Dominik Mirosław Piotrowski
Biblioteka Uniwersytecka w Toruniu
Uniwersytet Mikołaja Kopernika w Toruniu
e-mail: dpi@umk.pl.

Web integrator: the new role of academic librarians?

ABSTRACT: The subject of this study is the new role of an academic librarian who, as a web integrator cooperates with various experts in order to optimize the library's online information services by means of a range of technologies provided by the web environment. The purpose of this study is to prove, that a librarian can act as a web integrator. In order to realize this goal, a case study was conducted, focusing on the role of the author, who is also a librarian at the Department of Information of the Nicolaus Copernicus University Library in Toruń in the field of integration of web technologies. The analyses have confirmed the view that the studied librarian performs the role of a web integrator. This study has allowed to put forward another hypothesis, according to which the role of a web integrator is a new one among academic librarians who deal with informatization and optimization networking services available online.

KEYWORDS: library services, web integrator, web technologies, academic librarians.

Introduction

The paper presents the Author's remarks on the new roles of a librarian, as well as the profession in the context of integrating various web-related technologies and a modern digital workplace. The text focuses on

the solutions used by a librarian from the Nicolaus Copernicus University Library in Toruń. The conducted research may serve as an introduction to in-depth studies on the changing roles and contemporary working conditions of librarians.

Over the years, tasks and specializations of academic librarians evolved, which has contributed to the emergence of new roles and types of professional librarians. For instance, along with computerization of libraries and digitalization of their resources, specialized positions have emerged, such as a system librarian[1] or digital librarian[2], whileas a result of combining elements of traditional and digital libraries, a hybrid librarian[3] was created. Besides, the use of Internet 2.0 by libraries resulted in the appearance of librarian 2.0[4] in the library environment and academic discourse.

Over 14 years ago a Polish information scientist, Marek Nahotko, argued that in the future the most important tasks of librarians would be

> working with a computer system, online help, assistance in navigating within dispersed resources, and converting data into information, and information into knowledge[5].

The scholar's remarks correlate with the findings of research conducted in order to identify new and changing roles of librarians and information specialists. Analysis has revealed six new roles, namely: teachers, technology specialists, embedded librarians, information consultants, knowledge managers, and subject librarians[6]. Three of the above-mentioned roles

---

[1] T. C., Wilson, *The systems librarian designing roles, defining skills*, Chicago 1999.

[2] J. D., Monson, *Jump-Start Your Career as a Digital Librarian : A LITA Guide*, Chicago 2013.

[3] M. Adolphus, *The hybrid librarian* [online] [access April 10, 2020]. Available in World Wide Web: https://www.emeraldgrouppublishing.com/librarians/management/viewpoints/hybrid.htm.

[4] *Bibliotekarz 2.0 : nowoczesność na bazie tradycji : biblioteka w przestrzeni edukacyjnej*, edit.: S. Skórka, M. Rogoż, Kraków 2015.

[5] M. Nahotko, *Bibliotekarze cyfrowi w środowisku cyfrowej nauki, biblioteki i cyfrowych publikacji*, „Biuletyn EBIB" [online] 2006, nr 10(80) [access January 20, 2020]. Available in World Wide Web: http://www.ebib.pl/2006/80/a.php?nahotko.

[6] E. Vassilakaki, V. Moniarou-Papaconstantinou, *A systematic literature review informing library and information professionals' emerging roles*, „New Library World" 2015, vol. 116, no 1/2, pp. 37–66, https://doi.org/10.1108/NLW-05-2014-0060.

are interesting from the point of view of this paper. These are: technology specialists, involved in increasing the visibility of digital contents generated by an institution; information consultants, who deal with access to information and its integration; and knowledge managers, responsible for designing the architecture of information, creating taxonomies, and managing information[7]. Librarians can also develop their skills in the field of data science, becoming specialists in managing large library data sets[8].

In the era of the digital revolution and the massivedevelopment of information and communication technologies, including cloud-based solutions provided within the Software as Service model (SaaS), various open source content management systems (CMS)[9], and social media, the role of the librarian evolves as well. According to the findings of studies on the changes taking place in relation to the responsibilities and qualifications relevant for academic reference librarians, one can conclude that the librarian of the 21st century is a hybrid librarian responsible both for providing information and evaluating digital materials, as well as technical consulting, and content management solutions[10]. Currently, it is expected that the librarians discussed in the article will have special skills, including the ability to analyze databases and use content management systems[11].

