Perceptions of digitalization among Romanian librarians: A comparative analysis

Mireille RĂDOI[1], Marian OANCEA[2], Vladimir PRIPP[3], Bogdan SAFTIUC[4]

[1] Bucharest University of Economic Studies, Master of Businees Intelligence, Program Director, Bucharest, Romania

[2] Bucharest University of Economic Studies, Faculty of Business Administration in Foreign Languages, Lecturer, Bucharest, Romania

[3] University of Bucharest, Doctoral School of Sociology, Bucharest, Romania

[4] Bucharest University of Economic Studies, Faculty of Business Administration in Foreign Languages, Bucharest, Romania

mireille.radoi@fabiz.ase.ro, marian.oancea@fabiz.ase.ro;
vladimir.pripp@s.unibuc.ro, bogdan.saftiuc@fabiz.ase.ro

Abstract: Modern-day librarians have incorporated the newest IC&T instruments into their daily activities and are performing new functions in order to better fulfill their role, that of disseminating knowledge. This research's purpose is to identify the way in which employees from three different types of libraries (School, County and University) perceive the digitalization process in their workplace. The first objective is to identify the way in which digitalization changed the roles of libraries and librarians. Second, we want to observe the librarians' attitudes towards the digitalization process. We used sociological inquiry and gathered data through a questionnaire, which was sent to libraries nationwide. Thus, we covered two major literature gaps and provided novelty to the paper, by including answers from all of the library employees and by differentiating between three types of librarians. Generally, librarians' attitude towards digitalization is a positive one. However, County and University employees use technology more than their colleagues from School Libraries because they are conducting multiple activities which require the use of new devices. In conclusion, librarians appreciate the digitalization process which takes place at their workplace. However, there are significant differences regarding the use of newest IT&C instruments in their daily tasks.

Keywords: Digitalization Process, Cyber-Librarian, Library Digitalization, Digital Skills.

Percepția bibliotecarilor români asupra procesului de digitalizare: o analiză comparativă

Rezumat: Bibliotecarii din epoca modernă au încorporat cele mai noi instrumente din domeniul IT&C în activitățile lor zilnice și îndeplinesc noi funcții pentru a-și executa mai bine rolul, acela de a împărtăși cunoaștere. Scopul cercetării este de a identifica modul în care angajații din trei tipuri diferite de Biblioteci (Școlare, Județene și Universitare) percep procesul de digitalizare care se desfășoară la locul lor de muncă. Primul obiectiv este de a identifica modul în care digitalizarea a schimbat rolurile bibliotecilor și ale bibliotecarilor. În al doilea rând, dorim să observăm atitudinile bibliotecarilor față de acest proces. Cercetarea este o anchetă sociologică, în cadrul căreia am colectat date prin intermediul unui chestionar aplicat bibliotecarilor din întreaga țară. Prin includerea răspunsurilor de la toți angajații bibliotecilor și prin diferențierea între cele trei tipuri de bibliotecari, am acoperit două lacune din literatura de specialitate. În general, bibliotecarii percep pozitiv digitalizarea. Cu toate acestea, bibliotecarii județeni și universitari desfășoară mai multe activități care necesită folosirea noilor tehnologii decât bibliotecarii școlari. În concluzie, bibliotecarii apreciază procesul de digitalizare care are loc la locul lor de muncă. Cu toate acestea, există diferențe semnificative în ceea ce privește utilizarea celor mai noi instrumente IT&C în sarcinile lor zilnice.

Cuvinte-cheie: Digitalizare, Cyber-Librarian, Digitalizarea Bibliotecilor, Abilități Digitale.

1. Introduction

The digitalization process, which started before the third millennium, peaked during the Covid-19 pandemic, when people were unable to take part in activities based on physical contact. Thus, they adopted different digital solutions in order to continue to live their lives as normal as possible. Researchers emphasized that the digitalization process, which positively influenced

https://doi.org/10.33436/v35i3y202502

peoples' lives (Klein & Todesco, 2021; Gabor, Oancea & Pripp, 2023), was the outcome of the new technologies' implementation that took place during the COVID-19 pandemic.

The consequences of the Coronavirus Pandemic are still looming even after the epidemiologists declared it ended. Some of the technological novelties, which we were forced to adapt due to the physical restriction, have proved to be effective. Thus, executives from international and national organizations, private enterprises, NGO's etc, decided not to completely exclude these digital solutions but rather to integrate them permanently in the workplace.

For this reason, it is important to understand that only by evolving and adapting to the modern working conditions, by implementing „education and training activities to ensure that the flow and stock of skills are work ready for the 4th industrial revolution" (Lordan, 2019), libraries will fulfill more efficiently one of their main purposes, that of „giving everyone the possibility and skills to make the most of information" (IFLA, 2025).

2. Literature review

The research regarding the digitalization process in Romania mostly focused towards the shifts generated by the implementation of the newest technologies and did not include the librarians' attitudes. These papers acknowledge the improvements generated by the new technologies, and how they „eased the librarian's work". (Banciu, 2001). The report published by the Technical University of Cluj-Napoca goes a step further, and emphasizes the three distinct dimensions, „conservation, scientific research and communication" (Universitatea Tehnică din Cluj-Napoca, 2023) of the digitalization process. We believe that the work of the majority of librarians can be included within the three dimensions. Moreover, the authors consider that the ethical principles of librarian's profession, „do not function in the digitization of the cultural heritage" (Universitatea Tehnică din Cluj-Napoca, 2023). This important issue, however, is difficult to be addressed due to its subjective nature. The paper, *Digitization between necessity and challenge,* emphasizes the importance of the library employees within the digitalization process. In his research, Milica emphasizes the importance of „identifying and analysing the vulnerabilities which erode the professional activities of librarians" (Milica, 2020) without mentioning the lack of ICT skills or other vulnerabilities.

On the other hand, within the international context, librarians' attitudes towards the digitalization process has been extensively researched. More than two decades ago, the first researchers questioned the way in which the internet use influences the librarian's activities, and how they manage to find a „balance between traditional roles and new roles" (Melchionda, 2007). Afterwards, they widened the researched area, and began to address novelties generated by other elements encompassed within the ICT, which take part in the digitalization process. They studied the „librarians' attitudes toward IT application in libraries" (Ramzan & Singh, 2010) or even their role in "IT-related decision-making" (Yeasmin, 2014). In present times, some papers are addressing the way in which librarians are using AI-based technology, such as „Virtual Reality Programs in Academic Libraries" (Arata, 2022) or the "academic librarians' attitudes towards robotic process automation" (Lin, Chiu & Lam, 2022). It is an interesting approach to analyze the impact of a very specific technology. However, the focus on a specific technology was avoided because the authors were aware it could not be found nation-wide.

