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The "Collage Effect" – Against Filter Bubbles: Interdisciplinary Approaches to Combating the Pitfalls of Information Technology

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ABSTRACT

The rapid development of information technology has partially been reversed, and may become a tool for manipulation, which is incompatible with librarians' social mission. Making information available, connecting databases, and making them accessible result in people becoming more and more exposed. Customisation and effectively filtered information sources create filter bubbles. Although new systems of collaboration would be suitable for sharing reliable knowledge, they often lead to the spread of fake news. Despite worrying trends, we seek an encouraging future. Therefore, in this paper we analyse the relationship between information technology, market economy, and the librarian profession from the perspective of Hungarian LIS education, and emphasise the importance of active and creative information provision based on interdisciplinarity. Based on our experiences we believe that current and future readers can be reached through intriguing collages of credible information. The use of collages can compensate for the effects of filter bubbles, and librarians may become the masters of creating digital information collages.

Introduction

For the new generations of librarians, we need to redefine and rethink again and again what appealing career perspective the librarian profession can offer with its unstable prestige and income prospects (Prins, Gier, & Bowden, 1995; Sable, 1983; Shontz, 2004; Woodward, 2011), and how we envisage the future of libraries and librarians in the information society (International Federation of Library Association and Institutions, 2018b; Kane, 2011). All this happens in our current, information- and knowledge-based society, about which an increasing amount of concern has been raised in recent years (Cooke, 2017).

Edward Snowden's leak (Greenwald, 2013) confirmed our worries regarding the safety of our private sphere; the flood of fake news and the monopolisation of platforms questioned the social benefits of the global information system (Staltz, 2017); and the Cambridge Analytica scandal (Cadwalladr & Graham-Harrison, 2018) shook our faith in even the biggest service providers. In the age of artificial intelligence and robotics, new predictions are being published constantly on fields that are susceptible to computerisation, including the librarian profession (Frey & Osborne, 2013). *In which areas can our work be replaced by software-based services; and what will the profession be like in ten or five years, for which we are preparing our students at the university?*

In recent years more emphasis has been placed on reports and plans on renewing the library as a physical social space (Audunson, 2005; Watson, 2017). The attempts at expanding the library space and its provided functions are successful (Gisolfi, 2015), and the makerspace movement is spreading rapidly (Fourie & Meyer, 2015). Library services are becoming more and more flexible; they leave the confines of the library walls: pop-up libraries are popular, just like public bookshelves installed in busy public spaces; library buses that can reach even the smallest villages; and reading material arriving on ships or even on donkey back (International Federation of Library Association and Institutions, 2010; Moore, Elkins, & Boelens, 2017; Winter, 2010). The proactivity and creativity of librarians is becoming crucial (Johnson, 2016).

However, a fundamental element of the library science's vision for the future and its identity is that this particular field of science is inseparable from technological development. We are the experts on storing knowledge, making it retrievable, and providing it. The development of the internet is controlled by technology companies and commercial interests, but the same was true at the heyday of book publishing and printed press. The opinion of librarians is always of high value when it comes to classifying and categorising documents and information. The solutions and organisational principles of library science still serve as models or starting points when it comes to the research of making knowledge available or mediating it (Sarrafzadeh,

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Martin, & Hazeri, 2006).

Similarly to the functional expansion of the physical social space, we need to respond to the different and highly diverse demands of the field of digital services as well. Even in the smallest library there are several sources available to numerous phenomena, events, and issues in which readers are interested. The skills of selection and making the necessary connections are basic competences of information service, and are among the most important skills of the librarian profession. However, many librarians are intimidated by the notion of presenting the collected information in an intriguing way as digital content. The reason behind this, aside from the lack of time, might be that they are reluctant to assume responsibility for creation. They would prefer this to be the task of professional users: they would rather leave it in the hands of scientists, specialist authors, and publicists doing research in the collections. Admittedly, library professionals are not required to comment on parts of the collection; scientific narration is not their responsibility. Therefore in this paper the term “collage” is used to describe the activity when a librarian selects intriguing and in some respect connected pieces from a collection or knowledge base, and arranges them together. This does not require anything else but the librarian's competence of information service. The outcome of this work (the “collage effect”), however, may reach more people than the search engines of existing digital content and databases or the homepages of collections. With the regular publishing of sample collages consciously prepared from its collections, a library, through its virtual presence, can achieve the same goals as it aims for, renewed as a physical social space.

The presence and spread of compilations (collages) prepared from the scientifically credible content of collections may prove as an important counterweight in the era of fake news and filter bubbles. The conscious, creative use of the collage effect may preserve not only the credibility of information among the content offered by social media, but also the significance of libraries, collections, and the librarian profession in the era of digital content.

Our paper does not attempt to define the modern librarian profession itself, but aims to provide new perspectives for creating the future librarian's identity, and for adapting to the expectations of a multicultural society (Gollop, 1999; Overall, 2009). The basis of our analysis is the perspective of European higher education (Audunson, 2007) provided by the Institute of Library and Information Science at Eötvös Loránd University, the leading and oldest higher educational institution in the field of library and information science in Hungary, founded in 1949. We offer those interested in library and information science bachelor's and master's degree programs, teacher training, and a doctoral program.

The perspective of librarian training is unique because there is no library or public collection which needs to be more flexible, open-minded and multidisciplinary than university institutions and faculties training future librarians, due to the effects of digitization (Audunson, 2018; Jablonski, 2006). Curricula need to be updated more often than ever before, and there is a considerable strain to adapt to society's and the employers' changing demands (Bronstein, 2007; Chow, Shaw, Gwynn, Martensen, & Howard, 2011; Hider, Kennan, Hay, McCausland, & Qayyum, 2011).

We need to provide an up-to-date picture of the different areas of our field, so students can have a full and current view by the end of their education. We do not have our own collection, we are not bound by existing systems or our readers' fixed set of needs, and therefore we can focus on the most recent issues and best practices. Each year new students – thus new colleagues – arrive with the newest set of technological skills and questions. They are critical, open-minded, and not yet bound by commitment to this profession or by loyalty to the collection at which they will be employed. Nowadays starting a university program does not equal commitment either: students may need to graduate several universities to find their career, or they can try different professions before finding their true calling.

An ambivalent relationship: the library and the filter bubble

The developments of recent years filled the pioneers and inventors of the web with disappointment. Tim Berners-Lee (2017) and others (Allcott & Gentzkow, 2017) write studies, while the International Federation of Library Associations and Institutions (IFLA) (2018a) uses infographics to warn us about the dangers of fake news and filter bubbles. This disappointment also has an effect on the library profession's vision for the future. *The library is, so to speak, the opposite, the antithesis of the filter bubble*. In a collection all information is equal and everyone has access; we provide the same help, whatever they are looking for. On the other hand, the filter bubble is a direct consequence of the developments aimed at customised information service. We help everyone, but we attempt do so in a customised way. Take academic literature monitoring or thematic bookshelves, for example. We do not mix horror stories with children's books. A homogeneous, coherent selection makes searching more efficient. This service complements the browsing of bookshelves and catalogs; it is an individual accomplishment, development, and source of pride for the library. No wonder librarians feel that technological innovations which are increasingly better at determining the users' needs are closely related to their own goals.