In the context of this aspect, the results of the research obtained in a survey in Great Zealand seem interesting. The librarians discussed in this article and academic librarians were examined in this way. The research was aimed at determining the most valuable knowledge, skills, and competences among librarians employed in high school libraries. It turned out that the librarian, in addition to effectively providing relevant information, should have skills related to customer service, technical as-

---

[7] B. Rosenstein, *Emerging roles and possible futures for librarians and information professionals* [online] 2015 [access January 20, 2020]. Available in World Wide Web: http://www.emeraldgrouppublishing.com/librarians/features/librarian_roles.htm.

[8] M. Rădoi, *New Professional Developments in the Academic Libraries*, „eLearning & Software for Education" 2017, vol. 3, pp. 56–61, https://doi.org/10.12753/2066-026X-17-181.

[9] D. M. Piotrowski, *CMS w bibliotekach. Open source'owe systemy zarządzania treścią jako platforma realizacji usług bibliotecznych*, Toruń 2018.

[10] J. C. Gottfried, *The Plugged-in Reference Librarian: Who Do We Think We Are?*, „Reference Librarian" [online] 2013, vol. 54, no. 4, pp. 308–19 [access January 20, 2020]. Available in World Wide Web: https://doi.org/10.1080/02763877.2013.767766.

[11] Ibid, p. 314.

sistance, training, and communication[12]. Another interesting fact is that librarians can use their knowledge and skills when designing so-called educational communities that provide a comprehensive space for learning, research, and projects[13].

Librarians, by gaining new competences and performing new tasks, begin to take on modern professional roles which are required from them due to technological progress.

The Author's intention is a proposal to formulate a new role asan academic librarian, namely a „librarian web integrator". The concept of proposed specialization is based on a modern work position in terms of information technologies, namely a web integrator. A web integrator's main tasks include coordinating various elements and outcomes of actions carried out by specialists involved in Internet projects. A web integrator is responsible for obtaining particular goals, and his contribution often has a long-term impact on the client's actions[14]. When analyzing online job offers, it can be assumed that above all, web integrators must have high competence in information technology, in order to implement, facilitate the development and improvement of various web technologies, and to cooperate with specialists. Web integrators can also work remotely.

At the same time, it should be emphasizedthat the role of a librarian has already been noticed in the environment of school libraries. School librarians integrate technology to optimize the processes related to informing, teaching, and digital culture. Interestingly, schoollibrarians as specialists in their field may become the leader of technology integration underthe so-called distributed leadership. At the same time, the factors thatinfluence the development of librarians as leaders in technology

---

[12] B. Chawner, G. Oliver, *A survey of New Zealand academic reference librarians: Current and future skills and competencies*, „Australian Academic & Research Libraries" [online] 2013, vol. 44, no. 1, pp. 29–39, [access January 20, 2020]. Available in World Wide Web: https://doi.org/10.1080/00048623.2013.773865.

[13] J. Lippincott, S. Greenwell, *7 Things You Should Know About the Modern Learning Commons*, „ELI 7 Things You Should Know Series" [online] 2011 [access January 20, 2020]. Available in World Wide Web: https://library.educause.edu/-/media/files/library/2011/4/eli7071-pdf.pdf.

[14] *Web integration definitione*, „Web integration" [online] [access January 20, 2020]. Available in World Wide Web: http://www.web-integration.info/en/web-integration-definition/#section-what-is-a-web-integrator.

integration are the relations with various groups, such as the principals, who support and motivate librarians accordingly[15].

Another aspect thatis interesting in the context of this articleis the modern workplace of librarians, which is shaped by theimplementation of new technologies and mobile and remote access to tools and resources. Nowadays, librarians can work with the use of computer technologies both inthe library and at home, thanks to remote access via a desktop computer or a laptop or during a business trip via mobile devices. This is related to the development of libraries towards the digitalization of content and the possibility of remote work in the field of information management[16]. Communication and telecommuting in the digital domain are currently gaining importance, as they allow easy access to necessary tools and information[17].

When talking about an institution's employee access to digital tools, platforms, and information, the concept of the digital workplace (DW) should be introduced. Currently, DW has many definitions. For the purpose of this paper it can be assumed that

> The digital workplace is the experience of work delivered through the collective use of connected devices, software and interfaces[18].

This definition indicatesa digital workplace in the context of users and User Experience (UX), i.e. a different user various impressions of who engages in interaction with technology. The definition also includes the relations with other organizational units of the institution[19]. Importantly,

---

[15] M. P. Johnston, *Connecting Teacher Librarians For Technology Integration Leadership*, „School Libraries Worldwide" 2012, vol. 18, no. 1, pp. 18–33.