Moreover, researchers from other countries did not limit their studies to the librarians' attitudes towards the digitalization process. They also looked for the best ways to enhance the digitalization process, by focusing on the „education needed for digital librarians" (Tammaro, 2007), enabling them to better fulfill their tasks. Regarding sampling, many papers focused on a singular type of librarian, working in either university or public libraries. In the following chapter we will illustrate how this paper fills these literature gaps.

3. Relevance, purpose and objectives

This study is significant for multiple reasons. First, because it is based on a comparative analysis, capturing attitudes towards digitalization from three distinct categories of librarians.

Secondly, because it includes answers from all library employees, not only from those who are working with the users. Thus, the paper is also covering a gap in the literature, because many studies regarding digital literacy among librarians included only those who were directly involved with the readers. Third, based on the results of this paper, which describe the general attitude of the librarians towards digitalization, policy-makers and library managers will have a clear perspective of how librarians are viewing digitalization and also how their digital skills can be improved.

In order to properly implement the newest IC&T tools in the library, it is important to understand the technology's influence on libraries and also the librarians' relation with technology. Thus, the purpose of this paper is to identify the way in which library work has been affected by technology and how employees relate to the newest devices and applications used at the workplace. The first objective is to present the functions carried out by librarians in the digital age. The second objective is to point out their attitude towards the digitalization process. The third objective of this research is to identify if the library employees possess the necessary skills in order to use the newest programs and devices.

4. Functions of the digital libraries

Technology should be perceived as a double edged-sword. On one hand, it generates a positive impact, by „ending extreme poverty, reducing maternal and infant mortality and achieving universal literacy" (United Nations, 2020). However, on the other hand, it „can also threaten privacy, erode security and fuel inequality" (United Nations, 2020). Thus, technology should be included beneficially for society. Moreover, the digital librarians articulate the positive aspects of technology if they have the proper instruments and the digital skills.

Through her research, Chrisine Borgman's identifies two distinct roles of the digital library. From the users' perspective, „digital libraries are content collected and organized on behalf of user community" (Borgman, 1999). On the other hand, from the librarians' point of view, „digital libraries are institutions or organizations that provide information services in digital forms" (Borgman, 1999). In the 21st century, librarians are „helping users locate, access, and use the most accurate and reliable information in different formats" (Noh, 2015). In order to be able to perform these roles, librarians ought to possess the proper skills in order to use the most recent technologies. The following two chapters will illustrate the way in which the role of the librarians and the library's functions have been influenced by technology. Then, the way in which librarians perceive the newest technologies will be presented, in order to see if they are able to fulfill their new attributions.

4.1. Digital libraries build inclusive societies

Nations implement strategies and public policies in order to achieve sustainable, inclusive and efficient societies, able to adapt to the constant change of the modern world. For this reason, the UN developed a strategy incorporating more than 10.000 actions and 1000 targets, which can be grouped within 17 broad categories, representing the backbone of the *2030 Agenda for Sustainable Development*.

IFLA (International Federation of Library Associations and Institutions) has promoted the UN's *2030 Agenda for Sustainable Development* since its publication. Through its latest strategy, developed under the slogan „*Sustainable futures for all through knowledge and information"* (IFLA, 2024), IFLA publicly acknowledges that its activities are guided by the UN's goals, with the purpose of „creating bridges and serving the good of societies" (Arahova, 2022), by providing „libraries and library and information professionals with opportunities, arguments and evidence to support progress in their contexts." (Arahova, 2022).

The UN projects that technology will influence multiple socio-economic dimensions. First, it will increase the level of societal inclusion. Young peope will benefit the most. They will improve their academic results, because technology allows them to „learn or exchange information" (Stefan & Șerban, 2020). Second, technology will ease peoples' access to leisure activities, regardless of

their socio-economic status. However, the downside is that not everybody will benefit from technology. Recent studies showed that „socially disadvantaged individuals [...] are those who are disempowered, with less digital competencies and fewer benefits acquired by using the Internet" (Ragnedda, Ruiu & Addeo, 2022). Well-equipped libraries will help the youth to overcome the obstacles generated by the lack of resources. Technology will influence the future of the labor market, driving it towards a green economy, based on „economic activities, infrastructure and assets that allow reduced carbon emissions and pollution, enhanced energy and resource efficiency." (UNEP, 2018). Green economy impacts the whole society, by encouraging social inclusion and equality because it is based on „sharing, circularity, collaboration." (UNEP, 2019). Not only students can benefit from the opportunities provided by a library, but also „faculty and community members" (Feerrar, 2019). By employing the latest technological advancements, libraries will become centers where people can be taught new skills, thus becoming more competitive on the labor market. Moreover, libraries can offer the proper digital infrastructure which would help users not only to prepare, but also to apply for different jobs.

4.2 Libraries as digital information hubs

Each internet connected device leaves a digital footprint, leading to the development of databases containing information regarding any field of work, from construction to food delivery and from energy suppliers to factories producing toys or medicine. All of these data are stocked, not with the purpose of surveilling an individual's or a company's economic activities and personal preferences, but in order to „track and diagnose issues" (United Nations, 2020). Traditionally, libraries have been perceived as depositories of information, due to both its printed and digital resources, which can be used by the public. Libraries will become hubs for digital databases if they will guide their users in accessing international databases and obtaining „empirical insights related to diverse disciplines and research themes" (Dwivedi et al., 2023). Thus, library users will not only obtain data. They will also foresee problems and identify the required solutions, by navigating and extracting the proper information

5. The functions of cybrarians in the fourth industrial revolution

The fourth industrial revolution is a multi-faceted, complex phenomenon. It encompasses changes within the workplace environment which are characterized by the recalibration of the roles of the „physical, technological and human resources" (Leopold, Ratcheva & Zahidi, 2018) areas. However, even though it „has been progressing since the start of the 21st century" (Lee et al., 2018) it has been thoroughly researched by organizations and professionals from only a handful of domains and activities, thus, it is still perceived as „primitive and naïve to many sectors" (Oke & Fernandes, 2020).

