of them indicated that they do email them to classmates or their friends or share them in a closed community. In a later version of the survey which can be retrieved from Google Docs[1], this question has therefore been changed to a Yes/No question (Do you share your data with other people?) and only respondents who answer 'Yes' are directed to the other three options.

4.2 Item Nonresponse

Item nonresponse or "missing data" is another indication of low quality responses [16]. In the online version of the questionnaire it cannot appear because all the items are "required" questions. In the non-electronic version of the questionnaire that was used at The Hague University it was of course possible for respondents to miss an

[1] https://docs.google.com/spreadsheet/ccc?key=0Ao6yiKblkJ5udGpCenNrRWRLY2FzT1E5d2xiM3ZicUE#gid=0

item but this did not happen for any of the 79 completed forms. In other words, there was no indication that the students had not completed the questionnaire seriously and willingly.

4.3 Desirability Bias

Extreme numbers of positive answers can be considered an indication of desirable answering of questionnaire items. Particularly in an educational context there is the danger that students give answers that they believe to be desired by the researcher or by their teachers.

Although the questionnaire forms were completed anonymously, there was indeed a danger of desirability bias with at least item number 1. The results however did not indicate that students were reluctant to answer that they do not use personal information management tools at all. The number of respondents who chose option "No" was not high but neither was it negligible. Also, for the other items, there was no indication that the students chose the most desirable answers.

4.4 Consistency between Different Groups (Full Time/Part-Time Students; September/November)

Students from the Department of Software Engineering score more negatively for Question 1 than students from other departments. This was most clear for the full time students of the September group and was confirmed by the results for the full time group in November. The number of SE students in the part time groups was too small to draw any conclusions. Respondents for the Department of Business IT & Management differed in their answers for the different groups but these differences were so small that they can be put down to coincidence.

The answers for question 1 for the Departments of Computer Engineering and Library & Information Science were 100% positive.

In the following paragraph the statistical significance of the answers to question 1 will be discussed in more detail.

4.5 Information Value of the Results

A survey provides added value when the results are different for the various groups of respondents. In the case of the Academy of ICT&Media at The Hague University, students from the Department of Software Engineering scored much more negatively on question number 1 (whether one uses such a "Personal Information System") than those from the other departments. The results of a chi-square test for the distribution of the answers in Table 1 indicated that those differences for the four departments were very statistically significant (p value was 0,012). When obviously inconsistently answering respondents were deleted the chi-square test with the data from Table 1 resulted in an even more statistically significant p value (0,009 with N=69). It can be deduced from these results that Software Engineering students pay less attention to the keeping of personal information than students from the three other departments.

The rather low appreciation of Software Engineering students for PIM is confirmed by their preference for the keeping of more shallow data (URLs) and the small number of students who store subjects and/or summaries when they reported that they do use some kind of a PIM (Table 4).

5 Conclusions and Discussion

The questionnaire that was developed has proven to be an adequate tool for the assessment of PIM at an institutional level. A test with 79 students from the Academy of ICT&Media of The Hague University resulted in statistically significant outcomes for the four departments that participated in this Academy. There were no indications that the survey was not completed seriously and willingly by the students. The limited length of the questionnaire (it was easy to complete in about 5 minutes) and the context of the course in which it was administered (the course itself was on research skills) may have contributed to this.

At the moment of writing this paper the outcomes have not yet been evaluated with the managers of the Academy and those of the four departments. An interesting question would be whether the differences in results for the various departments can be explained by the contents of their curricula. The value of the outcomes for the departments also depends on the extent to which the managers, curriculum developers and teaching staff value the personal information management behaviour of their students.

The results for the complete group of respondents from the Academy of ICT&Media at The Hague University confirm the suggestion in the literature that people still build personal information collections and that they do not rely solely on retrieval of information via the World Wide Web.

In the context of this conference on information management in a changing world, however, it was quite disappointing that only 37 students of the 64 who answered that they used any PIM system, reported that they share their references with other people. This is an indication that extra attention needs to be given in the curricula to collaborative learning and collaborative work.

It is worth mentioning that in The Hague University test, more than 50% of the students reported that they do not restrict themselves to factual data when they keep references but that they also store subject related information.

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Appendix: Translation of the Questionnaire

1.
This survey (10 questions) is about the use of Personal Information Management strategies for maintaining personal collections of information sources. We would like to know whether you knowingly use one or more 'systems' to keep track of the information that you have found or discovered and that you may want to use again in the future. Examples of such systems are: a collection of bookmarks for websites, a digital system with references to journal articles, study books and URLs or a simple paper memo book to write down such data. Will you please indicate in this first survey question whether you use such a 'Personal Information System'.

0 Yes, I save data about information sources with the aim to use them at a later time
0 No, I don't save data. If I need a document or an information item, I will search for it again.

If you answered 'Yes…', continue to question number 2
If you answered 'No…', continue to question number 7

2.
Which of the 'tools' from the list below do you use to relocate information (sources) that you once discovered? (Multiple answers possible.)

0 Bookmarks or Favourites on my own computer
0 Online bookmarks (for instance Delicious)
0 My own memo book (paper)
0 A digital notebook app (for instance Evernote)
0 A self-created digital document (for instance with MS Word, Excel or Google Docs) with URLs and hyperlinks
0 Bibliographic Management Software (for instance RefWorks, Endnote or Mendeley)
0 I keep copies (downloads) of digital documents on my own computer
0 Other ……

3.
What information regarding the source do you keep? (Multiple answers possible.)

0 Bibliographic data like author, title and publication year
0 URL (address on the WWW)
0 Subjects (subject headings, labels or tags)
0 Summaries
0 Other ……

4.
How often do you add an information source or an information item to one of the systems that you mentioned in survey item 2?

0 Daily
0 Weekly
0 Monthly
0 Less than once a month.

How often do you retrieve an information item from one of the systems that you mentioned in survey item 2?

0 Daily
0 Weekly

0 Monthly
0 Less than once a month.

6.
Do you share the data from one of the systems that you mentioned in survey item 2 with other people, for instance by publishing it on the internet? (Multiple answers possible.)

0 Yes, I publish them on the public internet; everyone can access them.
0 Yes I share them in a 'closed community', for instance in a shared folder; people have to log in to access the data.
0 Yes, I share them with my classmates or my friends by sending them by e mail
0 No, I keep them for myself and nobody else has access to my data.

Finally, there are some questions about your personal position. Your answers will only be used for this research and will not be shared with your department's staff or your teachers.

7.
What is your department?

……

8.
How are you enrolled?

0 Full time
0 Part time

9.
What is your gender?

0 Male
0 Female

10
What is your age?

… years old.

Overview of the Digitization Policies in Cultural Memory Institutions in Turkey

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Abstract. The advances in information and communication technologies have permitted societies to produce, store, arrange and effectively benefit from information in different environments. These advances have necessitated both the use of new environments for the production of information and transfer of information produced in other environments into the new ones. Cultural memory institutions fulfill an important function in transmitting information reflecting cultural values of a society to the future generations and in enabling its effective use by transferring already existing information into new environments. Cultural memory institutions realize these functions on the basis of policies in which they define digitization processes. In this framework, this study deals with the policies developed by cultural memory institutions for digitization practices and analytic studies of the issue; and it investigates the situation in Turkey through document analyses within the scope of information and culture policies. The results of the study show that there are considerable differences in digitization practices between Turkey and other countries and that, in spite of the many projects on digitization, there are no policies in Turkey which define digitization processes on an institutional or national scale.

Keywords: Digitization, digitization policies, culture policies, information policy, Turkey.