[16] I. Augustynowska, B. Zwolak, *Nowe wyzwania w zawodzie bibliotekarza*, [in:] *Bibliotekarz: zawód czy powołanie*, Gdańsk 2010, s. 156–68.

[17] K. Byström, I. Ruthven, J. Heinström, *Work and information: which workplace models still work in modern digital workplaces?*, „Information Research" 2017, vol. 22, no 1, pp.1–13.

[18] E. Freed, *Which of these 8 definitions of „digital workplace" works best for you?*, „Digital Workplace Group" [online] March 31, 2015 [access January 20, 2020]. Available in World Wide Web: http://digitalworkplacegroup.com/2015/03/31/which-of-these-8-definitions-of-digital-workplace-works-best-for-you/.

[19] Ibid.

the improvement of UX and the creation of a modern DW can become a factor that defines the success of a modern institution[20].

Materials and methods

The subject of this study is the new role of an academic librarian who, as a web integrator, cooperates with various experts in order to optimize the library's online information services using a range of technologies provided by the web environment. The purpose of this study is to prove that a librarian can act as a web integrator. To achieve this goal, a case study was conducted, focusing on the role of the author, who is also a librarian at the Nicolaus Copernicus University Library, in the field of integration ofweb technologies. The chosen method allows to hypothesize and verify hypotheses[21] that seem useful research on the changing role and toolkit of a modern librarian. The study was conducted between June and August 2017 (some units changed their names in 2020, which was included in the text), but the cooperation with specialists and ongoing projects go beyond this time frame.

The following research questions were asked: If a librarian plays the role of a web integrator, does he cooperate with specialists in technology integration? What elements are the digital workplace of the studied librarian? How can web technologies be combined to optimize library services?

Results

The Nicolaus Copernicus University Library in Toruń is one of the largest libraries in northern Poland. It is a modern institution in terms of organization and technology, providing its users with many information resources and a wide range of services. The library has over 20 years of experience in using web technologies, as the library's first website was created as

---

[20] K. Dery, I. M. Sebastian, N. Meulen, *The Digital Workplace is Key to Digital Innovation*, „MIS Quarterly Executive" 2017, vol 16, no. 2, pp.135–52.

[21] E. Głowacka, *Metoda „case study" w badaniach i dydaktyce bibliotekoznawstwa i informacji naukowej*, „Przegląd Biblioteczny" 1986, vol. 54, nr 1, s. 25–32.

early as in 1993[22]. At the same time, the factor of having a great impacton the IT solutions used by the University Library is cooperation with other units operating within the University, such as the University IT Centre, and Faculty of Mathematics and Computer Science. Web technologies implemented and improved in the course of cooperation with the above-mentioned units support the library in providing internal and external on-line information services and in managing various types of digital content.

Cooperation with specialists in the field of technology integration

Thanks to the librarian's cooperation with numerous experts, it is possible to integrate the results of various works and activities in the context of achieving the objectives of new or previously used web technology. The specialists cooperating with the author come from the following groups:

1. Employees of the Nicolaus Copernicus University Library,
2. Employees of the University IT Centre,
3. Employees of the Faculty of Mathematics and Computer Science,
4. Employees of the Institute of Information and Communication Research,
5. Employees of commercial companies.

The employees of the Nicolaus Copernicus University Library are the first group with whomthe author of this study cooperates on a daily basis. To start with, it should be noted that all important decisions regarding the web technologies used by the Library are ultimately made by the Head of the Library, which also has asignificant impact on improving the functioning of online library services provided by IT specialists and librarians. IT specialists from the Department of Information Technology and Digitization provide professional support in terms of implementation, development, and maintenance of various types of computer systems. At the same time, the integration of the results of work and activities of IT specialists and experts from its home Department of Information

---

[22] B. Bednarek-Michalska, *Historia stron internetowych BG UMK* [online] 2016 [access January 20, 2020]. Available in World Wide Web: https://repozytorium.umk.pl/handle/item/3046.

(or other departments) contributes to the continuous improvement of technology and online service quality. Library employees working in other departments, who are often experts in various fields, also provide assistance in improving the quality of provided services. Consulting with other librarians often results in improved functionality of university online platforms.

In addition to IT specialists from the library, specialists from the university IT center who coordinate the supervision of the university network and information resources and implement new technologies at the university offer great help in the field of technology. Cooperation with IT specialists from the University IT Centre and the University Library is essential in the course of various library onlineprojects based on the university's digital resources, such as during the implementation of open source software. Employees design solutions connected to the optimization of distance learning, and offerassistance in the use of modern technologies. The unit maintains and develops most of the university's e-learning platforms based on the popular Moodle system. Cooperation with the Centre's IT specialists allows effective use of modern technologies for the Library's teaching services.