People are scared that through digitalization, robots and computer programs will replace human workers. However, the prediction of this dystopian future is unlikely to materialize. Many professions are not disappearing, but rather adapting to the prerequisites of a digitalized society. Here, technology does not replace the employee. It simplifies certain work processes, which consumed time and resources. Machines are „seamlessly integrated into the information network, the business partners and customers" (Xing & Marwala, 2017) in order to improve customer service and production.

Cyber-librarians, shortly, cybrarians, are the librarians who use the latest digital instruments in order to perform their daily tasks. In this paper, the term cybrarian is used to describe the modern-day librarian who is more than a specialist in library science. He is characterized by „flexibility, skepticism, and the ability to foster change, in addition to possessing high-quality technological skills" (Hicks, 2013). The term cybrarian is used to describe a highly specialized librarian. The cybrarian simultaneously fulfills multiple functions, such as those of a „teacher, technology specialist, information consultant and knowledge manager" (Vassilakaki & Moniarou-Papaconstantinou, 2015). He is able to perform activities such as „Bibliographic citation management, E-copyright management, electronic resource management" (Surendher, 2022). Moreover, the cybrarian possesses great communication skills. Thus, he is able to provide the same

quality service, whether he interacts in person with the library user or if he needs to „furnish research and instructional assistance to students and faculty who were unable to come to the library" (Jacobs, 2017). Next, the new roles of the cybrarian in the digital library will be illustrated.

5.1. The cybrarians' functions in a hybrid environment

During the digital age, associated with the transformations generated by the *Fourth Industrial Revolution*, the „functions of librarians may not change to the same extent" (Michnik, 2024) as the ones of other professions. However, they will certainly need to perform new roles, created by the implementation of new technologies or driven by the needs of their users, which require modern tools in order to access a larger quantity of information faster.

In order to clearly understand the evolution of the librarian's profession, we need to differentiate between their role, which is „a social construction influenced by norms and expectations in a specific context" (Michnik, 2024) and their functions, which refer to the „concrete tasks within a particular area" (Michnik, 2024). This distinction proves that the digitalization process does not impact the role of the librarian, that of curating information and guiding library users. However, it emphasizes the technology's influence on the way in which librarians accomplish their duties. Michnik's research proved that the main three functions of a librarian, „the collection development, informative and service" (Michnik, 2024) have changed, due to a paradigm shift generated by the influence of new technologies implemented in the work environment.

One of the most important functions of a librarian is to increase the volume of the library's collection by „identifying, evaluating, describing and cataloging" (Michnik, 2024) new resources. Multiple factors are considered during this process, such as the importance of the topic or the author's and publisher's relevance. The characteristics of the library users such as „age, social and emotional development, intellectual level" (American Library Association, 2018) and their interests are also important. Besides the previously mentioned factors, when selecting digital resources, the librarian also takes into account „technical requirements, licensing and renewal considerations" (Johnson et al., 2012).

Through their informative function, librarians make resources „not only accessible, but also discoverable" (Grabowsky, 2015). Nowadays, they not only inform readers about the library's physical resources, but also of the multiple digital ones. First, there are, digital libraries and scientific databases which allow readers to access articles and books online. Second, the digital archives, encompass scanned manuscripts, photographs, letters, articles and other documents grouped in separate collections. In order to accomplish their informative function, librarians need to be sure that they can properly help the users in accessing the new digital resources.

Librarians also provide various services, such as references and bibliographies sent through mail, exclusively online. Others, including training sessions, take place both online and in-person. Moreover, the majority of the libraries have implemented a digital system, enabling the reader to loan books and access reading rooms using only a library permit. In some cases, they can do it online, without the assistance of the library employees.

Thus, even though the librarians' functions remained the same, some of their tasks were transformed by the digitalization process which occurs in libraries. However, not all of the tasks imply the use of new IT&C technologies. Thus, we cannot say that the library has transitioned all of its activities in the digital realm. The modern library is rather a hybrid entity, encompassing not „only print resources with electronic resources" (Stachokas, 2020). It also provides services which require both face to face interaction and the use of digital skills.

6. Types of libraries

The library preserves, manages, disseminates and offers „access to knowledge, information, lifelong learning through a range of resources and services" (Koontz & Gubbin, 2010). Libraries can be differentiated based on different types of users. IFLA differentiates between at least six

distinct categories of libraries. First, there are the *National Libraries*, which are responsible with „acquiring and conserving copies of all relevant documents published" (IFLA, 2017). Second, there are the *Academic Libraries* which „cover the information needs of learning and research" (IFLA, 2017). Public Libraries are similar to the Academic Libraries, but they cover the information needs of a broader group of people, which are part 1of a local or regional community. It is usually financed, in whole or in part, „from public funds" (IFLA, 2017). *School Libraries* are very similar with the *Academic Libraries.* The main difference between them is that school libraries cover the need of the „pupils and teachers of such a school" (IFLA, 2017). The *Community Library* is similar with the Public Library; in the sense it serves people from a certain area. The main difference is that the Community Library generally receives funding from entities such as „community groups, charities, NGOs" (IFLA, 2017) and not from the local authorities. Beside the five types of libraries already mentioned, there are several more, such as „special libraries, government libraries, medical libraries, industrial and commercial libraries and other libraries" (IFLA, 2017) which cannot be integrated into any category. This research focusses on the attitudes towards digitalization of the employees from University, School and Public (County) Libraries.

7. Methodology

The quantitative research's purpose is to describe the librarians' perception of the digitalization process taking place at their workplace, through the implementation of the latest IT&C technologies.

The descriptive research, in which „the researcher observes and then describes what was observed" (Babbie, 2008) comprises two distinct stages. First, the researcher collects data which reflect the respondent's attitude towards the paper's subject. Second, the researcher analysis these data, using different statistical instruments and procedures. This research is also comparative, because there are respondents from three (School, County and University) distinct types of libraries. Their answers are compared in order „to examine differences" (Ruth, 2021) between their attitude towards the digitalization process of the library. Thus, closed-end questions were used, because additional, in-depth information, would not have been useful at this point.