1 Introduction

Information diversifies continuously due to technological advancements. This diversity and rapid increase have affected societies in many respects. The developments enable the societies that use information effectively to advance and steer scientific developments and innovations. In this development process, information and communication technologies have been an important means for using information multidimensionally: processing, storing, preserving, distributing information; evaluating information for business processes and reusing it when required. As information and communication technologies have such an important function, information has become a factor establishing competition in social and institutional dimensions and even an overwhelming parameter in this competitive environment. In this process, not only possessing information but also using, processing and transferring it with appropriate technologies and formats have proved to be so important that they are incorporated into national information policies.

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Since their establishment, cultural memory institutions such as archives, documentation centers, libraries and museums have been conducting studies in order to obtain, organize, preserve and share information resources for public needs. States and institutions have developed and implemented policies for using information resources within the framework of existing infrastructure and technologies. Among these policies, digitization efforts developed and implemented by cultural memory institutions command our attention. Cultural memory institutions take part in digitization efforts for protecting cultural heritage of society and transmitting it to future generations, and they act according to these policies.

This study deals with such digitization efforts carried out by cultural memory institutions in Turkey and the institutional and national policies developed within this framework.

2 Cultural Memory Institutions and Digitization

Institutions such as libraries, archives and museums have important functions in the protection of cultural heritage and making it available for the benefit of society. These institutions have recently come to the forefront with digitization efforts for the sake of realizing these functions. Among cultural memory institutions, libraries have invested in digitization projects since the 1990s and have increased their investments for these projects in order to facilitate access to the sources [1]. Within this framework they make use of newspaper archives, maps, music collections, works of children literature, coins, historical documents and video recordings that have cultural and international importance [2]. The digitization projects carried out by national libraries, in particular, have led the states to prepare guidelines for digitization and to develop national information policies.

There are various conceptions of the scope of digitization, which is defined as transferring materials (print sources, photographs, slides and 3D objects) in a variety of environments into a format that can be viewed in digital environment [1]. Digitization can also be defined as a "conversion process of physical or analogue materials such as paper documents, photographs or graphical materials into an electronic environment or into images stored in electronic environment, or in general terms, conversion of unconfigured form that cannot be detected by electronic systems into the configured form that can be detected in the electronic environment" [3]. In another study, digitization is described as a process which is composed of stages of digitization, scanning and capturing, processing, storing and access [4]. On the other hand, it is emphasized that digitization practices cover not only the scanning process, but also emulation and migration practices in order for the data to be transferred across digital environments [5]. According to another approach, the concept "digital" stands for the language used by computers, but "digitization" can be defined as "computerization" [6]. In light of these definitions, digitization practices are also accepted as a process of collecting, preserving and distributing cultural assets by cultural memory institutions [7], [8]. With their digitization projects, cultural memory institutions aim to realize the following goals for the sake of both the materials they possess and the information services they offer [7], [9], [10];

- Enabling the users to access the materials directly, to use them, to publish them in line with copyright agreements and to access many collections without paying a visit to the related institution,
- Increasing access to collections composed of rare works and manuscripts,
- Minimizing the physical use of sources that can be ruined in the course of use such as rare works and manuscripts, and taking precautions,
- Preserving the original source by using the digital copies,
- Creating the digital content for research, education and publishing activities, and for the protection of cultural heritage,
- Raising awareness of new user groups about online use of collections,
- Developing additional information services for users,
- Ensuring and developing the unity of collection,
- Improving the technical infrastructure of the institution and ensuring their services with a systematic approach.

The advances that societies have experienced in education, economic and cultural systems in the 21st century have featured information in a digital environment. This prominence is also the result of the speed, accessibility and easy processability of the digital environment [8]. In this scope, cultural memory institutions make use of information technologies to carry out digitization projects and offer cultural heritage to their users. The fact that the digitization projects are also of great importance in terms of life-long learning has been indicated in the studies of organizations such as UNESCO. It is particularly emphasized in such studies that cultural memory institutions should provide publicity and access to the collections they possesses [11].

Digitization, which has great importance for cultural memory institutions in transmitting life styles and history of societies, is a process that requires time and money [12]. For this reason, a strategic plan is required before the project proceeds in order to have, successful results and it is necessary to know precisely life-cycles of the materials in the digital environment at the end of the project [13]. Besides the strategic plans, in digitization practices, objective and scope, selection and features of the original materials, efficiency level of the existing technology for digital copies, processing level of the digital collection as well as factors such as administration and access should be taken into consideration [10]. Moreover, the relation between these factors should be taken into account by project executives. It is known, on the other hand, that institutions consider three fundamental factors within the framework of goals for digitization of collections, and they develop their strategies and plans within the context of these three factors: access, selection and preserving.

Access: One of the main functions of cultural memory institutions is their services in meeting the information needs of individuals. All memory institutions, principally libraries, collect information produced by the society, and offer it to users in need. It is clear that access comes into prominence in digitization practices. With digitization projects, access to materials such as manuscripts that have the risk of disappearance in the future, research projects, photographs, maps, voice records, official records and historical documents have been increased where technological infrastructure and copyrights permit [1], [9].

Selection: Selection for digitization is the process which a decision is made as to which materials will be digitized. This factor directly affects the dimensions of cost and time in addition to the technical dimensions of a project. It is found that for libraries, increasing access to materials of historical/cultural and research value comes first, followed by preservation, creation of physical space and commercial use [14], [15]. In the policies adopted for selection, it should be decided which materials are to be digitized, through which technological methods (scanning, emulation or migration), and what goals will be taken into consideration in the selection.

Preservation: Digitization is thought to be a new method of preserving sources in fields such as art, culture, science and technology, literature and human sciences, media, cultural heritage and history [16]. Cultural memory institutions invest in digitization and strive for protection of original collections they possess. These institutions use strategies of hardware and software protection, emulation and migration within the scope of preservation practices [5], [17]. Furthermore, functions of digitization for long-term protection begin with radical alterations in the information system used in content management, transfer of the content into another system, finalizing the use of original copy in production of content, and deciding what to do in case the capacity required for protection of the content is full [10]. Except for the technical applications, digitization may allow institutions to benefit from preserving materials in two ways: original materials are replaced by their digital copies so that the original material does not need to be used, transferred, or damaged during other procedures; digital copies may be kept for security reasons in case the original copy is damaged or lost. It can be said in strategic plans developed by national archives that digitization is not only the transfer of the printed material into the digital environment but rather it is the entire range of activities that result in providing access to digital copies to the end user access via internet and similar tools.

3 Digitization Policies as a Part of Information Policies

Information policy is a concept that includes the processes of producing, collecting, arranging, storing, accessing, distributing and preserving all kinds of information [18]. There are many other definitions that describe this concept differently, and some studies put forth that information policies differ from state to state and region to region [19]. It is also expressed that the concept contains applications such as laws, guidelines, rules and strategies related to producing, managing, processing, accessing and using information [19], [20], [21]. Besides this, it is stressed that reusing and transferring information have an important role in formation of the information policy [22]. In this framework, since the 1990s, practices that require investment such as digitization have begun to be one of the key elements of information policies.

Digitization practices can be seen as a crucial means for realizing the function of information policies to ensure the socialization of information [23]. The outputs obtained from digitization projects contribute, at the same time, to the realization of the objective of laying the groundwork for rational use of existing information,

produced or to be produced in a country, in terms of socioeconomic and scientific aspects [24], which is considered to be the core objective of information policies. Digitization practices and strategies support information policies for reusing and transferring information.

In brief, digitization policies in a country must be compulsory and a part of general information policies as they reflect new developments in information and communication technologies used in information policies.

4 Digitization Policies

Digitization practices are evolving within the scope of information policies as cultural memory institutions carry out digitization projects, especially since the 1990s. Research on cultural memory institutions confirms this piece of information. In this respect, according to research by the Institute of Museum and Library Services (IMLS) in 2001, one-third of research libraries and one-fourth of public libraries in the USA are attempting to digitize the material they possess [25]. In another study, it is indicated that most of the libraries that take part in digitization projects are research libraries, and these libraries carry out their projects in collaboration with financially viable institutions such as national museums and libraries [2].