Another group isthe experts from the Faculty of Mathematics and Computer Science, who as employees of the university's scientific and educational unit are a valuable source of knowledge and skills in the use of innovative information and communication technologies. Librarians participate in various training, workshops, and conferences organized by the Faculty. In this way, they enable the transfer of knowledge and skills, which ultimately results in improvements in the quality of information services offered by the Library. IT specialists from the Faculty of Mathematics and Computer Science cooperate with librarians in improving web technology, a good example of which was the recent migration of the Liferay Portal system to a new, more mature version.

Information scientists from the Institute of Information and Communication Research provide assistance in the field of broadly understood Informatology and Information Technology. The author's cooperation with the Institute's scientists and experts concerns such areasas information architecture, data management, usability and availability of internet contents and services, implementation of information systems, or optimization of online services.

Employees of commercial companies, such as EBSCO, are experts providing services related to customer service using licensed platforms and tools for providing modern information services. An example would be EBSCO Discovery Service tool for exploring library resources, which allows for browsing library resources with a single search window. The author cooperates with experts from this group in order to integrate the web technology used by the Library with commercial IT products.

Digital workplace of a librarian

In the studied case, the digital workplace includes numerous applications installed onthe computer which is physically present in the Library, as well as a range of solutions available via the Internet. From the point of view of this text, Internet solutions based on open source software, cloud platforms, and tools, as well as commercial products, which are sometimes available free of charge to library employees, are of significant importance. Four groups of Internet applications are identified below. The criterion of the division was the distribution, and at the same time, access to the given IT solution. The first group is an open source software that includes:

1. Liferay Portal, which is Enterprise Content Management, serving as the Portal of Nicolaus Copernicus University Library.
2. Joomla! acts as a platform which hosts the specialist libraries service within the library information system of the Nicolaus Copernicus University.
3. Moodle is a popular e-learning system, on the basis of which the University Library's platform for distance learning operates.
4. Mibew Messenger is an open source application used for online chat assistance.
5. Pidgin version for Windows/Linux as well asthe online browser version allows for communication (chat) among Library employees.
6. LimeSurvey, a survey system used to carry out various studies.
7. OwnCloud provides a platform for creating online drives, in this case, it is an EduDrive web drive, which is used by the entire university for file exchange and sharing.
8. Internet Mail Program (IMP) is the university's Webmail client.

The second group contains web solutions which are publicly available free of charge, such as social media and Google tools:
1. Social media:
    a. Facebook.
    b. Twitter.
    c. YouTube.
    d. Pinterest.
2. Google Analytics, Google Search Console, Google Drive, Google My Business.
3. Prezi and other SaaS tools.

The third group is consistsof licensed commercial tools and platforms. It includes:
1. EBSCO Discovery Service (EDS) and Full Text Finder (FTF) available via EBSCO admin interface. Theseare tools thatallow exploration of the resources of Nicolaus Copernicus University Library.
2. IBUK Libra is a platform popular in Poland that contains digital versions of books.

The last group of tools is commercial solutions which are available free of charge for the Library:
1. Adobe Creative Suite 5.5 Design Premium, which is a package containing popular applications from the Adobe family (Cloud-based Campus Services on Platon Science Service Platform).
2. Adobe Connect allows organizing video conferences (the system is provided by the University IT Centre).
3. Scala Content Manager, through which Digital signage is implemented (available to the Library thanks to „E-kultura" Project).

Even thoughthat small-scale research is intended to describe a specific digital workplace, it should be noted that the other librarians from the Department of Information also use some of the above-mentioned solutions in their daily work, as well as local network drives and the following internet systems:
1. DSpace, which is a popular open system for creating digital archives, implemented for the needs of the institutional repository at the University.
2. dLibra – a commercial platform thatserves as the basis for Digital Library. The dLibra system is managed through the application for the operating system.

Web technology integration
for optimizing library services

A perfect example of technology integration and cooperation among specialists to optimize online library services is the library portal. It works based on the open source Liferay Portal system, the Community Edition. In 2017 a migration of Liferay Portal from version 6.0.2 to version 6.2.5 was conducted. The migration process was attended by specialists from all the above-mentioned groups, especially from the Faculty of Mathematics and Computer Science[23]. In this case, the author of this paper took care of combining activities of various specialists, while being deeply involved in the implementation of the project. As a result, Liferay Portal was migrated in accordance with the assumed goals. As a system administrator, the author has full control over the integration of functions and data within the portal and outside of it.