The research method used in this study was the sociological enquiry, which was applied through the survey. The data were collected online, through an auto-administrated questionnaire which was accessed by the respondents through a Google-Forms link.

Only closed questions were included for multiple reasons. First, because we did not want to emphasize the main differences from the respondents' work environment, but their attitude towards digitalization. Consequently, the answers' consistency had to be maintained. Second, closed-end questions are easier to process, because respondents do not need to „formulate responses in their own words" (Scholz, Dorer & Zuell, 2021). This way, the respondent is not overwhelmed by a question he doesn't understand, and he will not provide irrelevant answers. Moreover, responses difficult to encode will be avoided, as they might impact the paper in a negative way. For example, when the respondent provides „more than one answer" and the researcher does not know which of the answers to include in the analysis. Third, it has been scientifically proven that, open-ended questions are leading to an „increase in survey break offs and item nonresponse" (Hadler, 2023).

Neither the National Statistical Institute nor the ABR (Association of Romanian Librarians) did not have a complete list of all the libraries, grouped according to the typologies included in this research. Thus, the method of *purpose sampling* was used, which is formed „by including in the sample respondents according to the needs of the study" (Mitulescu, 2011). However, this sampling method enabled the authors to gain access to a significant number of respondents. They managed to gather more respondents, „allowing the compilation of richer amounts of data" (Robinson, 2024). Thus, they succeeded to have a clear picture of the librarians' attitudes towards the digitalization process. In order to clearly differentiate between different types of respondents, four sociodemographic variables were included: gender (male/female), education (secondary/ university/PhD), age (18-29/30-39/40-49/50-59/over 60) and work experience (<1 year/1-5/5-10/10-20/over 20 years).

8. Data analysis

In general, most of the library employees are taking part almost daily in activities requiring IT competencies. However, while more than half of the employees from the University (56%) and County (53%) Libraries answered that they conduct activities which require IT competencies very often, only a third of their colleagues from the School Libraries (38%) answered that they engage in the same type of activities very often. Moreover, almost a quarter of the employees from the School Libraries (23%) provided a neutral answer *Neither rarely, nor often*, as shown in Figure 1.

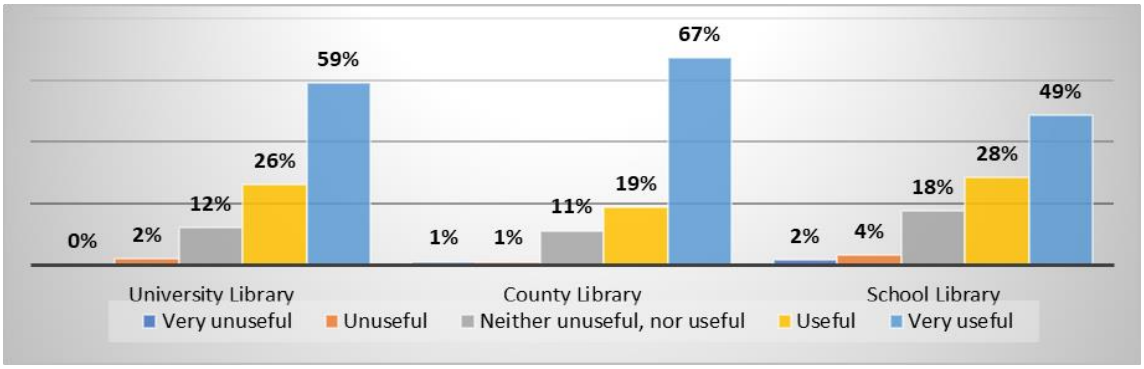

Figure 1. Perception of the utility of the digitalization process in your library
(Based on the data collected through the survey)

Simultaneously, the rate of the neutral answer was lower among the University (15%) and County (16%) Library employees. Interestingly, the percentage of employees which rarely engage in activities that require digital skills is similar. Not even 10% of the employees from University (8%), County (6%) and School (9%) mentioned that they engage *very rarely* or *rarely* in digital activities. There are two possible explanations for this situation. First, the employees from School Libraries do not need engage in activities which require digital skills as much as their colleagues from University and County libraries. School Libraries have fewer employees, which mostly interact with the readers. University and County Libraries have departments which only provide digital services. At the same time, University and County Libraries have employees, such as those from maintenance or security who do not need to engage with technology in order to conduct their daily activities.

Even though not all of the librarians engage daily in activities which require IT competences, in general, their perception towards the digitalization process is a rather positive one. Only few are not satisfied with the digitalization process. The most dissatisfied are those working in School Libraries (6%), as shown in Figure 2.

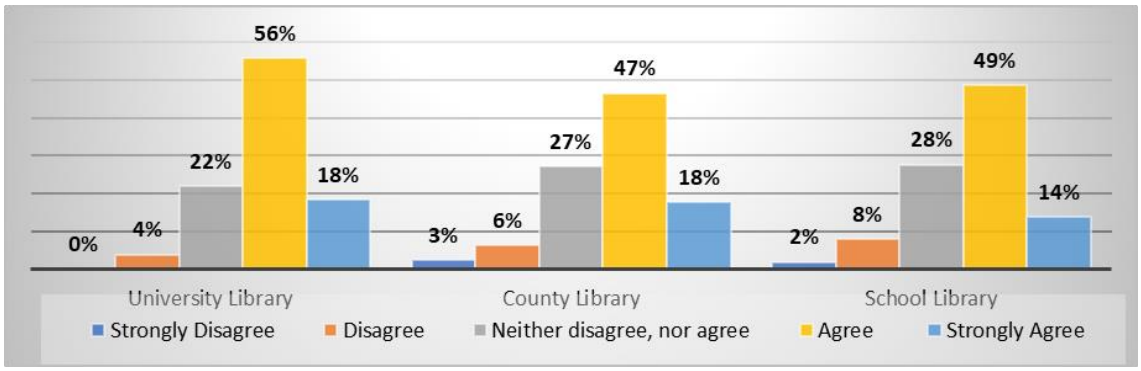

Figure 2. Perception of the level of possessed digital competences
(Based on the data collected through the survey)

They are three times less content with the digitalization process than those in County (2%) or University Libraries (2%). However, there are two aspects that need to be highlighted. First, half (50%) employees from School Libraries and two-thirds among those from University Libraries (59%) and County Libraries (67%) are very satisfied with the benefits of the digitalization process.