Digitization projects have several components: selection policy, conversion process, quality control, collecting methods, presentation and long-term access [9]. Digitization projects help cultural memory institutions to go beyond their conventional approaches and enable institutions such as libraries, museums and archives to offer fast, true and reliable information simultaneously to vast numbers of users along with preservation of this information [8], [9]. With these features, digitization projects and processes are described as a part of distribution and preservation strategies of cultural memory institutions, national libraries in particular, and today this is considered to be one of the main tasks of libraries [26]. Also, cultural memory institutions develop policies for digitization processes and try to ensure the effectiveness of their collections and services in terms of access, selection and preservation [27], [28], [29]. When works on the subject are examined, one can see that there are analyses and studies that feature digitization policies for cultural memory institutions, and put forth the requirement for these policies [1], [12], [30], [31]. Digitization policies are described as guidelines for digitization processes and projects. In this framework, it is emphasized [12], [26] in a holistic way, that digitization policies should include:

- objectives in detail, collection to be used, the way it is to be used, target audience, issues such as copyrights,
- budget procedures for digitization practices, formalities about equipment supports, sustenance, licenses and communication,
- training and orientation programs for personnel about digitization practices and services to be provided and attitude towards digitization practices,
- all elements concerning the digitization processes.

It is also stressed that in the course of developing digitization policies [8], [12];

- top management should determine the policy components very carefully,
- one should be aware of the fact that the related policies have a vital role in terms of the functions of cultural memory institutions,
- the policies developed should, at first, necessarily be confirmed by the appropriate authorized institutions and authorities, and cooperation should be developed with these institutions in order to sustain the process.

5 The Situation of Digitization Efforts in Turkey

Technological developments cause countries to attempt to protect the objects that reflect their culture and to formulate practices for protecting these cultural entities. Digitization projects are one of these practices. As in other countries, in Turkey digitization enterprises are realized by institutions such as the Ministry of Culture and Tourism, the National Library, university and public libraries and the General Directorate of State Archives. Aiming "to protect the original documents", these attempts generally consist of describing and cataloguing print materials and transferring them into a digital environment [32].

The first attempt at digitization efforts in Turkey was The Union Catalogue of Turkish Manuscripts (TÜYATOK) Project, started in the 1970s and continued until 2000 by the National Library, which included procedures for describing manuscripts [33], [34]. Similar to the TÜYATOK, another project on cataloguing and digitizing manuscripts in the Library of Ankara University was carried out in 1998 [35]. Studies for transferring manuscripts in the National Library into a digital environment began in 2004, and by the end of the project, 25,200 volumes of manuscripts out of 26,700 had been transferred into a digital environment [36]. Another project was carried out to digitize the manuscripts collection of the İstanbul University Library of Rare Works [37]. Besides these projects, universities that possess manuscripts in their collections are known to be carrying out digitization efforts [33]. In addition to university libraries, digitization efforts have been conducted in 28 public libraries in cities and districts which have manuscripts in their collections. As a result of these attempts, some of which were conducted with the support of sponsors, more than 167,000 works have been digitized [3], [38]. There are also some digitization projects at the Hacettepe University Department of Information Management focusing on providing access to master's and PhD dissertations as well as to the local cultural heritage in public libraries [39], [40].

It is an interesting fact that archives and institutions related to information management conduct projects about digitization within the scope of cultural memory institutions. It is indicated in these studies that there are more than nine million digital materials in the General Directorate of State Archives [3]. It is known that similar studies are being carried out by the General Directorate of Land Registry and Cadastre.

As for international digitization activity, there are plans to transfer digitized materials to Europeana, the European Digital Library, and distance education is being used to raise awareness about the issue. Conducted under the EU 7th Framework Programme, AccessIT (Accelerate the Circulation of Culture Through Exchange of Skills in Information Technology) Project whose institutional owner on behalf of Turkey is the Hacettepe University Department of Information Management, it is

planned to share the metadata of 50,000 cultural items with Europeana [3]. Also, a distance education certificate programme about digitization was carried out within the scope of the project.

Apart from the above-mentioned efforts, workshops were held on digitization and the principles that might guide the digitization practices in Turkey were negotiated. Furthermore, some reports and scholarly papers have been published about digitization procedures, sources for support, cooperation suggestions and digitization projects [4], [33], [38], [41], [42]. Problems in digitization practices in Turkey were determined in the Workshop on Standards and Cooperation in Digitization of Information Resources held on February 25-27, 2010. Similar to the decisions at the end of that activity, studies dealing with the problems in digitization projects play a supporting role in making up the deficiencies [3], [33]. Among the subjects of the studies, digitization policies were touched on for the first time and the fact that Turkey lacks such policies was identified as the real problem [3]. Apart from that major problem, the general problems related to digitization efforts in Turkey are as follows [3], [32], [33]:

- Conducting projects and institutional studies independently and unaware of each other,
- Qualified personnel and budget problems,
- Lack of national standards,
- Lack of terminological unity in defining sources in projects,
- Ambiguities in copyright for cultural memory institutions and lack of a definition for information sources in the related regulations,
- Lack of an overall catalogue of digitized materials,
- Lack of a supreme board having authority over digitization practices.

6 Approach on Digitization in Respect to Information Policy in Turkey

If there is no officially approved written policy on a subject, one must refer to various legal documents in order to understand the approach of the national policy on that subject. In Turkey, the principal legal documents that contain the national policies on various social issues are the five-year development plans, laws and guidelines. Since there is no separate and independent information policy in Turkey, the development plans will be taken into account for making evaluations in respect of information policy on digitization. Since 1963, a total of nine five-year development plans have been followed.

6.1 Approach to Digitization in Five-Year Development Plans

If the five-year development plans are examined, except for the goal of forming a National Cultural Archive, one cannot claim that there is an approach to digitization in the context of national policy in the first four plans. Some interesting principles and

approaches that might relate to digitization as a part of information policy are to be found in the 5th, 6th, 7th, 8th and 9th plans, as follows [43], [44], [45], [46], [47]:

- Considering the works that have cultural value as a part of daily life;
- Needing means for distributing and sharing culture in the context of cultural policies;
- Strengthening national integrity by transmitting cultural heritage to future generations;
- Existence of principles for developing and generalizing culture in development plans;
- Featuring research and development studies that will help enrich and transmit the cultural entities to the future generations;
- Ensuring cooperation between institutions and organizations that render cultural service;
- Establishment of the Manuscript and Rare Works Pathology and Restoration Center for protection of rare works and manuscripts, and manuscript restoration centers wherever needed;
- Protection of manuscripts and rare works in microform environments;
- Accelerating studies on protection and classification of archive documents and making them available for researchers' use;
- Supporting institutions and organizations as well as private enterprises, foundations and associations which introduce cultural works;
- Strengthening education at all levels so as to effectively transmit cultural values to the future generations;
- Establishment of a Turkish Culture Archive and Documentation Center that will bring together information, documents and video records of cultural entities;
- Transfer of information in different environments into an electronic environment;
- Facilitating access to the information about innovations and new technologies in the centers that have a high development potential for protection of cultural entities and transmitting them to future generations;
- Development of technological change and transfer systems; and,
- Creating the necessary environment to feature information and communication technologies at all platforms.