Filter bubbles are not the phenomena of the recent couple of years. Although the concept “filter bubble” started spreading after Eli Pariser (2011) gave his lecture titled *Beware online “filter bubbles”*, the process which leads to this current situation is an integral part of the technological development of information. We used to celebrate the technological option of customisation: we could access a personal website's uncontrolled content the same way we did with professional news portals. We could pick and choose blogs' feeds as we saw fit. Last.fm offered similar but unknown songs based on our favorites. Google practically guesses our interests and shows adequate ads accordingly. Amazon collects the users' feedbacks and recommends goods which satisfied other customers with similar needs. It is no surprise that after two decades of development, customisation works very well: parallel realities, filter bubbles are created on social media; whole masses of people misunderstand world events because of homogeneous information excluding counterarguments; many believe fake news because they confirm and explain each other.

All of the knowledge stored in libraries is impossible to acquire due to its size and depth. However, acquirable and customised knowledge may be misleading. How can the library's role be defined in a modern way between these two extremes?

Based on our experiences, the active presence of libraries and collections on social networks may be an effective remedy against filter bubbles. However, digitizing and publishing collections alone is not enough. Collages which are fascinating in many respects and reach an audience of varying interests are successful as alluring samples, because through being engaging they draw and lead readers out of the “comfort zone” of their filter bubbles without forcing them to renounce those. The collage effect can thus counterbalance the effect of filter bubbles; the presence of singular interests on social media. The conscious and creative content service of libraries can guarantee that each piece of the compiled sample collages is scientifically valid, while they also lead to their subcollections and knowledge bases.

Therefore it is an exciting challenge for LIS and LIS programs to increase this kind of online activity of collections, as well as to make the process more conscious and scientifically valid.

Perspectives of the librarian profession: evolution since the turn of the millennium

In January 2018, on the open day of our university, we showed two pictures to those interested in our programs: a photograph taken of a library's endless rows of shelves, and another of the robotized, endless storage hall of Amazon. We asked the students to think about the

differences between the two places.

The items need protection; we need to know their characteristics and their proper place; they need to be quickly accessible and served effectively. *Every single one will be needed by someone* – this is typical of Amazon's successful storage, which is slowly taking over all areas of retail, and almost the same can be said about our libraries' operations. The difference is that the library's concept is: *every single one may be needed by someone*. The commercial company's business model became successful because it was built on natural needs; it sells items directly on the internet instead of via distributors, and uses customers' recommendations as opposed to advertisements. It uses individual profit and satisfaction as its own profit.

The library's model is defined by social interest and the public's understanding of values. The goal of storage and service is to provide tradition, identity, and a future vision. Its operation is successful when individual profit becomes common profit in the long run.

However, many obstacles stand in the way of success. It was not hard to collect the most prominent ones with the young participants:

- It is burdensome to go to a library; and online services are all different, complicated, and unfamiliar to them.
- A smartphone can be used for and substitute practically everything.
- There is no common concept of identity, tradition, and vision for the future.
- Our set of common values is vague; there are overlaps, but nothing more.
- Fake news are spreading, we get informed in filter bubbles, we develop niche interests.
- There are no common interests. For example, rock bands and genres used to be important and they formed our identities – nowadays everyone is searching for different music on YouTube. Instead of simultaneously broadcast television programs everyone watches streamed series according to their own interests and schedules.

To summarise the opinions: everyone wants different things, everyone has different needs. This fragmentation is perfect for Amazon's business model, but it makes the usage of libraries rare; very few are aware of their values and importance.

The future of the library tells a lot about the future of society. In a fragmented society the empathy among citizens lead by their individual interests is decreasing. People who walk their own path in their parallel realities are easy to manipulate and become exposed. In 2018 what could we offer to the young generation, who came to decide whether to pursue library and information science as their profession? We promised them that they could *master collage making* in an age when collages will be necessary for effective information service. As shown by our definition in the Introduction of this paper, by "collage" we do not mean the fine art variety, even though we introduced a new project in which collage making was indeed important. The Bathing before closing time web project (Inaplo, 2018b), which is a good example of the practical work we do during the program (Fodor & Kiszl, 2018), is based on a uniquely valuable photo collection, the processing and publication of which was an assignment by our professional collaborating partner, the Metropolitan Ervin Szabó Library of Budapest. On the photographs taken during the 1930s we can see the visitors of the Szent Gellért Bath, the most elegant bath of Budapest at the time. The pictures were taken by the bath attendant, Sándor Pusztai. Although the digital publication of a picture collection is a routine task for a library or a museum, we aimed to go beyond publishing the pictures and their metadata. Digitizing and publishing special collections is important, but it is not enough by itself (Correa, 2017). Our students provided short insights into all fields of knowledge and interest related to the pictures. We collaborated with experts and conducted background research on the era, the bath, the bathing culture and the bathing suit fashion of the era, the well-known people in the photographs, and their fate and life. We have not been able to identify all bathers yet; all guesses are welcome on our Google form created for this purpose. For the social media campaign of the collection, which was published in the spring of 2018, we have prepared effectively shareable collages and picture compositions, but in a broader sense we published the collection itself as a collage as well. It is a collage of the knowledge linked to the pictures, a harmonious combination of samples from the deeper information researchable at the library and the surface of the science, which makes us want to do more research.

We have no way of knowing yet whether we have convinced the students showing interest, and whether they will enrol in one of our programs at the Institute in a few months. The perspective we offer may not be as spectacular as what a young professional might envision as a programmer or economic expert. *Based on our experiences from the past two decades we think that the future of the librarian profession should not be defined in comparison to other fields, but in respect of its own unique characteristics*.

As all layers of society appeared among web users (reader, researcher, user seeking information), the number of those attending libraries inevitably decreased. The library found its own role opportunities in the increasingly complex forms of network usage, but these roles often proved to be illusory. Looking back at the past two decades in retrospect, we probably see the perspectives offered by technological development more clearly today. The future of the library as a physical place used as a social space has strengthened, and we can attempt to find a precise, timeless definition of its role in a network setting. Fig. 1 illustrates the changes of technological perspective in the cross-section

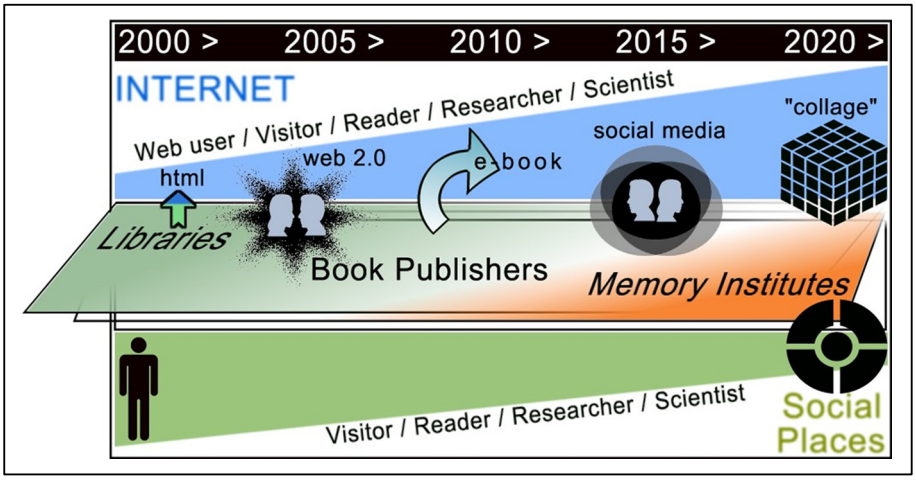

Fig. 1. Key concepts in the library students' vision for the future between 2000 and 2020.

of changing target audience, book publishers, memory institutions (museums, archives, other collections) and the web.