The second aspect which needs our attention is the percentage of people who chose the neutral answer. The highest rate of neutral answers is found among School Library Employees (18%). There are two explanations for this phenomenon. On one hand, in some school libraries, the digitalization process is not powerful enough to be clearly observed. On the other hand, they could have been afraid to provide a negative answer, and thus they decided to give a neutral one instead. Moreover, the number of School Libraries is greater than that of the County or University Libraries. Thus, the digitalization process does not occur simultaneously in all the School Libraries in Romania. The chart in Figure 3 illustrates that most employees, 74% of the University librarians, 65% of the County librarians and 63% of the School librarians believe that they are skilled enough to use the new IT&C technologies. Only 20% of the University Libraries employees chose the neutral response option „*Neither disagreement, nor agreement*", as opposed to almost 30% of the County or 28% of the School Libraries employees.

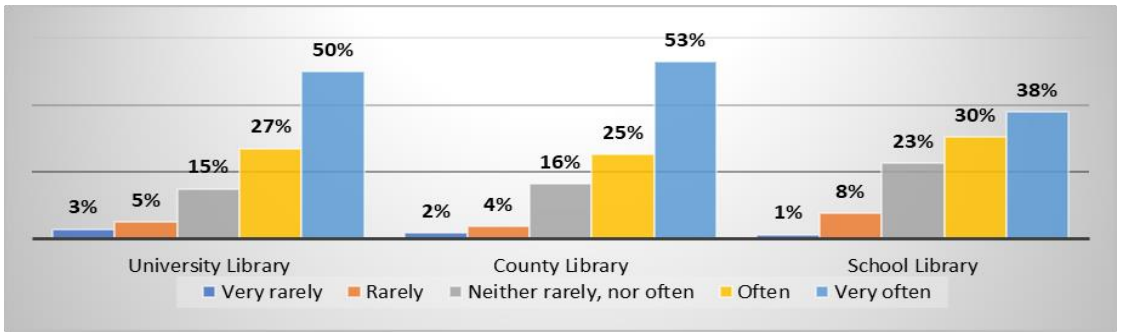

Figure 3. Frequency of the use of digital skills at work
(Based on data collected through the survey)

These results illustrate that the County and University Librarians are better prepared to use the new IT & C devices, for multiple reasons. First, because County and University Libraries carry out more activities which require the use of the new technologies, such as scanning or indexing books or other materials. On the other hand, there are more auxiliary employees in the University and County Libraries, such as people within the IT department, who utilize the new IT&C technologies on a daily basis. Thus, School Librarians are not less prepared to use the IT&C technologies. They are rather less required by their job to do so.

In general, library employees prefer to communicate suggestions through digital channels such as the online form or email address. More than two thirds of the employees from all three types of libraries preferred to communicate suggestions through digital means rather than using traditional means, such as *physical mail box* or *book of recommendations*. Most people who prefer the book of recommendations work in School Libraries (11%). Fewer University (6%) and County (4%) librarans use the same means of communications, as it is illustrated in Figure 4.

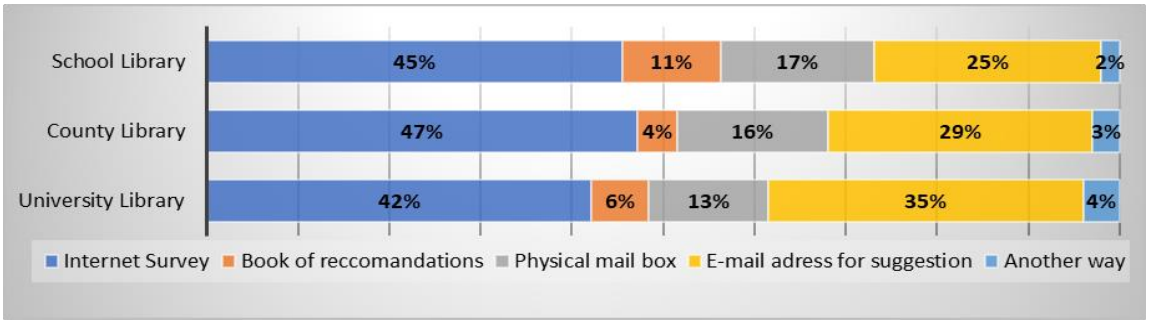

Figure 4. Best way to collect suggestions from library employees
(Based on data collected through the survey)

At the same time, most employees who prefer to send emails work in University Libraries (35%), while only a quarter of School Librarians (25%) opted for this. Interestingly, significant differences were not recorded for all of the answers. Almost half of the School (45%), County (47%) and University (42%) Libraries employees consider that the *internet survey* is an appropriate

option to submit suggestions. Second, less than a fifth of the employees from all the types of libraries (School (17%), County (16%) and University Library (13%) perceived that the *physical mail box* was a proper channel to collect employee suggestions.

Another statistical procession included in this research was the CHI-Square Test, which aims at analyzing exclusively non-numerical variables, such as nominal or ordinal ones, in order to see if „there is a relationship between two categorical variables" (Kremelberg, 2011). The Chi-Square Test shows data distribution, by illustrating „how each of the groups performed in the study" (McHugh, 2013). There was also included a test which measures the maximum likelihood ratio of the Chi-Square, according to which „80% of the cells have expected values of 5 or more" (McHugh, 2013). Afterwards, the value of the *Pearson Chi-Square* was analyzed and used to „validate the nominal 0.05 significance level under the null hypothesis". (Johnson et al., 2015). Second, the authors also looked at the Phi and Cramer's V tests, which „are alternatives to the correlation coefficient" and illustrate the direction and intensity of the relationship between two non-numerical variables. (Kishore & Jaswal, 2023).

Each type of answers was analyzed separately. The dependent variables analysed, included items which measured respondent's attitude towards the digitalization process, such as *Perception of the utility of the digitalization process*, *Perception of the level of possessed digital competences*, and *Frequency of the use of digital skills at work.* For the independent variables, sociodemographic items were included, such as gender, age, education and years of work experience.

For school-librarians' attitude towards the usefulness of the digitalization process, only *Gender* and *Education* registered signifficant values of the Cramer V test, for all of the three dependent variables.