6.2 Approach to Digitization in Related Laws, Guidelines and Directives

Besides the development plans, there are studies in laws, regulations and directives for realizing the same goals in the development plans. The laws, guidelines and directives that are directly or indirectly associated with the subject matter are as follows [48], [49], [50], [51], [52], [53], [54], [55], [56]:

1. Law on Establishment and Duties of a Directorate for Turkish Manuscripts Association
2. Decree Law on Organization and Duties of the Ministry of Science, Industry and Technology
3. Regulation on Amending the Regulation on Principles of Benefitting from Works of Public Institutions and Organizations

4. Guidelines for Benefitting from the Ministry of Culture Manuscript Libraries Having Manuscripts and Old Alphabet Printed Works
5. Guidelines for Amending the Guidelines for Benefitting from Ministry of Culture Manuscript Libraries Having Manuscripts and Old Alphabet Printed Works
6. Principles for Foreigners and Applicants on Behalf of Foreigners who Want to Make Scientific Research and Films in Turkey and Members of Foreign Press
7. Directive of the Principles for Foreigners, Applicants on Behalf of Foreigners and Foreign Press who Want to Make Scientific Research and Films in Turkey and under the Ministry of Culture and Tourism General Directorate of Libraries and Publications
8. Regulation on Benefitting from the Works of Public Institutions and Organizations
9. Directive of Principles for Foreigners who Want to Make Scientific Research and Films or for Members of Foreign Press bound to the Ministry of Culture and Tourism General Directorate of Libraries and Publications.

Laws and guidelines cited above remain restricted to manuscripts and rare works. There are also other points which can be considered as approaches to digitization. These can be listed as follows:

- Regarding digitization practices as a duty of the Directorate for Turkish Manuscripts Association,
- Responsibility of the same directorate to prepare training sessions and to establish an education and research center,
- Regarding digitization as a method for copying manuscripts without damaging the original copy,
- Offering the copies that are transferred into microfilm and electronic environments to users, preserving the original works,
- Forming archives of manuscripts in formats such as slides or microfilm, or digital environments, as well as photographs and similar non-digital environments; and making them available to users,
- Accepting, evaluating and supporting projects related to research and development activities, activities on technology, innovation and entrepreneurship; scientific and technical studies, investment applications for technological products; and determining procedures and principles for the support foreseen in the related regulation.

7 Conclusion and Evaluation

Digitization is one of the important recent efforts for protection of cultural entities of a society and transmitting them to the future generations. Many institutions, particularly the cultural memory institutions, establish strategies which describe the requirements for digitization efforts; organize digitization projects within the framework of these strategies; attempt to develop cooperation; organize training on the subject, and try to realize their objectives. On the other hand, it is an interesting fact that cultural memory institutions give particular importance to factors of access,

selection and preservation. These institutions not only prefer to digitize rare works and manuscripts as a selection criterion, but they also digitize their educational materials within the framework of copyrights in order to increase access. Many studies show that most of the institutions that carry out digitization studies are research libraries or public libraries.

The results of our study with respect to digitization practices show that there are various applications in Turkey. In this framework, it can be said that various legal regulations and plans have been drawn up, and efforts on digitization were first started in the late 1970s with description of works. In other projects, under the auspices of the Ministry of Culture and Tourism, manuscripts in public libraries are being transferred into digital environment. Similarly, in some university libraries, rare works and manuscripts are being transferred into digital environment.

Official Development Plans, beginning with the Second Five-year Development Plan (1968-1972), reflect the development and information policies in Turkey, acknowledging the need for protection of cultural heritage and its transfer to the future generations. They also describe the situation and set forth the tasks that should be carried out. These Plans also evaluate the subject in respect to cultural policies. The necessity of cooperation in the process of transmitting the cultural heritage to the future generations was indicated in the Sixth Five-year Development Plan (1990-1994). It can be seen that the five-year development plans were geared to the situation at the being of the related period of time and nearly all included subjects such as protection and introduction of cultural heritage and transmittal of it to the future generations. The latest plans, in particular, contain articles on digitization of resources for effective use of archive systems.

In documents reflecting information policies such as laws, guidelines and directives, digitization is mentioned in the context of the use of materials and the preservation of the original material. It is an interesting fact that digitization is defined only as the transfer of materials into the digital environment in the guidelines and directives. Digitization and digitization education were included among the duties of the Directorate of Turkish Manuscripts Association with a law laid down in 2010.

Apart from legal regulations about the issue and the five-year development plans, scientific studies and workshops are carried out on digitization in Turkey. These studies deal with issues such as procedures that should be followed in digitization projects. As for the practices, many digitization projects have been carried out by the National Library, various research libraries and public libraries and universities. In connection with these projects, problems encountered in digitization projects have been mentioned in scientific studies, and problems such as lack of an authoritative institution, a national standard and coordination on digitization efforts have been dealt with. In this context, the lack of digitization policies which should have been prepared as the initial document for digitization projects, was first seen as a problem in 2011. Furthermore, the analytic studies in the literature show that access is of top priority compared to other factors; the projects carried out in Turkey, on the other hand, consider preservation more important than access. Last but not least, the first digitization education for the personnel working in cultural memory institutions was given through distance education within the scope of a European Union project (AccessIT) in 2011.

In light of the results of this study, it can be suggested that attempts should be made to raise awareness of institutions about digitization practices and projects; detailed policies on digitization projects and digital collections should be established within the framework of culture policies at institutional and national levels; access should be given primary importance rather than preservation in digitization efforts; and an institution (e.g. the National Library) which can act as the leading authority in all these issues should be determined.

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The Nature of Information Science and Its Relationship with Sociology

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Abstract. The aim of this study is to discuss and explain the nature of information science and its relationship with other disciplines, especially with sociology. In this context, the historical development of information science, the effects of an interdisciplinary field on the development of information science and its future direction are discussed. The results of research showed that information science is multidisciplinary. Information science is especially related to library science, behavioral science, abstracting and indexing, communications science, documentation, and computer science. Classical and contemporary sociological theories and methodological approaches are important in the development of information science, which is a new field in the process of development. It has been seen that technology is the driving force in its development. As information science matures, it will be reorganized.

Keywords: Information, information science, sociology, interdisciplinary, technology.

1 What is Information Science?

What is information science? According to Merriam-Webster [1], the American Heritage Dictionary, and other dictionaries, information science is identified as "the collection, classification, storage, retrieval, and dissemination of recorded knowledge treated both as a pure and as an applied science". However, the answer to this question is more complex because information science is not a unique concept.

One of the early definitions of information science, provided by Borko [2] and based on Robert S. Taylor's definition, was that "information science is the discipline that investigates the properties and behavior of information, the forces governing the flow of information, and the techniques, both manual and mechanical, of processing information for optimum storage, retrieval, and dissemination".

Borko's definition is credited by both Bates [3] and Saracevic [4] as it remains popular among scholars and covers most aspects of information science. Bates [3] elaborates that information science, as a meta-discipline, focuses on the subject matter of all the conventional disciplines in the storage and retrieval of human knowledge in recorded form. Bates [3] states that efforts in information science center on how information is represented and organized compared to the knowledge itself, much less

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to any individual's ability to know and remember it. According to Bates, briefly, information science may be defined as the study of the storing, organizing, gathering, disseminating, and retrieving of information, which is close to Borko's definition. However, Bates adds that information science has other important elements as well. For Bates, besides systems, information science is interested in user applications and research.

On the other hand, Saracevic [4] takes a different approach. For him, information science is identified by the problems that it handles. The definition of these problems is the main factor for fostering the development of information science for the next few decades. Information science has to deal with these problems. Saracevic [4] states that the debates related to the proper definition of information science are useless, recommending instead a broad definition.

In order to understand the boundaries of the field, Saracevic lays out the general characteristics of information sciences. Some of these characteristics can be shared with other fields, such as sociology. To Saracevic [4], information science is an interdisciplinary science with three characteristics. First, it is a multidisciplinary field interconnected to two or more disciplines. Second, information science is directly related to current information technology. Finally, it has a human dimension in addition to the technological dimension.

Finally, as Saracevic noted, the definition of information science is a complex issue. Even though a definition is necessary for understanding the boundaries of subjects that are covered by the field, it cannot help to deepen our understanding of it. Taking into account the nature of information science, it is difficult to agree on a proper and common single definition. However, the attempts to provide a definition are helpful for the progression of the discipline. Taken together, all above definitions and discussions indicate that the debate regarding the definition of this field will go on for a long time.