The segments below can of course be divided and detailed further, but they show the most prominent stages and help drawing the most important conclusions.

Librarians as masters of the hypertext

Around the turn of the millennium one of the most important courses of the library and information science program at Eötvös Loránd University was the one on HTML. Students felt like they are acquiring knowledge that is truly useful. Many of them edited their own page or prepared pages for libraries as a service.

Why did it turn out to be an illusion?

After the appearance of personal web pages and the earliest web portals, libraries in Hungary were among the first institutions with their own web pages. Even the significance of institutions' pages can be questioned today, but in the age of web 1.0 such a website only functioned as a virtual bulletin board. Pages describing the libraries' services were unique, with different designs and navigation. Each website presented information in their own way, and the knowledge and taste of the designers resulted in completely diverse solutions. Even in these early stages it was noticeable that besides uniqueness, standardisation was important as well. The services and functions of libraries could not be made a part of the World Wide Web in the form of static HTML pages. It soon became evident that HTML teaching and basic web design in itself can only be considered the foundations of information technology in the training of future librarians.

How did we interpret it?

Besides basic coding exercises, education focused on analysing and comparing existing library web pages. Navigation, website structure, and the presentation of information are the new form of information service. We compared the websites of libraries and collections with each other and with other successful portals and effective content services. We have prepared hundreds of website comparison analyses. In 2002 we started to develop our literary text publication – still updated even today – to digitize the oeuvre and process the relationship network of a renowned Hungarian poet (Inaplo, 2018a). We keep developing this project to teach the basics of HTML and CSS even today.

What proved to be lasting?

Although today we only use static websites for the interpretation of a few partial collections, the linking of documents and background information, and the selection and recording of linked sources became essential knowledge. The professional designing of portals, blogs, and even posts created for social media are important librarian competences today. The aspects of planning network platforms have not changed. Future librarians need to be able to harmonize the aspects of navigation and accessibility with the structure of the collection and the characteristics of the content.

Librarians as the masters of Web 2.0

With the spread of database-based websites the web became more interactive, and radical changes started in the mid-2000s. The age of Web 2.0 brought about the opportunities of collaboration and remixing sources. Programmed websites made it possible to create services that could virtually represent real activities. Our students also got caught up in the Library 2.0 movement (Courtney, 2007) that appeared worldwide; many became pioneers of certain initiatives, and created and operated blog networks for Hungarian library bloggers.

Why did it turn out to be an illusion?

The possibility of interactivity did indeed broaden the operations of the library on the web. Information service can work in a chat window; the online catalog is accessible; digitized documents can be downloaded. However, creating a connection between institutions and readers was not entirely successful. No active online communities were formed around libraries. Metaportals linking libraries did not gain popularity. The opportunity for community tagging or collaborative collection building is technically available, but it has not spread. Introducing open source systems (e.g. KOHA) was only attempted by a few collections.

How did we interpret it?

With our students we tried practically all web 2.0 services. We published our studies in blog networks linked via RSS feeds, we operated a Joomla portal, and we created a blog-based web review. We created embedded maps in our collections, and built on community feedback. After studying several foreign examples, we used photo sharing pages for publishing collections (De Sarkar, 2017). In collaboration with our students, we made mash-up plans linking different data sources. We saw the implementation of some of these ideas on the web. Our most successful students contacted contemporary Hungarian start-ups, and organised a conference at our Institute, where promising collaborations started between the librarian profession and book-related social networks and meta-search engines.

What proved to be lasting?

The ideas and initiatives were inspirational, until the requirements of long-term sustainability hindered them. But the linking of data sources and the possibility of remixing became permanent creative knowledge. Studying web 2.0 users' needs was included in the librarian training as well. Planning for possible interactivity and collaborations is an important step when introducing a new service today (Huwe, 2015). But the mostly state-operated library system seeks security, and chooses paid programmers and paid support instead of free solutions. Our students, the future librarians will therefore have to mediate. They need to define modern library needs in a way that makes it clear for programming companies exactly what their job is.

Librarians as e-book experts

Digitizing the library coverage has been an issue since the appearance of information technology. The biggest Hungarian electronic library was created on Gopher servers in 1994 (National Széchényi Library, 2018a). With the appearance of the web many started to fear for textual information because of visual information and the reign of multimedia. This is why most librarians and students welcomed the popularity of e-books and the appearance and spread of e-book readers. Librarian students felt a connection to this new, modern form of reading, since it symbolised and strengthened the connection between library science and modern technology.

Why did it turn out to be an illusion?

Regardless of how practical and modern the e-book reader was, it did not bring significant changes to the publishing system of traditional books. In Hungary it became more of an extra service, a parallel publication method. Smaller e-book publishers bring more life to the publication scene, but the relationships between writing, writers, and readers were not transformed by the freedom of e-book publishing. From the perspective of library services, e-books have become more of a problem than anything else: harmonizing the need for copy protection and for e-book lending is still in an experimental stage. The legal deposit of e-books encountered problems as well; it conflicts with the commercial interests of publishers.

How did we interpret it?

The success of e-books was a good incentive worldwide for professionals thinking about the book's future. Our colleagues took part in the

domestic discourse by publishing papers (Kerekes, Kiszl, & Takács, 2013) and giving speeches on conferences. We organised a sold-out professional day, where those denying the future of the e-book could confront e-book publishers and library experts. We launched an e-book course that has been popular ever since, and many of our students started working at e-book publishers. We have performed significant digitizing work by involving our students. Through this collaborative digitizing and e-book creation we gained a lot of experience on internationally studied conclusions about works involving volunteers and students (Skulan, 2018).

What proved to be lasting?

The e-book reader as the object symbolising the library became part of contemporary culture. Students were interested, they were eager to try it, and could identify with the image of the e-book reading "geek". Creating and converting e-books brought back the joy of HTML creation and an editor-publisher competence that can be learnt and is useful. The e-book culture revived the connections between library science and publication studies, and brought students closer to authors, digitizing, and the sources of documents.

Librarians as experts on social media

Among the social network-type web 2.0 services one has appeared in Hungary in as early as 2002, and by the end of the decade it has won over almost the whole Hungarian user base. The so-called Iwiw, however, did not provide services that made the presence of institutions possible, and it did not work as a social medium either. Thus in 2010 Facebook practically burst into its place. Every company and institution wanted to be present, just like ten years earlier on World Wide Web. Libraries saw this as a new opportunity to create a community from the readers (Liew, King, & Oliver, 2015). Once again, our students felt that the skills acquired through our program – knowing social media and using it effectively – offered a kind of competence that is compatible with the newest market trends.

Why did it turn out to be an illusion?

The same way the competence of creating websites quickly lost its novelty status ten years before, expert knowledge on social media became common as well. Nevertheless, the proper use of social media is difficult. Libraries see that instead of their websites, social media is what captures the readers' attention, so they share their news and new contents on both platforms. It proved to be an illusion that a library could build a community in which all news reached the followers (Liew, Oliver, & Watkins, 2018). Instead of having one's own audience, there is an unequal fight for attention in the social media news battle. Collections have an increasingly hard time standing out among all the melodramatic content.

How did we interpret it?