Liferay Portal allows for creating many websites within one portal. The Library's portal contains public websites thatare available for readers, as well as private websites, which are only available to librarians. The private websites constitute the intranet, which is based on Liferay's core functions such as forums, blogs, wiki, calendars, or www content management. Liferay system's functions can be freely integrated with the information stored on the portal. The portal allows for the categorization of contents[24] as well as management and sparing of knowledge. Thanks to the categorization of contents subject librarians are able to manage thematic guides, and specialized librarians responsible for digital publications can manage informations about databases subscribed to by the University. By means of categorization and tagging of contents on the portal, librarians can create various types of taxonomies forcontents

---

[23] D. M. Piotrowski, G. Marczak, *Migracja otwartoźródłowego systemu Liferay Portal w Bibliotece Uniwersyteckiej w Toruniu – studium przypadku*, „Toruńskie Studia Bibliologiczne" [online] 2018, vol. 10, nr 2 (19), s. 111–134, [access April 10, 2020]. Available in World Wide Web: http://apcz.umk.pl/czasopisma/index.php/TSB/article/view/TSB.2017.020.

[24] J. Zhou, *A History of Web Portals and Their Development in Libraries*, „Information Technology & Libraries" 2003, vol. 22, no 3, pp. 119–28.

and knowledge. Further integration is expected in the future, as Liferay Portal as ECM-type software is basically designed for service integration.

The portal also has embedded functions from other systems. In order to optimize IT services provided by the Library, the code of the EDS tool for exploring library resources by EBSCO company was placed in the library content of a website within the portal. Thanks to this solution, the tool for exploring library resources (along with OPAC and FTF) may be displayed on any website and device. The tool's code has been also placed within the contents of the specialized libraries' module and on the library's e-learning platform. Another example of integration is the online information service, which the Library provides via Mibew Messenger application. Librarians provide answers to questions asked by readers through an interface available via a web browser. The code of special „button" which allows for communicating a librarian, just like the Searchbox, has been embedded within the contents of the library's website and other internet services.

The digital educational activity is mainly performed by the Library by means of an e-learning platform based on the open Moodle system. The Author is the administrator of the Library section of the Moodle system and is able to manage courses, contents, websites, and users. In order to optimize the training services, a number of technologies have been integrated, among others didactic resources in SCORM format, which allow cooperation with the teaching environment. For that purpose, using Adobe Captivate software, multimedia and interactive training contents have been prepared, which were later „packed" into the SCORM format and imported into Moodle, in order to embed them within a given course. Thanks to this solution, readers were able to interact with digital training contents, such as a quiz.Their results were transmitted to Moodle and displayed in a grade register. Another aspect in terms of improving web platforms and their integration was embedding special modules with the functionalities of Mibew Messenger and EDS + FTF + OPAC (Searchbox) systems as well as graphic links to the library's portal and social media.

Another website, biblioteki.umk.pl, is a platform containing the domains of all specialized libraries within the university's library and information system. The service is based on CMS Joomla!. The system

had to be adjusted to the specified goal, which was the integration of faculty libraries' websites by means of appropriate organization and categorization of contents, applying access control lists, installing and adjusting graphic templates, configuration Joomla! core functions, as well as installing and configuring a number of other extensions. Thanks to this solution, trained librarians can easily and dynamically add and edit the content of groups assigned to them, which ultimately affects the effectiveness of publication of information.

The Library has its profiles and websites on the most popular social media portals. Librarians actively participate in social media in terms of providing information, knowledge sharing, and promoting the Library's services, resources, and activities. In addition, in order to improve the Library's visibility on the internet, social media optimization (SMO) is being performed. SMO is aimed at combining the library's web platforms with social media, for example, by embedding the social media icons that link to the Library's profiles, or using social media icons, thus allowing to share the content found on the Library's websites. At the same time, on the basis of social media, various services are provided, such as online information service via Facebook Messenger.

The Library also provides the Digital signage service, which means creating (or obtaining), managing, and publishing the cultural contents using Scala Content Manager. The content is then transmitted to a number of screens and displayed at the Library and in cultural institutions, as well as the main spots of the region's largest cities. When designing posters and other graphic materials, Adobe Photoshop and Adobe Illustrator graphics software areused. The graphic materials can then be managed online and displayed on selected screens.