2 Interdisciplinary Nature of Information Science

In order to understand the nature of information science, it is better to talk about the conceptual ambiguity of information apart from the definition. Information is the defining point of this issue. There is no consistent definition of information. Wersig and Neveling found 17 distinct definitions [5]. Similarly, Schement [6] mentioned 22 unique definitions of information in his writings. As a result, various definitions of information developed to stand for a variety of concepts.

One important definition of information is identified by Shannon and Weaver [7]. It explains the term information through mathematical communication theory. A signal or message is information that is transmitted from a source to a destination. However, Bates [8] points out that information is not totally covered by entropy. According to Bates [8], "information is the pattern of organization of the matter of rocks, of the earth, of plants, of animal bodies, or of brain matter". Information can also be tangible. That is, it refers to the pattern of energy which exists in the air.

On the other hand, like other schools Buckland [9] also emphasizes the difficulty with the definition of information. Instead of a specific definition of information, he identifies three different principles of the term: information-as-knowledge, information-as-process, and information-as-thing. Wilson [10] also focuses on the difficulty of having no specific definition of information. Accordingly, the main difficulty is related to the multiple uses of information that bring about confusion among researchers. Wilson states that "researchers are often unclear about which sense they are referring to and sometimes do not clarify between different senses". Therefore, the problem regarding the definition of information doesn't stem from the lack of an appropriate definition of the term, rather, it is related to inaccurate, incomplete, and multiple uses of the term. In this sense, the ambiguity of information shapes the nature of information science.

As noted, information science is one of newest fields among the sciences. Therefore, it is more open to development, having a dynamic nature. In addition, it is strongly related to various other disciplines. Borko [2] underlines the interdisciplinary characteristic of information science that interacts with linguistics, mathematics, psychology, library science, management, engineering, behavioral science, logic, and other related fields.

According to Saracevic, one of the important characteristics of information science is its interdisciplinarity. Saracevic [4] presents two dimensions of being interdisciplinary. First, some problems cannot be solved only by one approach and/or one discipline. However, information science as an interdisciplinary field can provide the richness of other disciplines and approaches for solving a problem. Second, he states that "interdisciplinarity in information science was introduced and is being perpetuated to the present by the very differences in backgrounds of people addressing the described problems". To Saracevic, information science has a special connection with information technology.

Herner [11] mentions the development of information science. He states that information science has a common ground with computer science, library science, communication science, behavioral science, and various other similar disciplines. Therefore, each field has a significant contribution in the emerging field of information science.

The discussion of information science among scientists indicates that information science is more closely related to some disciplines than to others. As noted, library science is a very similar field regarding the preservation, use, and organization of information. Labels like the Department of Library and Information Science also suggest this. For Saracevic [4], the relationship between information science and library science is strong since they have a common goal: "sharing of their social role and in their general concern with effective utilization of graphic and other records, particularly by individuals". However, in this author's point of view, as information science has developed, its separation into multiple sciences was inevitable. Besides library science, communication, computer science, and education are also strongly related to information science.

Computer science is very closely related to information science. The common ground between computer science and information science is based on the application

of computers, networks, retrieval systems, related products and services (providing nearly all of the technology that information science currently relies on). An example is where a library uses information science to create and utilize a digital library and how information science uses that digital library to access information for further research. According to Saracevic [4], information science has commonality with computer science through a computer network's ability to process, search, organize, utilize, and present information.

Bates [3] argues that the fields of information science, education, and communication are "the conventional academic disciplines". Each one of them plays a distinct role in transmitting human knowledge. Bates' example shows information science providing storage and retrieval of information; education passes information on to the next generation, and the media discover and transmit that information. This situation is also called "content" disciplines.

Based on its interdisciplinary characteristic, information science has a huge commonality with various disciplines regarding perspectives, theories, models, and methodological approaches. In this sense, Bates [3] evaluates information science as a meta-discipline which takes its place under conventional disciplines. It assists conventional disciplines in the storage and retrieval of human knowledge in recorded form.

3 The Relationship of Information Science with Sociology

Information science also shares multiple aspects with sociology. Both fields share theoretical perspectives from other fields such as computer science, psychology, linguistics, philosophy, communication, and information technology. It is obvious that information science, to some extent, is comparable not only to sociology but also to most social sciences. For example, Wilson [12] states that "The recipient of information, his information-seeking behaviour (which involves social acts), his information-exchange activities and his use of information are also areas for sociological research". He further states, "Sociological studies in this area range from all-embracing theories in the sociology of knowledge to small-scale studies of collaboration in the writing of scholarly papers". Sociology is related to the dissemination of information: the availability of information at the micro level such as agency or the macro level such as the social structure. Sociology provides a theoretical background to information science.

The studies in both disciplines are utilized for proposing solutions to improve policy for the general public. The science of sociology deals with society; it is the study of society and is a very broad field. Sociology has two main components: social systems and social actions. While the study of social systems covers institutions and structures, the study of social actions is interested in processes. Since the subject matters of sociology range from the micro level (agency-interaction) to the macro level (social structure), several subject matters create a common goal for both fields.

The existence of technology and its effect on individuals and society is one of the main interest areas of both disciplines. The concept of social informatics is an

example. Kling [13] examines the relationship between technical and social systems arguing that there is a strong interrelationship between technologies and social change in order to explain the term “social informatics”. Similarly to Kling [13], Sawyer and Rosenbaum [14] also define Social Informatics as an interdisciplinary study that examines the interactions between information technologies and communication technologies, including their design, uses and consequences within both institutional and cultural contexts.

Kling utilizes symbolic interactionism for understanding “the social structure of the computing world” [15]. Symbolic interactionism is a part of mainstream sociology, and also a sociological perspective. Similarly, Gusfield [16] said that "We didn't think symbolic interaction was a perspective in sociology, we thought it was sociology". Therefore, Kling embeds the social cultural aspect of knowledge into the nature of information science and communication technology.

Thus information science and sociology converge in information technology. The function of technology varies regarding the interaction of human beings with technology. For example, in terms of the social development of society, the development of societies and the changes during development are strongly dependent on technological advancement [17]. That is, technology has influenced all aspects of social life and has been an important player in the development of the information society [18]. Using this approach, Lenski indicated that technology influences, guides and brings about social change and development. Similarly, Robert Pool [19] explained how society was shaped by technology through positivism by linking technological knowledge with the development of society. Brown and Duguid [20] also emphasized the relationship between society and technology in an article titled “A Response to Bill Joy and the Doom-and-Gloom Technofuturists”. They stated that “technological and social systems shape each other” [20].

The impacts of information technology today are seen more often in every aspect of social life. In other words, technology alters not only the behavior of individuals but also of organizations. It is viewed as an exogenous force, suggesting that neither the individual actor nor the organization has control over their actions. Pfeffer [21] explained the impact of information technology on organization through the situational control perspective. According to Pfeffer [21], "In this view, action is seen not as the result of conscious, foresightful choice but as the result of external constraints, demands, or forces that the social actor may have little control over or even cognizance of".

Similarly, Markus and Robey [22] also stated that “Organizations would recentralize, levels of middle management would disappear, and top management elite would emerge”. Perhaps more concretely, Simon [23] argued that computers would not decentralize decision making, but rather the organizational structure becomes more complex and requiring more lateral interaction. Markus and Robey [22] argued that information technology brings about environmental uncertainty in organizational structure. Therefore, changes appear to merge unpredictably concerning the interaction between people and information technologies.

Another relationship between information science and sociology is human behavior. While sociology conducts studies of human behavior at societal and agency

levels, information science focuses on human information behavior and does not distinguish between societal or agency levels. Sociology has a holistic approach when examining human information behavior comparing to information science. As noted above, many theoretical assumptions can be derived within one field, (such as psychology) yet are later shared by two disciplines. It is obvious that an interconnective relationship exists in the two disciplines.