For county librarians, the strongest associations of the dependent variables were with gender and education. The value of the Cramer V test exceeded .700. Age was the independent variable which registered the lowest values of the Cramer V test, all below .500. Gender illustrates an interesting situation, because, for the dependent variables, *Frequency of the use of digital skills* and *Perception of the level of possessed digital competences,* it registered lower levels of association. However, the association was stronger for the variable *the digitalization's utility*, and education registered a small, yet significant value of .547 for the Cramer V test.

For university employees, the association between dependent and independent variables are lower than in the previous analysis. The value of the Cramer V test is lower than the .500 for all of the cases. However, it is important to underline the fact that the association is positive in all of the cases.

9. Discussions

The results are surprising, because they illustrate that, the differences between the employees from the three types of libraries are less significant than initially expected. This reflects, on a certain level, the successful implementation of the digitalization policies.

Through these findings, new policies might be drafted in order to improve the digital skills of the School Librarians. It also addresses the issue of the human resources. Policy makers need to think of ways to convince younger people to become librarians. Another possibility is to draft courses, meant to improve the digital skills. This paper also has practical implications, because it illustrates the way in which librarians prefer to communicate. The results of the paper are somewhat similar to those which analyzed the attitudes of the academic librarians towards digitalization. The main difference is that other socio-demographic variables were included.

This paper's limitations stem from the sampling procedure and from the general stance that was adopted. The difference between the sample sizes also impacted our results. Digitalization comprises multiple procedures. Moreover, for personal reasons, some respondents might not have provided true answers.

In the future, the focus could be on a certain aspect of the digitalization process, and gain in-

depth information. Other research methods, such as interviews or focus-groups, could also be applied in order to research the use of certain technologies, as was the case of the papers written by Arata (2022) and Lin, Chiu and Lam, (2022). The authors' future quantitative research will include more socio-demographic items and also more numerical variables, in order to be able to conduct multiple statistical procedures, such as Binary Regression and Anova.

10. Conclusions

Through this paper, we illustrated the way in which the functions of the librarians changed due to technological evolution. Moreover, we managed to illustrate the librarians' attitudes towards the digitalization process.

Recently, libraries became hybrid institutions which provide both traditional and digitalized services. Librarians seem to be familiarized with the use of digital instruments and, overall, have a positive attitude towards the digitalization process from their workplace.

University and County Librarians tend to be more open towards the use of the newest digital tools than their colleagues from School Libraries. This difference of perception stems from the fact that the digitalization process did not occur simultaneously in all libraries.

Another interesting finding is that the independent variable Gender and Education tend to have a stronger association with the dependent variables than Age and Work Experience.

REFERENCES

American Library Association (2018) *Selection Criteria*. https://www.ala.org/tools/challengesupport/selectionpolicytoolkit/criteria [Accessed 19 May 2025].

Arahova, A. (2022) The Role of IFLA: Serving Libraries, Creating Bridges and Serving Societies. *Access: An International Journal of Nepal Library Association*. 1(1), 128–130. doi:10.3126/access.v1i1.46623

Arata, H. (2022) *A New Mechanism for Dialogue: Virtual Reality Programs in Academic Libraries*. https://programminglibrarian.org/articles/new-mechanism-dialogue-virtual-reality-programs-academic-libraries [Accessed 9 August 2025].

Babbie, E.R. (2008) *The basics of social research*. 4th ed. Belmont, California: Thomson/Wadsworth.

Banciu, D. (2001) *Informatizarea bibliotecilor*:concept și bune practici. București. Editura Universității din București.

Borgman, C.L. (1999) Discussion. *Information Processing & Management*. 35(3), 227–243. doi:10.1016/s0306-4573(98)00059-4.

Dwivedi, Y.K., Sharma, A., Rana, N.P., Giannakis, M., Goel, P. & Dutot, V. (2023) Evolution of artificial intelligence research in Technological Forecasting and Social Change: Research topics, trends, and future directions. *Technological Forecasting and Social Change*. 192, 122579, 1–17. doi:10.1016/j.techfore.2023.122579.

Feerrar, J. (2019) Development of a framework for digital literacy. *Reference Services Review*. 47(2), 91–105. doi:10.1108/rsr-01-2019-0002.

Gabor, E., Oancea, M. & Pripp, V. (2023) The Impact of Deep Fakes in the Age of Populism and Post-Democracy. *Revista de Științe Politice. Revue des Sciences Politiques.* 80(4), 32–46.

Grabowsky, A. (2015) The Impact of Open Access on Collection Management. *Virginia Libraries*. 61(1), 17-22. doi:10.21061/valib.v61i1.1325.

Grazia Melchionda, M. (2007) Librarians in the age of the internet: their attitudes and roles. *New Library World*. 108(3/4), 123–140. doi:10.1108/03074800710735339.

Hadler, P. (2025) The Effects of Open-Ended Probes on Closed Survey Questions in Web Surveys. *Sociological Methods & Research*. 54(1), 106-139. doi:10.1177/00491241231176846.

Hicks, D. (2013) *Technology and Professional Identity of Librarians: The Making of the Cybrarian*. Hershey, PA: IGI Global.

IFLA (2017) *IFLA Library Map of the World*. https://librarymap.ifla.org/data-glossary/library [Accessed 19 May 2025].

IFLA (2024). *IFLA Strategy 2024-2029*. *IFLA.* https://repository.ifla.org/items/300159c9-9973-433e-9ad5-3e69f4ea4832/full [Accessed 15 May 2025].

IFLA (2025) *Powering Sustainable Development.* https://www.ifla.org/units/sustainable-development/ [Accessed 23 May 2025].

Jacobs, W. N. (2010) Embedded Librarianship is a Winning Proposition. *Education Libraries*, 33(2), 3–10. doi:https://doi.org/10.26443/el.v33i2.290.

Johnson, S., Evensen, O.G., Gelfand, J., Lammers, G., Sipe, L. & Zilper, N. (2012) *Key Issues for E-Resource Collection Development: A Guide for Libraries*. [online] *IFLA.com*, IFLA, pp.1–32. https://www.ifla.org/wp-content/uploads/2019/05/assets/acquisition-collection-development/publications/electronic-resource-guide-en.pdf [Accessed 20 May 2025].