Librarians in their work also make use of cloud storage services such as EduDrive in order to collect, store, and share different types of files. The web storage within a cloud is becoming an important element of a digital workplace. Another noteworthy component is various types of tools from the SaaS model. SaaS solutions allow for cooperation and communication between various specialists and teams. The results of each person's work can then be shared and embedded on the library's WWW websites. An example of this is the numerous content embedded as block code on Library websites.

Discussion

The research has allowed characterizing fields of the Author's coopera-tion with numerous specialists, as well as describe a librarian's DW, and analysis of the integration of various elements to optimize web-based services. The study has made it possible to view a librarian who develops web technologies and cooperates with specialists of various types for this purpose, as a websites integrator.

We live in the times when digital library resources available via web-sites play an increasingly important role. At the same time, technology allows the creation of many advanced solutions, which require only the right competencies to properly use the opportunities offered by modern technology. The librarian as a web integrator must, therefore, have a wide range of skills, along with relevant knowledge of modern information technologies, and organizational solutions aimed at optimizing online library services. The librarian must stay up-to-date with technological advances[25]. Another important factor is cooperation with IT specialists, as

librarians and IT people share many common concerns[26].

That is why a librarian as a web integrator should be exceptionally aware of the rules of interpersonal communication in order to make contacts with specialists, as well as show creativity in the field of implementing internet-based library services.

An interesting issue is thelibrarian's digital workplace and remote access to the tools used at work. Flexible „teleworking" may contribute to a more effective realization of the set objectives, both by librarians themselves and the institutions that employ them[27]. Remote access to

---

[25] S. J, *How Libraries Are Integrating Effective Technology,* „Masters In Library Sci-ence.net" [online] [access January 20, 2020]. Available in World Wide Web: http://www.mastersinlibraryscience.net/how-libraries-are-integrating-effective-technology/.

[26] J. Zhou, opt. cit., p. 128.

[27] D. Hickey, N.Tang, *Theoretical and Applied Approaches to Remote Work for Aca-demic Reference and Instruction Librarians*, [in:] *Library staffing for the future* [online] 2015, pp. 245–62 [access April 10, 2020]. Available in World Wide Web:https://doi.org/10.1108/S0732-067120150000034008.

information and tools can increase the efficiency of the librarian's work, and while teleworking, tools such as Windows remote desktop may appear useful.

At present, a librarian is equipped with numerous tools and web platforms. There are many types of open source CMS systems that can be implemented and developed in order to provide various online services. There are different types of systems meant for collecting, storing, and publishing contents in the digital format. This indicates further development in the field of open web platforms in libraries. At the same time, a large number of platforms require efficient collection and management of the used logins, passwords, and access to the administered systems. In other words, a program for managing access data is required, such as the open source KeePass.

A librarian web integrator has many duties that overlap the roles performed by a librarian, but a librarian integrator specializes in web technologies and online services. At the same time, a librarian integrator should be familiar with the current procedures related to the functioning of the library, thanks to which he or she is capable of designing system functionalities more efficiently within the library's information infrastructure.

The roles of librarians will successively evolvein the coming years[28]. The evolution of the librarian's profession and the integration of technologies and services will be undoubtedly influenced by the appearance of the technological successor of the Integrated Library System, namely the Library Services Platform in libraries, which is currently being developed in the open source LSP FOLIO software[29]. In the FOLIO system, all library services and processes will be by definition integrated, which will definitely have influence on new tasks performed by librarians.

Data and knowledge management, as well as designing and implementing information systems are practical and useful skills, which in the digital era allow for the effective functioning of a librarian and

---

[28] B. Chawner, G. Oliver, opt. cit.
[29] D. M. Piotrowski, B. Kmiecikowska, I. Olińska, *FOLIO, OLE oraz TIND, czyli nowoczesne Platformy Usług Bibliotecznych: open source i jego komercjalizacja*, „Biuletyn EBIB" [online] 2016, nr 8(170) [access April 10, 2020]. Available in World Wide Web: http://ebibojs.pl/index.php/ebib/article/view/164.

an information specialist. That is why another important issue is the need to develop qualifications related to effective use of a digital workplace and education of future librarians and information specialists in this field. At present, universities educate information specialists who are prepared, among other tasks, for data management, design, and implementation of information services, as well as conductingtraining for users of theseservices[30]. An information specialist (with the assistance of IT specialists) designs information services (for example, by means of various types of CMS), and knows the techniques of searching for information and resources[31]. Education in schools that offer the best curriculum in the field of information systems can be a model in this respect (e.g. University of Michigan School of Information).