Similarly to the way we did with websites and web platforms of collections, we started studying the social media presence of libraries and memory institutions. Using a set of parameters developed together with our students, we examined more than 4500 posts of 126 institutions in 2013 (Fodor, 2014). As a continuation of this research in 2016 we analysed an additional 2200 posts to examine the presence of 90 memory institutions (Fodor, 2017). Our study proved that local history topics are the most important links between reliable knowledge and popular content on social media, and this is the field in which we can most reliably count on the enthusiasm of non-professional volunteers, and projects carried out in collaboration with them (Roued-Cunliffe, 2017). Besides the Facebook page of our Institute, we have also created Facebook groups for our databases showcasing old photographs of Budapest.

What proved to be lasting?

In social media we can use one or a few pictures with a short accompanying text and links to serve content and to offer reliable and valuable information. This overly concentrated publication method forces professionals to rethink what the purpose of information service is, and how it can be achieved among more spectacular and popular content. Knowledge stored in collections is reliable and endless content, the sharing and recommendation of which is the same kind of information service as the organisation of bookshelves with recommended readings (Vignau & Quesada, 2006). Digital document collections, repositories, and databases remain unnoticed if librarians do not show how to share them and use them for research. The library usage of social media campaigns, which are spreading worldwide (Garner, Goldberg, & Pou, 2016), has become an important part of our education program.

The spread of social media gave a new dimension to teaching digital literacy, and a new task for library professionals. We need to prepare our student not only to be able to stay informed themselves, but to inform others, and to use social networks and mobile communication platforms safely (Martzoukou & Elliott, 2016).

The "collage effect"

For the time being we can only guess whether the Cambridge Analytica scandal (Cadwalladr & Graham-Harrison, 2018) will just be a one-time loss of trust, or it will be revealed in more areas how exposed we are to the commercial interests of database managers. Sensitive areas cover our whole lives: public administration, smart households, autonomous cars, and shopping habits.

We have no way of knowing whether in five years, when our current librarian freshmen will graduate, Facebook will still exist, or what kind of new services will emerge by then.

It is certain, however, that readers and people seeking information will not have more time or attention to spare than now. They will still face a plethora of information, which they will not be able to sort through themselves, thus they will need filters and algorithms, so they will encounter news, culture, and science in the form of personally customised selections based on their lives, habits, and activities.

The readers' experience of Facebook or Instagram – or more broadly, the whole web – perceived through filter bubbles is similar to a mosaic or – a collage. The diverse and differing information are not linked by the individual's information acquiring strategy, but by the linearity of the reception process. We can set thematic filters or choose news sources in a feed reader; we can trust certain editorial staffs or pick our important friends, but this "fine-tuning" is far from an own research plan.

It is easy to see that if consecutive impressions are explained by conscious information seeking or a competent person, knowledge expands differently, than when we interpret the composition of consecutive collages as stories, and the reader's changing knowledge is dependent on this process. For centuries, the frescos of Christian churches in Europe were interpreted as a coherent story and context by the canonised explanation of the Bible and the priests. In the believers' minds these sequences of pictures, these collages had a similar effect. People fit the story into their own knowledge and worldview. The need for coherent stories is still present: the new interpretations of comic book heroes, the seemingly endless television series and spin-offs are the favorites of viewers who got attached to an already known fictional world.

The less personal experience and knowledge is linked to the pieces of a collage, the less confident the recipient is: fragmented experiences are vaguely linked to new impressions, and even the most superficial trains of thoughts are welcome, if they can provide a system for the impressions, and offer context for the collage.

Being shallow or superficial is incredibly dangerous in the era of filter bubbles. There is only one defence against manipulative context:

we need to create reliable collages that encourage learning about science and culture.

For the librarian profession to be able to provide readers who consume information collages with scientifically credible and unbiased information collages, there is in fact only one new competence that needs improvement: digital literacy and creativity. However, as soon as we recognise the significance of the *collage effect*, this skill becomes a logical actualisation of centuries of librarian competences. If readers stay informed through interconnected pieces of information, then libraries need to present their collections in collages as well. We need to accept that this is one of the 21st century forms of information service expected from libraries, and it may just be the one which, in the long run, can ensure the secure identity of library professionals in spite of algorithmization and robotization.

The possibility of an interdisciplinary collage

As a direct effect of technological development (Scripps-Hoekstra, Carroll, & Fotis, 2014) library and information science (Lugya, 2014), and consequently, the interdisciplinary context of librarian training (Lørring, 2007; Luo, 2013) is more important than ever. Competence development in the field of library and information science can only be effective if we include innovative methods (Missingham, 2006).

A conscious intention of our Institution is to broaden the perspective of the librarian profession to the role of the mediator between different fields of science. Enriching functions and roles makes this profession more appealing and it increases the social value of the library and librarians. The indirect but dynamic effects of technological (and economic, social) changes got incorporated into our educational programs in two principal areas.

Librarians as information managers

In the library science education program of Eötvös Loránd University from the beginning of the 2000s – initially with one course (at university level with the course titled Information Sources), then from 2006 with individual specialisations that are indicated on the certificate (BA program: Information and Knowledge Management, MA program: Business Information Manager) – the library support of developing small enterprises is included, just like the training of librarians who have confident competences in market economy. Several new American studies (Feldmann, 2014; Franks & Johns, 2015; Hoppenfeld & Malafi, 2015; Macdonald, 2015; Mehra, Bishop, & Partee, 2017) and practical projects (Hoppenfeld, Wyckoff, Henson, Mayotte, & Kirkwood, 2013) confirm what the European British Library's (2016) study confirms as well: in parallel with the traditional librarian role, we need to prepare our students for meeting business-related professional needs and for serving small business target audiences; which can be traced back to the traditional librarian role, but cannot be labelled classic. These mean further (complementary) employment market opportunities, and they promote working beyond the library sphere, even as self-employed professionals (Fraser-Arnott, 2016; Tella & Issa, 2013).

We created the curricula of our information management specialisations so the completion of the courses prepare the students for successful partnerships with the actors of the business world (Alvarez, 2016), develop their financial literacy (American Library Association, 2014; Bowen & Rizk, 2015), and they also fit the international higher education practices (Abdullahi, 2009; Kristiansson & Jochumsen, 2015) and European recommendations (European Association for Library and Information Education and Research, 2014; Kajberg & Lørring, 2005), and the experiences of young professionals (Farrell, 2013).

The obligatory courses of the information and knowledge management specialisation of our Bachelor's program are: Foundations of Economy, Entrepreneurship and Law; Information and Knowledge Management; Marketing and PR; Business Communication; Business Information; Economic Literature Information; Research Methodology; Project Management; Copyright Laws; Document Editing, Business Correspondence, Spelling.

The obligatory courses of the business information manager specialisation of our Master's program are: Market Economy and Librarianship in the Information Society; Business and Law; Theory and Practice of Business Information; Modern Methods of Information Management and Marketing; Professional Information Research and Mediation; Institutional Information Management and Information Consultancy; Paid Information Service in the Library; Fund Raising and Tender Workshop; Fundamentals of Information Protection; Management; Project Work.

Teaching the basics of economics and management is becoming common everywhere, which is why we need to concentrate on the specialisation of these: the library application of intelligent applications, the up-to-date use of software and applications, introducing the solutions provided by leading business databases, teaching data protection and social responsibility, practicing the use of marketing tools, developing creativity and problem solving, and deepening domestic and international relations. For the purpose of networking – taking the good example of the activities of the British Library Business and IP Centre National Network (2018) and the Small Business Development Centers (SBDCs) (2018), or the goals of the American Library Association Reference and User Service Associations Business Reference And Services Section (ALA RUSA BRASS) (2018) as guidance – we need to do all this in close collaboration with libraries and the corporate sector, so professional traineeships can be conducted at companies as well, not only at libraries.