Both information science and sociology share practical implications. The subject matters of information science – such as information system management, and information retrieval systems – have significant value to sociology. The two fields are complementary to each other through theoretical and methodological validation, as well as within techniques employed in practical daily life. Therefore, scholars may employ tested practical implications in both information science and sociology.

Taken together, there is a strong relationship between information science and sociology. A huge amount of theoretical background in information science is based on sociology, owing to the social side of information science. The most influential theorists such as George Herbert Mead, Charles Cooley, and Herbert Blumer (symbolic interactionism), Bruno Latour (Actor-Network theory), Manuel Castells (networked society), Pierre Bourdieu (habitat-capital theory), Daryl Chubin, and Harriet Zuckerman (social constructivism), Robert Merton (Matthew effect), Harold Garfinkel (ethnomethodology), and Anthony Giddens (structuration theory) are the most cited sociologists in the studies of information science [15]. Their theories and methodological approaches have an important contribution to the development of information science.

4 Is Being Interdisciplinary Advantageous or Disadvantageous?

As an interdisciplinary science, information science has advantages and disadvantages in terms. We can say that it may be advantageous since some problems handled with information science cannot be resolved by a unique approach or constructed from a single discipline [4]. That is, considering the complexity of human information behavior, only the interdisciplinary relationship of information science can deal with and explain the many factors related to information behavior.

In the same fashion, Cronin [15] states that “the chunky concepts make up our field’s intellectual core (e.g. knowledge, information, communication, representation)”. Therefore, for Cronin [15], the interdisciplinary relationship of information science contributes to broadening its intellectual enrichment due to its interaction with other disciplines. Cronin [15] enumerates some of the disciplines from which information science takes perspectives and approaches: linguistics, computer science, psychology, philosophy, sociology, cognitive science and human–computer interaction.

However, there is one disadvantage to information science’s being interdisciplinary: it is difficult to define the borders of the field. Information science’s multiple relationships with other disciplines force its re-evaluation more than others’. Likewise, Saracevic [4] also points out that the advancement of technology expands information science. He states that “a technological imperative is compelling and constraining the evolution of

information science, as is the evolution of a number of other fields, and moreover, of the information society as a whole". Developments in related disciplines add to the growth of information science, a growth that is all the more rapid because it is compounded by this interdisciplinary relationship. In addition, the core terms of information science are still under discussion due to the ambiguity brought about by its interdisciplinary nature.

As noted, several perspectives and approaches originating in other fields cause information science to contract. In other words, borrowing from many theories and using the assumptions from them to examine a problem within information science may lead to contradictions. Therefore, it can bring about confusing deviations and problems in theory or research within information science. The separation of information retrieval from information seeking perspectives would be a good example of that disadvantage.

5 Historical Development of Information Science

Information science is one of the latest modern sciences. Many scholars provide a brief look at the history of information science [24], [4], [25]. They indicate that information science has existed since World War II. After the Second World War, the information explosion pushed forward expanding information technologies and technical publications [4], [26].

Vannaver Bush's [27] article was a milestone in the history of information science. His influential article defined the problem as "the massive task of making more accessible a bewildering store of knowledge" and proposed a solution [4]. Saracevic called it "the problem of information explosion". As to the solution, Bush [27] mentioned a machine, the "Memex". He described the memex in his most influential article "As We May Think" as a storage device for mechanically recording and containing books, records, communications, etc. for future reference that is both highly flexible and quickly accessed [4]. His idea regarding the 'memex' has been considered by some scientists as a stepping-stone for the development of the internet. According to Buckland [28], the "Memex" was also seen as an escalator for development of information retrieval, computing, and hypertext. Therefore, some scholars accept Vannaver Bush as the "father of information science" owing to his contribution to the development of information science [29].

Another significant event was the change of name of the American Documentation Institute to the American Society for Information Science in 1968. After that, the term information became more articulate than before, and refers to both the discipline and the profession [2]. The emergence of Shannon's information theory in the 1940s also kept the discussion of information among scientists [26].

Saracevic [4] takes a historical perspective when explaining information science. He focuses on the origin and social background of information science. He suggests three powerful ideas that shaped the historical development of information science: information retrieval, relevance, and interaction. The emergence of information retrieval in the 1950s created a formal logic base for the development of information science. Its relevance is more directly related to human information needs. The idea of

interaction emerged in the 1970s. This idea is based on the relationship involving exchanges and feedback. The relation between the information retrieval process and systems was also important for the development of information science [4].

Finally, information science came out of the aftermath of World War II as a field of research. It is a new discipline. As mentioned above, several factors have contributed to the development of information science since then, technology being the driving force.

6 Future Direction of Information Science

The nature of information science makes it more open to development than any other science. We can enumerate several reasons but the following two are important to review before continuing. First, information science is an interdisciplinary science, and second, developments in technology, computing and computer networking have direct and indirect effects on information science. Many studies in information science research evolving systems and networks centered within and around this technological advancement.

Rayward [30] highlighted the importance of computer technology for information science. He argued that computer science directly interacts with information science. This interaction covers all computer applications, products, networks, and related services. In addition, the prominence of information science among other fields is increasingly made stronger by means of research regarding organizing, searching, filtering, and presenting, using highly complicated machines and networks, and this trend will continue for at least the next three decades [4], [30]. For example, Saracevic pays attention to digital library research because it attracts not only the attention of computer scientists but also professionals in many other disciplines.

The industrialized society is turning to the information society. Nowadays, the effects of information are seen more clearly in society. According to Beniger [31], individuals have the ability to make changes in the behavior of how information is processed and communicated. The activities of information and communication are parts of the control function in terms of both individual and society level [31]. That is related to information technologies. The advancement of technology also brings about problems relating to storing and retrieving information. The tremendous amounts of circulating information make it difficult to control and organize them. In addition, with the further development of technology, the problems become more complicated and multifaceted. For example, in order to control the flow of data, some supportive systems are needed. From this perspective, studies regarding information retrieval systems become more important and researchers will focus more on them in the future. In this respect, information science becomes more important.

Additionally, the effectiveness and efficiency of technological advancement is also based on the issues of information systems management. This is an important sub-consideration under information science. Finally, as noted above, the interconnection of information science with other disciplines makes the field more valuable. Information science as an interdisciplinary science will also continue to contribute and provide various valuable opportunities to other fields over the coming years.

7 Conclusion

It seems obvious that information science will become increasingly more important to general academia over the next few decades. The characteristics of information science, such as its connection with technology, the rapid evolution of information, and its interdisciplinary nature, are considered the main reasons for this increase due to the growing need to research information problems.

Information science is an interdisciplinary science. There are both positive and negative aspects to this interdisciplinary characteristic. Based on the varying theories, perspectives, methodological approaches, practices, and interests of the related disciplines, the definition of information can vary widely from one discipline to another. Researchers from different disciplines propose different definitions for the same term. Thus, the lack of a common definition of information may be seen as a major problem among scholars. However, in this author's point of view, this does not undermine the importance of information science. On the contrary, the interdisciplinary characteristic of information science strengthens other fields. Finally, taken all together, information science has an essential role and strategic importance in our modern society in the coming decades.

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Bulgarian Library Associations and Lifelong Learning for LIS Professionals

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Abstract. The paper explores the role and contribution of the Bulgarian library associations in the development of librarianship in the country, in establishing a modern vision for libraries and librarians and their involvement in the information, educational, scientific and cultural construction of the emerging knowledge society. It is focused on the priorities in the work of library associations in response to mobilizing science knowledge and policy for sustainable development. The report tracks the development and operation of the Bulgarian library associations – Bulgarian Library and Information Association (BLIA), Association of University Libraries (AUL) – and other library consortia – Bulgarian Information Consortium (BIC) and National Academic Library and Information System (NALIS). The main goal is to systematize the achievements in the implementation of projects and initiatives of the Bulgarian library associations in an effort to be effective partners of LIS higher education (especially with the State University of Library Studies and Information Technology), in lifelong learning of LIS professionals. Research methods: retrospective and systematic analysis, desk research and critical analysis of the results. The article's conclusions are linked with the national cultural policy, library legislation and with the collaboration between library associations and LIS education system. The research investigates the impact of the library organizations' activities on the theoretical fields of library and information science and education and also on library practice.