Further research is recommended to explore the better collaboration of librarians with specialists as well as the elements and applicationsof thedigital workplace in the context of technology integration and development of online services. This study allowed toput forward another hypothesis, according to which the role of a web integrator is a new one among academic librarians who deal withcomputerization and optimizationnetworking services available online. Further research may, therefore, be useful in determining the correctnessof the above hypothesis.

The analyzes confirmed the view that the studied librarian plays the role of a web integrator, by using his competences and qualifications, as well as the elements of a digital workplace, he cooperates with specialists in order to integrate and develop technologies, as well as optimize library services.

Conclusion

Irena Augustynowska and Barbara Zwolak in their article entitled *Nowe wyzwania w zawodzie bibliotekarza*, postulate „modernizing the terminology" concerning library employees by adding information on specializa-

---

[30] M. Górny, *Nauka o informacji jako dyscyplina naukowa*, [in:] *Nauka o informacji*, Warszawa 2016, s. 23–40.

[31] Ibid.

tion[32]. Therefore, the author of this article also proposes a new modern specialization of a librarian web integrator.

The Author perceives a librarian web integrator as a person who possesses the knowledge and a wide range of skills from the field of content management, categorization, and organization of information, creating taxonomies and knowledge resources, as well as the implementation of information systems. A librarian web integrator cooperates with various specialists and combines different systems and web applications and their functions to optimize the process of providing services in the digital environment. At the same time, a librarian web integrator has communication skills and knowledge of organizational solutions, procedures, and functions of a library. That is why he or she is able to cooperate with specialists more efficiently and designs integration and functionalities of various library systems more effectively.

Bibliography

Adolphus Margaret, *The hybrid librarian* [online] [access April 10, 2020]. Available in World Wide Web: https://www.emeraldgrouppublishing.com/librarians/management/viewpoints/hybrid.htm

Augustynowska Irena, Zwolak Barbara, *Nowe wyzwania w zawodzie bibliotekarza*, [in:] *Bibliotekarz: zawód czy powołanie,* Gdańsk 2010, s. 156–68.

Bednarek-Michalska Bożena, *Historia stron internetowych BG UMK* [online] 2016 [access January 20, 2020]. Available in World Wide Web: https://repozytorium.umk.pl/handle/item/3046.

Byström Katriina, Ruthven Ian, Heinström Jannica, *Work and information: which workplace models still work in modern digital workplaces?,* „Information Research" 2017, vol. 22, no 1, pp. 1–13.

Chawner Brenda, Oliver Gillian, *A survey of New Zealand academic reference librarians: Current and future skills and competencies*, „Australian Academic & Research Libraries" [online] 2013, vol. 44, no. 1, pp. 29–39 [access April 10, 2020]. Available in World Wide Web: https://doi.org/10.1080/00048623.2013.773865.

---

[32] I. Augustynowska, B. Zwolak, op. cit., s.166.

Dery Kristine, Sebastian Ina M., Meulen Nick van der, *The Digital Workplace is Key to Digital Innovation*, „MIS Quarterly Executive" 2017, vol 16, no. 2, pp. 135–52.

Freed Ephraim, *Which of these 8 definitions of "digital workplace" works best for you?*, „Digital Workplace Group" [online] March 31, 2015 [access January 20, 2020]. Available in World Wide Web: http://digitalworkplacegroup. com/2015/03/31/which-of-these-8-definitions-of-digital-workplace-works-best-for-you/.

Głowacka Ewa, *Metoda «case study» w badaniach i dydaktyce bibliotekoznawstwa i informacji naukowej*, „Przegląd Biblioteczny" 1986, vol. 54, nr 1, s. 25–32.

Gottfried John C., *The Plugged-in Reference Librarian: Who Do We Think We Are*?, „Reference Librarian" [online] 2013, vol. 54, no. 4, pp. 308–19 [access January 20, 2020]. Available in World Wide Web:https://doi.org/10.1080/ 02763877.2013.767766.

Górny Mirosław, *Nauka o informacji jako dyscyplina naukowa*", [in:] *Nauka o informacji,* Warszawa 2016, s. 23–40.

Hickey Daniel, Tang Nelly, *Theoretical and Applied Approaches to Remote Work for Academic Reference and Instruction Librarians*", [in:] *Library staffing for the future* [online] 2015, pp. 245–62 [access January 20, 2020]. Available in World Wide Web: https://doi.org/10.1108/S0732-067120150000034008.

J Sarah, *How Libraries Are Integrating Effective Technology,* „Masters In Library Science.net", [online] [access January 20, 2020]. Available in World Wide Web: http://www.mastersinlibraryscience.net/how-libraries-are-integrating-effective-technology/.