Modelling the creation of small businesses in the field of information service is a central pillar of our Master's program. Our students prepare business plans, which are evaluated by independent experts – similarly to the New York Public Library New York StartUP! Business Plan Competition (2018). We invite guest lecturers, monitor the newest international practices, analyse the academic press, edit volumes of thematic periodicals, and prepare professional articles and books for domestic use (we refrain from referencing these, since they are in Hungarian, and thus not relevant to the international professional audience). We include several practical projects in the curriculum that are different each semester, for example analysing the network operations of the third biggest public library of Europe, the Metropolitan Ervin Szabó Library (2018), or taking part in the fund raising campaign of the Foundation for the University Library of the University Library (Eötvös Loránd University, 2018b) of Eötvös Loránd University in Budapest, which was founded in 1561, and has many rarities of book history, including codices and incunabula. These are integral parts of our program, which prepare students for everyday librarian work. Our doctoral (PhD) topics list includes many titles that examine the connections between libraries and economic activities.

Unfortunately, business information service in libraries is in its infancy in Hungary; it practically does not exist, so there is a lot to be done. A change of perspective and central (governmental) help are needed. Our complex plan promoting this was published in 2004 in the Hungarian academic press (Kiszl, 2005).

Our students benefit from the outlined knowledge. For example, in 2018 in Riga, as co-organisers of the BOBCATSSS (2018) conference everything requiring real managerial inclinations was their job, including finding sponsors, ordering catering, and publishing the program leaflet.

Based on our experiences – which are currently being confirmed by the data of the Graduate Tracking System (DPR) – the majority of our students leave the field and find jobs with other actors of the non-profit sector or in public administration, where they benefit greatly from the financial-entrepreneurial competence development at the university. The main reason for leaving the field is the low salary, and the fact that humanities graduates are able to acquire knowledge necessary for other jobs easily and quickly, they speak languages, and thus they are sought-after in the employment market. This is not favorable for the library

system, since there is already a significant staff shortage, and the student supply is not enough, according to the feedback of professional organisations and employers. Thus it would be important to introduce the librarian career model.

Librarians as experts on digital humanities

Naturally, we have been working together with other departments and institutes of the faculty, and we give priority to the library's role in digital humanities, which is an increasingly popular field in the academic press (Koltay, 2016; Sula, 2013; Wong, 2016; Zhang, Liu, & Mathews, 2015). A direct relationship was established with the IT Humanities Individual Programme (Eötvös Loránd University, 2001), which has a pioneering role worldwide in the network publication of critical texts and electronic book research; most of our students – as humanities majors – have humanities-related interests. In 2017, with government support, the independent Centre for Digital Humanities was founded within the framework of our Institute (Eötvös Loránd University, 2018a), and in 2018 we will host the first international, multi-day digital humanities conference of the region in Budapest, in cooperation with the Digital Research Infrastructure for the Arts and Humanities (DARIAH), the Common Language Resources and Technology Infrastructure (CLARIN) and the Michael Culture Association.

After studying the history (Dalbello, 2011) and trends (Terras, Nyhan, & Vanhoutte, 2016) of the field, the publications of the Alliance of Digital Humanities Organizations (ADHO) (2018) and the projects of the European Association for Digital Humanities (EADH) (2018), the Centre for Digital Humanities of Eötvös Loránd University defined the following research directions:

- Computational text analysis, corpus linguistics methods for analysing primer text sources and academic literature in accordance with the humanities and social sciences questioning method; topic modelling; automatic keywording; hierarchical and multilingual keyword systems (ontologies).
- Distant reading, stylometrics, data visualisation: linguistic-statistical analysis of literary texts and historical text sources; analysis of written sources with deep learning methods; automatic processing of audio material.
- Semantic web, Linked Open Data: metadata, representation of ontologies in RDF form, semiautomatic conversion of existing databases, data enrichment; semantic annotation of multi-sourced, semantic searches, sources and academic literature.
- Search languages, indexing tools, text mining, named entity recognition and identification.
- Development of a virtual research environment to help and to measure the efficiency of humanities and social science researches; automatic intertextuality and plagiarism search; instant machine search and analysis of academic literature or bibliographical references. Machine scientometrics.
- GeoTagging: identification and visualisation of geographic data in big text corpora.
- Digital philology: markup language transcriptions of academic text publications and their processing with (semi)automatic tools.

From the perspective of digital humanities and library science education the three-year National Library System project (National Széchényi Library, 2018b) is a significant milestone. It provides for the IT catch-up of the national library – and thus the whole Hungarian library system. It ends on 31 December 2018, and it was included in a government decree in 2016. Another essential step was the Digitizing Strategy of Public Collections accepted in 2017, which defines the development guidelines up until 2025. According to the experts' findings 3% of the 111 million documents stored in libraries, 5% of the 3.5 billion archive pages, and 25% of the 59 million museum items need to be digitized; between 2003 and 2015 the libraries managed to carry out 0.9%, and archives and museums 8–8% of this workload, respectively (Ministry of Human Capacities, 2017, p. 31). The organisation of web archiving is currently on-going in Hungary.

The mission of digitization – besides the protection of cultural heritage – is to provide unlimited access to contents for the whole society. This requires many associated background activities (bibliographic and content description of adequate depth, providing interactive access to integrated search platforms, etc.). Professionals of public collections (librarians, archivists, museologists) will not be left without tasks in the interdisciplinary environment created together with the experts of IT, linguistics, digital humanities, and other fields (Hartsell-Gundy, Braunstein, & Golomb, 2015; Poole, 2017). Their abilities to adapt and cooperate will hopefully improve the prestige of library and information experts, and thus the education program itself.

Experts on collage creation: conclusion

If we think about what appealing library and information science perspectives were offered to young future professionals in the last two decades, we can see some very educational changes. We admit, we had high hopes for hypertext and bigger plans for web 2.0, and we were hoping for a revolutionary transformation by e-books or business information service. It is also visible that we aim for a partnership with digital humanities instead of rivalry.

In the age of information independent from its carrier we also need to admit that social media did not simplify the process of reaching readers and users – if anything, it made it more difficult. But every change, every disciplinary and interdisciplinary innovation and link added lasting knowledge and competences to our instruments. The common traits of these competences are:

- expert selection of reliable sources,
- constructive, creative editing,
- learning about users' needs, and
- the technique of effective network publication and providing information services.

If we want to define the modern librarian irrespective of current technology or IT status, a fitting turn of phrase could be *the master of collages*.

As explained in the paper, a collage is a piece of work interpretable on its own: an informational object. It is a document, the parts of which all come from distinct sources. Joining the parts is a creative, editing procedure, but the source of every single part also belongs to the essence of the result.

The system of information leads to the knowledge stored in libraries, museums, archives – that is, public collections. The task of the librarian is to create and show segments of this graph in a way that catches the eye and encourages further research: visiting a library, a digital gallery, or a document library (Carini, 2016).

We cannot promise our future students anything more than that regardless of the available technologies, this knowledge, this competence will remain unsuitable for computerisation. Their career demands from future librarians not only precise knowledge of reliable sources and needs, but also knowledge and routine that serves as a template for creating software solutions, but will not be replaced by artificial intelligence in the near future.