Keywords: Library association, LIS higher education, lifelong learning, State University of Library Studies and Information Technology.

1 Introduction

The library associations enable the consolidation of librarians, provide leadership and development of the profession, form a society's opinion on libraries and their modern mission, influence social and cultural trends in society and participate in dispute resolution. With their activities the library associations encourage interaction among library staff at the national level as well as international and intercultural dialogue with Europe and the whole world.

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2 Bulgarian Library Associations – A Brief Review

The survey, by the methods of retrospective and systematic analysis, tracks the emergence, development and operation of the Bulgarian library associations – Bulgarian Library and Information Association (BLIA), Association of University Libraries (AUL) – and other library consortia – Bulgarian Information Consortium (BIC), the National Academic Library and Information System (NALIS) – and presents their structure and activities. The main goal is to systematize the current theoretical issues and concrete achievements in the implementation of projects and initiatives of the Bulgarian library associations in their effort to be effective partners of LIS higher education in lifelong learning of LIS professionals.

The first attempt to create a professional association of librarians in Bulgaria occurred on 17 October 1926. The Constituent Congress of the Bulgarian Library Union was held in the University Library in Sofia. It opened with Vasil Klasanov's paper entitled "Goals and Tasks of the Bulgarian Library Union". The Union existed for a short time; attempts have been made to reopen it but without sustainable success.

2.1 Bulgarian Library and Information Association (BLIA)

On 13th March 1990 the Bulgarian library community established an association named the Union of Library and Information Services Officers (ULISO). In 2008 the name of the association was changed to the Bulgarian Library and Information Association (BLIA). The BLIA is a non-governmental organization of specialists in the library and information sector. It is a voluntary, independent professional organization that brings together professionals, united for improving library and information service and raising the prestige of librarianship. Members may be individuals or institutions who have the willingness to mark their interest in and support for the purposes and professional activities of the Association. BLIA's institutional members are divided into two sections: Libraries, and other organizations and companies. There are some sections: the American Experience for Libraries Section (founded on 3rd October 2004, supported by exchange programs of the US Department of State); the Bibliology Section; Student Affiliates Section; the Sociological Research Section; and the School Library Section [1].

BLIA's [1] main tasks and priorities are the following:

- Representing the interests of BLIA's members in the implementation of the national library, information and cultural policies;
- Continuous working on the development of updated library regulations, relevant to the needs of different types of libraries;
- Assisting and encouraging the development of the library and information sector in Bulgaria in line with European and international standards and trends;
- Encouraging interlibrary cooperation;
- Participation in current national programs and initiating new programs and projects at local, national and international level;

- Providing support for enhancing professional qualifications and the continuing education of library and information specialists;
- Expanding and consolidating the Association's structure; develop BLIA's cooperation with the international library community;
- Developing publishing programs and stimulating research and sociological surveys on current issues in the field;
- Involvement in proactive public communication for: transforming the profile and standing of the profession; increasing the visibility of BLIA in the Bulgarian public sphere; attracting new partners in the country and abroad.

In 2011 three experts nominated by BLIA were elected to the IFLA Standing Committees' for Sections, for the 2011-2015 term [1].

Other library associations have also been established in Bulgaria – Association of University Libraries (AUL), Bulgarian Information Consortium (BIC) and "National Academic Library and Information System" (NALIS) Foundation. The basic aims of their activity is to increase the possibilities for information provision for science and education.

2.2 Association of the University Libraries in Bulgaria (AUL)

In 2000, on the initiative of the University Library "St. Kliment Ohridski", the AUL was established under its president Prof. DSc Ivanka Yankova. The Association of the University Libraries is a natural outgrowth of the joint work of the Board of Directors of the High School libraries formed in 1978 under the management of the University Library at Sofia University, and of the Board's work to build a united information system in Bulgaria [2]. The Association of the University Libraries in Bulgaria contributes to improving and developing the library-information services in the sphere of higher education in Bulgaria, to the consolidation of the professional community of university libraries and to the consolidation of their active role in the information society. The basic aims which the Association of University Libraries is striving to realize are protection of the common interests of the university libraries in deciding questions of status, place, finance and transformation into digital libraries as a significant and necessary component of the development of higher education on the road to European integration. The AUL achieves its goals through project management, lifelong learning programs and training, best practices implementation, consultations, conferences and seminars, database presentations, publications, etc. [3].

2.3 Bulgarian Information Consortium (BIC)

The BIC has the mission of providing the best information resources at the best possible price to the Bulgarian users, applying high professional selection and criteria and offering the best services. Its goals are the following [4]:

- To support and encourage the use of information resources in Bulgaria;
- To meet the information needs of the Association's members and their users;

- To negotiate preferential financial terms for the use of information resources for all Association members;
- To encourage further development of information services provision through training, additional qualification, public relations and other appropriate means and methods;
- To foster the co-operation, resource sharing and exchange of experience between the members of the Association.

The Association achieves its goals through:

- Popularizing and distributing information resources by marketing analyses, training and fund raising policy;
- Establishing and keeping productive contacts with vendors, publishers and corresponding organizations in the country and abroad; Negotiating preferential financial terms and conditions for its members;
- Organizing promotional sessions for introducing the public to the electronic databases and their functionality;
- Keeping its members informed about the latest trends in digital information dissemination;
- Offering a wide range of activities to support collaboration among the members of the Association and improvement of the services and information packages offered.

2.4 National Academic Library and Information System (NALIS) Foundation

NALIS Foundation was registered as a legal entity of a non-commercial character on April 15th 2009. The activities of the NALIS Foundation are organized around a large-scale project supported by the America for Bulgaria Foundation. The founders are: Central Library of the Bulgarian Academy of Science, Central Library of Sofia University "St. Kliment Ohridski" and Library of the American University in Bulgaria. The NALIS Foundation was launched to answer the growing need of Bulgarian society for the following [5]:

- Functional integration of the library and information systems and catalogue registers of the research institutes, universities and some bigger book repositories;
- High awareness in the field of research and scientific activity;
- Application of up-to-date information service models meeting world standards;
- International cooperation in the field of the library information and communication systems.

3 Library Associations and Public Relations for Popularization of Lifelong Learning Activities

Table 1 summarizes the use of Public Relations (PR) tools of the Bulgarian library associations to achieve their goals and objectives in lifelong learning programs.

As Table 1 shows, all four of the associations have their own web sites. They organize conferences, carry out projects, educational and lobbying activities as well as publishing and disseminating press releases. On the other hand, only two of these associations, namely BLIA and BIC, use social media for PR and only BLIA carries out national campaigns.

National campaigns carried out by BLIA in the period of 2006-2011 are listed below:

- 2006 - Library – Investment in the Future
- 2007 - Libraries – our Shared Responsibility!
- 2008 - Libraries on the Agenda!
- 2009 - Library – Information and Communication for All!
- 2010 - Modern Library – your Right!
- 2011 - Libraries – Partners in Education!