Johnston Melissa P., *Connecting Teacher Librarians For Technology Integration Leadership*, „School Libraries Worldwide" 2012, vol. 18, no. 1, pp.18–33.

Lippincott Joan, Greenwell Stacey, *7 Things You Should Know About the Modern Learning Commons*, „ELI 7 Things You Should Know Series" [online] 2011 [access January 20, 2020]. Available in World Wide Web: https://library. educause.edu/-/media/files/library/2011/4/eli7071-pdf.pdf.

Monson Jane D., *Jump-Start Your Career as a Digital Librarian : A LITA Guide*, Chicago 2013.

Nahotko Marek, *Bibliotekarze cyfrowi w środowisku cyfrowej nauki, biblioteki i cyfrowych publikacji*, „Biuletyn EBIB" [online] 2006, nr 10(80) [access January 20, 2020]. Available in World Wide Web: http://www.ebib.pl/2006/80/a. php?nahotko.

Piotrowski Dominik M., *CMS w bibliotekach. Open source'owe systemy zarządzania treścią jako platforma realizacji usług bibliotecznych*, Toruń 2018.

Piotrowski Dominik M., Kmiecikowska Barbara, Olińska Iwona, *FOLIO, OLE oraz TIND, czyli nowoczesne Platformy Usług Bibliotecznych: open source i jego komercjalizacja*, „Biuletyn EBIB" [online] 2016, nr 8(170) [access April 10, 2020]. Available in World Wide Web: http://ebibojs.pl/index.php/ebib/article/view/164

Piotrowski Dominik M., Marczak Grzegorz, *Migracja otwartoźródłowego systemu Liferay Portal w Bibliotece Uniwersyteckiej w Toruniu – studium przypadku*, „Toruńskie Studia Bibliologiczne" [online] 2018, vol. 10, nr 2 (19), s. 111––134 [access April 10, 2020]. Available in World Wide Web: http://apcz.umk.pl/czasopisma/index.php/TSB/article/view/TSB.2017.020

Rădoi Mireille, *New Professional Developments in the Academic Libraries*, „eLearning & Software for Education" [online] 2017, vol. 3, pp. 56–61 [access January 20, 2020]. Available in World Wide Web: https://doi.org/10.12753/2066-026X-17-181.

Rosenstein Bruce, *Emerging roles and possible futures for librarians and information professionals* [online] 2015 [access January 20, 2020] Available in World Wide Web: http://www.emeraldgrouppublishing.com/librarians/features/librarian_roles.htm.

Stanisław Skórka, Rogoż Michał, (red.), *Bibliotekarz 2.0 : nowoczesność na bazie tradycji: biblioteka w przestrzeni edukacyjnej*, Kraków 2015.

Vassilakaki Evgenia, Moniarou-Papaconstantinou Valentini, *A systematic literature review informing library and information professionals' emerging roles*, „New Library World" [online] 2015, vol. 116, no 1/2, pp. 37–66 [access January 20, 2020]. Available in World Wide Web:https://doi.org/10.1108/NLW-05-2014-0060.

Web integration definitione, „Web integration" [online] [access January 20, 2020]. Available in World Wide Web: http://www.web-integration.info/en/web-integration-definition/#section-what-is-a-web-integrator.

Wilson Thomas C., *The systems librarian designing roles, defining skills*, Chicago 1999.

Zhou Joe, *A History of Web Portals and Their Development in Libraries*, „Information Technology & Libraries" 2003, vol.22, no 3, pp. 119–28.

Web integrator: nowa rola bibliotekarza akademickiego?

Streszczenie: Przedmiotem badania jest nowa rola bibliotekarza akademickiego, który jako web integrator współpracuje z różnymi ekspertami w celu optymalizacji bibliotecznych usług informacyjnych za pomocą szeregu technologii dostepnych w środowisku sieciowym. Celem jest dowiedzenie, że bibliotekarz może pełnić role web integratora. Aby zrealizować cel, przeprowadzono studium przypadku koncentrujące się na roli autora, który jest jednocześnie bibliotekarzem w Oddziale Informacji Biblioteki Uniwersyteckiej w Toruniu w zakresie integracji technologii sieciowych. Analiza potwierdziła pogląd, że badany bibliotekarz pełni rolę web integratora. Badanie pozwoliło wysunąć kolejną hipotezę, zgodnie z którą rola web integratora jest nową rolą bibliotekarzy akademickich zajmujących się informatyzacją i optymalizacją usług sieciowych dostępnych online.

Słowa kluczowe: usługi biblioteczne, web integrator, technologie sieciowe, bibliotekarze akademiccy.