Johnson, W.D., Beyl, R.A., Burton, J.H., Johnson, C.M., Romer, J.E. & Zhang, L. (2015) Use of Pearson's Chi-Square for Testing Equality of Percentile Profiles across Multiple Populations. *Open Journal of Statistics*. 5(5), 412–420. doi:10.4236/ojs.2015.55043.

Kishore, K. & Jaswal, V. (2023) Statistics Corner: Chi-squared Test. *Journal of Postgraduate Medicine, Education and Research*. 57(1), 40–44. doi:10.5005/jp-journals-10028-1618.

Klein, V.B. & Todesco, J.L. (2021) COVID-19 crisis and SMEs responses: The role of digital transformation. *Knowledge and Process Management*. 28(2), 117–133.

Koontz, C. & Gubbin, B. (2010) *IFLA Public Library Service Guidelines*. 2nd, completely revised edition. Berlin/New York: De Gruyter Saur.

Kremelberg, D. (2011) *Practical statistics:a quick and easy guide to IBM SPSS statistics, STATA, and other statistical software*. Los Angeles, Sage Publications.

Lee, M., Yun, J., Pyka, A., Won, D., Kodama, F., Schiuma, G., Park, H., Jeon, J., Park, K., Jung, K., Yan, M.-R., Lee, S. & Zhao, X. (2018) How to Respond to the Fourth Industrial Revolution, or the Second Information Technology Revolution? Dynamic New Combinations between Technology, Market, and Society through Open Innovation. *Journal of Open Innovation: Technology, Market, and Complexity*. 4(3), 1–24. doi:10.3390/joitmc4030021.

Leopold, T.A., Ratcheva, V. & Zahidi, S. (2018) *The Future of Jobs Report*. [online] *World Economic Forum*. pp. 1–147. https://www3.weforum.org/docs/WEF_Future_of_Jobs_2018.pdf [Accessed 20 May 2025].

Lin, C.-H., Chiu, D.K.W. & Lam, K.T. (2022) Hong Kong academic librarians' attitudes toward robotic process automation. *Library Hi Tech*. 42(3). doi:10.1108/lht-03-2022-0141.

Lordan, G. (2019) *What Work Disappears? Automation and the Changing Nature of Work*. [online] *Publications Office of the EU*, pp.1–35. https://op.europa.eu/en/publication-detail/-/publication/1246be88-329a-11ea-ba6e-01aa75ed71a1/ [Accessed 20 May 2025].

McHugh, M.L. (2013) The Chi-square Test of Independence. *Biochemia Medica*. 23(2), 143–149. doi:10.11613/bm.2013.018.

Michnik, K. (2024) *Library Career Management in the Digital Age*. Elsevier.

Milica, I. (2020) Biblioteca la răscruce. *Biblioteca. Revista de bibliologie și știința informării.* 5, 3–5.

Mitulescu, S. (2011) *Metode de cercetare în ştiinţele sociale*. Pro Universitaria.

Noh, Y. (2015) Imagining Library 4.0:Creating a Model for Future Libraries. *The Journal of Academic Librarianship*. 41(6), 786–797. doi:10.1016/j.acalib.2015.08.020.

Oke, A. & Fernandes, F.A.P. (2020) Innovations in Teaching and Learning: Exploring the Perceptions of the Education Sector on the 4th Industrial Revolution (4IR). *Journal of Open Innovation:Technology, Market, and Complexity*. 6(2), 1–22. doi:10.3390/joitmc6020031.

Ragnedda, M., Ruiu, M.L. & Addeo, F. (2022) The self-reinforcing effect of digital and social exclusion: The inequality loop. *Telematics and Informatics*. 72, 1–13. doi:10.1016/j.tele.2022.101852.

Ramzan, M. & Singh, D. (2010) Factors affecting librarians' attitudes toward IT application in libraries. *The Electronic Library*. 28(2), 334–344. doi:10.1108/02640471011033675.

Robinson, R.S. (2024) Purposive Sampling. *Springer eBooks*. 1(1), 5645–5647. doi:10.1007/978-3-031-17299-1_2337.

Ruth A., W. (2021) *Comparative Sociology | EBSCO*. [online] EBSCO Information Services, Inc. | www.ebsco.com. https://www.ebsco.com/research-starters/sociology/comparative-sociology.

Scholz, E., Dorer, B. & Zuell, C. (2021) Coding Issues of Open-Ended Questions in a Cross-Cultural Context. *International Journal of Sociology*. 52(1), 1–19. doi:10.1080/00207659.2021.2015664.

Stachokas, G. (2020) *The role of the electronic resources librarian*. Cambridge, MA: Chandos Publishing, an imprint of Elsevier.

Stefan, V. & Șerban, A.M. (2020) *Insights Into Social Inclusion and Digitalisation*. [online] *The Council of Europe*, pp.1–39. https://pjp-eu.coe.int/documents/42128013/47261953/089620-Insights-SID-WEB.pdf/f7e7c6ae-bb7d-d469-27de-4b67ba986484 [Accessed 14 May 2025].

Surendher, K. (2022) Emerging Library Technology Trends-A Critical Review. *Journal of Research & Development*. 13(8).

Tammaro, A.M. (2007) A curriculum for digital librarians: a reflection on the European debate. *New Library World*. 108(5/6), 229–246. doi:10.1108/03074800710748795.

UNEP (2018) *Green Economy*. [online] UN Environment Programme. https://www.unep.org/regions/asia-and-pacific/regional-initiatives/supporting-resource-efficiency/green-economy [Accessed 15 May 2025].

UNEP (2019) *What is an 'Inclusive Green Economy'?* [online] UNEP - UN Environment Programme. https://www.unep.org/explore-topics/green-economy/why-does-green-economy-matter/what-inclusive-green-economy [Accessed 19 May 2025].

United Nations (2020) *The Impact of Digital Technologies*. [online] United Nations. https://www.un.org/en/un75/impact-digital-technologies [Accessed 12 May 2025].

Universitatea Tehnică din Cluj-Napoca (2023) *Raport de analiză a practicilor și politicilor relevante în domeniul european*. București: Autoritatea pentru Digitalizarea României. pp.1–160.

Vassilakaki, E. & Moniarou-Papaconstantinou, V. (2015) A systematic literature review informing library and information professionals' emerging roles. *New Library World*. 116(1/2), 37–66. doi:10.1108/nlw-05-2014-0060.