Future librarians can be not only the mediating experts of cultural and scientific heritage they are entrusted with. As mediators they have a crucial role in harmonizing the needs of scientific fields, media, and business. They will be organisers and innovators of the collage of knowledge from scientific research to business information, which requires constant reform from the educational institutions.

Expert mediation of scientific and cultural heritage will be essential if people's information seeking methods keep heading in the same direction (Augustyniak & Orzechowski, 2017). This global informational

system that fills up each second of our attention is not favorable for immersion and learning detailed information. There is a need for effective and creative showcasing: collages of information, in which the reader notices the familiar and interesting elements. If we perform well enough, chances are that even the unfamiliar pieces of the collage will catch the eye of those using library services.

References

Abdullahi, I. (2009). Global library and information science. A textbook for students and educators. *IFLA publications* (pp. 136–137). München: K.G. Saur.

Allcott, H., & Gentzkow, M. (2017). Social media and fake news in the 2016 election. *Journal of Economic Perspectives, 31*(2), 211–236. https://doi.org/10.1257/jep.31.2.211.

Alliance of Digital Humanities Organizations. Publications. (2018). Retrieve from http://adho.org/publications, Accessed date: 23 June 2018 (online).

Alvarez, B. A. (2016). *Embedded business librarianship for the public librarian.* Chicago: American Library Association.

American Library Association. Financial literacy education in libraries: Guidelines and best practices for service. (2014). Retrieve from http://www.ala.org/rusa/sites/ala.org.rusa/files/content/FLEGuidelines_Final_September_2014.pdf, Accessed date: 23 June 2018 (online).

American Library Association. About BRASS. (2018). Retrieve from http://www.ala.org/rusa/sections/brass/about, Accessed date: 23 June 2018 (online).

Audunson, R. A. (2005). The public library as a meeting place in a multicultural and digital context. The necessity of low intensive meeting places. *Journal of Documentation, 61*(33), 429–441. https://doi.org/10.1108/00220410510598562.

Audunson, R. A. (2007). Library and information science education — Discipline profession, vocation? *Journal of Education for Library and Information Science, 48*(2), 94–107.

Audunson, R. A. (2018). Do we need a new approach to library and information science? *Bibliothek Forschung und Praxis, 42*. https://doi.org/10.18452/18964 (Preprint).

Augustyniak, A., & Orzechowski, V. (2017). Unlocking the vault: Sharing special collections on social media. *Computers in Libraries, 37*(7), 12–15. Retrieved from http://www.infotoday.com/cilmag/sep17/Augustyniak-Orzechowski–Unlocking-the-Vault-Sharing-Special-Collections-on-Social-Media.shtml.

Berners-Lee, T.. Three challenges for the Web, according to its inventor. (2017). Retrieve from World Wide Web Foundationhttps://webfoundation.org/2017/03/web-turns-28-letter, Accessed date: 23 June 2018 (Mar 12, online).

BOBCATSSS. Organizers. (2018). Retrieve from https://bobcatsss2018.lu.lv/about/organizers, Accessed date: 23 June 2018 (online).

Bowen, C. F., & Rizk, D. A. (2015). Libraries and financial literacy programs. *Journal of Business & Finance Librarianship, 20*(1–2), 1–6. https://doi.org/10.1080/08963568.2015.978722.

British Library. Evaluation of the innovating for growth programme 2011–2015. Final report. (2016). Retrieve from https://www.bl.uk/britishlibrary/~/media/bl/global/business%20and%20ip%20centre/documents/i4g%20project%20evaluation%20finalweb.pdf, Accessed date: 23 June 2018 (February, online).

British Library. Business and IP Centre National Network. (2018). Retrieve from https://www.bl.uk/business-and-ip-centre/national-network, Accessed date: 23 June 2018 (online).

Bronstein, J. (2007). Current trends in library and information studies curricula around the world: Looking for the user-centred approach. *Journal of Information, Communication and Ethics in Society, 5*(2–3), 59–78. https://doi.org/10.1108/14779960710837579.

Cadwalladr, C., & Graham-Harrison, E.. Revealed: 50 million Facebook profiles harvested for Cambridge Analytica in major data breach. (2018). Retrieve from The Guardianhttps://www.theguardian.com/news/2018/mar/17/cambridge-analytica-facebook-influence-us-election, Accessed date: 23 June 2018 (Mar 17, online).

Carini, P. (2016). Information literacy for archives and special collections: Defining outcomes. *portal: Libraries and the Academy, 16*(1), 191–206. https://doi.org/10.1353/pla.2016.0006.

Chow, A. S., Shaw, T., Gwynn, D., Martensen, D., & Howard, M. (2011). Changing times and requirements: Implications for LIS education. *LIBRES: Library and Information Science Research Electronic Journal, 21*(1), 1–23. Retrieved from https://libres.uncg.edu/ir/uncg/f/A_Chow_Changing_2011.pdf.

Cooke, N. A. (2017). Posttruth, truthiness, and alternative facts: Information behavior and critical information consumption for a new age. *The Library Quarterly, 87*(3), 211–221. https://doi.org/10.1086/692298.

Correa, D. J. (2017). Digitization: Does it always improve access to rare books and special collections? *Preservation, Digital Technology & Culture, 45*(4), 177–179. https://doi.org/10.1515/pdtc-2016-0026.

Courtney, N. (Ed.). (2007). *Library 2.0 and beyond: Innovative technologies and tomorrow's user*. Westport, CT: Libraries Unlimited.

Dalbello, M. (2011). A genealogy of digital humanities. *Journal of Documentation, 67*(3), 480–506. https://doi.org/10.1108/00220411111124550.

De Sarkar, T. (2017). Adopting a photo-sharing site as a library tool: A web-based survey. *Information and Learning Science, 118*(3–4), 185–209. https://doi.org/10.1108/ILS-12-2016-0085.

Eötvös Loránd University. Gépeskönyv contentware products 2000–2001. (2001). Retrieve from http://magyar-irodalom.elte.hu/f-book/old/directory.html, Accessed date: 23 June 2018 (online).

Eötvös Loránd University. Centre for Digital Humanities. (2018). Retrieve from The Centrehttp://elte-dh.hu, Accessed date: 23 June 2018 (online).

Eötvös Loránd University. University Library. About us. (2018). Retrieve from https://konyvtar.elte.hu/en/libraries/university-library-and-archives-university-library, Accessed date: 23 June 2018 (online).

European Association for Digital Humanities (2018). Projects. Retrieve from http://eadh.org/projects, Accessed date: 23 June 2018.

European Association for Library and Information Education and Research. EUCLID guidelines for curriculum development. (2014). Retrieve from http://euclid-lis.eu/wp-content/uploads/2014/03/euclid-guidelines-cur-dev.pdf, Accessed date: 23 June 2018 (online).

Farrell, B. (2013). New kid on the block: The troubles and triumphs of being a new business librarian. *Journal of Business & Finance Librarianship, 18*(3), 251–258. https://doi.org/10.1080/08963568.2013.795786.

Feldmann, L. M. (2014). Academic business librarians' assistance to community entrepreneurs. *Reference Services Review, 42*(1), 108–128. https://doi.org/10.1108/RSR-04-2013-0021.

Fodor, J. (2014). A megosztó hivatás. Könyvtári jelenlét a Facebook közösségi oldalon 2013/2014-ben [The profession of sharing. Presence on Facebook, 2013/2014]. *Tudományos és Műszaki Tájékoztatás, 61*(7–8), 275–294. Retrived from http://tmt.omikk.bme.hu/tmt/article/view/409 (in Hungarian) .