Table 1. Library associations and their public relations activities

PR Tools	*BLIA*	*AUL*	*BIC*	*NALIS*
Conferences	x	x	x	x
National campaigns	x	-	-	-
Web sites	x	x	x	x
Social media (blogs, Facebook etc.)	x	-	x	-
Project activities	x	x	x	x
Press releases, bulletins, publishing (print and e-version)	x	x	x	x
Educational activities	x	x	x	x
Others (lobbying, media coverage, etc.)	x	x	x	x

This new direction for the activity of BLIA follows the experience of the American Library Association (ALA), shared in the framework of the project American-Bulgarian Library Exchange (ABLE - http://www.ableportal.bg). BLIA also organizes a campaign called “Reading Marathon“ which has been held annually since 2006 as a part of the national campaign “Reading Bulgaria”. In this initiative libraries from all around the country take part and Bulgaria participates in the celebration of World Book Day in this way. World Book Day, celebrated since 1996, was initiated by UNESCO in recognition of the crucial role of reading and education for personal development.

A number of successful projects have been carried out by the Bulgarian library associations. We will mention some selected projects of BLIA and AUL, which have had an important effect, both for the lifelong learning activities of the associations and their members and for the society as a whole.

3.1 Selected BLIA National Projects

Access for persons with disabilities to electronic information in Bulgarian libraries (2005-2006, British Council Bulgaria, www.libsu.uni-sofia.bg/project_access/); legislative framework for libraries and library and information activities in Bulgaria

(2006); Management of public libraries (2008, British Council-Bulgaria); Bulgarian Libraries – access points to information and communication for all (2008 to date, part of the Global Libraries Initiative of the Bill & Melinda Gates Foundation (BLIA is one of the key partners, http://www.glbulgaria.bg/en/); advancement and sustainable development of the library sector in Bulgaria (2010-2014, supported by the America for Bulgaria Foundation).

BLIA is also a partner in the following international projects: American-Bulgarian Library Exchange (ABLE, 2003-2006, Bureau of Educational and Cultural Affairs of the U.S. State Department, IRIS, Colorado Association of Libraries); CALIMERA (2005, Cultural Applications: Local Institutions Mediating Electronic Resource Access); PULMAN Network (Public Libraries Mobilising Advanced Network); ENTITLE (Europe's New Libraries Together in Transversal Learning Enviroments).

3.2 Selected AUL Projects

The University libraries – center for scientific and culture communication, bridge to the unified European educational space (European Year of Intercultural Dialogue 2008, http://www.aub-bg.org/ey2008/index_en.html); partner of the State University of Library Studies and Information Technology in the project "Developing a network of continuous education centers for librarian organizers, serving the small local communities" (2008-2009, PHARE); the international project 'Danube Seniors' Universities - DASUN 2011, http://www.dasun.eu/; Centre for General Scientific Education of the University of Ulm (ZAWiW der Universität Ulm), etc. In 2011 AUL was co-organizer, together with the State University of Library Studies and Information Technology and Bourgas Free University, of a Conference with international participation on "Library and Cultural Management and ICT" (September 3-4, 2011, Bourgas).

A summary, Bulgarian library associations apply rich PR techniques and approaches for effective interaction with the LIS higher education institutions, professional community and to strengthen collegial relationships at national and international level.

4 Models of Collaboration in Lifelong Learning

The first sustainable model of cooperation is the Center for Continuing Education for Librarians (CCEL) at the BLIA which was founded in 2001, in cooperation with the Department of Library and Information Studies and Cultural Policy at the Sofia University 'St. Kliment Ohridski'. The Center provides opportunities for professional qualification and continuing education for graduate specialists with bachelor's or master's degree.

CCEL is a focal point for continuing professional qualification in library management, management of information resources, services and staff; introduction of new technologies and their application. The range of programs is designed to supplement and expand the knowledge and skills of university graduates in Library and Information Studies.

The Center for Continuing Education for Librarians [6] offers training for:

- library managers, librarians, information specialists with bachelor's or master's degree, working in different types of libraries;
- graduate specialists with bachelor's or master's degree, working in other institutions;
- librarians from the methodological departments of regional libraries, who provide consulting services and training for small libraries' staff in their regions.

The curriculum complies with the current trends and standards in library and information service. It comprises the following modules: Management for library leaders; Library marketing and communication; Sociology of reading and readers; Library programs; Collection management; Cataloguing; Library services; Training of library users; Technologies in libraries; Foreign language training for librarians; and Cultural heritage [6].

In 2004 the Center for Continuing Training in the State University of Library Studies and Information Technologies was established. Among its activities we would like to underline the Project "Developing a Network of Continuing Education Centers for Librarian-Organizers, Serving the Small Local Communities" (1st June 2008 – 1st June 2009), Project PHARE, Program of EU "Economic and Social Cohesion". The project was realized under the management and vocational training guidance and capacity of the State University of Library Studies and Information Technologies (SULSIT), together with the Association of the University Libraries (AUL) in Bulgaria and with the support of the Union of the Chitalishta[1], Sofia. It had the mission of helping the unemployed persons from small towns and villages to become librarian-organizers and to adapt the trained people to the new reality of the Bulgarian membership in the European Union by means of initiatives for lifelong learning. Thanks to that vocational training they can develop and exploit the local potential – cultural, historical, ethnographical. The project assures preparation (training) assistance for improvement of the employability skills and chances of the members of the local community with respect to the local, regional, national and EU market. It helps to lessen unemployment thanks to training and reorienting some unemployed persons to new activities.

The specific objective of the project was to establish a network of continuing education centers for librarian-organizers in small local communities through development of existing adult training centers and implementation of the new information technologies in the educational process for the specialty "librarian-organizer". This was carried out by SULSIT, AUL and chitalishte "Razvitie" in Drianovo, chitalishte "N.Y.Vaptsarov" in Dulovo and chitalishte "Razvitie" in Elhovo. This partnership guaranteed both high quality, effectiveness, and efficiency of the proposed project action and continuation of the activities envisaged in the project after its actual completion in the specified time [7].

[1] Traditional community centers.

5 Conclusions and Suggestions

Library associations carry enormous potential to increase the competence of professionals on current topics, concentrating their efforts on solving problems and inspiring many followers in the direction of useful public purposes.

By tracking the emergence and development and in-depth analysis of the lifelong learning activity of the Bulgarian library associations, namely BLIA, AUL, and other library consortia and associations, namely BIC and NALIS, we reached the following conclusions:

- Library associations are an important factor in the continuing lifelong education of library specialists; they are the intermediary that carries theoretical achievements, knowledge and leading experience to practicing librarians. This makes them “trainer associations”, “educating library associations", and their natural partners are the higher educational institutions;
- The emergence, development and activity of library associations BLIA, AUL, BIC and NALIS are very important for the presentation and promotion of the activities of Bulgarian libraries. With their activities they unite and activate the library, museum, archives and information institutions in the process of building the information society and community, based on knowledge;
- Analysis of the programs and themes of their conferences, seminars, workshops and initiatives gives us a summary for the assessment of current problems, of the solutions achieved to modern theoretical and practical issues and the specific achievements of libraries in the way of implementing EU policies to build a single European information and educational space;
- Associations are active in developing the basic problems of information society: digitization, preservation and provision, free and equal access to online European and world cultural heritage; information legislation and protection of intellectual property; modernization of LIS education; development and application of information technologies, etc.;
- With their activities the library associations promote intercultural and international dialogue and encourage interaction with library communities in Europe and the world.

Suggestions for best practices:

- It is necessary to have a partnership with state and local authorities in the initiatives of the library associations to make a real impact that can benefit the society;
- Realization of coherent Public Relations strategy – continuous and effective in order to make the efforts and activities, mission and objectives of the library associations visible and recognizable to the community;
- To build stable relationships with other cultural institutions – museums, archives, galleries in order to develop the implementation of new information technologies in preservation, digitization and ensure access to cultural heritage for society;

- Library Associations should be engaged win tangible initiatives, which are current in the library and information sphere in certain countries and in the whole world and which contribute real benefits to the society;
- Library Associations must be open and linked in networks on national and international levels. They create the stable library international community which spreads the best world practices and achievements to every researcher and practitioner in the library and information field.

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