Xing, B. & Marwala, T. (2017) Implications of the Fourth Industrial Age for Higher Education. *The Thinker*. 73(3). doi:10.25073/0866-773x/87.

Yeasmin, R. (2014) *Librarians' Attitude Towards Library Digitization*. [online] University of Dhaka: Department of Information Science and Library Management. http://reposit.library.du.ac.bd:8080/xmlui/bitstream/handle/123456789/815/Rumana%20Yeasmin.pdf?sequence=1&isAllowed=y [Accessed 12 August 2025].

Mireille RĂDOI is the General Director of the Carol I Central University Library and the Coordinator of the *Business Intelligence* Master's program at the Bucharest University of Economic Studies (ASE). She holds a Bachelor's degree in Psychosociology, a Master's degree in Political Science, and a Ph.D. in Political Science. Her expertise covers digitalization, digital resource management, knowledge management and information security, acquired through roles in both the public and private sectors. She has held key positions, including Governmental Advisor and Romania's representative to ENISA – the European Union Agency for Cybersecurity. She is the author and co-author of over 60 publications and has led numerous digitalization projects, including *Lib2Life* and the *Digital Library for Romanians Worldwide*. She has been invited to international conferences such as the Annual Convention of the International Studies Association, UNESCO GUNiHumanities 2018, and multiple IFLA annual conferences.

Mireille RĂDOI este Director General al Bibliotecii Centrale Universitare „Carol I” și coordonator al Masterului *Business Intelligence* la ASE București. Este licențiată în Psihosociologie, absolventă al unui master în Științe Politice și doctor în Științe Politice. Expertiza sa acoperă digitalizarea, managementul resurselor digitale, managementul cunoștințelor și securitatea informațiilor, dobândită prin activități în sectorul public și privat. A ocupat funcții importante, inclusiv consilier guvernamental și reprezentant al României la ENISA- Agenția Uniunii Europene pentru Securitate Cibernetică. Este autoare și coautoare a peste 60 de lucrări și a condus numeroase proiecte de digitalizare, printre care *Lib2Life* și *Biblioteca digitală pentru românii de pretutindeni*. A fost invitată la conferințe internaționale precum Convenția Anuală a Asociației de Studii Internațioanle, UNESCO GUNiHumanities 2018 și multiple conferințe IFLA.

Marian OANCEA is a Lecturer at the Faculty of Business Administration in Foreign Languages, Bucharest University of Economic Studies (ASE), where he teaches *Digital Business Models, Fundraising for Business, Leadership*, and *Digital Transformation.* He holds a Bachelor's degree in Political Sciences, a Master's degree in International Relations from ASE Bucharest, and a Ph.D. in Political Science, from the University of Bucharest. His professional experience spans both the public and private sectors, with expertise in digitalization, political science, and business model innovation. Since 2021 he has been heading the Research, Innovation and IT Department at the Carol I Central University Library, and he has served as a digitalization advisor to the Romanian government as well as Chief of Staff at the Romanian Authority for Digitalization.

Marian OANCEA este lector la Facultatea de Administrarea Afacerilor în Limbi Străine, ASE București, unde predă *Modele Digitale de Afaceri, Strângere de Fonduri pentru Afaceri, Leadership și Transformare Digitală.* Este licențiat în Științe Politice, absolvent al unui master în Relații Internaționale și doctor în Științe Politice la Universitatea din București. Experiența sa profesională acoperă atât sectorul public, cât și cel privat, iar expertiza sa vizează digitalizarea, științele politice și inovarea modelelor de afaceri. Din 2021 conduce Departamentul de Cercetare, Inovare și IT al Bibliotecii Centrale Universitare „Carol I” și a fost consilier pe probleme de digitalizare în Guvernul României și director de cabinet la Autoritatea pentru Digitalizarea României.

Vladimir PRIPP is a Ph.D. candidate at the Doctoral School of Sociology, University of Bucharest, where he teaches seminars *Sociology of the Victim, and Classical and Modern Sociological Theories.* He holds a Bachelor's and a Master's degree from the Faculty of Sociology and Social Work, University of Bucharest. His research interests include immigration, digitalization, information management, and trust in public institutions. He has participated in national and international conferences and has benefited from Erasmus grants at Umeå University (Sweden), and the University of Nicosia (Cyprus). Since 2022 he has been a Research Assistant at the Carol I Central University Library.

Vladimir PRIPP este doctorand la Școala Doctorală de Sociologie a Universității din București, unde susține seminariile *Sociologia Victimei, Teorii Sociologice Clasice și Moderne*. A absolvit studiile de licență și master în cadrul Facultății de Sociologie și Asistență Socială, Universitatea din București. Interesele sale de cercetare includ imigrația, digitalizarea, managementul informațiilor și încrederea în instituțiile publice. A participat la conferințe naționale și internaționale și a beneficiat de burse Erasmus la Universitatea din Umeå (Suedia), și Universitatea din Nicosia (Cipru). Din 2022 este asistent de cercetare la Biblioteca Centrală Universitară „Carol I”.

Bogdan SAFTIUC is a Ph.D. candidate at the Bucharest University of Economic Studies. He has a solid academic and professional background in Business Administration. His research focuses on the digitalization’s impact on leadership and organizational culture. His work examines how digital transformation shapes leadership dynamics, decision-making process, and organizational values within institutions. He is passionate about understanding the evolving role of leaders in the digital era and the strategic integration of technology in organizational settings. He combines theory with practice, providing insights that support sustainable digital innovation and cultural adaptability, contributing to the development of leadership studies and modern managerial thinking.

Bogdan SAFTIUC este doctorand la Academia de Științe Economice din București. Are o pregătire academică și profesională solidă în domeniul Administrării Afacerilor, iar cercetările sale se concentrează pe impactul digitalizării asupra leadership-ului și culturii organizaționale. Lucrările sale analizează modul în care transformarea digitală influențează dinamica leadership-ului, procesul decizional și valorile organizaționale din cadrul instituțiilor. Este pasionat de înțelegerea evoluției rolului liderilor în era digitală și de integrarea strategică a tehnologiei în mediile organizaționale. Bogdan Saftiuc îmbină teoria cu practica, oferind perspective care să sprijine inovația digitală sustenabilă și adaptabilitatea culturală, contribuind astfel la dezvoltarea studiilor de leadership și a gândirii manageriale moderne.