Fodor, J. (2017). Megosztás vagy szerkesztés? A könyvtár változó szerepe a közösségi médiában [Sharing or editing? The changing role of libraries in social media]. *Tudományos és Műszaki Tájékoztatás, 64*(1), 24–36. Retrieved from http://tmt.omikk.bme.hu/tmt/article/view/767 (in Hungarian) .

Fodor, J., & Kiszl, P. (2018). Developing digital collections: A training model of digital humanities web projects in library and information science education. *Information Science Research, 1*(1), 78–104. Retrieved from https://wow.umcs.pl/czasopisma/controller/Default/module/Ejournals/action/downloadContent/cid/81.

Fourie, I., & Meyer, A. (2015). What to make of makerspaces: Tools and DIY only or is there an interconnected information resources space? *Library Hi Tech, 33*(4), 519–525. https://doi.org/10.1108/LHT-09-2015-0092.

Franks, J. E., & Johns, C. (2015). Entrepreneur assistance & economic development in Florida libraries. *Reference Services Review, 43*(3), 400–418. https://doi.org/10.1108/RSR-03-2015-0014.

Fraser-Arnott, M. (2016). The value of the MLS or MLIS degree. *The Bottom Line, 29*(3), 129–141.

Frey, C. B., & Osborne, A. M.. The future of employment: How susceptible are jobs to computerisation? Working paper. (2013). Retrieve from https://www.oxfordmartin.ox.ac.uk/downloads/academic/future-of-employment.pdf, Accessed date: 23 June 2018 (Sept 17, online).

Garner, A., Goldberg, J., & Pou, R. (2016). Collaborative social media campaigns and special collections: A case study on #ColorOurCollections. *RBM: a Journal of Rare Books, Manuscripts, and Cultural Heritage, 17*(2), 100–117. https://doi.org/10.5860/rbm.17.2.9663.

Gisolfi, P. (2015). New trends that define the 21st-century library. In D. E. Williams, J. Golden, & J. K. Sweeney (Vol. Eds.), *Advances in library administration and organization: Vol. 33*, (pp. 173–195). Bingley, UK: Emerald Group Publishing Limited. https://doi.org/10.1108/s0732-067120150000033005.

Gollop, C. J. (1999). Library and information science education: Preparing librarians for a multicultural society. *College & Research Libraries, 60*(4), 385–395. https://doi.org/10.5860/crl.60.4.385.

Greenwald, G.. NSA collecting phone records of millions of Verizon customers daily. (2013). Retrieve from The Guardianhttps://www.theguardian.com/world/2013/jun/06/nsa-phone-records-verizon-court-order, Accessed date: 23 June 2018 (Jun 6, online).

Hartsell-Gundy, A., Braunstein, L., & Golomb, L. (Eds.). (2015). *Digital humanities in the library: Challenges and opportunities for subject specialists*Chicago: Association of College and Research Libraries (ACRL). Retrieve from http://www.ala.org/acrl/sites/ala.org.acrl/files/content/publications/booksanddigitalresources/digital/9780838987681_humanities_OA.pdf, Accessed date: 23 June 2018.

Hider, P., Kennan, M. A., Hay, L., McCausland, S., & Qayyum, A. (2011). Moving from LIS to IS+L: Curriculum renewal at Charles Sturt University. *Australian Library Journal, 60*(3), 205–217. https://doi.org/10.1080/00049670.2011.10722617.

Hoppenfeld, J., & Malafi, E. (2015). Engaging with entrepreneurs in academic and public libraries. *Reference Services Review, 43*(3), 379–399. https://doi.org/10.1108/RSR-02-2015-0011.

Hoppenfeld, J., Wyckoff, T., Henson, J. A. N., Mayotte, J. N., & Kirkwood, H. P., Jr. (2013). Librarians and the entrepreneurship bootcamp for veterans: Helping disabled veterans with business research. *Journal of Business & Finance Librarianship, 18*(4), 293–308. https://doi.org/10.1080/08963568.2013.825227.

Huwe, T. K. (2015). Building digital libraries. Collaborative collection development comes of age. *Computers in Libraries, 35*(3), 25–27.

Inaplo. Fodor András hálózati életműkiadás(2018). [Web edition of András Fodor's Oeuvre]. Retrieve from http://inaplo.hu/fodorandras, Accessed date: 23 June 2018 (online, in Hungarian).

Inaplo. Hullámfürdő záróra előtt(2018). [Bathing before closing time]. Retrieve from http://inaplo.hu/hullamfurdo, Accessed date: 23 June 2018 (online, in Hungarian).

International Federation of Library Association and Institutions. Mobile Library Guidelines. IFLA professional reports. no. 123. Revision by a working group of the IFLA Public Libraries Section. Co-ordinated by I. Stringer. (2010). Retrieve from https://www.ifla.org/files/assets/hq/publications/professional-report/123.pdf, Accessed date: 23 June 2018 (online).

International Federation of Library Association and Institutions. How to spot fake news. (2018). Retrieve from https://www.ifla.org/publications/node/11174, Accessed date: 23 June 2018 (online).

International Federation of Library Association and Institutions. IFLA global vision. (2018). Retrieve from https://www.ifla.org/globalvision, Accessed date: 23 June 2018

(online).
Jablonski, J. A. (2006). *Conceptualizing the field of library and information studies: The perspective of LIS faculty and LIS practitioners in the United States.* Madison: University of Wisconsin.
Johnson, E. D. M. (2016). The right place at the right time: Creative spaces in libraries. In S. S. Hines, & K. M. Crowe (Vol. Eds.), *Advances in library administration and organization: . Vol. 36. The future of library space* (pp. 1–35). Bingley, UK: Emerald Group Publishing Limited. https://doi.org/10.1108/S0732-067120160000036001.
Kajberg, L., & Lørring, L. (Eds.). (2005). *European curriculum reflections on library and information science education*Copenhagen: Royal School of Library and Information Science. Retrieve from http://euclid-lis.eu/wp-content/uploads/2014/02/european-curriculum-reflections.pdf, Accessed date: 23 June 2018.
Kane, L. T. (2011). *Working in the virtual stacks: The new library and information science.* Chicago: American Library Association.
Kerekes, P., Kiszl, P., & Takács, D. (2013). *E-könyvészet. A digitális könyvkultúra alapvonásai [E-publishing. The basic features of the digital book culture].* Budapest: Eötvös Loránd Tudományegyetem (in Hungarian).
Kiszl, P. (2005). Hogyan tovább? Üzleti információszolgáltatás a magyarországi könyvtárakban [Business information services at Hungarian libraries – the way forward]. *Tudományos és Műszaki Tájékoztatás, 51*(9), 371–378. Retrieved from http://tmt-archive.omikk.bme.hu/show_news.html@id=3698&issue_id=454.html (in Hungarian) .
Koltay, T. (2016). Library and information science and the digital humanities: Perceived and real strengths and weaknesses. *Journal of Documentation, 72*(4), 781–792. https://doi.org/10.1108/JDOC-01-2016-0008.
Kristiansson, M. R., & Jochumsen, H. (2015). How to implement entrepreneurship in LIS education: A Danish example. *BID 35*. Retrieve from http://bid.ub.edu/en/35/kristiansson.htm, Accessed date: 23 June 2018 (online) .
Liew, L. C., King, V., & Oliver, G. (2015). Social media in archives and libraries: A snapshot of planning, evaluation, and preservation decisions. *Preservation, Digital Technology & Culture, 44*(1), 3–11. https://doi.org/10.1515/pdtc-2014-0023.
Liew, L. C., Oliver, G., & Watkins, M. (2018). Insight from social media use by memory institutions in New Zealand: Participatory vs curatorial culture. *Online Information Review, 42*(1), 93–106. https://doi.org/10.1108/OIR-08-2016-0218.
Lørring, L. (2007). Didactical models behind the construction of an LIS curriculum. *Journal of Education for Library and Information Science, 48*(2), 82–93.
Lugya, F. K. (2014). What counts as a science and discipline in library and information science? *Library Review, 63*(1–2), 138–155. https://doi.org/10.1108/LR-08-2013-0103.
Luo, L. (2013). Being interdisciplinary: A look into the background and experiences of iSchool faculty members. *LIBRES: Library and Information Science Research Electronic Journal, 23*(2), 1–20. Retrieved from https://www.libres-ejournal.info/1034.
Macdonald, A. T. (2015). Dedicated business centers in public libraries. *Reference Services Review, 43*(3), 344–368. https://doi.org/10.1108/RSR-02-2015-0007.
Martzoukou, K., & Elliott, J. (2016). The development of digital literacy and inclusion skills of public librarians. *Communications in Information Literacy, 10*(1), 99–115. Retrieved from http://www.comminfolit.org/index.php?journal=cil&page=article&op=viewArticle&path%5B%5D=v10i1p99.
Mehra, B., Bishop, B. W., & Partee, R. P. (2017). Small business perspectives on the role of rural libraries in economic development. *The Library Quarterly, 87*(1), 17–35. https://doi.org/10.1086/689312.
Metropolitan Ervin Szabó Library. Introduction. (2018). Retrieve from http://www.fszek.hu/english/introduction/?article_hid=6905, Accessed date: 23 June 2018 (online).
Ministry of Human Capacities. Közgyűjteményi Digitalizálási Stratégia 2017–2025(2017). [Public Collection Digitalization Strategy 2017–2025]. Retrieve from http://www.kormany.hu/download/9/ac/11000/K%C3%B6zgy%C5%B1jtem%C3%A9nyi%20Digitalizl%C3%A1si%20Strat%C3%A9gia_2017-2025.pdf, Accessed date: 23 June 2018 (in Hungarian, online).
Missingham, R. (2006). Library and information science: Skills for twenty-first century professionals. *Library Management, 27*(4–5), 257–268. https://doi.org/10.1108/01435120610668197.
Moore, J., Elkins, A., & Boelens, H. (2017). Libraries on the move: By land, by sea, and by air. *Selected papers from the International Association of School Librarianship Annual Conference* (pp. 203–211). .
National Széchényi Library. Hungarian electronic library. Our story…. (2018). Retrieve from http://mek.oszk.hu/html/torteneteng.html, Accessed date: 23 June 2018 (online).
National Széchényi Library. OKR Projekt. (2018). Retrieve from http://www.oszk.hu/okr-projekt, Accessed date: 23 June 2018 (in Hungarian, online).
New York Public Library. New York StartUP! 2018 Business Plan Competition. (2018). Retrieve from https://www.nypl.org/help/services/startup, Accessed date: 23 June 2018 (online).
Overall, P. M. (2009). Cultural competence: A conceptual framework for library and information science professionals. *The Library Quarterly, 79*(2), 175–204. https://doi.org/10.1086/597080.
Pariser, E.. Beware 'Online Filter Bubbles'. (2011). Retrieve from TEDhttps://www.ted.com/talks/eli_pariser_beware_online_filter_bubbles/transcript, Accessed date: 23 June 2018 (online).
Poole, A. H. (2017). The conceptual ecology of digital humanities. *Journal of Documentation, 73*(1), 91–122. https://doi.org/10.1108/JD-05-2016-0065.
Prins, H., Gier, W., & Bowden, R. (1995). The image of the library and information profession. How we see ourselves. An investigation. A report of an empirical study undertaken on behalf of IFLA's round table for the management of library associations. *IFLA publications* (pp. 71). Munchen; New Providence, NJ: K.G. Saur.
Roued-Cunliffe, H. (2017). Collection building amongst heritage amateurs. *Collection Building, 36*(3), 108–114. https://doi.org/10.1108/CB-01-2017-0003.
Sable, M. H. (1983). A prescription for professional prestige. *International Library Review, 15*(1), 5–8. https://doi.org/10.1016/0020-7837(83)90062-6.
Sarrafzadeh, M., Martin, B., & Hazeri, A. (2006). LIS professionals and knowledge management: Some recent perspectives. *Library Management, 27*(9), 621–635. https://doi.org/10.1108/01435120610715527.
Scripps-Hoekstra, L., Carroll, M., & Fotis, T. (2014). Technology competency requirements of ALA-accredited library science programs: An updated analysis. *Journal of Education for Library and Information Science, 55*(1), 40–54.
Shontz, P. K. (Ed.). (2004). *The librarian's career guidebook*. Lanham, MD: Scarecrow Press.
Skulan, N. (2018). Staffing with students: Digitizing campus newspapers with student volunteers at the University of Minnesota, Morris. *Digital Library Perspectives, 34*(1), 32–44. https://doi.org/10.1108/DLP-07-2017-0024.
Small Business Development Centers. About us. (2018). Retrieve from https://americassbdc.org/about-us, Accessed date: 23 June 2018 (online).
Staltz, A.. The web began dying in 2014, here's how. (2017). Retrieve from The Next Webhttps://tnw.to/2ylMQrj, Accessed date: 23 June 2018 (online).
Sula, C. A. (2013). Digital humanities and libraries: A conceptual model. *Journal of Library Administration, 53*(1), 10–26. https://doi.org/10.1080/01930826.2013.756680.
Tella, A., & Issa, A. O. (2013). An examination of library and information science undergraduate students' career aspirations in entrepreneurship and self-employment. *Journal of Business & Finance Librarianship, 18*(2), 129–145. https://doi.org/10.1080/08963568.2013.768891.
Terras, M., Nyhan, J., & Vanhoutte, E. (2016). *Defining digital humanities. A reader.* Abingdom OX; New York, NY: Routledge.
Vignau, B. S. S., & Quesada, I. L. P. (2006). Collection development in a digital environment: An imperative for information organizations in the twenty-first century. *Collection Building, 25*(4), 139–144. https://doi.org/10.1108/01604950610706005.
Watson, L. (2017). Space in the academic library of the 21st century: Trends and ideas. *BID 38*. Retrieve from http://bid.ub.edu/en/38/watson.htm, Accessed date: 23 June 2018 (online) .
Winter, J. (2010). *Biblioburro: A true story from Colombia. Illustrated by J. Winter.* San Diego: Beach Lane Books.
Wong, S. H. R. (2016). Digital humanities: What can libraries offer? *portal: Libraries and the Academy, 16*(4), 669–690. https://doi.org/10.1353/pla.2016.0046.
Woodward, J. A. (2011). *A librarian's guide to an uncertain job market.* Chicago: American Library Association.
Zhang, Y., Liu, S., & Mathews, E. (2015). Convergence of digital humanities and digital libraries. *Library Management, 36*(4–5), 362–377. https://doi.org/10.1108/LM-09-2014-0116.

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